15 August 2022

Ryan MacDougall
117 Centrepointe Drive, Suite 300
Ottawa, ON K2G 5X3

Subject: **4386 Rideau Drive, Manotick – Headwater Drainage Features Review and Assessment**

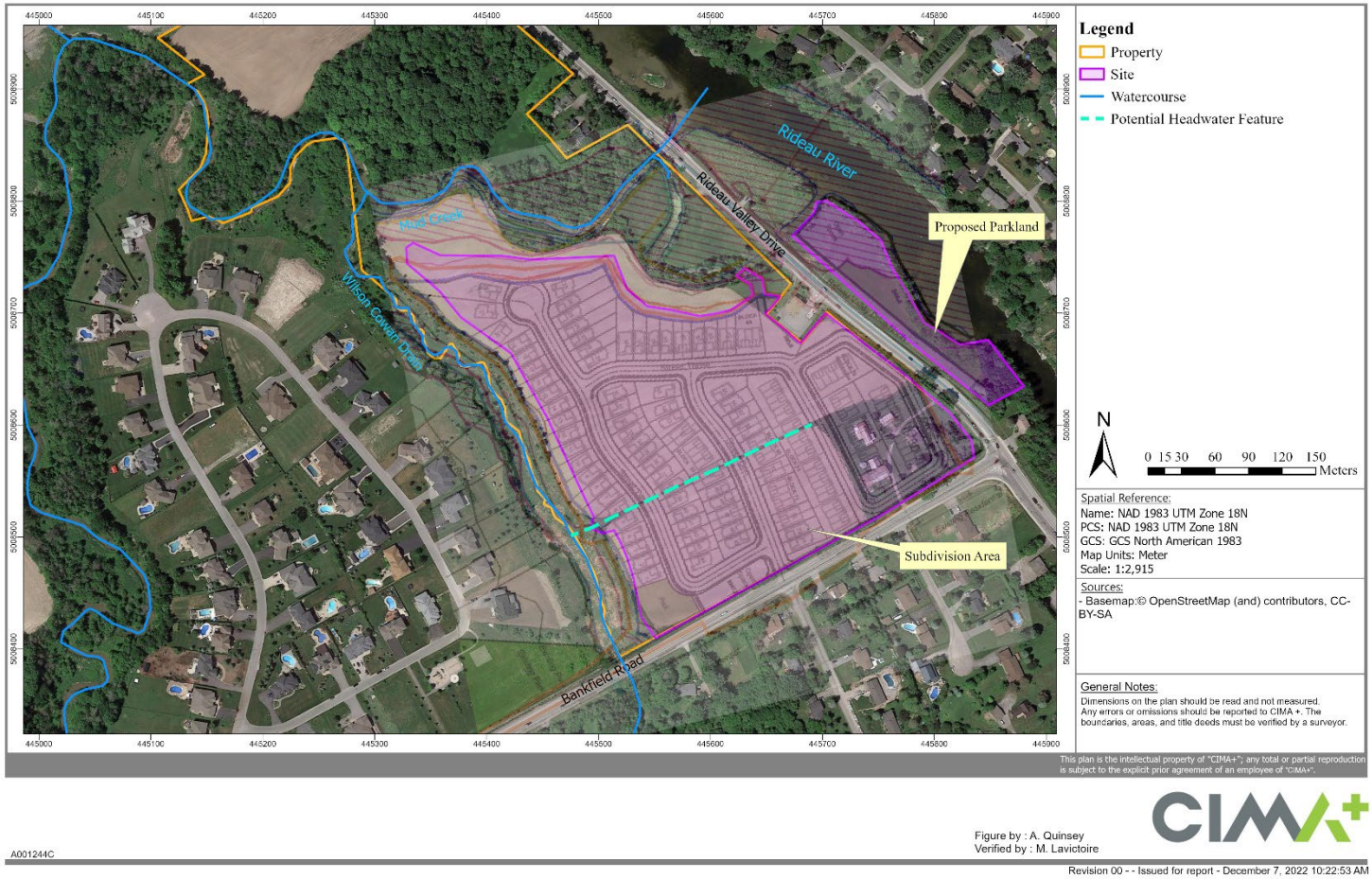
Mr. MacDougall,

CIMA+ was retained by Uniform Developments, hereafter referred to as the proponent, to prepare an Environmental Impact Statement (EIS). a Tree Conservation Report (TCR), and a Headwater Drainage Features Assessment Report (HDFR). All three reports are stand alone documents, however the pertinent information from each has been included in the EIS. The following memo summarizes the details of the methods and results from the Headwater Drainage Features Assessment (HDFA).

The proponent owns two properties along Rideau Valley Drive; 4386 Rideau Valley Drive on the west side, and another parcel on the east (along the Rideau River with no civic address) (Figure 1). They are proposing a residential subdivision on a portion of the 4386 Rideau Valley Drive property and to make improvements to access to the parcel along the Rideau River to create a parkland. Both parcels are in part of Lot 1, Concession 1, of the Geographic Township of Nepean. There were no potential headwater drainage features on the parkland parcel.

4386 Rideau Valley Drive is situated northwest of the intersection of Rideau Valley Drive and Bankfield Road (Figure 1). This parcel is split into two by Mud Creek. It is the portion of to the south of Mud Creek that is proposed for development. That part of the property is also bordered on its west side, by the Wilson Cowen Municipal Drain. Both of those features are larger systems, and Mud Creek is not considered headwaters. Wilson Cowan Municipal Drain may meet the catchment area as per the definition of a headwater features, however the proponent identified both of these named features early in their process and designed the subdivision plan to avoid direct impact (setback recommendations are in the EIS). This left one potential HDF that would be impacted, one that was situated between two agricultural fields and directed flow towards Wilson Cowan Municipal Drain (Figure 1). This is the feature that is assessed herein.

Figure 1: Location of Property and Potential Headwater Drainage Feature



METHODS

The following Headwater Drainage Feature Assessment Report involved the evaluation of the site's headwater drainage features based on the guidelines outlined in the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (here after referred to as the Guidelines) (prepared by Credit Valley Conservation Authority and Toronto and Region Conservation, revised July 2014). The Guideline is divided into three parts.

- Part 1 - Evaluation and various suggested study designs/methods
- Part 2 - Classification of features
- Part 3 - Management Recommendations.

As per the definition of the catchment area for a headwater in this guideline and the relevant *Ontario Stream Assessment Protocol* (OSAP) module, the catchment must be at least 2.5 ha and less than 1000 ha (or <10 km^2).

As is noted below, sampling was discarded once the first site visit was completed as it was determined that there was no habitat to describe or sample.

Results - Part 2 – Classification of Features

The feature length was estimated to be roughly 200 m and the drainage area was unknown. It was anticipated to flow from east to west into the Wilson Cowan Municipal Drain. The first visit was completed on April 5, 2022 (details on the site investigations dates, time and conditions are provided in Appendix A). The snow was gone from the site and some water was present in the ploughed fields. While the visit occurred early in the season, the feature was dry. There were no pockets of water dip netting. Since little rain had fallen in the days prior to the first visit, the flow conditions were re-assessed on April 11, 2022 after a significant rain event (31.5 mm and 2.9 mm of rain fell in the Ottawa area on April 7 and 8, 2022 (www.climate.weather.gc.ca). Again, it was confirmed that there was no flowing water or standing water in feature. The feature itself best met the definition of a vegetated swale (no sorting of substrate) but it was not continuous, in that there was a wide section (without a culvert) that was ploughed through (see **Photo 3**). Further, no indication of flow or channel could be found connecting this feature to the Wilson Cowan Municipal Drain. The was no riparian habitat, as the agricultural uses (row cropping) was right up to the edge of the feature.

Table 1: Summary of Results

Function	Results	Classification
MODIFIERS: Feature is ploughed through; catchment area may be <2.5ha		
Hydrology	Swale (7) Dry (1) – April 5 and 11, 2022	Limited
Riparian	Ploughed field (both sides)	Limited
Fish and Fish Habitat	Not really applicable, no water contribution to downstream habitat	Contributing/n/a
Terrestrial Habitat	Swale (7) Dry No corridor function	Limited/n/a

Photo 1: Looking upstream, towards the east, along the feature (April 5, 2022)

Photo 2: After moving vegetation aside, the lack of water was confirmed (April 5, 2022)

Photo 3: Section that was ploughed (looking downstream towards Wilson Cowan M. D.) (April 11, 2022)

Photo 4: Looking north, across the slope of Wilson Cowan Municipal Drain, where the headwater feature would have flowed (no connection found in vegetation) (April 11, 2022)

Discussion - Part 3 – Management Recommendations

The Guidelines provides six management categories: Protection, Conservation, Mitigation, Maintain Recharge, Maintain/ Replicate Terrestrial Linkage, and No Management Required. It also provides general recommendations for each. For this project, the feature that may be impacted was found to fall under No Management Required and the following is noted:

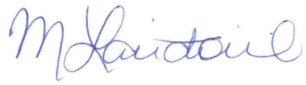
- Catchment area may be <2.5 ha, the adjacent agricultural fields were flat with ponding. Difficult to visualize the catchment area. If so it would not meet the minimum requirement for assessment.
- There was no channel carving and no contributing water to downstream habitats.
- Portion, towards the downstream end, was ploughed through

Based on the above, the No Management Recommendation option is the best fit and no further assessment of this headwater feature is required.

We trust that this memo will meet your requirements. Should you have any questions or comments, please contact the undersigned.

Sincerely,

CIMA+



Michelle Lavictoire,
Senior Biologist / Senior Project Manager

Reference

Evaluation, Classification and Management of Headwater Drainage Features Guideline. Toronto and Region Conservation Authority and Credit Valley Conservation, TRCA Approval July 2013 (Finalized January 2014).

A

Appendix A
Site Visit Dates and Conditions

Table 2: The site investigations primarily occurred in early April

Date	Time (h)	Staff	Air Temperature (Min-Max) °C*	Cloud Cover (%) Beaufort Wind Scale [Descriptor (scale)]	Total Rainfall (mm) 7 days prior to visit*	Water Level Conditions ***	Purpose
April 5, 2022	1400-1500	S. Lafrance A. Quinsey	12 (-0.4-10.0)	Clear sky Wind: light breeze (2)	3.3	Flood Outlook	- Initial Visit
April 11, 2022	1015-1215	M. Lavictoire	7.0 (-4.0-13.0)	Clear Sky Wind: light breeze (2)	34.4	Water Safety	- Initial Visit

M. Lavictoire – Michelle (Nunas) Lavictoire – B. Sc. Wildlife Resources and M.Sc. Natural Resources
S. Lafrance – Sophie Lafrance – B.Sc. Biology and graduate diploma in Ecosystem Restoration
A. Quinsey – Al Quinsey - B.Sc. Environmental Biology

*Min-Max Temp Taken From: Environment Canada. National Climate Data and Information Archive. Ottawa International Airport. Available: http://climate.weatheroffice.gc.ca/ [September 27, 2022].
**Water Level Conditions taken from Rideau Valley Conservation Authority (RVCA): https://www.rvca.ca/

Water Level Definitions

Water Safety: Indicates that high flows, melting ice or other factors could be dangerous for such users as boaters, anglers and swimmers but flooding is not expected.

Flood Outlook : Gives early notice of the potential for flooding based on weather forecasts calling for heavy rain, snow melt, high winds or other conditions.