Stantec Consulting Ltd.
400-10220 103 Avenue NW, Edmonton AB T5J 0K4

November 4, 2021
File: 110220804

Attention: Jamie Kitlarchuk
Qualico Developments West
280, 3203 – 93 Street NW
Edmonton, AB T6N 0B2

Dear Mr. Kitlarchuk,

Reference: Palm Cove Biophysical Update Letter

Stantec Consulting Ltd. (Stantec) was retained by Qualico Developments West (Qualico) to complete a biophysical update for the Palm Cove development) located within W ½ 34-039-02 W5M in Lacombe County, AB (Study Area) (Figure 1).

The original biophysical assessment for the Study Area was completed in 2010 and Qualico received conditional subdivision approval for the proposed development in 2011. *Water Act* approval was also received for the development in 2011 and 2012 to remove wetlands W1, W2, W3, W4, W5, W6, W7, W8, W9, W10, W11 and W13 under approval numbers 00297805-00-00 and 00297805-00-01 (Figure 2) and wetland replacement costs were paid to Ducks Unlimited Canada. Vegetation clearing and wetland disturbance started in 2012 and included mulching and brushing activities along the proposed future roadway (Figure 1). Due to economic constraints caused by market conditions during that time period in Alberta, the activity was not completed as planned and was the project was put on hold.

Qualico is currently working on re-initiating the proposed development and completing revisions or modifications to the original development plans. Specifically, in the original subdivision plan, the north drainage area (Figure 1) was shown for retention as a combination of environmental reserve (ER) and municipal reserve (MR) from the shoreline of Sylvan Lake, north to Rainy Creek Road. Qualico may revise portions of the development concept including lot placement along the north drainage area and incorporation of stormwater management infrastructure. Although *Water Act* approval was received for the whole development, because these changes may affect the north drainage area and because there have been changes to the Wetland Policy and the Alberta wetland classification system since the original development was approved, the north drainage area was re-assessed for wetlands. The changes to the north drainage area may require a new *Water Act* approval if wetlands are disturbed or altered or there are modifications to the flow of water or direction of flow within the drainage channel.

1.0 SCOPE OF WORK

In 2020, Lacombe County released an updated version of the *Multi-lot Development Proposals: Lacombe County's Guide to the Approval Process*. Stantec reviewed the 2020 guidelines and determined that the 2010 biophysical assessment provided all the required data. In addition, the 2010 field program was typically above the level of effort required for biophysical assessments in accordance with the guidelines.

Qualico has engaged with Lacombe County on the proposed development. During a meeting on September 8, 2021, Lacombe County requested an update to the biophysical to document changes in the

Study Area since the original biophysical assessment in 2010. Because the 2010 biophysical assessment does provide the required information in the guidelines, this letter has been prepared to provide an update on any field findings or changes from the original biophysical assessment and also to documented site conditions along the north drainage channel to inform future regulatory requirements under the *Water Act*.

The scope of the biophysical update includes the following tasks:

- Complete a field reconnaissance to document changes to the Study Area
- Assess the north drainage area to document site conditions and identify if wetlands are present within the north drainage area assessment boundary. (Figure 1)
- Complete updates to vegetation mapping to identify areas that have been disturbed or modified since 2010 and to document wetlands or changes to the north drainage area
- Provide a letter summarizing the current site conditions, any changes to the site conditions and any updates to recommendation (e.g., conservation priorities)

2.0 METHODS

The following section outlines the methods used to conduct the biophysical update and the findings.

2.1 FIELD RECONNAISSANCE

A field reconnaissance visit was completed on September 30, 2021. The Study Area was visually inspected on foot to confirm the vegetation communities and any changes from the initial biophysical assessment. The field reconnaissance focused on the forested area in the south part of the property as the aerial photographs showed vegetation disturbances from the mulching and brushing activities along the proposed future roadway that occurred following the 2010 biophysical assessment.

Representative areas had vegetation assessments completed to show plant communities. A meandering survey was completed in representative areas (Figure 2, Reconnaissance Points) to get a general plant species composition list and overall percent covers for the area to confirm there were no changes to plant communities compared to the original biophysical assessment. Photo Points were complete at various locations within the Study Area to visually show environmental features. Incidental weed and wildlife observations were also recorded along with general observations on disturbances and forest health.

Vegetation mapping was updated to reflect the areas disturbed by the mulching and brushing activities along the proposed future roadway.

2.2 NORTH DRAINAGE AREA ASSESSMENT

In the original subdivision plan, the drainage channel (Figure 1) was shown for retention as environmental reserve (ER) and municipal reserve (MR) from the lakeshore all the way north to Rainy Creek Road. Qualico may look to revise portions of the development concept including lot placement and alignment.

Because of the potential changes to the development adjacent to or within the north drainage area (e.g., revisions to lotting, incorporation of stormwater management infrastructure), a field assessment was completed along to north drainage area to document the site characteristics and assess and delineate wetlands that may not have been identified in the 2021 biophysical, which was completed under the former wetland classification system and Wetland Policy. The boundary for this assessment is depicted on Figure 1 (north drainage area assessment boundary).

A Stantec Qualified Aquatic Environmental Specialist completed an assessment of the north drainage area with a 25 m buffer (Drainage Assessment Study Area). The assessment used procedures based on standard protocols outlined in Alberta Transportation's Fish Habitat Manual (2009) and Schedule 4 of the COP (GOA 2019). The focus of this assessment was to identify if the north drainage channel met the definition of a watercourse (i.e., defined bed and banks) or was consistent with an ephemeral drainage (i.e., no defined bed and banks). Observations of the characteristics of the north drainage area were documented at thirteen locations along the drainage path.

Any additional wetlands associated with the north drainage area were assessed following provincial directives (GOA 2015). Soils, hydrology and vegetation were examined to confirm the presence of wetlands and to classify them feature according to the AWCS. The following methods were used:

- Soils were examined using a shovel to a depth of 29 centimetres (cm), the active rooting zone, in the outermost community of the potential wetland. The depth, texture, color, structure and abundance of redox features (i.e., gleys and mottling) in each soil horizon were recorded. Redox features in the upper soil profile develop under conditions of inundation or saturation over a long period of time and are therefore used to determine the extent of each wetland and waterbody. The area was considered a wetland if redox features were recorded within the top 29 cm and plant species characteristic of wet conditions were also recorded. Areas were considered ephemeral waterbodies if they lacked hydric soil indicators in the top 29 cm but had plant species characteristic of ephemeral flooding.
- Wetland and ephemeral waterbody hydrology indicators were assessed qualitatively by:
  - observing whether surface water was present at the site
  - looking for evidence of recent saturation or ponding
  - observing the topography of the site, including any landscape features that would lead to water accumulation. Evidence of these features includes watermarks on woody vegetation or anthropogenic features, sediment or drift deposits and algal crusts. Quantitative measurements of hydrological indicators include water depth and depth to saturation (depth at which soil pores are saturated).
- Vegetation communities larger than 10 m by 10 m (or equivalent) were sampled within the wetland and ephemeral waterbody using 1 m by 1 m subplots. Discontinuous communities were sampled by placing subplots in different patches of the same community. Each subplot was assessed for percent cover of dominant vascular species and percent cover of total vascular species, non-vascular species, litter, bare ground and open water. Outside of the subplots, a random meander was conducted to document less common species.
- The boundary of assessed wetlands and ephemeral waterbodies was also walked in the field. Global positioning system tracks were collected and used to assist with mapping refinement.

3.0 RESULTS

The results identifying changes to the upland forest areas, north drainage area and wetlands can be found below and in Figure 2. Overall, there were no major changes to the upland forest areas beyond brushing for the proposed future roadway and higher weed concentrations within the cleared areas associated with the proposed future roadway. Two additional wetlands were observed within the north drainage area and parts of the drainage channel had defined bed and banks.

3.1 FORESTED AREAS

The field reconnaissance confirmed that there have been no major changes to the forested portion of the Study Area from the original biophysical assessment beyond the cleared area for the proposed future

roadway. The forested area has an overstory of Aspen (*Populus tremuloides*) and Aspen/Balsam Poplar (*Populus balsamifera*) with an understory typically dominated by red-osier dogwood (*Cornus stolonifera*), willow (Salix spp), prickly rose (*Rosa acicularis*), snowberry (*Sympphoricarpos albus*), bluejoint (*Calamagrostis canadensis*) and smooth brome (*Bromus inermis*).

3.2 NORTH DRAINAGE AREA

The north drainage area is comprised of two waterbodies, Drainage 1 and Drainage 2 (Figure 2). Drainage 1 originates along the north boundary of the Study Area, with flow being received from a culvert on Township Road 400. This drainage has been modified by excavation to expedite flows across the landscape. In areas where excavation has occurred, short sections of defined channel was observed. However, Drainage 1 would primarily be classified as an ephemeral drainage due to the lack of defined bed and banks. Drainage 1 flows into Drainage 2 upslope from Wetland 1. Drainage 2 originates along the east boundary of the Study Area. Upstream of the confluence with Drainage 1, Drainage 2 has also been excavated in some locations to expedite flow. These areas of excavation were primarily confined to the locations where the drainage intersected aspen stands. Downstream of the confluence with Drainage 1, Drainage 2 flows diffusely through Wetland 2, a temporary graminoid marsh. Upon exiting Wetland 2, Drainage 2 flows back into the aspen forest, at this point, Drainage 2 was observed to have short sections (i.e., less than 20 m) of defined channel, but primarily would be classified as an ephemeral drainage due to the lack of defined bed and banks. No defined channel was observed where Drainage 2 flows into Sylvan Lake. Drainage 2 would not be considered fish habitat as there is no direct connectivity to Sylvan Lake via defined channel.

Wetland 1, a temporary graminoid marsh was dominated by small bottle sedge (*Carex utriculata*), smooth brome (*Bromus inermis*) and timothy (*Phleum pratense*). Wetland 2, a temporary graminoid marsh, was dominated by bluejoint *(Calamagrostis canadensis*), small bottle sedge and pussy willow (*Salix discolor*). Both wetlands were assessed using the *Alberta Wetland Rapid Evaluation Tool-Actual* (*ABWRET-A*) *Guide* (Government of Alberta 2015b) and submitted to Alberta Environment and Parks (AEP) for review. Both wetlands received an ABWRET-A value of D.

3.3 WEEDS

The 2010 original biophysical report identified *noxious* weed species creeping thistle (*Cirsium arvense*) and perennial sow-thistle (*Sonchus arvensis*). The majority of the *noxious* weed species were within the agricultural land, the north drainage area and on the fringe of where the agricultural area transitions to the main forested area to the south although creeping thistle was observed within wetland areas as well. These species were observed in 2021. However, because parts of the forest have been cleared for future road construction, the presence and distribution of *noxious* weed species has spread within the disturbed areas. N*oxious* weeds were observed in low to moderate densities (occasional to scattered plants between 1% and 25% cover) in the cleared areas associated with the future road. Weeds were present in these densities on all parts of the cleared area for the proposed future road, with higher percent covers of weeds were typically observed in low spots and high disturbance (e.g., rutting in road) areas. *Noxious* weeds were typically not observed in the forested areas except in wetlands.

Other non-native or invasive species were observed both in 2010 and in 2021 including smooth brome, dandelion (*Taraxacum officinale*) and alsike clover (*Trifolium hybridum*). Smooth brome was observed primarily in the cleared areas but was also observed in the upland forest. Alsike clover and dandelion were primarily concentrated in the cleared areas within the forest.

3.4 WILDLIFE

Wildlife incidental observations were also recorded during the field assessment. One snag with a potential woodpecker cavity was observed within the forest near the shoreline but there was no evidence of recent activity. Various game trails were seen throughout the forested area. Multiple horses were observed throughout the forested areas and are likely contributing to the trails through the forested area.

4.0 CONCLUSIONS AND RECOMMENDATIONS

No changes to the ecological priority rankings based on the original biophysical report are recommended (Attachment A, Figure 10). Most of the forest is still considered high priority for retention with transition areas between the forest and agricultural field and north drainage ditch considered moderate priority for retention. The agricultural field was given a low retention priority.

The recommendations from the 2010 biophysical include the use of environmental reserve (ER), municipal reserve (MR) and conservation reserve (CR) to retain the high priority areas within the development. These tools are still appropriate for use in the proposed development plans. Additional tools that may be considered include the use of Public Utility (PU) designation where natural features are incorporated into the stormwater management system. Areas that would meet the definition of ER include Sylvan Lake, the shoreline of Sylvan Lake to allow public access, retained wetlands (i.e., Wetland W12) and retained ephemeral drainage. Areas that would meet the definition of MR or CR include the forested areas. The use of CR could also be considered by landowners to protect natural areas within individual lots.

Mitigation measures should be incorporated around retained waterbodies, wetlands and drainages to prevent pollution (e.g., nutrients, hydrocarbons, sediment) from entering the natural areas. These measures could include the use of vegetated filter strip or other engineered solutions such as sediment forebays, bioswales or stormwater management facilities to treat surface water runoff from developed areas prior to entering into the retained natural areas. The size of a filter strip may vary but should be at least five metres wide as the first five meters of a filter strip are critical and remove more than 95% of sediment greater than 40 micrometres in size (GOA 2012).

If the ephemeral drainages are modified or realigned as part of the development, an engineering analysis should be completed to confirm that there are not adverse effects on downstream users including but not limited to flooding, increased erosion and sedimentation or reduction in surface water flow. Modifications to surface water drainage patterns may also require *Water Act* approval.

Weed control measures are recommended to be implemented both during construction of the proposed development and after construction of the proposed development to prevent further spread and establishment of weeds thought the Study Area. This should include cleaning construction equipment prior to entering and leaving the Study Area to prevent new establishment and spread of weeds, not using topsoil from areas with weeds for landscaping within the development and implementing active weed control measures such as tillage, mowing or chemical control. Weed management will require multiple treatments over multiple seasons. If herbicide application will be used, it must be done by a licensed professional in accordance with provincial legislation.

The recommendations listed in the 2010 biophysical report are still appropriate and should be considered for the future development. These recommendations included using native plant material wherever possible in landscaping plans, using pocket development and limiting vegetation clearing to the extent possible,

incorporating wildlife friendly design elements such as lighting that minimizes spill and glare, using erosion and sediment control products during construction and obtaining the required federal and provincial approvals.

5.0 LIMITATIONS

This document entitled “Palm Cove Biophysical Update Letter” was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Qualico Developments (West) Ltd. (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

6.0 CLOSURE

Based on the results of the biophysical update, there are no major changes to the natural feature retention priorities, conservation tools or the general development recommendations from the 2010 biophysical assessment., We trust that this biophysical update provides enough information to for Lacombe County to allow for development to continue on the Palm Cove property. If you have any questions, please contact the undersigned.

Regards,

Stantec Consulting Ltd.

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Attachment: Attachment A - Figures
Attachment B - Site Photographs

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kjf https://stantec.sharepoint.com/teams/110220804/shared documents/general/06_reports/03_biophysical_update/palm_cove_biophysical_update_fin_20211104.docx

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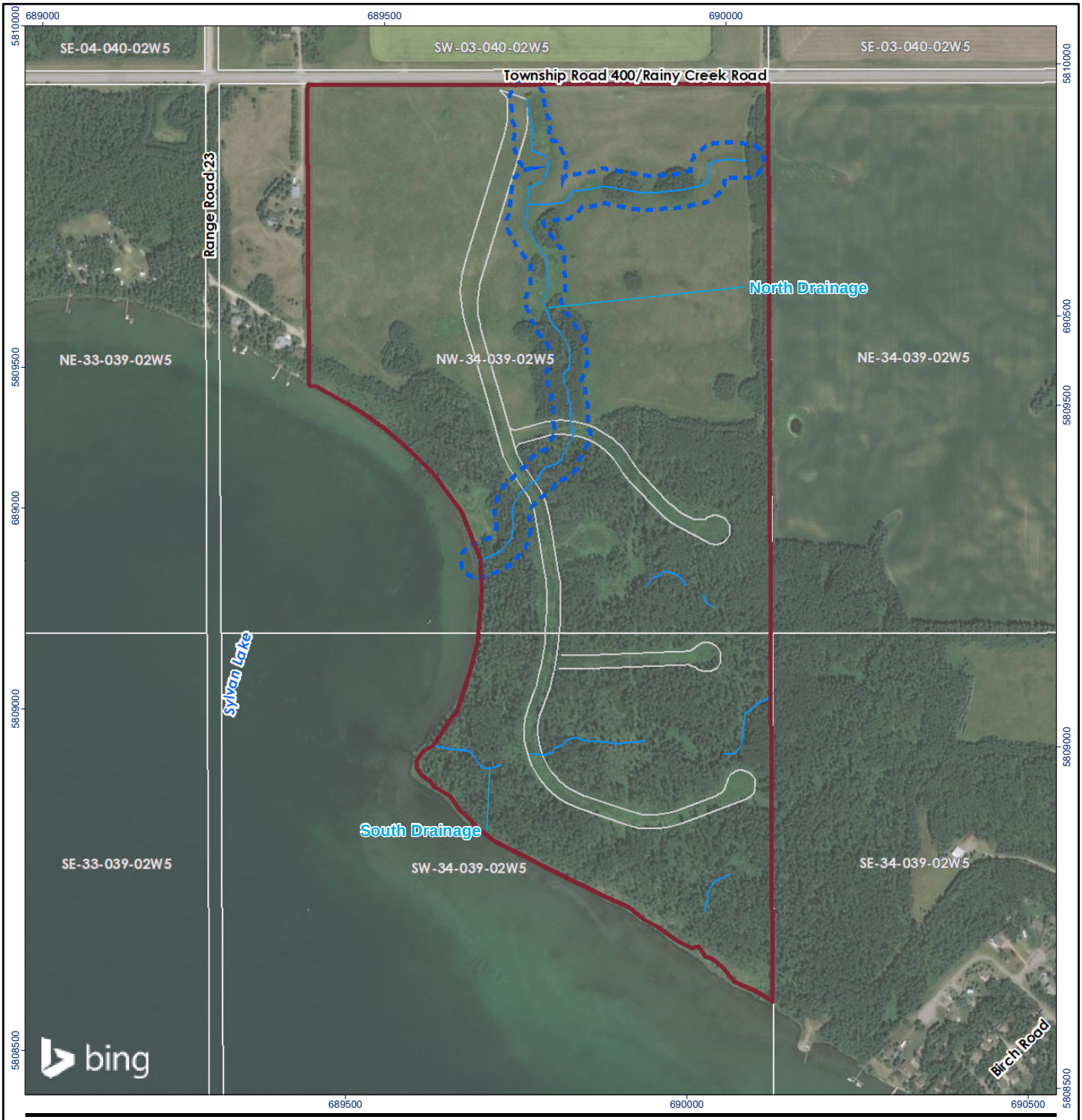
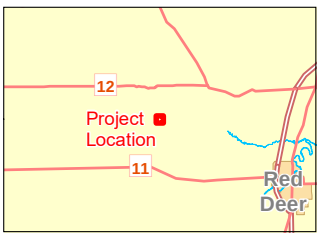
ATTACHMENT A

Figures





Study Area
Drainage
Proposed Future Roadway
Drainage Assessment Study Area
Quarter Section

0 100 200 metres
(At original document size of 8.5x11)
1:8,500

N

Stantec

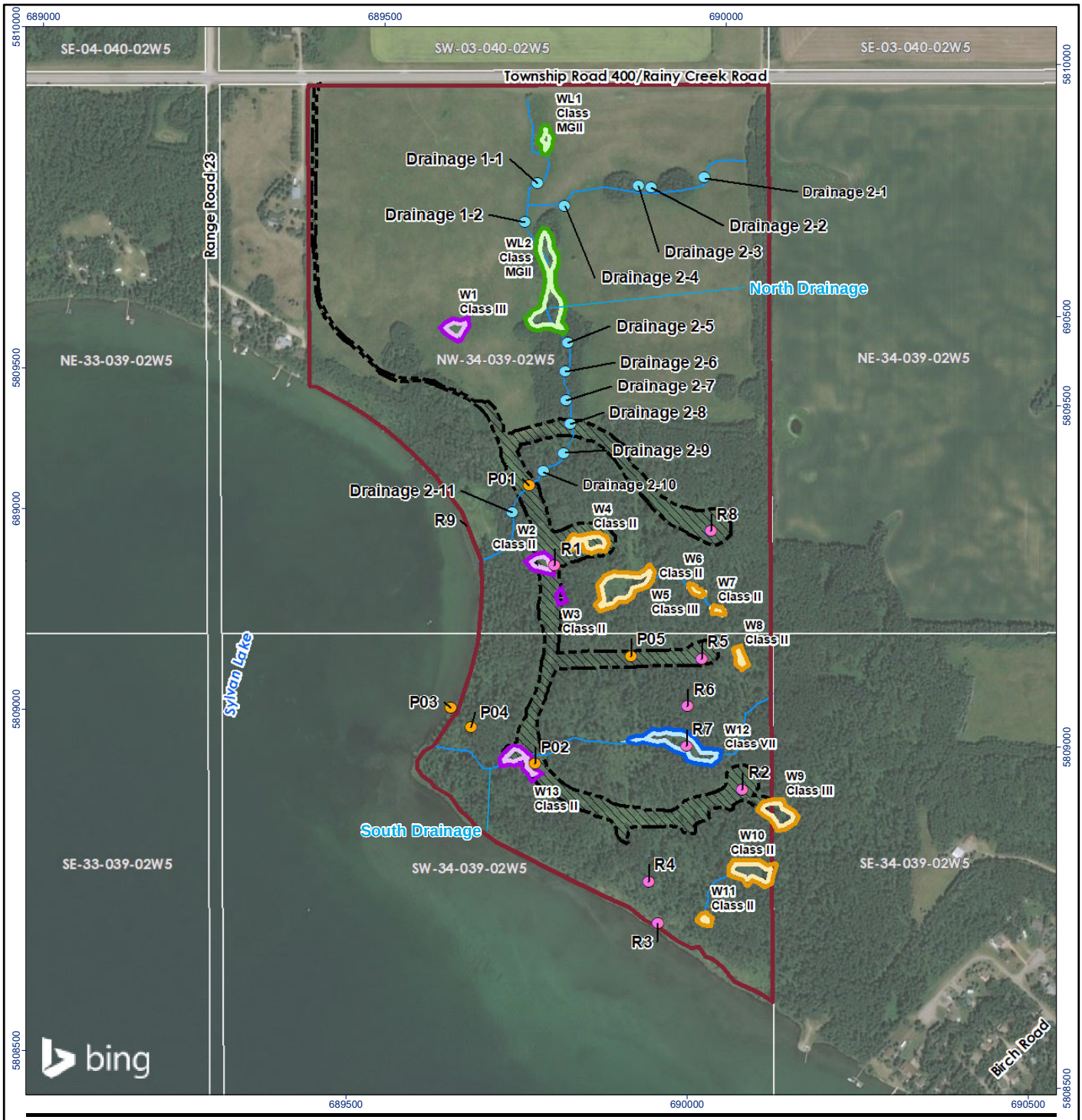
Project Location	Prepared by TQuilichini on 2021-10-27
W-34-039-02 W5M	TR by TPhaurest on 2021-10-17
Sylvan Lake, Alberta	IR by MChisholm on 2021-10-XX

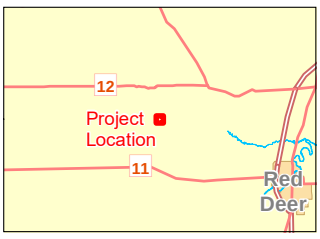
Client/Project 110220804
Qualico Developments West Ltd.
Palm Cove Development – Biophysical Update

Figure No.
1

Title
Site Overview

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Background: © 2021 Microsoft Corporation © 2021 Maxar ©CNES (2021) Distribution Airbus DS





Study Area
Drainage Assessment Point
Photo Point
Reconnaissance Point
Drainage
Additional Wetland Assessed in 2021
Wetland Retained in Development
Wetlands Approved for Disturbance in 2011 (00297805-00-00)
Wetlands Approved for Disturbance in 2012 (00297805-00-01)
Brushed Area
Quarter Section

0 100 200 metres

(At original document size of 8.5x11)
1:8,500

N

Notes

1. Coordinate System: NAD 1983 UTM Zone 11N
2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Background: © 2021 Microsoft Corporation © 2021 Maxar ©CNES (2021) Distribution Airbus DS

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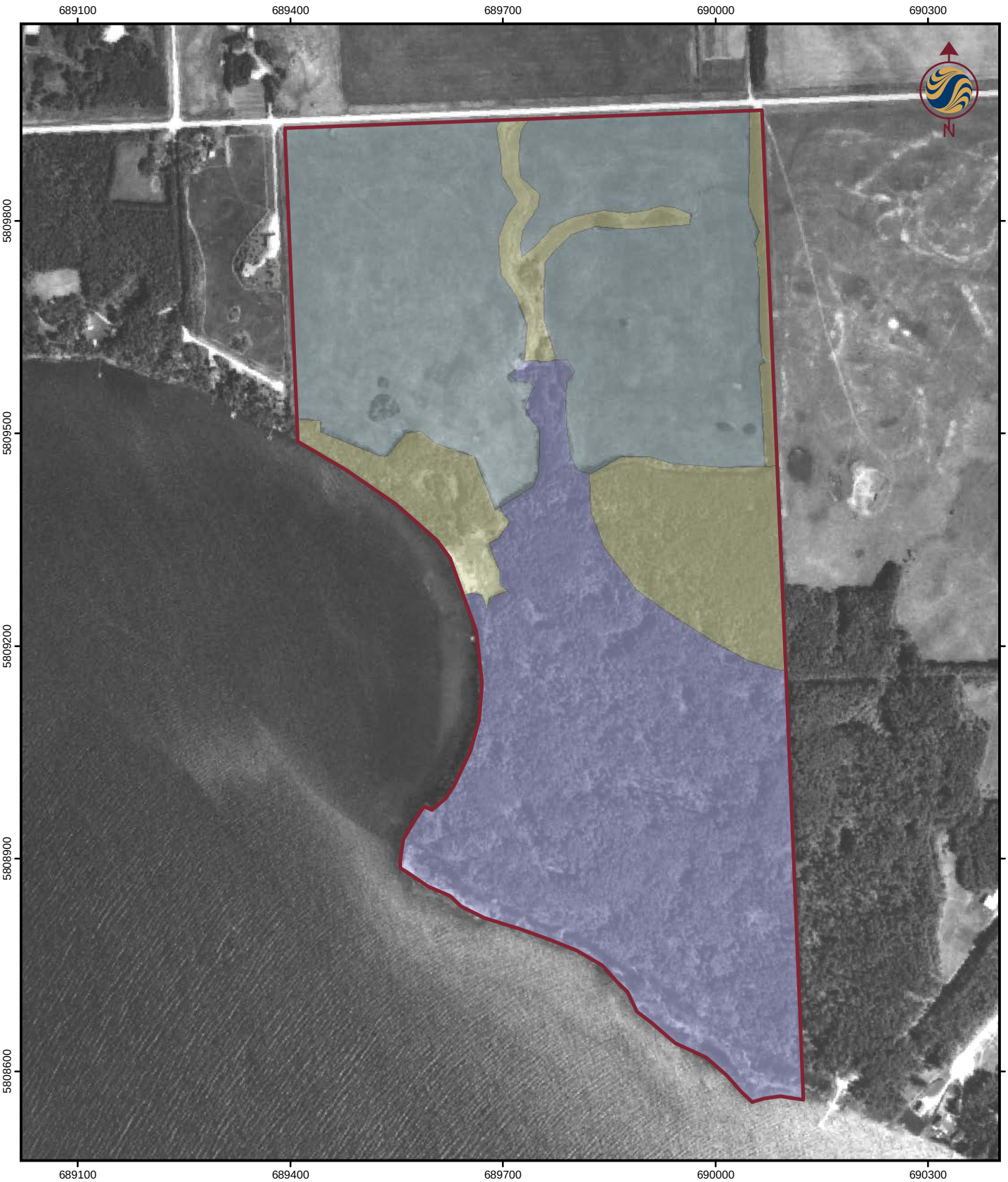
Project Location
W-34-039-02 W5M
Sylvan Lake, Alberta

Prepared by TQuilichini on 2021-10-27
TR by TPhaurest on 2021-10-27
IR by MChisholm on 2021-10-XX

Client/Project 110220804
Qualico Developments West Ltd.
Palm Cove Development – Biophysical Update

Figure No.
2

Title
Assessment Locations and Wetland Mapping



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2010-07-29 02:57PM By: rcassells

July, 2010
1102-17665

Stantec

Projection: UTM Zone 12 Datum: NAD 83
Imagery obtained from Alberta Sustainable Resource Development, 1993.

STUDY AREA

PRIORITY RANKING

- LOW
- MEDIUM
- HIGH

0 60 120 180 240 300

1:7,500 Metres

This map is for reference purposes only

Client/Project
QUALICO DEVELOPMENTS WEST LTD.
BIOPHYSICAL ASSESSMENT

Figure No.
10

Title
ECOLOGICAL PRIORITY RANKING

ATTACHMENT B

Site Photographs

Stantec

Photographic Log

Client:	**Qualico Communities**	**Project:**	**Palm Cove Biophysical Update**
Site Name:	**Palm Cove**	**Site Location:**	**W1/2 34-039-02 W5M**

Photograph ID: 1

Photo Location:
R1

Direction:
North

Survey Date:
9/30/2021

Comments:
Showing road clearing

Photograph ID: 2

Photo Location:
R8

Direction:
West

Survey Date:
9/30/2021

Comments:
Showing road clearing

Client:	**Qualico Communities**	**Project:**	**Palm Cove Biophysical Update**
Site Name:	**Palm Cove**	**Site Location:**	**W1/2 34-039-02 W5M**

Photograph ID: 3

Photo Location:
R6

Direction:
North

Survey Date:
9/30/2021

Comments:
Showing Aspen/Poplar Forest

Photograph ID: 4

Photo Location:
R2

Direction:
North

Survey Date:
9/30/2021

Comments:
Showing road clearing

Client:	**Qualico Communities**	**Project:**	**Palm Cove Biophysical Update**
Site Name:	**Palm Cove**	**Site Location:**	**W1/2 34-039-02 W5M**

Photograph ID: 5 **Photo Location:** R3 **Direction:** Northeast **Survey Date:** 9/30/2021 **Comments:** Showing south shoreline	

Photograph ID: 6 **Photo Location:** R3 **Direction:** Southwest **Survey Date:** 9/30/2021 **Comments:** Showing south shoreline	

Client:	**Qualico Communities**	**Project:**	**Palm Cove Biophysical Update**
Site Name:	**Palm Cove**	**Site Location:**	**W1/2 34-039-02 W5M**

Photograph ID: 7 **Photo Location:** P03 **Direction:** Northeast **Survey Date:** 9/30/2021 **Comments:** Showing west shoreline	
Photograph ID: 8 **Photo Location:** P03 **Direction:** West **Survey Date:** 9/30/2021 **Comments:** Showing west shoreline	

Client:	**Qualico Communities**	**Project:**	**Palm Cove Biophysical Update**
Site Name:	**Palm Cove**	**Site Location:**	**W1/2 34-039-02 W5M**

Photograph ID: 9 **Photo Location:** R4 **Direction:** North **Survey Date:** 9/30/2021 **Comments:** Cavity in tree snag	
Photograph ID: 10 **Photo Location:** P01 **Direction:** NA **Survey Date:** 9/30/2021 **Comments:** Showing creeping thistle on road clearing	

Client:	**Qualico Communities**	**Project:**	**Palm Cove Biophysical Update**
Site Name:	**Palm Cove**	**Site Location:**	**W1/2 34-039-02 W5M**

Photograph ID: 11

Photo Location:
P01

Direction:
North

Survey Date:
9/30/2021

Comments:
Showing rutting in road clearing

Photograph ID: 12

Photo Location:
Drainage 2-6

Direction:
South

Survey Date:
9/30/2021

Comments:
Showing drainage ditch running downstream