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* I have read and understand that my name, contact information and comments will be made publicly available in the Council Agenda.

* First name **Gordon**

* Last name **Johnson**

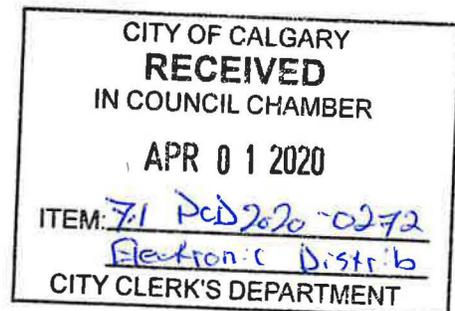
Email **burgessenv@shaw.ca**

Phone **403 249 1684**

* Subject **MDP Review on behalf of the Brodylos**

* Comments - please refrain from providing personal information in this field (maximum 2500 characters)

Submitted on behalf of the Brodylos on the instruction Leslie Chisholm



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March 2nd, 2020

Project #: BROD-01

Brodylo Family Farm
15015 53rd Street SW
Calgary, Alberta

Attn: Reid Brodylo
President

Dear Reid:

Subject: Review of Providence Master Drainage Plan

Introduction

This letter summarizes my comments and opinions regarding the Providence Master Drainage Plan (MDP) accepted by the City of Calgary (City) in a letter dated February 7, 2020 that are specific to the Brodylos Property. The main body of this letter summarizes my primary opinions and comments. The accompanying attachments provide the following supporting information:

1. background information for context
2. comments regarding the Terms of Reference associated for a third-party review of the Providence MDP, which was completed by Urban Systems
3. comments regarding Urban Systems third-party review of the MDP
4. comments regarding the Providence MDP

In my opinion, the Providence MDP should not have been accepted by the City for the following primary reasons.

1. The MDP process did not involve meaningful consultation with the Brodylos. I am aware of only one meeting that was held with the Brodylos. In that meeting EXP refused to accept most of the errors in the MDP and associated SMDPs that were brought to their attention by the Brodylos and Burgess Environmental. These errors were later confirmed by Sheffer Andrews Ltd. and Urban Systems. To my knowledge, the Brodylos had little or no input into the development of the Terms of Reference for the third-party review or the selection of the consultant to complete this review. Neither the Brodylos nor Urban Systems were given an opportunity to review if or how their concerns were incorporated into the final MDP that was accepted by the City. Many meetings were held between the City, EXP and Urban Systems during the review period and the Brodylos were not asked to participate in any of these meetings.

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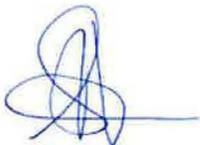
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2. The MDP does not address many of the errors and recommendations that were brought to EXP's attention by the Brodylos and Urban Systems. For example, the model used to predict predevelopment flows must still contain many of the problems that Urban Systems identified. The predevelopment flow model does not appear to account for flows from the north and south wetlands on the Brodylos Property, to the east and across 53rd St SW. The MDP does not include any explanation as to how development flexibility is provided to the Brodylos Property as was recommended by Urban Systems' review.
3. In my opinion, the MDP overrepresents the size of the south wetland on the Brodylos Property. The predevelopment model appears to represent the south wetland (Wetland 6) as fully impounded by 53rd St SW. The post-development size of the south wetland is larger than the size of the south wetland as interpreted using aerial images that predate 2000, the approximately timeframe that 53rd St SW began to drastically impound water in this wetland over and above its previous levels.
4. The culverts underlying 53rd St SW that drain overflows from the south and north wetlands on the Brodylos Property should be fully repaired or replaced as required to fully re-establish natural flows so that flooding of the Brodylos Property no longer occurs and the MDP should be revised to reflect this.

I trust that this letter satisfies your current need, is clear and properly summarizes my primary concerns and opinions associated with the Providence MDP as it relates to the Brodylos Property. If you have any questions or require additional information, please contact the undersigned.

Yours sincerely,

BURGESS ENVIRONMENTAL LTD.

A handwritten signature in blue ink, appearing to be 'Gordon J. Johnson', with a horizontal line extending to the right.

Gordon J. Johnson, M.Sc., P.Eng.
President

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Attachment 1: Background

Qualico Communities (Qualico) and Dream Development (Dream) are planning to develop properties within Section 36-22-2 W5M, between 53rd Street SW and 45th Street SW, and 146th Avenue SW and 162nd Avenue SW. These land parcels are located within the Providence Area Structure Plan (ASP), which encompasses the area bounded as follows:

- to the north by 146th Ave SW and the Tsuu T'ina First Nation
- to the east by the Transportation and Utility Corridor and Stoney Trail SW
- to the South by Highway 22X and the M.D. of Foothills
- to the west by the Calgary City Limits and the M.D. of Foothills

To support their development plans, the following companies commissioned EXP Services Inc. to develop a (draft) Master Drainage Plan (MDP) for the ASP, which was completed in May 2018 under the direction of Dream:

- Dream Developments
- Qualico Communities
- Ronmor Developments
- Hopewell Residential Communities

Staged Master Drainage Plans (SMDPs) have also been filed for the proposed Dream and Qualico developments within Section 36-22-2 W5M. The Brodylo Family Farm (Brodylos Property) is located within the East ½ of 35-22-2 W5M and represents the most significant tract of land within the Providence ASP that is not otherwise represented by these companies. The Brodylos have raised concerns and objections to the Providence MDP and the Dream and Qualico SMDPs, and the related Water Act Applications, because in the Brodylos' view these plans do not properly account for the drainage characteristics of the Brodylo Property.

In an effort to address the Brodylos concerns, the City retained an independent company (Urban Systems) to complete a third-party review of the Providence MDP application. Urban Systems' review of the draft Providence MDP (May 2018) was subject to a Terms of Reference prepared by the City and shared with the Brodylos in August 2019. Urban Systems' review is presented in a report dated December 2019 that was signed off by Urban Systems on February 3, 2020.

The above consortium of development companies again retained EXP to finalize the Providence MDP, which was completed in February 6, 2020 and was formally accepted by the City of Calgary in a letter dated February 7, 2020.

The attachments to this letter summarize aspects of my reviews of the Terms of Reference, the Urban Systems' report and the Providence MDP that are relevant to the Brodylos' Property. In these attachments the issue is presented in plain text and my opinion regarding that issue is presented in italics.

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Attachment 2: Terms of Reference Comments

This section reiterates my comments regarding the Terms of Reference of the Providence MDP, which I believe provide useful context to subsequent comments pertaining to the MDP and Urban Systems' review.

The planning parameters, timelines and deliverables included as the main body of the Terms of Reference were considered reasonable provided the Brodylos were given a copy of the draft MDP in a timely manner and at the same time as Urban Systems.

By that I meant that both the Brodylos and Urban Systems were provided draft copies of this final MDP, not just the May 2018 draft version of the MDP. Urban Systems based its comments solely on review of the May 2018 draft MDP and not any draft versions of the MDP that was recently approved by the City. The compressed nature of the timeline (February 3rd sign-off of Urban Systems' review, February 6th, 2020 submission of the final MDP, February 7th, 2020 acceptance of the MDP) appears to be a deliberate move to prevent the Brodylos from having any meaningful review and input. Further, it is difficult to believe that the City could have completed a meaningful review and provided input into this MDP over the 24 hours it provided itself to review and accept this document.

The Brodylos' primary concerns (see below) were summarized so that Urban Systems could consider and address these concerns as specific deliverables.

1. There is a drainage within the north end of the Brodylo Property that recharges two wetlands that drain to the east. The culvert that conveys overflow from these wetlands to the east (across 53rd Street SW) is blocked. The flows from these wetlands through the culvert crossing 53rd Street SW and onto the Qualico Property to the east should be assumed in the 'existing condition' for the MDP and maintenance of these flows should be allowed for in the MDP and any SMDP addressing developments to the east of the Brodylo Property. It is not known whether the City wants to conserve these wetlands as part of any future developments.

Urban Systems' correctly concluded that these 'north wetlands' drain east across 53rd St SW and onto Qualico property. Urban Systems also correctly concluded that these wetlands spill on a regular basis. Neither the MDP nor the SMDPs developed for Qualico contemplate maintaining and managing these flows in the predevelopment case and the City has refused to clear or replace this culvert. As a result, the Brodylos Property will continue to flood in this area until this situation is rectified, presumably if and when the Brodylos decide to develop their lands and/or when 53rd St SW is reconstructed. This is a primary concern of the Brodylos that has not been accounted for in the final MDP.

2. There is a large wetland within the south end of the Brodylo Property (south wetland) that drains to the east during periods of high water. The culvert that conveys overflow from this wetland (across 53rd Street SW) has been blocked on a near continuous basis for many years, causing the Brodylos Property to flood. The flows from this wetland through the culvert crossing 53rd Street SW and onto the Qualico Property to the east should be assumed in the 'existing condition' for the MDP and maintenance of these flows should be allowed for in the MDP and any SMDP addressing developments to the east of the Brodylo Property. It is understood that the City plans to conserve this wetland as part of any future developments.

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Urban Systems' correctly concluded that the 'south wetland' drains east across 53rd St SW and onto Qualico/Dream property. Urban Systems also concluded that this wetland spills on a frequent basis and that storm flows could exceed 2.4 l/s/ha. The south wetland culvert has since been partially cleared. In my opinion, the south wetland culvert should be properly designed and replaced.

3. Stormwater ponds included in the MDP on the Brodylo Property should have appropriate regard for the existing topography and drainage patterns. Notwithstanding this presumption, any future development plans should have the ability to alter the pond locations to best conform to the development of the Brodylo Property.

Urban Systems recommended that the MDP be modified to describe what flexibilities are available to the Brodylos, which I agree with. The MDP simply states that flexibility is provided by the MDP but does not provide any further description. Based on a telephone conversation with Michael Ubar of the City, it is Mr. Ubar's opinion that the Brodylos have the ability to modify the locations of the stormwater ponds, post-development; however, it is noted that the accepted MDP specifically states that all subsequent SMDPs must follow this MDP.

4. Past versions of the MDP included post-development stormwater ponds on the Brodylo Property that drained into storm sewers. It is noted that the wetlands on the Brodylo Property are almost entirely recharged by runoff from the Brodylo Property. Very little recharge occurs from lands outside of the property. Maintenance of this recharge will need to be incorporated into the development plans for any wetlands that are to be conserved. The most appropriate option may not conform precisely with city and provincial policies for wetlands within municipal developments.

The MDP acknowledges this requirement and the south wetland is fed from a stormwater pond on the Dream property to the west. The stormwater ponds on the Brodylo property continue to drain to storm-sewers. Ms. Bozic of Urban Systems indicated that current provincial policy prevents stormwater runoff from developed areas from being directed to wetlands and that this policy is likely to be changed in the near future. Mr. Ubar of the City indicated that wetlands maintenance is typically addressed after acceptance of the MDP as part of the SMDP.

5. Further to point number 4, the size of the south wetland should be properly defined if it is to be retained as environmental reserve and incorporated into the MDP.

The south wetland is conserved in the MDP; however, no analysis was completed to determine its proper size. The predevelopment modeling is based on a south wetland size of approximately 20 hectares. In my opinion this area is much too large and exceeds the size of this wetland before it was blocked by 53rd St SW and flooded the farmland and undeveloped areas of the Brodylos Property.

Figure 1 illustrates the drainages and wetland areas within the Brodylo Property. In my opinion, the city should (in a timely manner) reconstruct the two culverts crossing 53rd Street SW and the MDP should be designed assuming their existence and maintenance.

As previously noted, the culvert that conveys flow from the south wetland across 53rd St SW has been partially cleared but remains in disrepair. No attempt has been made and none is planned to repair or

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replace the culvert for the north wetland even though the Urban Systems review concluded that these wetlands spill regularly, and that associated flow should be accommodated in the predevelopment case.

Figure 1: Plan View of Area (2005 image)



Brodylo Property

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Attachment 3: Urban Systems Report Review

The following recommendations were made in the Urban Systems report that are relevant to the Brodylos Property and its potential future development.

- Section 2 describes how the MDP divides drainage into Fish Creek and Pine Creek, as well as its assumptions regarding predevelopment drainage. This section recommends that the MDP provide more extensive rationale explaining the basis of these decisions and their potential implications to developments in the area.

The final MDP that was accepted by the City provides some additional explanation but does not appear to specifically address the issue raised by Urban Systems. It is not clear that the south wetland on the Brodylos Property ultimately drains to the south and Pine Creek as the drainage for the area down-gradient of the south wetland, east of 53rd St. SW is very poorly defined. The City should not have accepted this MDP without first completing a thorough review of Urban Systems' concerns.

- Section 3 concludes that the predevelopment hydrologic model was inaccurate and should be redone (Ms. Bozic was also critical of this model during our telephone conversation). Section 3 also concludes that the drainages from the Brodylo lands, including the Brodylo wetlands, were inaccurately represented by the draft MDP and that these wetlands would spill 'frequently' across 53rd Street SW were functioning culverts maintained by the City. Urban Systems recommends redoing the hydrologic model, with correct input parameters and proper surveys of the wetlands.

The MDP does not appear to have involved re-modeling of the predevelopment flow conditions as recommended by Urban Systems. It does acknowledge the easterly drainage of the Brodylo wetlands across 53rd St SW; however, it is not clear how these flows will be accommodated by developments to the east of the Brodylos Property, prior to the Brodylos Property being developed.

- Section 4.2 concludes that developments located east of 53rd St SW should assume fully functioning culverts across 53rd St SW and that the pre-development flows likely exceed the Fish Creek release rate of 2.4 l/s/ha, which will result in oversized requirements of the downstream facilities and minor system.

These requirements are not included in the SMDPs completed for the Qualico and Dream developments and these shortcomings were raised in my review of these SMDPs.

- Section 4.3 concludes that the location of the pond servicing the north portion of the Brodylo Property will require extensive grading. While it is acknowledged that this may ultimately be more economic, the MDP should accommodate the possibility that two drainage areas are established for this portion of the Brodylo Property, replicating current conditions. Urban Systems goes on to recommend that the MDP describe how this flexibility can be achieved.

The MDP does not describe how this flexibility is incorporated into the MDP and has not repositioned this stormwater pond as discussed in meetings with the Brodylos.

- Urban Systems recommends that sub-catchments S16, S17, S18, S19, S20, S21N, S21S should discharge to Providence stormwater trunk and not to the drainage course C-SE and that a hydrologic study be completed if this drainage course is to be preserved.

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The MDP appears to have incorporated addressed this recommendation.

I agree with the comments raised by Urban Systems in its review. Urban Systems' comments are consistent with those raised repeatedly by the Brodylos to the City and the ASP developers, and in Burgess Environmental's correspondences regarding the earlier MDPs and SMDPs.

Attachment 4: MDP Report Review

Section 1.4 states that stakeholders and in particular the Brodylos were consulted through the process. It also states that the MDP offers flexibility to the Brodylos in developing their land.

EXP did not account for any of the Brodylos comments and concerns in prior versions of this report or in the SMDPs for Dream and Qualico. It was only after EXP received Urban Systems comments did they accept that the Brodylos' Property, including its north and south wetlands, drain east across 53rd St SW. Further, Urban Systems recommendation that the MDP describe how this MDP offers flexibility to development of the Brodylos Property appears to have been ignored. Section 6.2 states that the stormwater management concepts described in the ASP as informed by the MDP must be adhered to. The MDP does not accommodate flows from the Brodylos Property across 53rd St SW, predevelopment of the Brodylos Property.

Section 2.3 and Figure MDP5 indicate the locations of existing culverts.

The culvert that conveys flow from the north wetlands on the Brodylo Property east across 53rd St SW is not shown, despite the Brodylos bringing this culvert to their attention and Urban Systems identifying this culvert as being present and needing to be accounted for in the management of predevelopment flows from the Brodylos Property. Further, the drainages associated with the north and south wetland discharges are not depicted in Figure MDP5.

Section 2.4 and Figure MDP6 identifies that the Brodylo south wetland flows into Pine Creek watershed. Urban Systems commented that this was assumed but not supported in the 2018 version of the MDP.

Additional discussion was included in the MDP to address this comment, though it is not clear to me that any new evidence was gathered. This aspect of the MDP should be revisited and the implications of its conclusions should be discussed with the Brodylos prior to being accepted and implemented.

The predevelopment hydrologic modeling basis and results are described in Section 3.5 to 3.7. Additional flow measurements were collected in 2019, presumably to assist in calibrating the model.

It is not clear how the concerns raised by Urban systems were addressed, or whether they were addressed at all. It is not clear that the model is better calibrated. Specifically, it is not clear how EXP modeled flows from the Brodylos' wetlands and whether they based these models on functioning culverts crossing 53rd St SW, as was recommended by Urban Systems. It doesn't seem that EXP could possibly have included the detailed wetland surveys as was recommended by Urban Systems.

The post-development flow modeling is presented in Section 4. Discharge from the Brodylos' south quarter section is routed through the outlet from the south wetland and across 53rd St SW. Discharge from the entire north quarter section of the Brodylos' property is routed along the north boundary of the Study

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Area. Flow allowances out of the south wetland for the 1 in 100 years runoff event appear to be much lower than 2.4 l/s/ha. There is no allowance for discharge from the north wetlands across 53rd St SW.

Urban Systems concluded that the existing drainage from the Brodylos Property associated with the 1 in 100 years rainfall event likely exceeds the 2.42 l/s/ha allowance.

The water depth in the south wetland (Wetland 6) is predicted to increase by 0.1 to 0.2 m as shown in Section 4.8.2. Stormwater ponds will be located adjacent to wetlands to be retained to replenish water in these wetlands, though it is not clear to me how this system is meant to operate.

The increase in water level of the south wetland is significant given the very shallow slopes surrounding this wetland and the damage associated with current flooding that has resulted from blockage of the culvert draining this area. It is not clear whether the predevelopment modeling case that is presented for comparison is based on a fully functioning culvert or that the errors in the predevelopment modeling as identified by Urban Systems' review have been corrected. I could not discern the post-development size of the south wetland from the information provided. The pre-development size depicted in Figure MDP5 and specified in Appendix E (up to 19 hectares) reflects the flood levels caused by blockage of the 53rd St SW culvert. The depiction of the south wetland in Figure MDP7 (post-development) appears to be significantly larger than the size of the south wetland prior to spillage from this wetland being blocked by 53rd St SW.

Section 5 describes the Storm Trunk location and general sizing.

I understand that development of the Brodylos Property will require participation in the funding of this trunk line.

Table 1 compares the content of the May 2018 draft MDP and the February 2020 MDP that has been accepted by the City.

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Table 1: Comparison of May 2018 Draft MDP with February 2020 MDP Accepted by the City			
MDP Section	May-18	Feb-20	Comments
Section 1: Introduction	Includes: Background, Subject Lands, Project Scope, Stakeholder Engagement, Watershed Context and Relevant Policies, Background Documents.	Same	Reference is now made to consulting with the Brodylos and not limiting their options. Otherwise not changed. The degree of consultation with the Brodylos was overstated.
Section 2: Master Drainage Plan Principles	Includes: Site Description and Land Use Planning, Environmentally Significant Areas, Existing Infrastructure, General Servicing Concepts, Low Impact Practices, Stormwater Reuse.	Now includes a sub-section on Identification of Receiving Water Body, which describes work completed to verify that the drainage boundaries are as determined in 2018. Likely in response to a recommendation by Urban Systems.	Essentially unchanged. Even though the culvert across 53rd St SW at the north wetlands of the Brodylos Property was discovered and uncovered, it was not included in the Existing Infrastructure.
Section 3: Pre-development Hydrologic Assessment	Assessment of Pre-development hydrology, which includes Methodology, Data Sources, Drainage Patterns, Climate data and Design Storms, Model Development, Results	Now includes a Model Calibration Section, which describes flow monitoring completed to assist in calibrating the predevelopment flow model. The effects of the calibration change is not described - the net affect was to reduce average annual runoff flows by about 10%. Minor changes were made to drainage courses that do not appear to affect the Brodylos.	It was not possible for me to assess the actual model to determine what changes, if any, were made. Flows from the north wetland on the Brodylos Property now stop at 53rd St SW rather than flowing to the east. Spillage from this wetland over 53rd St SW does not appear to have been considered.
Section 4: Post-Development Analysis Methodology	Includes Hydrologic and Hydraulic Analysis, Computer Model, Runoff Computation, Groundwater, Evaporation and Irrigation, Storage Routing.	A table of development discharges is now included, though it is not clear that there are any changes. Predictions for water levels have changed and now predict increases of 0.1 to 0.2 m for all probabilities for Wetland 6.	The further increases to predicted water levels in the south wetland of the Brodylos Property is very significant as they are in comparison to levels that are also high due to flooding caused by 53rd St SW. This is the only wetland where consistent increases are built into the MDP. All predicted pond sizes and runoff volumes are unchanged.
Section 5: Preliminary Outfall and Storm Trunk Design	Includes City funded infrastructure.	\$7.75M estimate now provided for the storm truck.	Otherwise unchanged.
Section 6: Conclusions and Recommendations	Includes Conclusions and Recommended Actions.	In the Conclusions a significant amount of policy discussion is now included, most regarding water course policy and best management practices. Recommendations now included a statement saying the SMDPs must follow MDP. Recommendations are significantly changed.	There are two new requirements specified for wetlands management within the context of SMDPs for wetlands that are to be preserved.