
WRITTEN SUBMISSIONS OF BRODYLO FARMS LTD.

**RE: PROPOSED AMENDMENTS TO
PROVIDENCE AREA STRUCTURE PLAN
(BYLAW 8P2019)**

CITY COUNCIL HEARING ON MONDAY, JANUARY 14, 2019

SUBMITTED ON:

January 7, 2019

SUBMITTED BY:

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PART I - OVERVIEW

1. The Brodylo Family asks City Council to adjourn, or alternatively refuse, the City Planning Department's motion to amend the Providence ASP.
2. Dream and City planners demand that City Council remove a key protection for neighbouring landowners woven into the Providence ASP, requiring the completion of a Master Drainage Plan ("MDP") before an outline plan may be approved. No proper explanation is provided for this remarkable demand – including why it is so urgent that the development proceed without a MDP in place.
3. The City and Dream assert, contrary to the available evidence, that the drainage courses within the proposed Outline Plan are "isolated" from the surrounding properties. An expert retained by the Brodylo Family, however, provides strong findings otherwise. According to this expert, there is a significant drainage course running west to east from the Brodylo Farm through to Dream's proposed development. This challenges the City's Planning Commission Report and EXP's Staged Master Drainage Plan ("SMDP") findings that water flows "uphill" from the Brodylo Farm and drains directly north. There are therefore potentially serious problems with the SMDP which must be considered in greater detail.
4. The Brodylo Family was denied basic procedural fairness leading up to this hearing. They have repeatedly requested, and have consistently been denied access to, the draft MDP upon which the SMDP relies. They are asked to make submissions on a matter of intense personal interest with only snippets of information being made available to them. In addition, the Brodylo Family was not provided with the SMDP for review until December 20, 2018 – just before the Christmas holidays. Since that time, they were expected to consult with an expert, review the technical information available in the SMDP, and provide submissions to City Council.
5. Both substantively and procedurally, City Council must not approve this motion. Dream, just like all other developers, should be required to conform to an approved MDP prior to proceeding to outline stage. There are no compelling reasons to break with the City's standard operating procedure in this case; on the other hand, there are significant risks for the Brodylo Family Farm if City Council allows Dream to proceed with its development. Dream should consequently come back to Council with its outline plan once it has an approved MDP in hand.

PART II - BACKGROUND

THE INTERESTED PARTY, BRODYLO FARMS LTD.

6. Brodylo Farms Ltd., is a family farm owned by Margaret Brodylo and her children, Leslie Chisholm, Reid Brodylo, John Brodylo, and Ellen Brodylo (together the “Brodylo Family”).

7. Brodylo Farms owns a large farm property located at the edge of the southwest limits of the City of Calgary (the “Farm”) which is approximately 129.5 hectares (320 acres) in size. The Farm contains two wetland complexes (one large one to the south and a smaller one to the north) that the Brodylo Family have diligently stewarded since the family purchased the Farm in 1958.

BRODYLO FAMILY’S INITIAL CONCERNS ABOUT PROVIDENCE

8. Providence was commenced in October 2014 as one of the City’s first developer-funded ASPs. Its boundaries cover an area of approximately 816 hectares (2,016 acres) of land.

9. Initially, Providence’s commencement was not disclosed to neighbouring landowners unless they were a part of the private developing conglomerate behind the project. In February 2015, however, the Brodylo Family became aware, through a media report, that private developers to their east and south intended to complete a substantial development and were completing a privately funded ASP. Immediately, the Brodylo Family raised concerns to City planners and, at this time, learned of Providence’s existence.

10. The Brodylo Family requested information about what was proposed within Providence and how the Providence development would impact their Farm. They were concerned that the private developers might engage in “de facto” or “shadow” planning of stormwater drainage into their Farm in an effort to maximize developable land within Providence. They were concerned that Providence planners did not account for drainage patterns in the surrounding area and that the Farm and its wetland were in jeopardy. They requested that the City’s Planning Department ensure the completion of all necessary studies prior to Providence’s approval and that these studies be provided to the Brodylo Family for review.

INITIAL LACK OF INFORMATION ABOUT STORMWATER PLANNING

11. The private developers and City planning were not open or forthcoming with information about Providence. At least 14 planning meetings were held about Providence between 2014 and 2015 from which the Brodylo Family was excluded.
12. From the beginning, the Brodylo Family was met with hostility from members of the City's Planning Department who were assisting the private developers in getting Providence ready for City Council approval.
13. The Brodylo Family attended an "open house" for Providence seeking information directly from City Planners and private developers about Providence on September 8, 2015. City staff members and experts retained by the private developers were unable to answer some very basic questions about the storm drainage management plans within Providence. City staff members, and agents of the private developers, further displayed open hostility and anger towards the Brodylo Family.

APPROVAL OF PROVIDENCE BY CITY COUNCIL

14. On October 22, 2015, the Providence ASP was provided to the City's Planning Commission for its review in advance of a December 7, 2015 public hearing before City Council.
15. City Council completed the public hearing for Providence on December 7, 2015. At the conclusion of the hearing, City Council adopted ByLaw 48P2015 approving Providence.

SECTION 8.3.1 OF PROVIDENCE

16. Section 8.3.1 of the Providence ASP contained a very important qualification to help protect the public interest and postponing discussion by Council of some of the Brodylo Family's most pressing concerns about stormwater planning. This provision required that:

8.3.1 The Master Drainage Plan for the plan must be approved by The City of Calgary's Water Resources Department prior to Outline Plan / Land Use Amendment approval.

17. This provision provides some protection to the Brodylo Family and other affected landowners / interest holders in Providence and surrounding areas. It ensures that, before

development proceeds, stormwater planning is properly accounted for and placed before City Council for its consideration.

18. City Council should have a high degree of confidence that it knows who is affected by stormwater runoff and what plans are in place for this prior to approving any development.

19. Once provided with a proper factual foundation through a MDP, City Council can balance the potentially competing interests of the various landowners and interest holders affected by proposed stormwater drainage planning. Stormwater drainage issues, by their very nature, involve competing landowner interests. The question is whose property will be left to carry the burden of, and potentially sustain damage from, the excess water.

20. The Brodylo Family understands that the provision of a MDP prior to proceeding to outline stage approval is a standard operating procedure for the City and that what Dream and the City Planning Department are proposing in this case (proceeding without a MDP in place) is a significant deviation from the norm.

STEPS TO OBTAIN A MDP

21. As of today's date, and more than three years after Providence was approved by City Council, a Master Drainage Plan is not in place. The Brodylo Family and the general public still have no explanation for why there is such a long delay in completing a MDP.

22. In May 2018, Stantec provided a draft MDP to Water Resources. The Brodylo Family does not know why this draft MDP was not approved.

23. The Brodylo Family has repeatedly requested that City planners, and the developers behind Providence, provide any draft MDP and all available supporting data for their review. They were repeatedly rebuffed, ostensibly on the ground that a MDP will only be publicly disclosed once approved by the City's Water Resources.

24. As of today's date, the Brodylo Family has not yet had an opportunity to review the May 2018 draft MDP. They continually are advised that things are "under review" by the City's Water Resources department and that there are "unresolved" issues with the MDP. The Brodylo Family has no idea what these unresolved issues are and whether they relate to drainage issues affecting their Farm.

25. Dream and the City's Planning Commission ask City Council to take them at their word that the Dream development at the northeast corner of Providence will not affect drainage for other neighbouring landowners. They rely upon their own, predominately undisclosed, studies that have not been tested by independent experts.

PART III – SUBSTANTIVE ISSUES

THE PROPOSED AMENDMENTS

26. Dream and the City's Planning Commission now ask City Council to approve amendments to Providence and ByLaw 48P2015 that will remove the protections afforded by Section 8.3.1. They maintain that a "carve out" is appropriate because Dream's development in NE36-22-2-W5 is, allegedly, "fairly isolated with respect to drainage and... there are no major drainage systems that have any measurable impact on lands to the north or west...".¹ The Planning Commission believes, therefore, that the proposed changes are "low risk".

GORDON JOHNSON'S REPORT

27. The Brodylo Family has retained the services of Gordon Johnson, a professional engineer and president of Burgess Environmental Ltd. His report is provided for City Council's review, together with these submissions.

28. Mr. Johnson's report raises several serious objections to the methodology and evidence relied upon by EXP Consulting in the SMDP it prepared for Dream, including:

- a) EXP's SMDP relies heavily upon a MDP that has not been approved by Water Resources and which may change prior to approval;
- b) EXP's SMDP relies upon key inaccurate factual information including, in particular, that 53rd St SW blocks flow from the north half of the Brodylo Farm and that the drainage course from the Brodylo Farm does not connect to Dream's proposed development; and

¹ City of Calgary Planning & Development Report dated November 29, 2018 at 7.

- c) Dream's development may risk encumbering drainage from the Brodylo Family's property, thereby increasing the water retained on Brodylo Family land.

REFERENCES TO MDP

29. The most obvious problem with EXP's SMDP is that the information it relies upon is taken from a MDP that is not publicly available for review and which is not approved by Water Resources. Significantly, the SMDP assumes a future Brodylo stormwater management facility, in accordance with the (unapproved) Providence MDP.²

30. The SMDP therefore "puts the cart before the horse". Even though there is not yet City Council or Water Resources' approval for a stormwater management facility on Brodylo land (or on Qualico land for that matter), the SMDP bases its assumptions on the existence of these as "functional storages" for stormwater.³ It is not clear what happens with EXP's SMDP if City Council or Water Resources refuses to approve stormwater facilities at either location.

DRAINAGE ACROSS 53rd STREET

31. In 2015, the Brodylo Family identified a clogged culvert to the east of the Farm's southern wetland that was covered by roadwork widening 53rd Street SW. The clogged culvert led to significant impounding of the southern wetland – causing damage both to the Brodylo Family's farming operations and to the wetland environment. When the culvert was unclogged, a massive water release took place, easing the impoundment on the Brodylo southern wetland and thereby draining the artificially impounded water into the eastern properties – including Qualico and Dream lands.

32. The Brodylo Family asserts that there is also a culvert buried under 53rd Street SW that drains the northern wetland into lands to the east of 53rd Street. There is no indication in EXP's SMDP that a culvert was considered at this location.⁴ If there is a buried culvert, as asserted by the Brodylo Family, it may lead to a potentially massive outflow of water into Qualico and Dream lands to the east once unburied and unclogged.

² EXP's Staged Master Drainage Plan ("SMDP") at 3 - para 3.1, at 14 – para 4.5, and at 23 – para 6.0.

³ SMDP at 14 – para 4.5

⁴ Report of Gordon Johnson dated January 7, 2019 ("GJ Report") at p 6.

33. At a minimum, some study of whether there is such a culvert and, if so, what effect it will have on the proposed SMDP, must take place. There is simply no information before City Council to account for this possibility.

34. Notably, Mr. Johnson suggests that before an MDP is completed, it may be necessary to re-establish and account for the drainage through the culvert.⁵

DRAINAGE COURSE INTO DREAM'S PROPOSED DEVELOPMENT

35. Contrary to the assertions of Dream and the City's Planning Commission, Mr. Johnson forcefully maintains that the Dream development area is, for drainage purposes, not a fairly isolated area.⁶ The northern wetland located on the Brodylo Farm drains directly east along Qualico's proposed development area and ultimately into Dream's proposed development. This is clearly illustrated in the map provided by Mr. Johnson at Figure 3.⁷ Ultimately, the northern wetland on the Brodylo Farm drains east into Dream's development area and then north onto Dream's proposed development, as well as into Fish Creek.

36. EXP's SMDP remarkably asserts, contrary to the known laws of fluid dynamics, that water from the northern wetland on the Brodylo property "flows uphill" due north of the Brodylo Farm or northeast on the western edge of Qualico's property and into Fish Creek via the Tsuu T'ina reserve across 146th Avenue SW. A three dimensional topographical map with drainage collection basins, provided by Mr. Johnson, visually illustrates the issues with EXP's assertions.⁸

37. A drainage course from the northern wetland on the Brodylo Farm, on the contrary, runs directly east from the Brodylo Farm through Qualico's land and into Dream's development. The drainage course is bordered by higher elevations on both the north and the south side, funnelling the water into the drainage valley and proceeding in an easterly direction. This drainage course flows downhill eastbound until it reaches a ridge located within the proposed Dream development. The drainage course then appears to dissipate into Dream's land or to flow northward towards Fish Creek.

⁵ GJ Report at 6.

⁶ GJ Report at 4.

⁷ GJ Report at 4, Figure 3.

⁸ GJ Report at 6, Figure 5.

38. The City's Stormwater Management & Design Manual discourages the "segregation" of natural drainage courses. Nevertheless, the SMDP proposed by Dream and the City does precisely this. This is an unjustified break with ordinary rules of stormwater drainage design and planning.

RISK OF DAMAGE TO BRODYLO FARM LAND

39. The obviously interconnected nature of the drainage course between Brodylo Farms through to the proposed Dream development raises the spectre of significant risk of harm. The Brodylo Family already has suffered extensive damage to their Farm because of the impoundment of the southern wetland. Mr. Johnson's Report suggests that similar damage may occur, if it has not already occurred, to the northern wetland as well.

40. Dream's development risks encumbering surface water flows. EXP's SMDP provides no details as to how pre and post-development flows of surface water through the proposed development will be accommodated.⁹ Additional flooding of the Brodylo Farm may occur if there is further impoundment of water. Mr. Johnson's analysis suggests, in fact, that there is a possibility of significant enough flooding to, in effect, bisect the Brodylo Farm from north to south due to the proportion of the Farm that is below the elevation of the crown of 53rd Street.

41. A MDP which takes all of this into account is crucial. There is a real risk of harm to the Brodylo Farm (and the lands of others) and simply no compelling reason why the Dream development should be rammed forward without such a plan.

PART IV – PROCEDURAL FAIRNESS ISSUES

DENIAL OF BASIC PROCEDURAL FAIRNESS

42. The Brodylo Family maintains that this motion is being pushed through quickly and without proper disclosure of key information. In particular, they raise the following basic concerns about the fairness of the approach taken by the City in moving forward with this motion:

- (a) The Brodylo Family, and the general public, *have not been provided access to the MDP* (including the studies and technical data from this) which the SMDP relies heavily upon; and

⁹ GJ Report at 7.

- (b) Despite the fact that the Brodylo Family was known to the City as an interested party, and despite the City taking steps towards this motion at a much earlier date, it was not until December 10, 2018 that the City advised the Brodylo Family of this motion, consequently, *the Brodylo Family has had extremely limited time to review and comment on a decision of substantial importance to them.*

LACK OF INFORMATION

43. The Brodylo Family has consistently requested that the City's Planning Department and Water Resources provide it with a MDP, including any draft versions of this document that it receives. City representatives, to date have refused to do so.

44. Even with this motion pending, City representatives continue to refuse to disclose EXP's MDP, which the EXP SMDP relies upon, to the Brodylo Family and the general public for comment and review.

TIMING OF DISCLOSURE

45. Equally disconcerting is the fact that the City did not provide the Brodylo Family with EXP's approved SMDP until December 20, 2018. Thus, the Brodylo Family has had precisely 18 days to retain an expert to review the SMDP and supporting documentation, flag potential concerns, and prepare submissions for City Council. The 18-day period, of course, does not take into account the customary Christmas holidays observed by most Albertans.

KEY PERSONAL INTERESTS INVOLVED

46. The Brodylo Farm is a property that is greater than 320 acres in area. This land is, by far, the greatest economic asset of each of Margaret Brodylo and her four children, who are the sole shareholders of the property. It goes without saying that the Brodylo Family has a substantial vested interest in ensuring that the Farm is not further harmed by flooding incidents and artificial impoundment of water.

47. Given their significant personal interests in the Farm, the Brodylo Family rightly demands that they receive a full and fair hearing before City Council – particularly as their expert, Mr. Johnson, warns that there are significant implications for their Farm if City Council approves the proposed amendments to Providence and allows Dream to proceed without an approved MDP in

place. At a minimum, the City should provide the Brodylo Family with appropriate conditions to ensure that City Council is adequately informed of the risks and benefits of a proposed course of action with a potentially profound impact on them.

EFFECT OF LACK OF INFORMATION AND LACK OF TIME TO RESPOND

48. The lack of disclosed information and the timing of the disclosure of information is highly prejudicial to the Brodylo Family and does not accord with their right to a procedurally fair hearing. In particular, the Brodylo Family lacks access to the basic information that City planners and private developers have in brining this motion. The Brodylo Family, further, does not know if information was selectively excluded from disclosure to City Council by EXP or City planners and, if so, the effect that this may have on the reasonableness of their conclusions.

49. The Brodylo Family therefore cannot make meaningful and fully informed submissions to City Council without the available information. Mr. Johnson has worked with information that was available in the SMDP and the information the Brodylo Family has compiled over the last several years; however, the City's Planning Department retains information that Mr. Johnson has not reviewed.

50. On a rush basis, the Brodylo Family retained Mr. Johnson to compile a report and to comment on the EXP SMDP, together with the City Planning Commission's report to City Council. If provided with additional time, it is very likely that significant additional concerns about the SMDP would have been discovered.

51. The Brodylo Family cannot help but wonder whether Dream's rush to get its SMDP approved by City Council is an effort to avoid public scrutiny of the large drainage problems associated with the Providence development.

PART V – REQUEST OF COUNCIL

52. The motion to amend the Providence ASP and to approve Dream's Outline Plan simply must not be allowed. EXP's SMDP relies upon inaccurate information and assumptions and the process leading to this City Council hearing is fundamentally flawed.

53. Brodylo Farms and the Brodylo Family therefore requests that City Council:

- (a) Adjourn the motion until a Master Drainage Plan is approved by Water Resources and fully disclosed to the Brodylo Family; or
- (b) Refuse Dream's and the City's Planning Commission's motion to amend the Providence ASP.

All of which is respectfully submitted this 7th day of January, 2019



JOHN KINGMAN PHILLIPS

Waddell Phillips Professional
Corporation

SUPPORTING DOCUMENTATION

1. Report of Gordon Johnson of Burgess Environmental dated January 7, 2019
2. Summary of Information prepared by Gordon Johnson of Burgess Environmental dated January 7, 2019

Burgess Environmental

24 Strathlorne Crescent SW
Calgary, Alberta, T3H 1M8
Telephone: (403) 875-5206
burgessenv@shaw.ca

January 7th, 2019

Project #: BROD-01

Brodylo Family Farm
15015 53rd Street SW
Calgary, Alberta

**Attn: Reid Brodylo
President**

Dear Reid:

Subject: Review of Staged Master Drainage Plan for Dream Asset Management Corporation

Summary

Dream Asset Management Corporation (Dream) has submitted an Outline Plan (Stantec, 2018) and supporting Staged Master Drainage Plan (SMDP, EXP, 2018) for development of 56.38 hectares of land primarily located within the NE ¼ of 36-22-2 W5M (yellow outline, Figure 1). The Dream property is located immediately east of a proposed Qualico development and a ¼ Section east of the Brodylo Family Farm, which is located within the East ½ of 35-22-2 W5M (red outline, Figure 1).

The City of Calgary (City) proposes to accept and approve the Outline Plan and SMDP without first having an approved Master Drainage Plan (MDP) for the area. In my opinion, the proposed OP and SMDP should not be approved without first approving a MDP for the following reasons.

- The approval of the SMDP contravenes the City's own process, whereby an approved MDP is required prior to issuing and approving a SMDP.
- The fundamental premise that the Dream lands are hydraulically isolated from the surrounding lands that would be subject to the MDP is flawed. A significant water course flows from the Brodylo lands, across 53rd St SW and Qualico lands, through the Dream lands, and should be accounted for by an approved MDP and the SMDP.
- EXP's primary conclusion that, 'the overall drainage concepts considered for the Providence SMDP adhere to the Providence Master Drainage Plan (Providence, 2018)' is not supported. If the SMDP relies on the MDP then the MDP should be finalized and approved prior to processing Dream's OP and SMDP for the Dream Development.
- The City's technical staff has been told that 53rd St SW entirely blocks flow from the north half of the Brodylo land, which is not correct and should not be relied upon. 53rd St SW impedes flow from the Brodylo property but does not entirely blocking it. The buried culvert at this location should be replaced to return natural drainage to this portion of the Brodylo lands.
- Approval of a SMDP in the absence of an approved MDP has the potential to encumber drainage from the Brodylo and Qualico properties, as well as their future development.

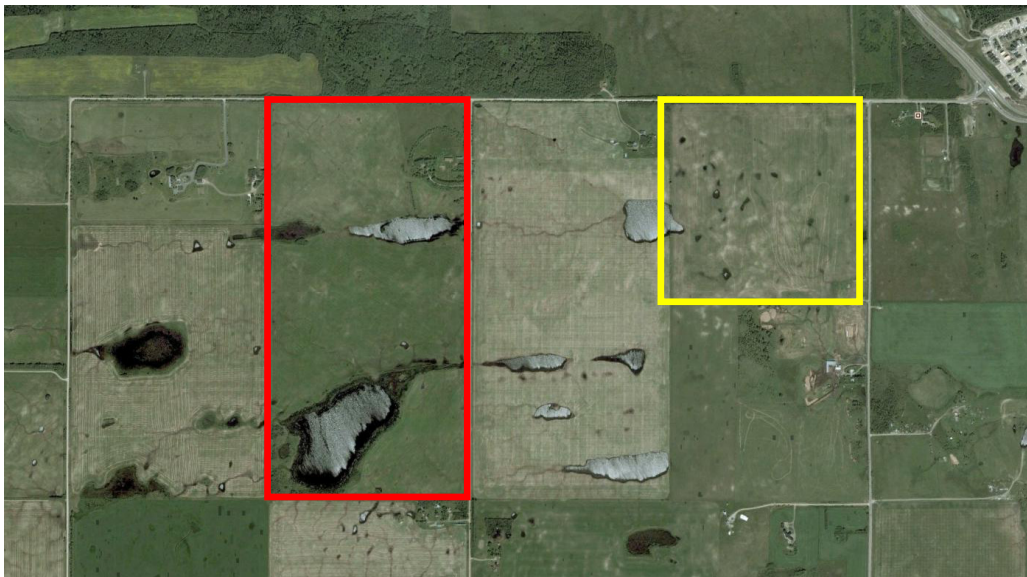
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Proposed Dream Outline Plan
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Introduction

Dream Asset Management Corporation (Dream) has submitted an Outline Plan and Staged Master Drainage Plan (SMDP) for development of a parcel of land in southwest Calgary, within the Providence Area Structure Plan (ASP). The application contemplates the development of 56.38 hectares of land primarily located within the NE $\frac{1}{4}$ of Section 36 Township 22 Range 2 W5M (yellow outline in Figure 1), between 37th Street SW and the 45th Street SW road allowance, and south of 146th Avenue SW. The Dream property is located immediately east of a proposed Qualico development and $\frac{1}{4}$ Section east of the north half of the Brodylo Family Farm, which is located within the East $\frac{1}{2}$ of 35-22-2 W5M (red outline in Figure 1). The City of Calgary has circulated an information package that describes this development with the objective of obtaining feedback and comments from potentially affected stakeholders in the area.

Figure 1: Plan View of Area (2005 image)



This letter provides my assessment of this information package. The focus of this review is on the SMDP, the hydrology of the area, and the potential for this development to impact future land developments in the area, including the Brodylo Family Farm. This letter provides a follow up to Burgess' letter of December 13, 2018, which was based only on review of the Outline Plan.

Development Plans

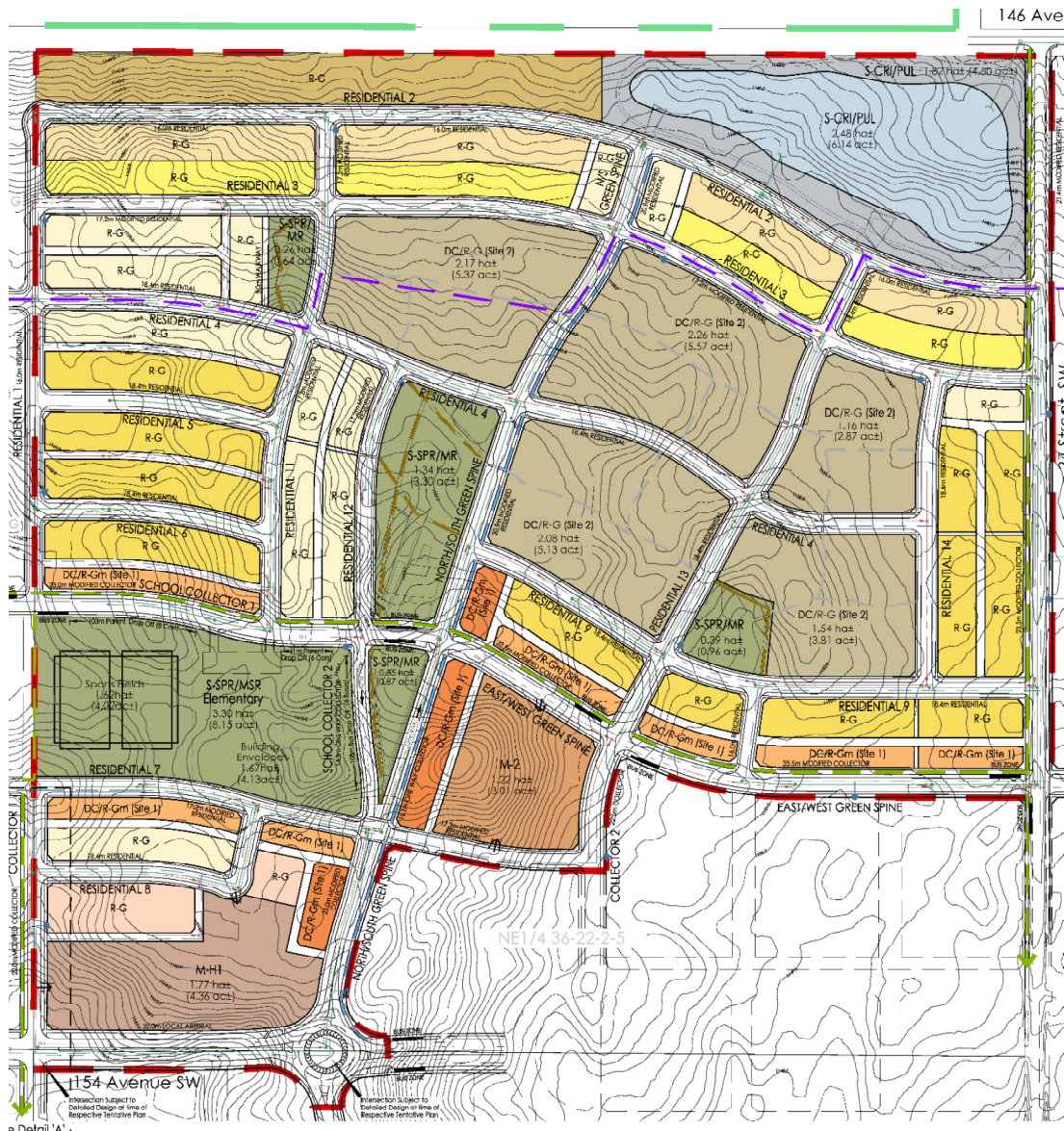
Outline Plan

Figure 2 illustrates the land development plan as presented in Dream's Outline Plan, which was prepared by Stantec (2018). The proposed development consists of low-density residential land use (R-G); direct control low density mixed housing (DC/R); multi-residential medium profile and high density low-rise (M-2 and MH-1); and municipal reserve (S-CRI, S-SPR). A stormwater pond (S-CRI) is located in the northeast corner of the development.

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Figure 2: Proposed Dream Outline Plan



Staged Master Drainage Plan

The SMDP complements the Outline Plan (Stantec, 2018) and Land Use Application (LOC2017-0308) as shown in Figure 2, and reportedly relies on the Providence Master Drainage Plan (MDP), prepared by EXP in May 2018. The referenced MDP was not included in the information package made available by the City for this review.

Stormwater runoff is managed by a minor system (storm-sewers and catch-basins, shown in green in Figure 2) that are positioned along most of the internal roads and each of the major streets and avenues shown above, and a major system (above ground drainage along roadways and drainage ways). These systems direct runoff to a stormwater management facility (SWMF), which is used to regulate flow to Fish Creek and acts as a sedimentation basin to control water quality. From the perspective of surface

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Proposed Dream Outline Plan
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water management, the proposed development is managed as an entity separated from the surrounding lands. To eliminate the need for a dual piped system through Providence, EXP proposes that the future upstream SWMFs (Qualico and Brodylo) be routed through the Dream Development as a flow through and ultimately discharge to Fish Creek (EXP, 2018). No specifics are provided regarding the nature of these interfaces or their associated flow limitations and the SMDP does not appear to account for current flows.

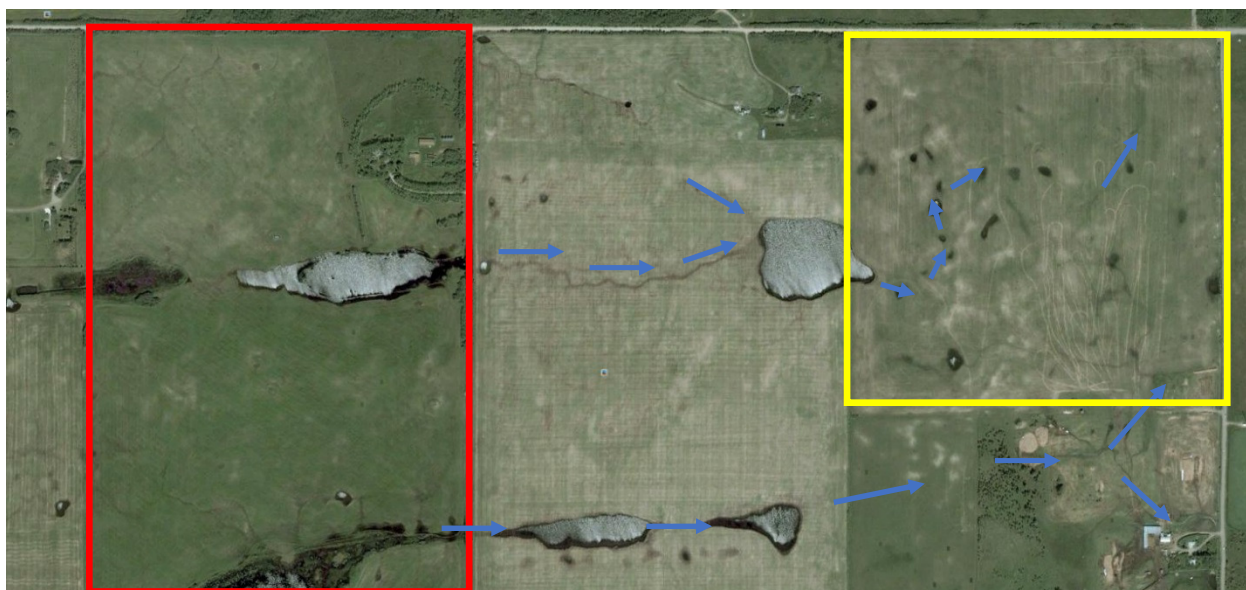
The SMDP was submitted by Dream and was accepted even though the MDP has not been approved for the area as a whole. The rationale for the City's decision was that Dream's property 'is fairly isolated with respect to drainage and that there are no major drainage systems that have any measurable impact on adjacent lands' (City of Calgary, 2018). Dream and the City of Calgary administration is proposing to amend the Providence ASP to exempt Dream from the requirement that the MDP be completed prior to land use and outline plan approval.

Assessment

Basis of City's Approval

The basis of the City administration's recommendation that a SMDP is acceptable for Dream's Outline Plan because this property 'is fairly isolated with respect to drainage' is incorrect. Figure 3 illustrates the proposed Dream development area in yellow, which is located immediately east of the Providence land and ¼ east of the north half of the Brodylo Family Farm (in red). This image was taken in 2005. It is evident in this image that the two northern wetlands on the Brodylo Family Farm overflow to the east, through the Providence lands and onto Dream's lands. While drainage patterns have been obscured and impeded by years of farming and by road construction, the overall drainage of this plateau area that includes the Brodylo Family Farm is to the east, through the Qualico and Dream lands, as shown by the blue arrows, to Fish Creek. Other historical air photos show the same drainage (Trace, 2017).

Figure 3: Existing Surface Water Drainage Pattern



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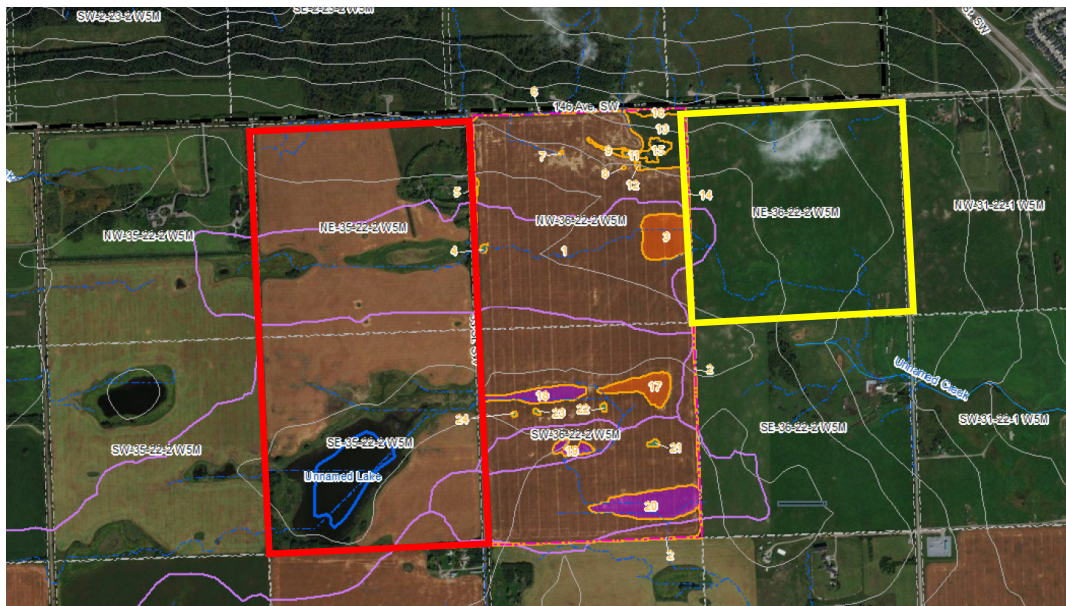
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The City's decision to waive the requirement to have an approved MDP in place before processing and approving a SMDP appears to be in conflict with the concerns raised by its own technical reviewer. Gloria Bei's comments issued on August 17th, 2018 that represent her first review of the SMDP included 31 individual comments and concerns, of which 10 were related to issues that would be addressed by an approved MDP.

Drainage Basin Assessment

Trace Associates (2017) in its assessment of potential wetlands impacts associated with the proposed Qualico development within the west ½ of Section 36, Township 22, Range 2 W5M depicts the drainage from the north wetlands of the Brodylo property, through the Qualico property onto the Dream property, as shown in Figure 4. This figure contradicts statements made by Trace in communications with the City in May 2018 where Ron Sparrow states that 53rd St SW blocks flow from the Brodylo wetlands and redirects this flow to the north, along ditches paralleling 53rd St SW. Review of Figure 3 indicates that this is clearly not the case. 53rd St SW should not be relied upon to restrict flow from the Brodylo wetlands. Further, if 53rd St SW is restricting the outflows from the Brodylo wetlands repairs should be made to re-establish the natural drainage patterns of the area, as required by the Calgary (2011) Stormwater Management & Design Manual.

Figure 4: Drainage Courses Interpreted by Trace (2017)



The nature of this drainage area is clearly evident in the three-dimensional topographic imagery presented in Figure 5, which is based on LiDAR data obtained from the Province of Alberta. The drainage area that covers most of the north half of the Brodylo property and includes the two northern wetlands clearly flows west to east, through the Qualico property, and into the wetland that straddles the Dream and Qualico properties. Runoff water that overflows this wetland flows to the east and south, through Dream's property and eventually into Fish Creek. Water within the Brodylo wetland cannot flow to the north along 53rd St SW because this is uphill.

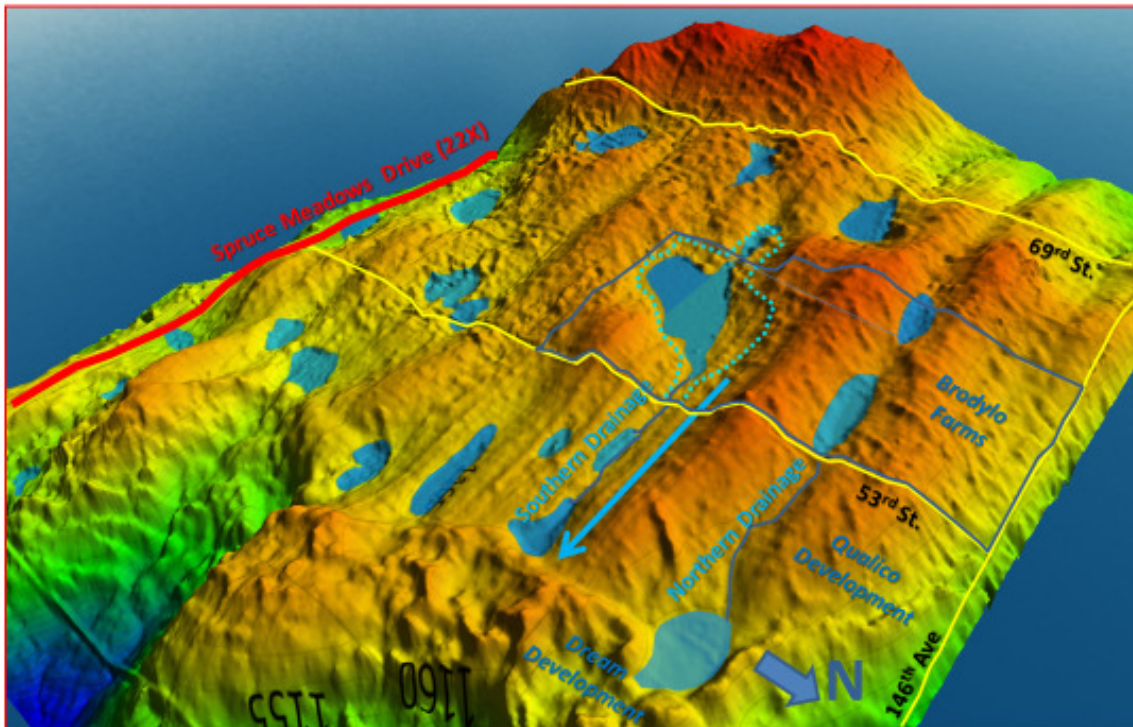
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Figure A2 of the SMDP illustrates the drainage areas as interpreted by EXP and is used as the base for Figure 6 (below). The 'existing catchment boundaries' depicted in Figure A2 are incorrect and are inconsistent with Trace's interpretation of the drainage course as shown in Figure 4. First, the EXP interpretation of the existing catchment boundaries on the north half of the Brodylo property indicates a drainage boundary between the two northern wetlands, which is clearly not the case (see Figure 5). The EXP interpretation appears to treat the drainage areas on the Brodylo and Qualico lands as separate but does not indicate where flows from these areas go. While it is true that 53rd St SW impedes flow across 53rd St SW it is evident from review of Figure 3 that flow across this barrier still occurs during periods of high runoff. According to the Brodylos, a culvert across 53rd St SW was in place at this location but was covered when 53rd St SW was widened. Regardless, drainage across 53rd St SW should be re-established and should be accounted for by the drainage plans completed for the developers.

To put the importance of this drainage area into perspective, the area outside or straddling Dream's property that drains into the Dream property totals approximately 68 hectares (Figure A2), which exceeds the entire area of the Dream development that is covered by the SMDP. To exclude this drainage and its implications from the SDMP is not appropriate and underscores the need to have an approved, comprehensive MDP in place before SMDPs for individual parcels are submitted and approved.

Figure 5: Drainage Basins Around Dream Development



The drainage area that flows from the south half of the Brodylo property, through the south portion of the Qualico lands and south of the proposed Dream Development is equally important to the area as a whole and should be integrated into a comprehensive MDP before any development is approved in the area. This drainage area is clearly integral to stormwater management plans for 53rd and 46th Streets SW and should be considered when evaluating all development plans in the area.

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Potential Implications to Nearby Landowners

Failure to properly account for flows originating on the Brodylo property and flowing through the Qualico property onto the Dream property can encumber the surface water flows and development potential of these properties. While the SMDP allows for flow-through of 'future' post-development runoff from these properties it ignores the surface water flows that will occur prior to the development of the Qualico and Brodylo lands. It also provides no details regarding how post-development flows will be accommodated.

The underlying hydraulic analysis demonstrates the need for water management for both the post-development and the pre-development cases. Section 3.8.1 of the SMDP (EXP, 2018) states that the approved (sic) MDP specifies 'Unit Area Release Rates (UARR) from 70 L/s/ha to 120 L/s/ha depending on site nature and topography. UARR of 70 L/s/ha is proposed for single family residential; 115 L/s/ha is proposed for multi-family and commercial sites'. Based on the drainage areas presented in Figure A2 of the SMDP, which are incorrect and underestimate the drainage areas, the range in allowable release rates from the Brodylo and Qualico properties are significant and total 4,000 to 7,000 lps (see Table 1).

TABLE 1: POST DEVELOPMENT RELEASE RATES FROM NORTH DRAINAGE

Parameter	Brodylo	Qualico	Combined
Area (ha)	24.2	34.4	58.6
Minimum UARR (lps/ha)	70	70	70
Maximum UARR (lps/ha)	120	120	120
Minimum Design Flow (lps)	1,692	2,407	4,099
Maximum Design Flow (lps)	2,900	4,126	7,026

Table 2 estimates the average annual outflows from the north wetlands of the Brodylo property for normal, dry and wet years. Inflows to the wetland are represented by precipitation directly onto the wetland and net runoff from the adjacent lands. Outflows are represented by evaporation and groundwater seepage out of the wetland. The Brodylo Family Farm property is expected to act as an area of groundwater recharge as it is located on a plateau. Water seepage is expected to be low relative to the gain and loss of water associated with precipitation and evaporation because of the low permeability of the underlying soils. The following assumptions were made:

- an annual runoff coefficient (R_c) of 0.15 for the cultivated farmland that drains into the wetland (Kennessey, 1930; Alberta Transportation, 2011)
- annual evaporation from areas that contain shallow water (e.g. the pond portion of the wetlands) of 765 mm (AESRD, 2013)
- a downwards gradient of 10% and an average hydraulic conductivity of 10^{-8} m/sec

Based on Figure A2 of EXP's SMDP, the total area that drain into the north wetlands is estimated to be 24.2 hectares, which is incorrect and underestimates the drainage area. The total ponded water area of the north wetlands is estimated to be 3 hectares, which reflects historical averages based on review of aerial images.

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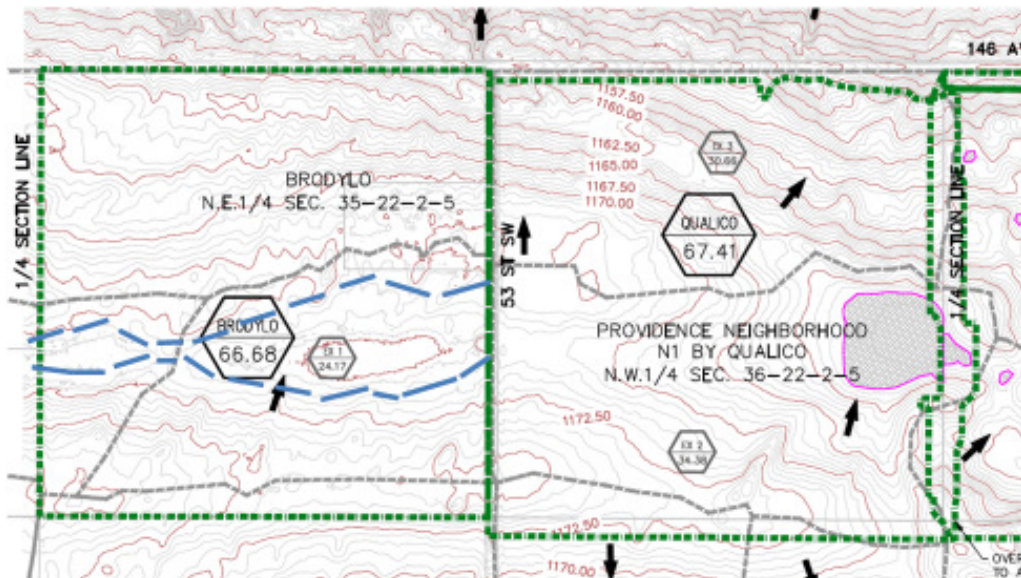
TABLE 2: HYDROLOGIC ANALYSIS OF NORTH BRODYLO WETLAND

Area	Precipitation		Dry Year		Average Year		Wet Year	
	Area (ha)	R _c	Precipitation (mm)	Total (m ³)	Precipitation (mm)	Total (m ³)	Precipitation (mm)	Total (m ³)
Grass Farmland	24	0.15	300	11,000	420	15,000	550	20,000
Pond Area	3	1	300	9,000	420	13,000	550	17,000
Pond Evaporation	3	1	-765	-23,000	-765	-23,000	-765	-23,000
Pond Seepage	3			-1,000		-1,000		-1,000
Net Annual Outflows				-4,000		4,000		13,000

This analysis indicates that outflows are expected from the north Brodylo wetland area during normal and wet years; hence, the need for finalizing a MDP before authorizing any land development. This simple analysis also demonstrates the need to replace the buried culvert beneath 53 St SW and account for outflows from these wetlands to prevent the Brodylo wetlands from increasing in size. If the drainages for the Brodylo Family Farm and other lands in the area are not accounted for by a MDP, large tracts of lands will become isolated from the drainage infrastructure and will be prone to flooding. The flooding would be greater during large rainfall events as is evident from the swelling of the north wetlands that occurred in 2005 (see Figure 3). During a 1 in 25 years, 24-hour rainfall event the volume of water flowing into the Dream Development from this undeveloped drainage basin will approach 20,000 m³.

The implications to the Brodylo property are significant. Figure 6 illustrates the approximate portion of the north half of the Brodylo property that is beneath the elevation of the crown of 53rd St SW. This represents the portion of the north half of the Brodylo property that is susceptible to flooding if this drainage is not accounted for by the design of 53rd St SW and/or the adjacent developments.

Figure 6: Portion of Drainage Basins Around Dream Development



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The administration's recommendation that SMDP's can be developed and pieced together on an ad-hoc basis, one parcel development at a time, without any reliable MDP for the area is ill-advised. The administration's approach will lead to significant difficulties for development of the lands to the south and west of the Dream property. Reliable, safe and environmentally effective stormwater and surface water controls are required to enable responsible development of the area as a whole.

Closure

I trust that this assessment is clear and properly addresses stormwater management issues associated with the proposed Dream Outline Plan. If you have any questions or require additional information, please contact the undersigned.

Yours sincerely,

BURGESS ENVIRONMENTAL LTD.



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

References

Alberta Transportation, 2011. Erosion and Sediment Control Manual. Technical document issued by Alberta Transportation.

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City of Calgary, 2011. Stormwater Management & Design Manual.

City of Calgary, 2018. Outline Plan in Residual Sub-Area 13D (Ward 13) at 15113 – 37 Street SW, LOC2017-0308 (OP). Planning & Development Report to the Calgary Planning Commission. November 29, 2018.

Environment Canada, 2014. Climate Normals for Canadian Weather Monitoring Stations. <http://climate.weather.gc.ca/climateData/>, accessed July, 2014.

EXP Services Inc., 2018. Staged Master Drainage Plan Dream Development. Report issued to Dream Development in support of the Outline Plan. November 8, 2018.

Kennessey, B., 1930. Runoff Factors and Retention. Published in Vizugy, Koyiemenyek, Hungary, 1930.

Stantec, 2018. Attachment 3 Proposed Outline Plan. Prepared by Stantec for Dream Asset Management Corporation. November 13, 2018.

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The City of Calgary plans to Approve the Dream Outline Plan and Stage Master Drainage Plan (SMDP). This should not be approved for the following reasons:

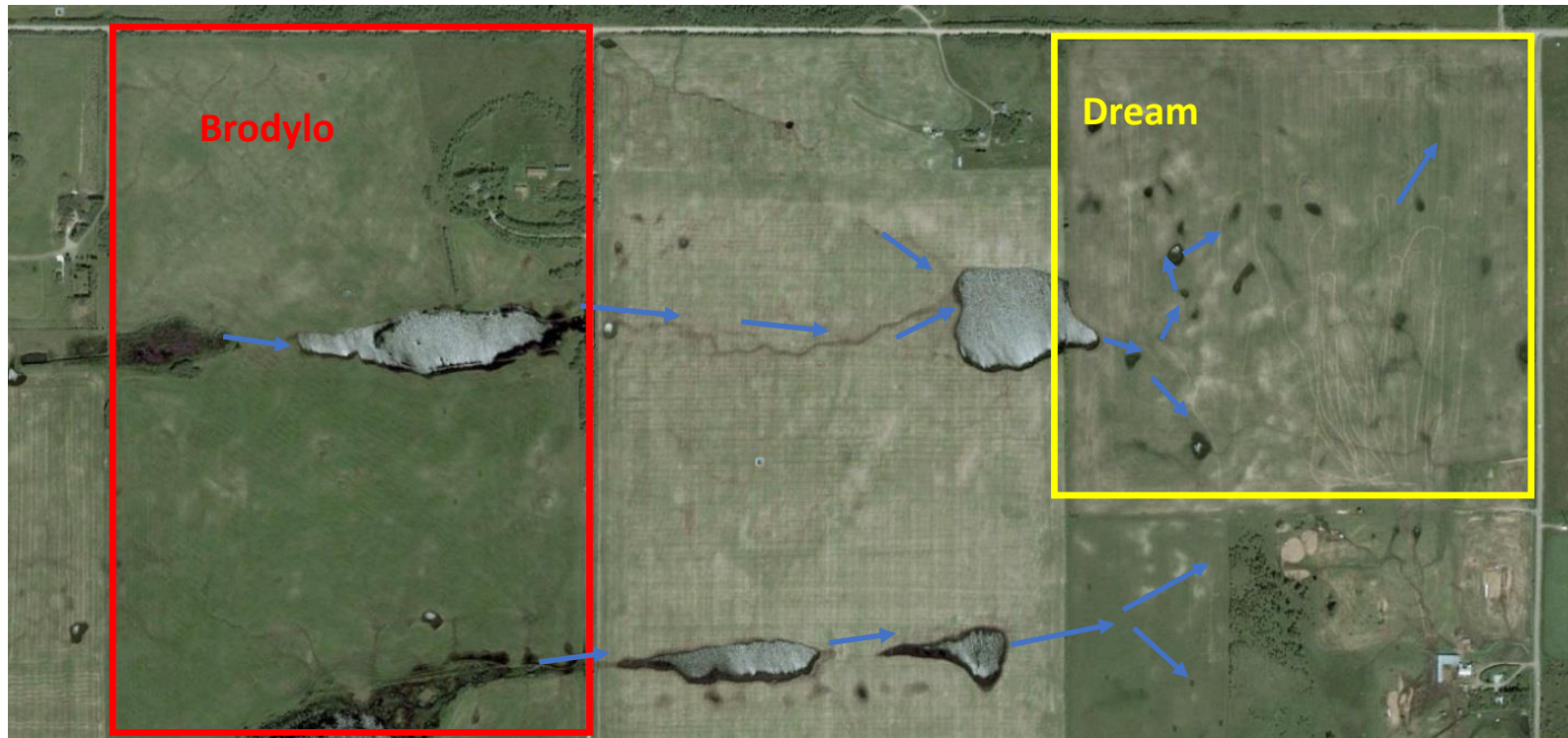
- An approved Master Drainage Plan (MDP) is not in place, which contravenes the City's own development rules.
- The Dream SMDP is based on incorrect drainage assumptions and ignores a major drainage course that flows from the Brodylo Property, through the Qualico property, into the Dream property.
- The Dream SMDP relies on segregating natural drainages, which is contrary to the City's Stormwater Management & Design Manual
- Approval of the Dream Outline Plan and SMDP in their current form can adversely affect the drainage and development potential of the Brodylo and Qualico lands.

An approved MDP should be in place before the Dream development is approved and the culvert drainage across 53rd St SW should be re-established as part of this MDP.

From Trace
(2017)

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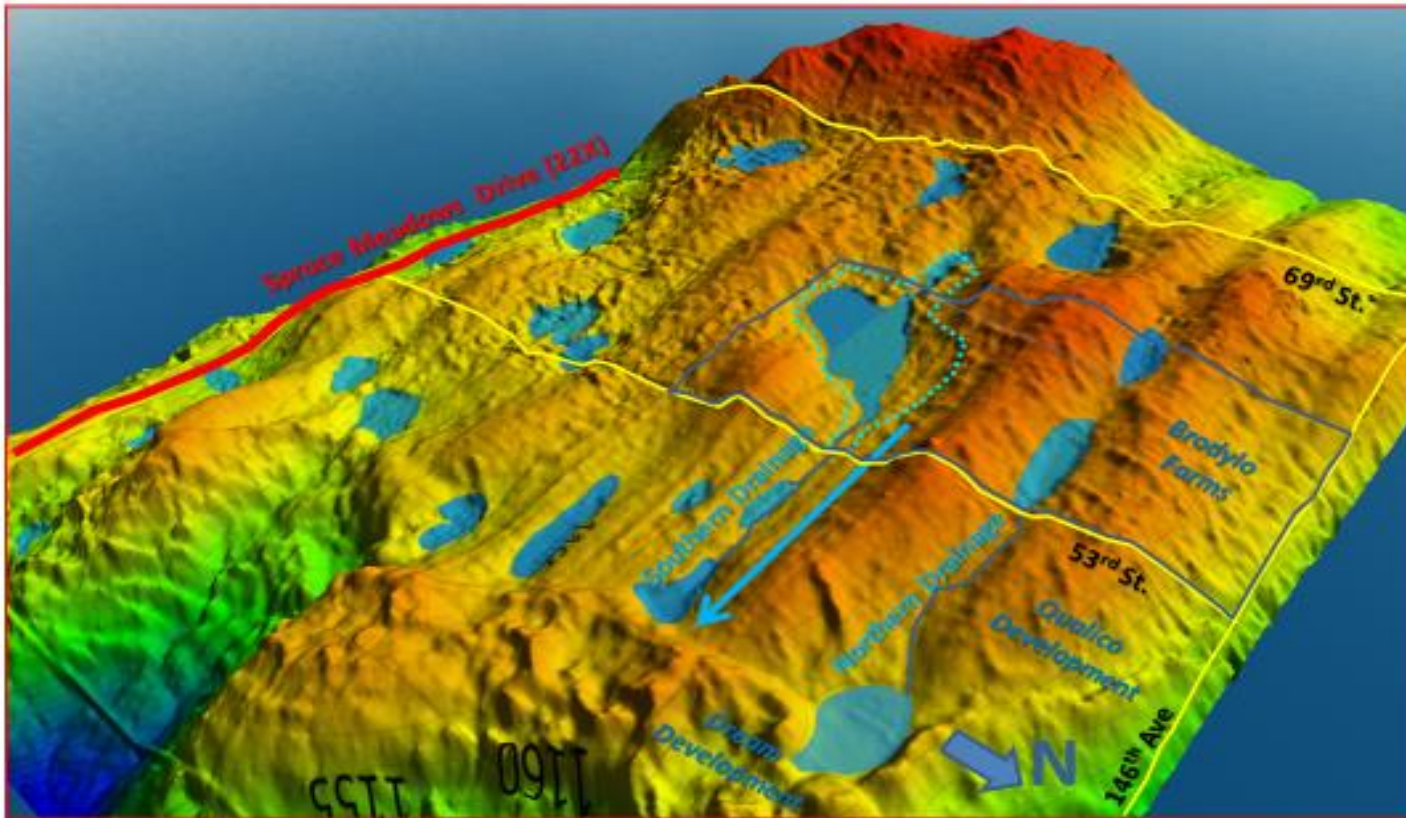
This natural drainage course is clearly evident in this 2005 airphoto. It is also evident that flooding of the Qualico and Brodylo lands occurs if this drainage course is not properly managed.



Google Earth
(2005) image

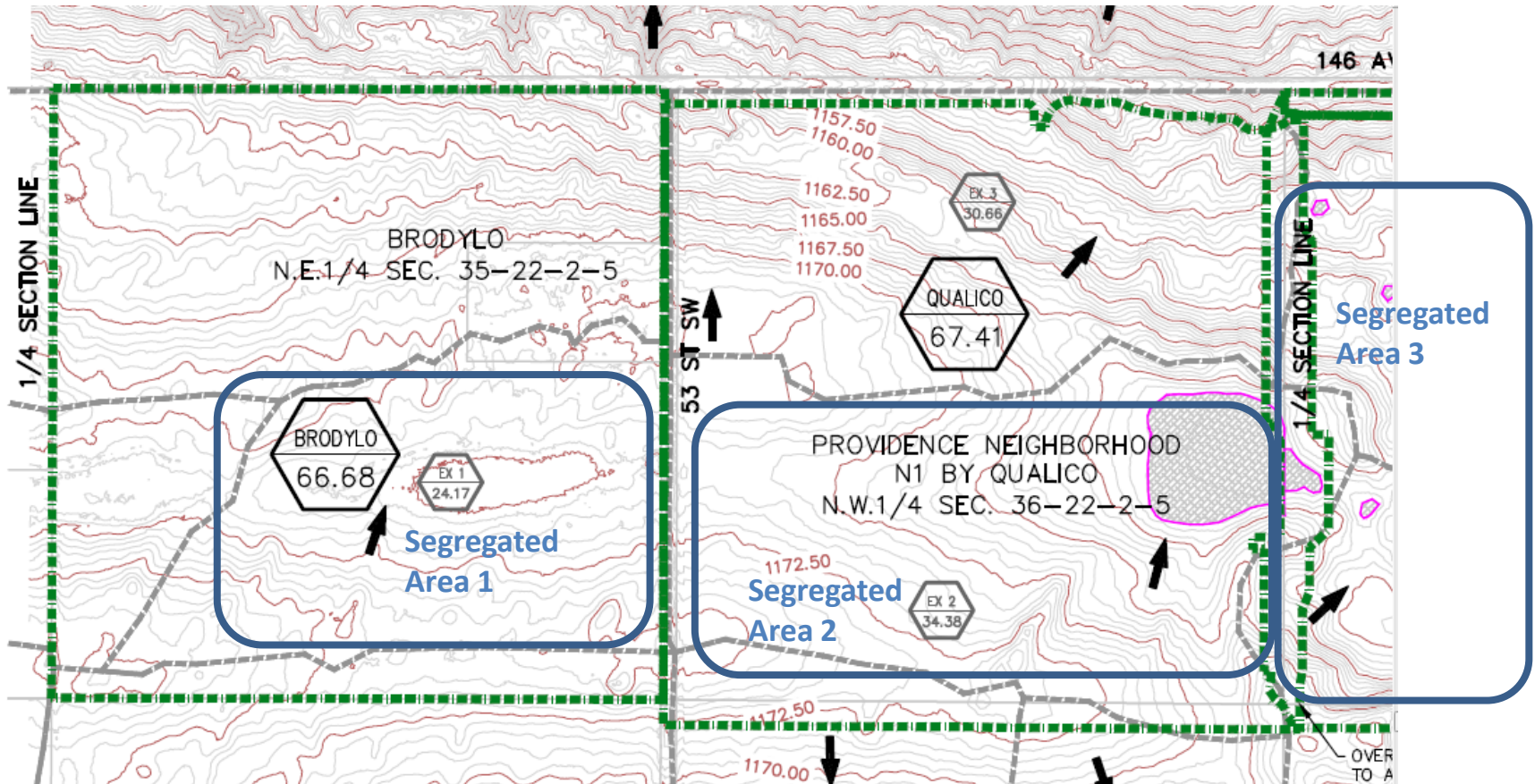
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The drainage area through these properties is also shown clearly in this 3-D topographic image that was created using LiDAR obtained from the Province.



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The drainage area boundaries of the Dream are wrong and their SMDP would segregate natural drainage areas, which contravenes one of the basic principles of the City's Stormwater Management & Design Manual.



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Flooding of the north portion of the Brodylo property will occur if the drainage across 53rd St SW if this drainage is not incorporated into Dream's SMDP and re-establish as per the City's Stormwater Management & Design Manual.

