LETHBRIDGE COUNTY
IN THE PROVINCE OF ALBERTA

BYLAW NO. 1466

A BYLAW OF LETHBRIDGE COUNTY BEING A BYLAW PURSUANT TO SECTION 633(1) OF THE MUNICIPAL GOVERNMENT ACT, REVISED STATUTES OF ALBERTA 2000, CHAPTER M.26

WHEREAS Transmark Ltd. wishes to develop on lands in the NW and SW 27-7-20-W4;

AND WHEREAS the County's Municipal Development Plan requires that developers prepare an Area Structure Plan to ensure sound development occurs within the County;

AND WHEREAS the total area of the development will be 207 acres;

AND WHEREAS the landowner/developer have prepared the "Area Structure Plan – Portions of NW and SW 27-7-20-W4" which contains engineering, survey, and geotechnical information to support the above conditions.

NOW THEREFORE BE IT RESOLVED, under the Authority and subject to the provisions of the Municipal Government Act, Revised Statutes of Alberta, 2000, Chapter M-26, as amended, the Council of Lethbridge County in the Province of Alberta duly assembled does hereby enact the following:

1. The "Area Structure Plan for Portions of NW and SW 27-7-20-W4" Bylaw No.1426, attached as "Appendix A".

GIVEN first reading this 21st day of April, 2016.

Reeve

Chief Administrative Officer

GIVEN second reading this 16th day of June, 2016.

Reeve

Chief Administrative Officer

GIVEN third reading this 16th day of June, 2016.

Reeve

Chief Administrative Officer

BYLAW NO. 1466

VITERRA AREA STRUCTURE PLAN

PORTIONS OF NW & SW-27-7-20-W4
Lethbridge County, AB

Submitted to
Lethbridge County

PREPARED BY:
Hasegawa Engineering
A Division of 993997 Alberta Ltd.
330, 3120 – 32nd Street South
Lethbridge, Alberta
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1.0 INTRODUCTION

This area structure plan has been prepared by Transmark on behalf of Viterra to describe the development concept for the 83.83 hectares (207.15 acres) on NW & SW-27-7-20-W4.

An Area Structure Plan (ASP) is required under Section 6.2 of the Municipal Development Plan of Lethbridge County.

This ASP is submitted as support for the application to adopt the Plan as a by-law of the Lethbridge County (Bylaw 1466) and the subsequent change to the Land Use By-Law. The ASP will provide a basis for evaluation.

2.0 PLANS AND DRAWINGS

In order to illustrate the location of the property, site drainage, and the proposed subdivision layout, five figures have been prepared. The figures are provided in Appendix A and are as follows:

1.0 Area Map
2.0 Site Map
3.0 Lot Layout
4.0 Existing Ground Topography

These maps are conceptual in nature and are to be used for planning purposes only. Upon ASP acceptance, detailed design plans will be prepared and submitted with any subdivision application.

3.0 LAND USE CONCEPT

3.1 EXISTING CONDITIONS

The lands within the boundaries of the proposed ASP are currently used for agri-business and the major portion is cropped agricultural land. The lands are bordered by Transmark Ltd. to the north and Township Road 74 to the south. To the west is Hwy 845 and to the east lies agricultural land.

3.2 DEVELOPMENT OBJECTIVES

The objective of Phases 1 and 2 is to provide a location to increase the trans-loading capacity, add rail car storage and enhance the growth of businesses which primarily provide services to the oil and wind sectors within Lethbridge County.

The development of Phases 1 and 2 in the ASP is for the purposes of expanding trans-loading activities at the Transmark site. As such these will be extensions of the rail lines of that facility. Rail lines will be extended into each lot and vehicle

access will be from the Transmark site. In addition there will be no need for structures or services since these lots will only be used for rail line and trans-loading operations.

There are no plans currently for the development of Phases 3 and 4 at this time. In addition the future use of Phases 3 and 4 are uncertain. As such prior to proceeding with the development of these phases additional planning and design will be required as detailed in Section 5.

Land Use Classification
The current land use classification is Rural Agriculture (RA). The proposed land use classification is Rural General Industrial (RGI) as per the Lethbridge County Land Use Bylaw.

3.3 PROPOSED LAND USE AREAS

The concept is to add new tracks in Phase 1 with additional tracks in Phase 2. Phases 3 and 4 are dedicated to future expansion to the Viterra property.

The distribution of land use within the proposed ASP is shown in Table 1 below.

Table 1: Land Use Statistics

	Hectares (Acres)	Percent of Gross Area
Net Developable Area	79.16 (195.61)	94.4
RGI (Rural General Industrial)	79.16 (195.61)	94.4
Utility Lots - Ponds	4.67 (11.54)	5.6
Gross Developable Area	83.83 (207.15)	100

4.0 PHASE 1 & 2 DEVELOPMENT

4.1 SERVICING

There will be no requirements for sewer or water to Phases 1 and 2 lots as no structures will be built on these lots. In the event that electricity is needed, Fortis Alberta will provide underground services.

4.2 ROADS AND TRANSPORTATION

Primary access to these parcels will be to access rail trans-loading activities. Truck and vehicle traffic planned to access the parcel will be accessed through the Transmark facility.

Proposed access to these sites would be from the existing Transmark access on Hwy 845 access. In addition, there is an existing approach on Township Road 74 which could be used for light company equipment.

Alberta Transportation has been approached about this project and they have indicated that for Phase 1 and 2 no Traffic Impact Assessment (TIA) would be required. However at the time of subdivision and/or development, a TIA may be required.

4.3 SITE DRAINAGE AND GRADING

All drainage onsite must conform to Lethbridge County, Alberta Transportation and Alberta Environment requirements. The intent of storm water management for the development is to control runoff with the use of storm water management ponds such that pre-development runoff condition are not exceeded post-development. A Site Drainage Analysis was completed for the site (Appendix B) and is summarized below.

4.4 SITE DRAINAGE

The Proposed Phases 1 and 2 development area is relatively flat with the elevations in the 931 – 934 meter range. Existing drainage direction is to the west and southwest into the existing drainage ditches along Hwy 845 and Township Road 74. Several low lying areas that lie within the development area provide minor storage. These areas are seasonally wet but have been consistently cultivated. They are classed as non-wetland based on our review of the Alberta Wetland Classification System document (2015).

Post development drainage direction of Phases 1 and 2 will be into the proposed storm water retention pond and drainage ditch located along the west lot line of Phase 1 which joins Phases 1 and 2.

Post development drainage for Phase 3 and for the north half of Phase 4, is to the north and into the proposed storm water retention pond at the north corner of the development.

The south half of Phase 4 will drain west and south into the existing drainage ditches along the east side of Hwy 845 and the north side of Township Road 74. Refer to Figure 3.0 for locations of storm water retention ponds and drainage ditches.

As part of Phase 1, the north storm pond will be installed (refer to Figure 3). This will be a private facility managed by the land owner; however, the landowner will enter into an agreement with the County on proper operation and management.

A detailed stormwater management plan is required for the Phase 1 storm pond next to highway 845 including a detailed flow analysis.

The stormwater management plan will meet the requirements of Alberta Transportation and Alberta Environment and Parks and will require endorsement by both departments.

As per the SMRID requirement, a restrictive valve will be added at the outlet to control runoff flow leaving the property (refer to correspondence in Appendix C).

4.5 DRAINAGE MODELING

The pre- and post-development storm drainage patterns of the development area are described in the attached Storm Water Management Report, attached to this document as Appendix B– Site Drainage Analysis.

The addition of the rail will affect drainage and the drainage plan has been completed to account for additional runoff from developed areas. Two storm water ponds are proposed to control runoff from the site. The storm water ponds will also provide sufficient storage to account for the loss of low lying areas in the subject area.

4.6 STORM-WATER AGREEMENTS AND APPROVALS

The storm water retention ponds will require approval under the Water Act and a registration under EPEA from AEP as municipal storm water management ponds prior to construction. An approval by Alberta Transportation is also required.

4.7 SUBDIVISION

4.7.1 Process

With the appropriate Engineering Detail Plan and land use designation in place, the developer or landowner will apply for subdivision of the parcel. Phases 1 and 2 will be consolidated into the Transmark facility. Transmark will have certain costs to consider associated with the subdivision process. These include: subdivision application fees, municipal reserve payments, survey costs and Land Titles registration costs. Any required infrastructure to be installed to service the subdivision will be in addition to this.

4.7.2 Policies

1. The area structure plan is to be used as a guideline for subdivision when a landowner/developer decides they want to subdivide any land affected by this plan. The proposed density and minimum lot size shall be adhered to when subdividing a lot.

2. A landowner/developer is responsible for the costs of subdividing and developing parcels affected by this plan, and Lethbridge County shall not be responsible for executing the Plan or any associated costs.
3. As a condition of subdivision approval, the landowner or developer will be required to enter into a development agreement with Lethbridge County.
4. Costs of infrastructure/utilities shall be borne by the persons owning and developing land in the Plan area.
5. As a condition of subdivision approval, the developer must provide a plan of survey from a certified Alberta Land Surveyor that certifies the location and dimensions of any existing buildings and the exact dimensions of the lot(s) to be subdivided.
6. Subdivision proposals will be reviewed in terms of conformity to the area structure plan design. Prior to the application or survey of the subdivision proposal, developers are encouraged to consult with Lethbridge County and their planning staff to determine if the proposal is in compliance with the plan.
7. At the time of subdivision, municipal reserve shall be provided by way of land or cash in lieu of land in an amount not exceeding 10 percent of the acreage of the parcel being subdivided or 10 percent of the per acre value of the parcel being subdivided. It is assumed that municipal reserve will be provided as cash in lieu of land in most cases.
8. Any utility easement(s) as required by utility companies or Lethbridge County shall be established prior to finalization of the subdivision application.
9. All subdivision applications will be required to include a site plan or surveyors sketch that identifies:
    a. Existing buildings or structures and the location of any utility lines or easements, drainage ditches or swales, dugouts or ponds, etc.
    b. Any existing private sewage disposal systems so a record and location of the system is available in consideration of property lines and to ensure existing systems remain on the titles they are associated with and the dwelling they serve.
    c. Any storm water management facilities, existing and/or proposed, to ensure that the location and interconnecting of the facilities is feasibly developed in accordance with the storm water management plan.
    d. Any other information required by the Subdivision Authority or under the County’s land use bylaw.
10. A Traffic Impact Assessment (TIA) will be required from Alberta Transportation.

5.0 ENGINEERING DETAIL PLANS FOR PHASES 3 & 4

Once this Area Structure Plan has been adopted by Council, the land eligible to be subdivided in Phases 3 and 4 must have the proper planning and design prior to subdivision. Prior to subdivision, rezoning will also need to occur.

Prior to rezoning or subdivision, this Area Structure Plan shall be amended to include the proposed build-out density, type of parcel sizes and land uses. Updates may also be required for the drainage and transportation sections of the Area Structure Plan.

To ensure any concerns over the suitability of Phases 3 and 4, the provision of a professional engineered investigation/analysis and report to ensure the land is suitable in terms of topography, soil characteristics, groundwater, flooding or drainage subsidence, and sanitary sewerage servicing will be required as part of the Engineering Detail Plan to be submitted by landowners/developers for each subdivision.

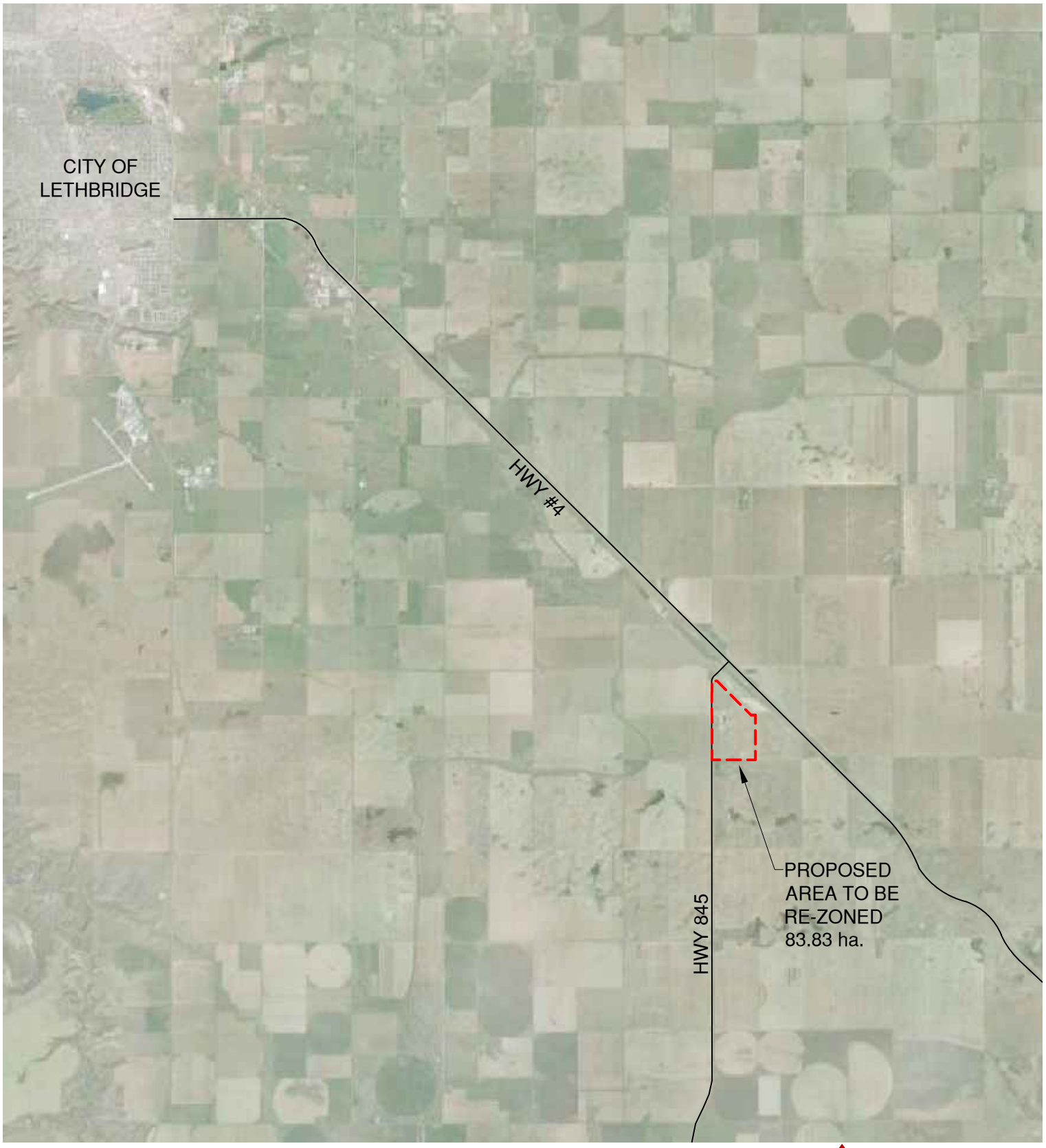
1. Landowner(s) would need to provide the required information and additional engineering details pertaining to their parcel of land. Additional information to be provided in a professional report with diagrams (to be referred to as the “Engineering Detail Plan”) includes:
    a. Detailed surveyed subdivision plan (e.g. lots with dimensions, road network, utility layout, easements or right-of-ways, etc.).
    b. Engineered soils analysis (Level 4) for private septic sewage treatment systems in consideration of number of lots and land use.
    c. Detailed engineered storm water management plan for each Phase
    d. Other required engineering information, such as lot grade plans, fire suppression plan.
2. Lethbridge County must be satisfied with the engineering information provided in order to approve the Engineering Detail Plan.
3. The Engineering Detail Plan and its associated engineering information must be approved by the County prior to further subdivision of Phases 3 and 4. At this stage a government and public referral process would occur, including circulating the application to AT and AEP.
4. A potential access for Phases 3 and 4 has been depicted in Figure 3. This is conceptual and will be refined upon rezoning and subdivision. A Traffic Impact Assessment (TIA) will be required from Alberta Transportation.
5. Once the previous outlined processes are complete and determined to be acceptable and redesignation approved, subdivision applicant(s) could then be processed. Conditions of subdivision application approval may include, but is not limited to, the following:

a. AEP approval under Water Act for the storm water management plan.
b. Requirements for landowners/developers to enter into Development Agreements to address infrastructure and servicing, and provide security.
c. Providing any necessary utility easements or right-of-ways.
d. Providing a copy of professional soils analysis for on-site septic treatment for the individual lots being subdivided.
e. Providing a final plan of subdivision that corresponds to the approved lot layout and road network of the Plan Area.
f. The provision of Municipal Reserve as per subdivision approval.

6. A Traffic Impact Assessment (TIA) will be required from Alberta Transportation as a condition of subdivision application approval.

APPENDIX A

FIGURES



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CLIENT: VITERRA

PROJECT TITLE: AREA STRUCTURE PLAN
NW & SW-27-7-20-W4

DRAWING TITLE: AREA MAP

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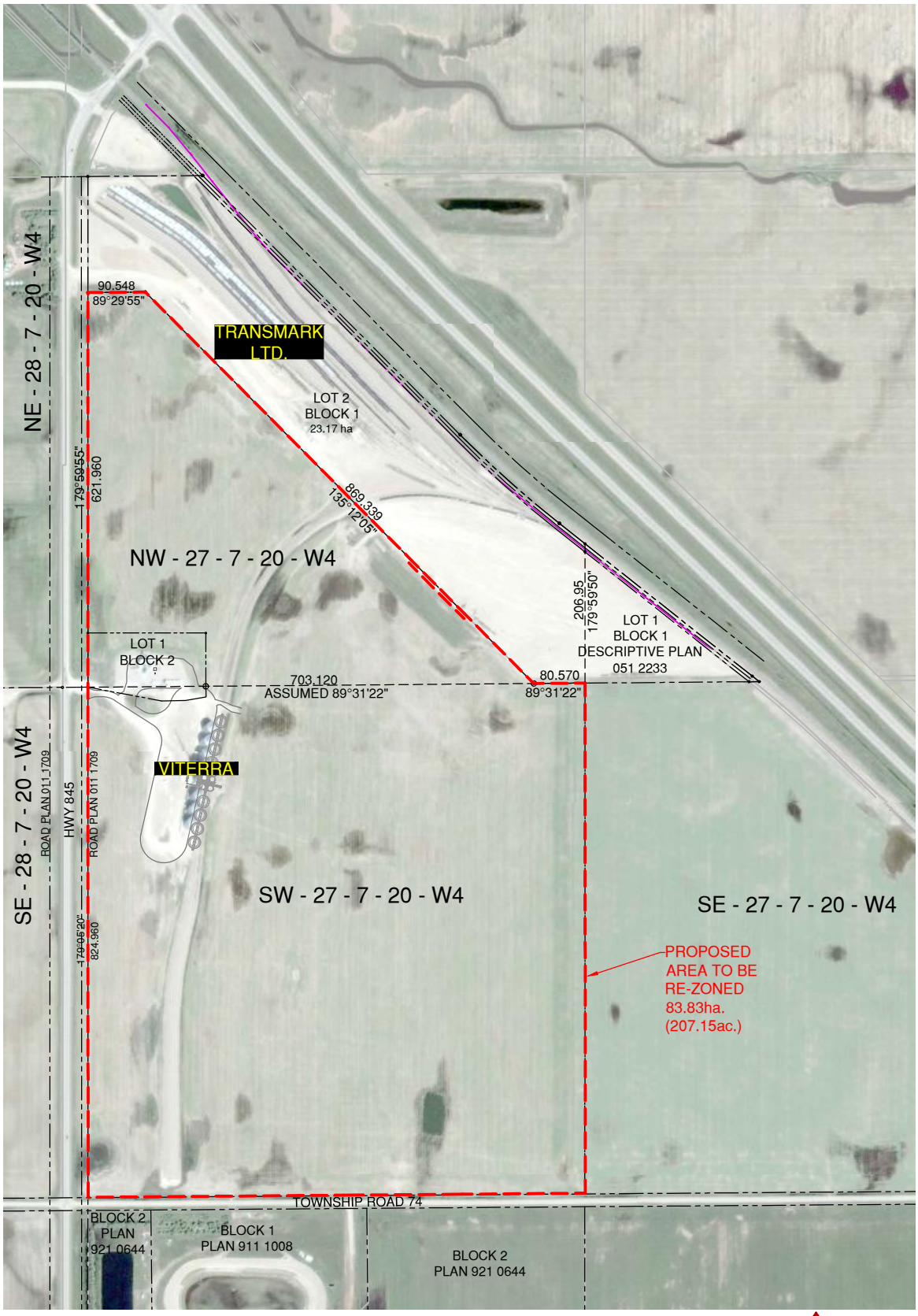
CHECKED	MAH
APPROVED	MAH
SCALE	AS SHOWN

PROJECT NUMBER	16-001
VERSION NUMBER	IFA1-1
DATE DRAWN	APR. 4, 2016
SHEET NUMBER	1.0



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CLIENT: VITERRA

PROJECT TITLE: AREA STRUCTURE PLAN
NW & SW-27-7-20-W4

DRAWING TITLE: SITE MAP

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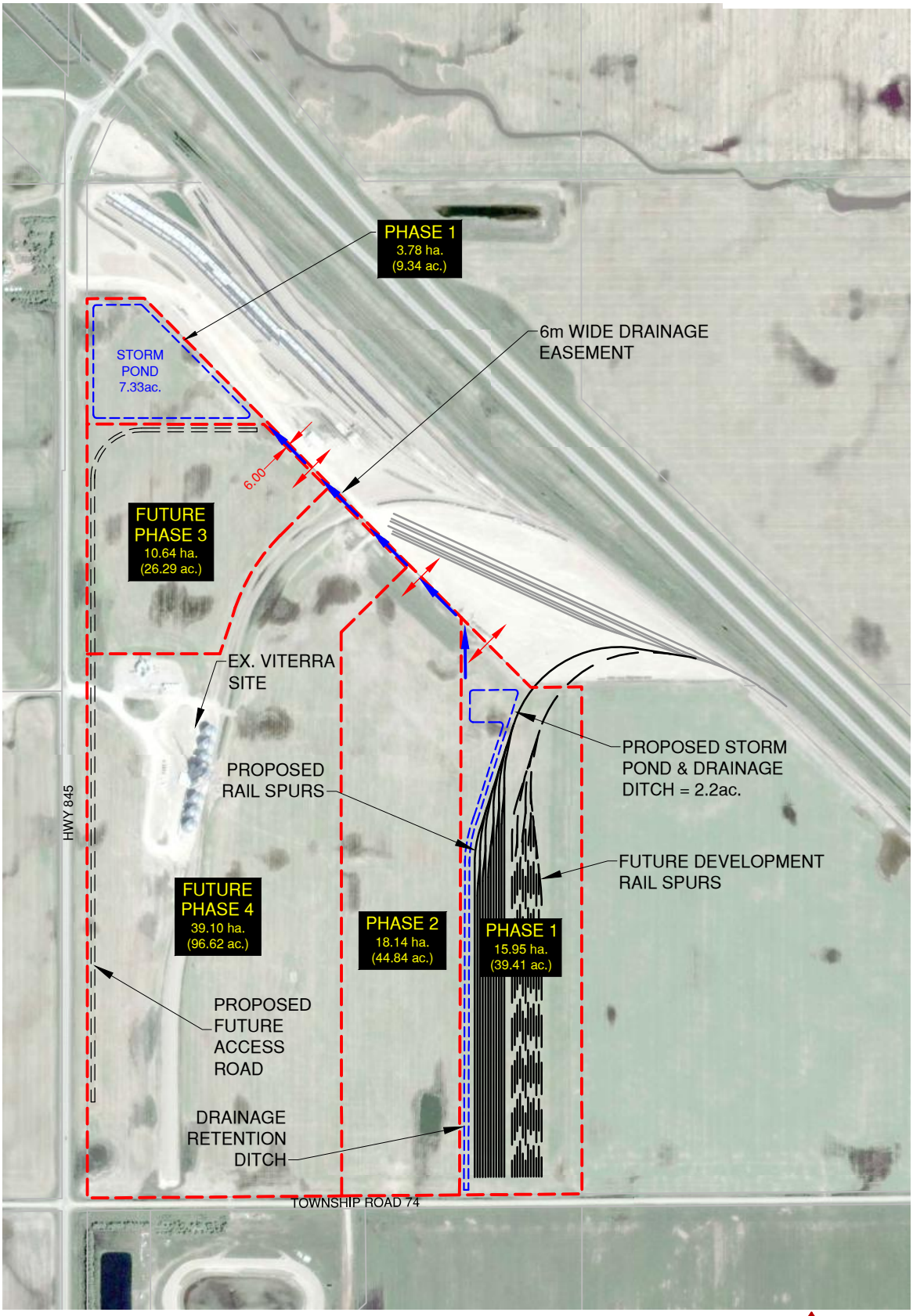
VERSION NUMBER	IFA1-1
DATE DRAWN	APR. 4, 2016
SHEET NUMBER	2.0



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ACCESS POINT

DRAINAGE PATH

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#	REVISION	DATE	BY

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CLIENT: VITERRA

PROJECT TITLE: AREA STRUCTURE PLAN
NW & SW-27-7-20-W4

DRAWING TITLE: LOT LAYOUT

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CHECKED	MAH
APPROVED	MAH
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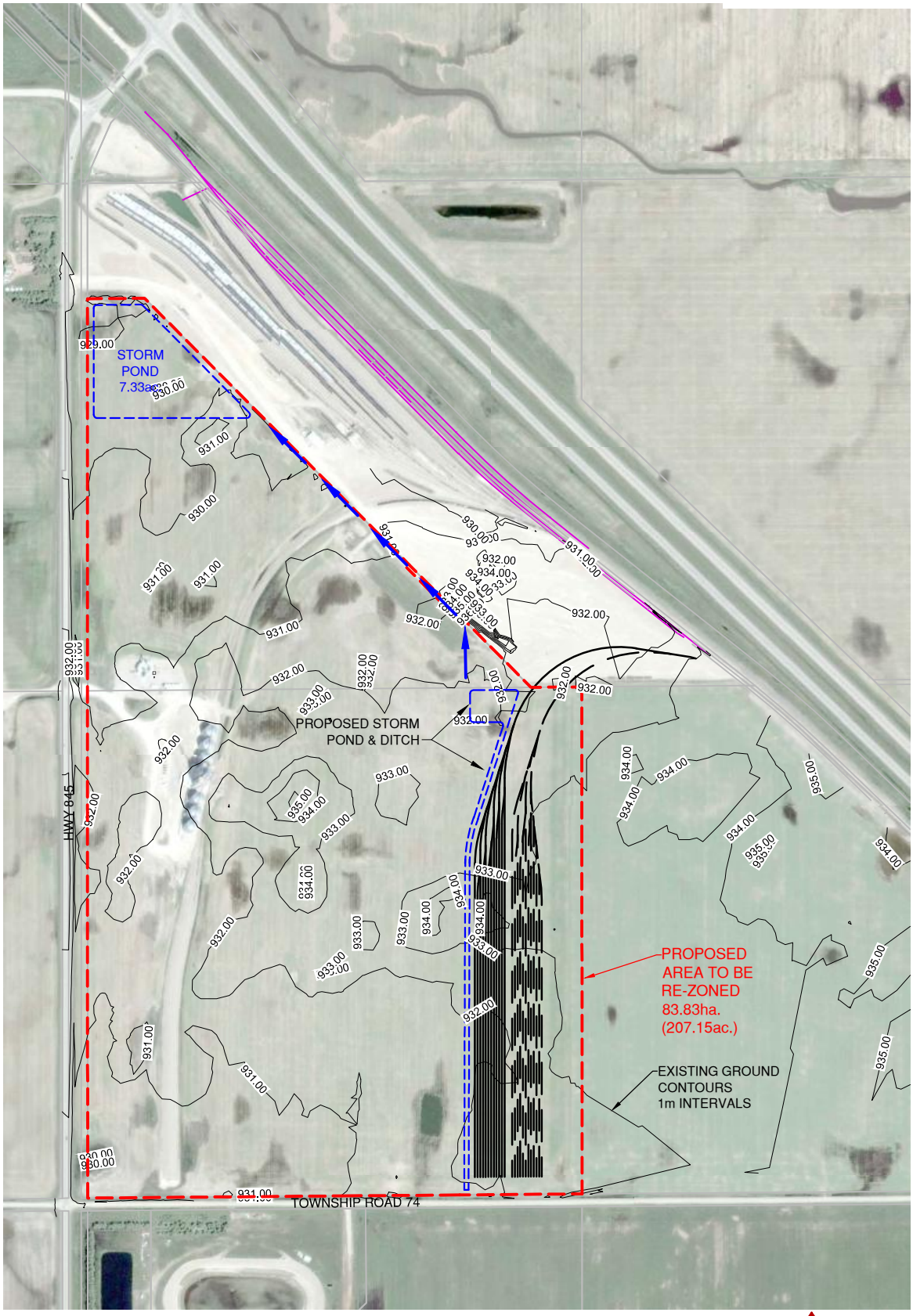
VERSION NUMBER	IFA1-1
DATE DRAWN	APR. 4, 2016
SHEET NUMBER	3.0



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CLIENT: VITERRA

PROJECT TITLE: AREA STRUCTURE PLAN
NW & SW-27-7-20-W4

DRAWING TITLE: EXISTING GROUND TOPOGRAPHY

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PROJECT NUMBER	16-001
VERSION NUMBER	IFA1-1
DATE DRAWN	APR. 4, 2016
SHEET NUMBER	4.0

APPENDIX B

SITE DRAINAGE ANALYSIS

SITE DRAINAGE ANALYSIS

VITERRA AREA STRUCTURE PLAN

Located in 27-20-W4 near Lethbridge, AB

PREPARED FOR:
Viterra

PREPARED BY:
Hasegawa Engineering
A Division of 993997 Alberta Ltd.
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1.0 Introduction

On behalf of Viterra, Hasegawa Engineering (HE) has completed this preliminary hydrological analysis of the subject site. The hydrological analysis includes the following major aspects:

1. On site layout, topography and conditions
2. Offsite topography
3. Precipitation and runoff analysis
4. Retention Pond storage size calculations

The site is located near the intersection of Highways 4 and 845 southeast of Lethbridge, Alberta as shown in Figure 1 (Appendix A.)

2.0 Site Conditions

Currently, the site consists of relatively flat cultivated land. Drainage in the general area is to the north but the site itself has split drainage to north and south from an area of higher ground roughly in the center. Some of the area east of the site toward Highway 4 contribute offsite runoff at present but development plans would re-route this storm water around the development.

The proposed site consists of an area of future lots in the north and 2 lots for rail traffic in the south.

3.0 Runoff Design Criteria

3.1 Predevelopment

Modeling used SWMM, a storm runoff software program developed by the United States Environmental Protection Agency and widely accepted for runoff analysis. The existing ground was first modeled to determine predevelopment flows during a 5 year/4 hour storm event. This storm event is a Modified Chicago method synthetic storm accepted by the City of Lethbridge for modeling runoff and uses rainfall intensity data obtained from the Atmospheric Environment Service of Environment Canada for the City of Lethbridge. The rainfall data produces a peak intensity and total rainfall depth as summarized in Table 1 in section 4.

Predevelopment modeling divides the site into runoff catchments based on direction of runoff flow and assumes the surfaces are 100% pervious. Each catchment was analyzed using the slope of existing ground and general drainage patterns. The SWMM software estimates the rate of predevelopment storm runoff which then determines allowable post development release.

3.2 Post Development

The post development drainage model is shown in Figure 2 (Appendix A). The development is again divided into catchments according to flow paths dictated by design. Catchments producing offsite flow are shown but since a berm to divert this water is intended the model has been adjusted so they produce no runoff. Release of stormwater from storage areas is restricted so that total release does not exceed the 5 year predevelopment rate.

The north lots were modeled as industrial lots with a 5000 square meter building (100% impervious surface) and the remainder of the lot graveled parking areas (70% impervious surface). For these lots, the existing topography drains stormwater to the north and it was assumed an area of low ground at the north edge would become a retention area for the runoff from the north lots. Given the release rate modeled for the north storage area, the approximate area required for storm water retention is shown in Figure 3 (Appendix A). This uses existing topography and involves the least site work - other options could include:

- A more defined retention area to reduce the area required – since the existing low ground may limit how deep this can be, berms may need to be built and site work would be increased.
- Individual lot storage.

In the south lots, railway track for only a portion of one south lot is designed at present, but the south lots would eventually have a significant area of railway track. The ballast for the track was assumed to be more pervious than a gravel parking area and was modeled as 50% impervious - the remainder of the lot was assumed to be essentially unchanged at 100% impervious. The track area designed at present would have zero slope north to south, a 0.5% cross slope and a 1 meter deep ditch running for about 730 meters along the outside of the track into a retention pond near the north lot boundary. SWMM modeling used this design as the starting point and incorporated the ditch as storm water storage. The drainage model as shown in Figure 2 includes future rail expansion, and so has 4 storage ditches modeled after the proposed railway design. Since there is no north/south slope, the ditches will not completely drain – it is assumed that drainage will be sufficient to allow for subsequent storm events and the residual storm water will evaporate.

The model shows a common storm water outlet from the retention areas of the north and south lots – this is not to be taken literally and exists only to provide a combined post development runoff rate for the entire development that can be compared to predevelopment runoff rates.

4.0 Surface Runoff Results

Table 1 below summarizes computer modeling.

Storm Event	Maximum Intensity/ Total Rainfall*	Peak Runoff (m^3/sec)		Post Development Maximum Release** (m^3/sec)
		Pre Dev.	Post Dev.	
5 yr/4hr	122mm/hr, 39mm	0.217		0.114
100 yr/24 hr	255mm/hr, 109mm	2.54	10.9	North Storage 0.083 South Storage 0.132 Total 0.214**

***Based on a Modified Chicago Storm. This storm has a maximum rain intensity at time = 0.3 and is a synthetic event but uses Environment Canada rainfall data for Lethbridge to produce a storm profile.**
**** Based on release restricted to the 5 year predevelopment rate. Since the total release rate is system wide and depends on timing of individual peak flows, it is not the sum of both storage areas.**

As shown in the table, the predevelopment 5 year storm produced a runoff rate of 0.217 m^3/second. The post development model restricts system wide outflow to no more than this rate in all events up to the 100 year storm. The pre-development 100 year storm was modeled separately and as shown above produces about 2.54 m^3/second of runoff – this increases to 10.9 m^3/second after development and illustrates the increase in peak runoff intensity that is to be expected and that is attenuated to below 5 year storm predevelopment levels as shown in the final column. The post development 5 year storm was also modeled separately, but the peak runoff of 0.114 m^3/second is included here to show that these benefits are available in all lesser storm events which includes the majority of rainfall.

Detailed results of runoff models are included in Appendix B - key points for the 100 year post development storm are as follows:

- Modeling the ditches of the south lots as described above shows insignificant flooding of 61 m^3 total from all ditches. The ditches are therefore full to capacity with no freeboard. However, the retention pond as shown in the proposed design was not included and can be included if the capacity of the ditches alone is felt to be insufficient.
- Retention capability as modeled attenuates storm flows over approximately 48 hours (see Figure 4 – Appendix A).

Key input parameters for SWMM analysis along with summaries of the computer simulations are attached in Appendix B.

5.0 Conclusion

Computer modeling of the proposed subdivision shows that the post development increase in storm runoff is attenuated over 48 hours through a combination of ditches and retention areas. Release into existing drainage systems during the 100 year storm does not exceed that of the predevelopment 5 year storm. Similar benefits are provided for all storm events up to the 100 year design storm. Final design will refine the storm retention system as required.

APPENDICES

APPENDIX A-FIGURES

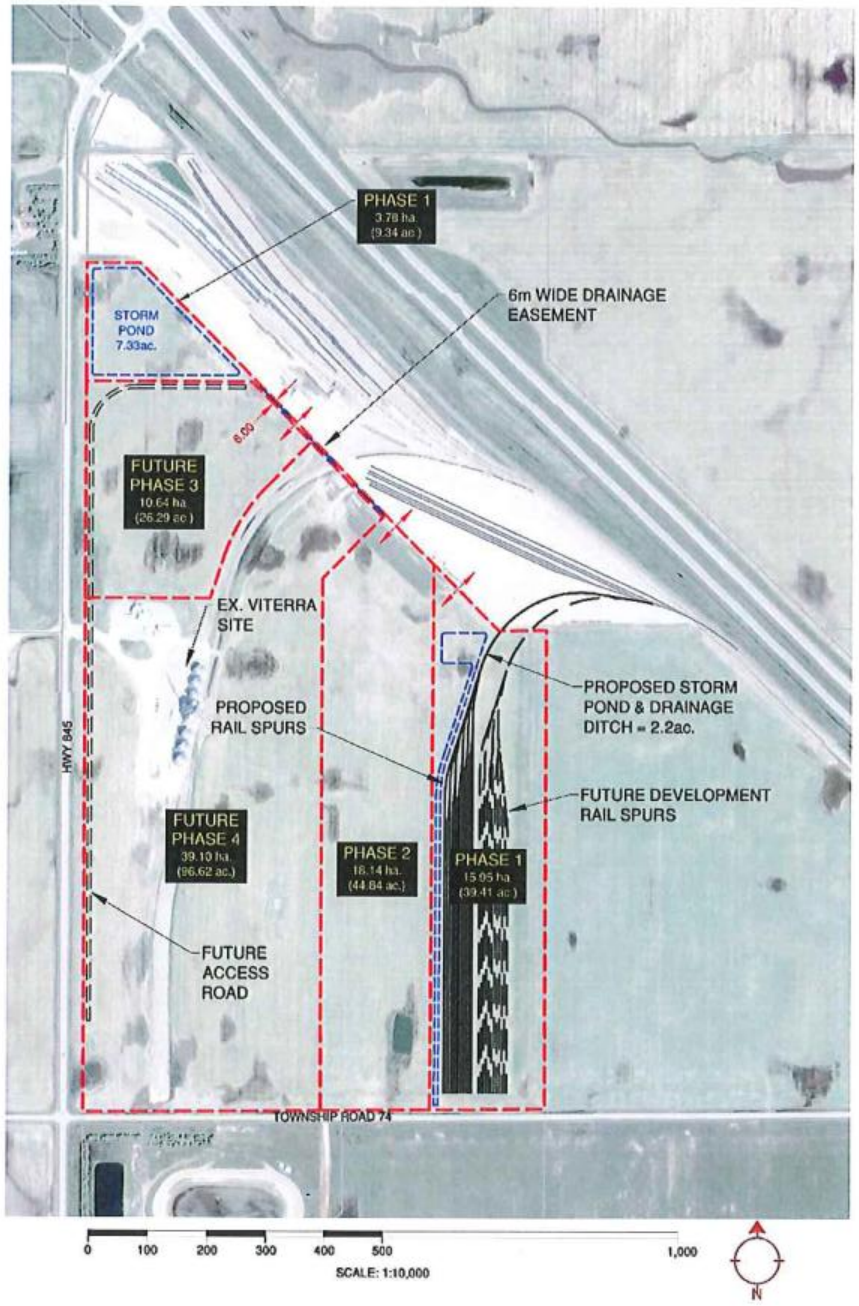

Figure 1 – Proposed Subdivision Site

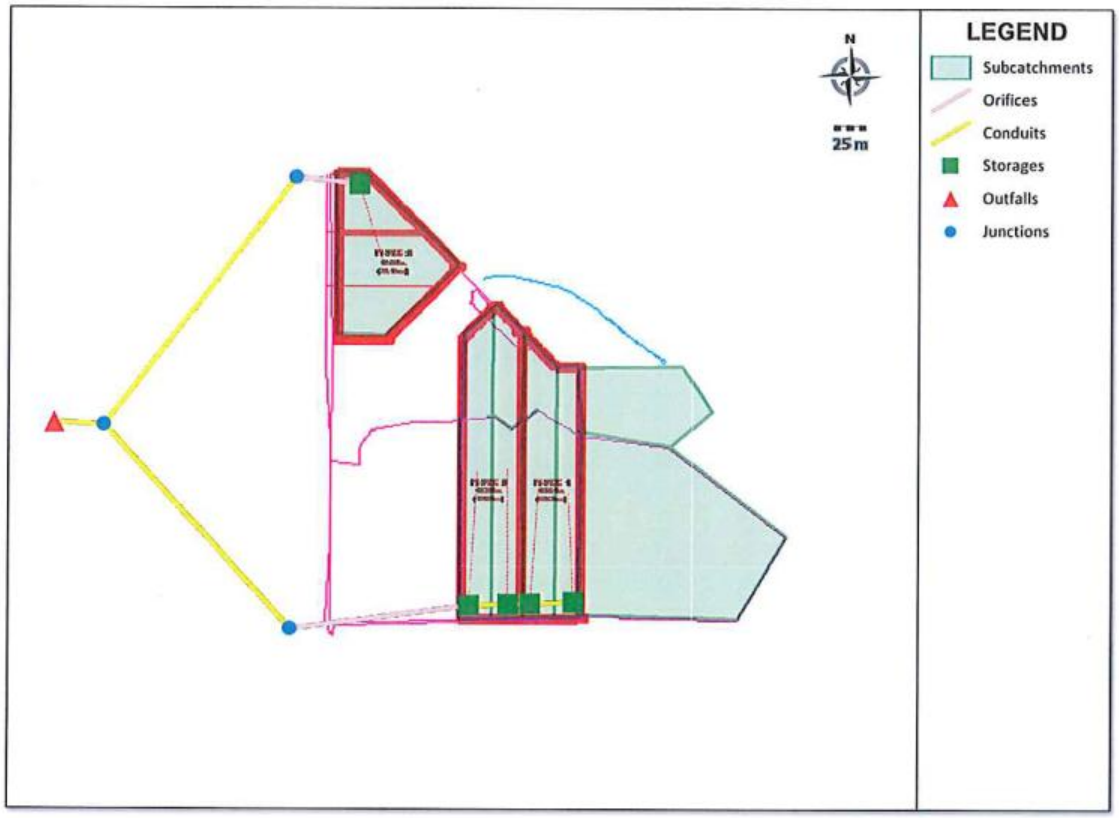

Figure 2 – Proposed Subdivision Post Development Runoff Model

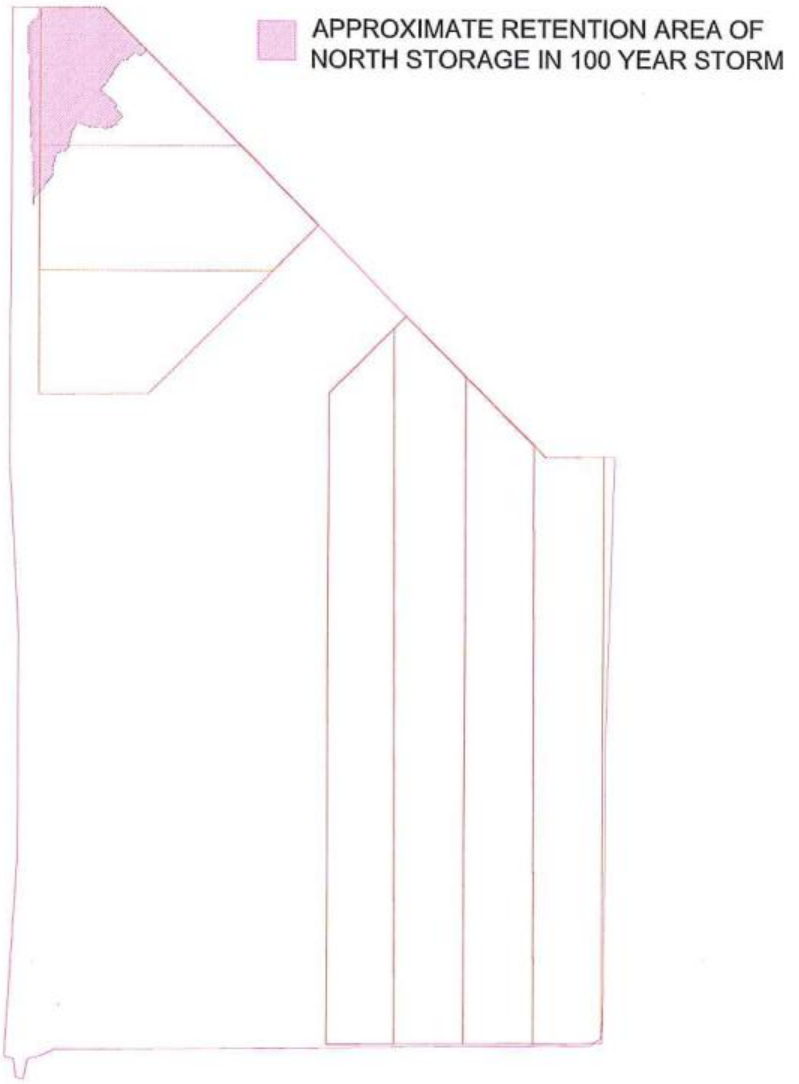

Figure 3 – North Storm Pond Retention Area During 100 Year Storm

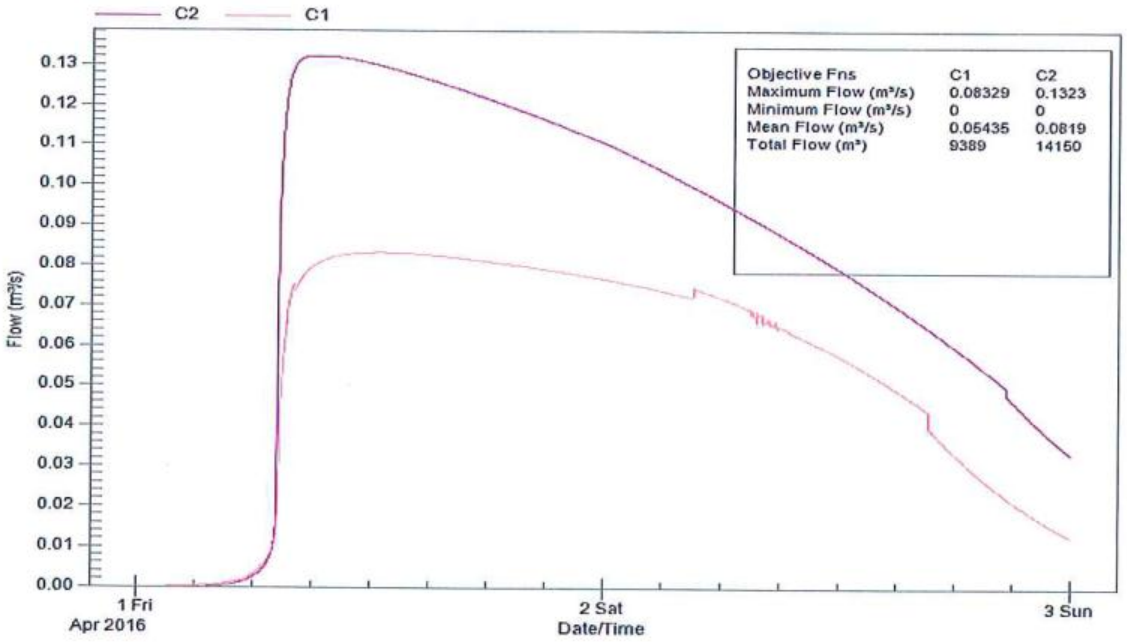

Figure 4 –Pond Retention Times During 100 Year Storm

APPENDIX B-SWMM SUMMARIES

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.021)

Predevelopment 5 year 4 hour Storm

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Flow Routing Method ..... DYNWAVE
Starting Date SEP-25-2014 00:00:00
Ending Date SEP-27-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 5.00 sec

WARNING 04: minimum elevation drop used for Conduit C1

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	1.858	22.088
Evaporation Loss	0.000	0.000
Infiltration Loss	1.806	21.467
Surface Runoff	0.053	0.633
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.051	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.053	0.532
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.053	0.532
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	5.00 sec
Average Time Step	:	5.00 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff

1a	39.17	0.00	0.00	38.09	1.10	0.15	0.06	0.028
1b	39.17	0.00	0.00	37.98	1.21	0.12	0.05	0.031
1_offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
2	39.17	0.00	0.00	38.09	1.10	0.26	0.11	0.028
2_offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.00	0.00	885.50	0 00:00
J2	JUNCTION	0.00	0.00	0.00	0 00:00
OF1	OUTFALL	0.00	0.00	0.00	0 00:00
SU1	STORAGE	0.00	0.00	0.00	0 00:00

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.000	0.000	0 00:00	0.000	0.000
J2	JUNCTION	0.000	0.000	0 00:00	0.000	0.000
OF1	OUTFALL	0.217	0.217	0 01:25	0.532	0.532
SU1	STORAGE	0.000	0.000	0 00:00	0.000	0.000

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

	Max. Height	Min. Depth

Node	Type	Hours Surcharged	Above Crown Meters	Below Rim Meters
J1	JUNCTION	48.00	0.000	1.500

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
SU1	0.000	0	0	0.000	0	0 00:00	0.000

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
OF1	3.12	0.099	0.217	0.532
System	3.12	0.099	0.217	0.532

****
Link Flow Summary
****

	Maximum |Flow|	Time of Max Occurrence	Maximum |Veloc|	Max/ Full	Max/ Full

Link	Type	CMS	days	hr:min	m/sec	Flow	Depth
C1	CONDUIT	0.000	0	00:00	0.00	0.00	0.00

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
		--- Fraction of Time in Flow Class ----								
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 07 13:42:08 2016
Analysis ended on: Thu Apr 07 13:42:08 2016
Total elapsed time: < 1 sec

```
[TITLE]
Predevelopment 5 year 4 hour Storm


[OPTIONS]
FLOW_UNITS           CMS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         DYNWAVE
START_DATE           09/25/2014
START_TIME           00:00:00
REPORT_START_DATE    09/25/2014
REPORT_START_TIME    00:00:00
END_DATE             09/27/2014
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          0:01:00
WET_STEP             0:05:00
DRY_STEP             0:05:00
ROUTING_STEP         5
ALLOW_PONDING        YES
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0

[EVAPORATION]
;;Type           Parameters
;;-------------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time    Snow    Data
;;Name           Type      Intrvl  Catch   Source
;;-------------- --------- ------- ------ ----------
5yr4hr           INTENSITY 0:05    1.0    TIMESERIES 5yr4hr
100yr24hr        INTENSITY 0:05    1.0    TIMESERIES 100yr2hr
zero_rain        INTENSITY 0:05    1.0    TIMESERIES zero_rainfall
```

[SUBCATCHMENTS]

;;Name	Raingage	Outlet	Total Area	Pcnt. Imperv	Width	Pcnt. Slope	Curb Length	Snow Pack
1a	5yr4hr	OF1	13.42	0	303.62	0.4	0	
1b	5yr4hr	OF1	10.03	0	214.775	0.56	0	
1_offsite	zero_rain	1_offsite	7.7298	0	209.48	0.81	0	
2	5yr4hr	OF1	23.997	0	484.788	0.5	0	
2_offsite	zero_rain	2_offsite	28.957	0	552.615	0.4	0	

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
1a	0.1	0.1	2	3	25	OUTLET	
1b	0.1	0.1	2	3	25	OUTLET	
1_offsite	0.1	0.1	2	3	25	OUTLET	
2	0.1	0.1	2	3	25	OUTLET	
2_offsite	0.1	0.1	2	3	25	OUTLET	

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
1a	253	3.5	0.25
1b	253	3.5	0.25
1_offsite	253	3.5	0.25
2	253	3.5	0.25
2_offsite	253	3.5	0.25

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J1	885.5	1.5	0	0	0
J2	0	0	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate
OF1	0	FREE		NO

[STORAGE]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Storage Curve	Curve Params			Ponded Area	Evap. Frac.	Infiltration Parameters
SU1	0	5	0	FUNCTIONAL	1000	0	0	0	0	

```
[CONDUITS]
;;               Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Max.
;;Name            Node             Node             Length     N          Offset     Offset     Flow       Flow
;;--------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
C1               J2               SU1              400        0.01       0          0          0          0

[XSECTIONS]
;;Link            Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;--------------- ------------ ---------------- ---------- ---------- ---------- ----------
C1               CIRCULAR     1                0          0          0          1

[TRANSECTS]

NC 0.01     0.01     0.01
X1 swale          3        0.0      0.0      0.0       0.0       0.0      0.0      0.0
GR 0        0         -0.3     1.2      0         2.4

[LOSSES]
;;Link            Inlet      Outlet     Average    Flap Gate
;;--------------- ---------- ---------- ---------- ----------

[TIMESERIES]
;;Name            Date       Time       Value
;;--------------- ---------- ---------- ----------
5yr4hr                       0:00       0
5yr4hr                       0:05       2.4
5yr4hr                       0:10       2.6
5yr4hr                       0:15       2.8
5yr4hr                       0:20       3
5yr4hr                       0:25       3.4
5yr4hr                       0:30       3.7
5yr4hr                       0:35       4.2
5yr4hr                       0:40       4.9
5yr4hr                       0:45       5.8
5yr4hr                       0:50       7.3
5yr4hr                       0:55       9.8
5yr4hr                       1:00       15.5
5yr4hr                       1:05       37.6
5yr4hr                       1:10       122.3
5yr4hr                       1:15       51
5yr4hr                       1:20       28
5yr4hr                       1:25       19
5yr4hr                       1:30       15
5yr4hr                       1:35       12
5yr4hr                       1:40       10
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.021)
--------------------------------------------------------------

Transmark Post Development - 100 Yr 24 hr Storm
Allowable Release based on 5 Yr Storm is 0.217 cu. m/sec.

**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************

****************
Analysis Options
****************
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Flow Routing Method ..... DYNWAVE
Starting Date ..... APR-01-2016 00:00:00
Ending Date ..... APR-03-2016 00:00:00
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:01:00
Wet Time Step ..... 00:05:00
Dry Time Step ..... 00:05:00
Routing Time Step ..... 5.00 sec

WARNING 04: minimum elevation drop used for Conduit C4
WARNING 04: minimum elevation drop used for Conduit C5
WARNING 04: minimum elevation drop used for Conduit C6

**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         5.220        61.991
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         2.143        25.447
Surface Runoff ...........         3.044        36.149
Final Surface Storage ....         0.057         0.680
```

Continuity Error (%) ..... -0.460

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	3.044	30.437
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	2.353	23.533
Internal Outflow	0.000	0.000
Storage Losses	0.457	4.568
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.233	2.334
Continuity Error (%)	0.004	

****
Highest Continuity Errors
****
Node 2_2Retention (7.80%)
Node 2_3retention (5.42%)
Node 2_4retention (4.19%)

****
Time-Step Critical Elements
****
Link C5 (27.33%)

****
Highest Flow Instability Indexes
****
Link C1 (4)
Link C3 (3)
Link OR1 (2)

****
Routing Time Step Summary
****
Minimum Time Step : 1.66 sec
Average Time Step : 4.64 sec

Maximum Time Step : 5.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
1a	109.86	0.00	0.00	19.84	87.01	11.68	1.65	0.792
S2_4	109.86	0.00	0.00	55.72	54.36	4.76	2.48	0.495
1_offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
2_offsite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
S2_2	109.86	0.00	0.00	54.10	55.95	4.57	2.36	0.509
S2_1	109.86	0.00	0.00	52.49	57.54	4.48	2.30	0.524
S2_3	109.86	0.00	0.00	57.33	52.77	4.94	2.59	0.480

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days	hr:min
J2	JUNCTION	0.06	0.09	933.09	0	09:21
J1	JUNCTION	0.22	0.36	930.76	0	12:26
J3	JUNCTION	0.10	0.13	930.33	0	10:38
OF1	OUTFALL	0.10	0.13	929.13	0	10:38
2_1Retention	STORAGE	0.57	1.00	934.00	0	09:18
1_retention	STORAGE	0.43	0.70	931.10	0	12:25
2_2Retention	STORAGE	0.57	1.00	934.00	0	09:18
2_3retention	STORAGE	0.57	1.00	934.00	0	09:23
2_4retention	STORAGE	0.57	1.00	934.00	0	09:21

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	0.000	0.132	0 09:21	0.000	14.146
J1	JUNCTION	0.000	0.083	0 12:25	0.000	9.389
J3	JUNCTION	0.000	0.214	0 10:38	0.000	23.533
OF1	OUTFALL	0.000	0.214	0 10:38	0.000	23.533
2_1Retention	STORAGE	2.295	2.300	0 07:15	4.482	4.636
1_retention	STORAGE	1.647	1.647	0 07:25	11.677	11.676
2_2Retention	STORAGE	2.361	2.431	0 07:15	4.571	8.240
2_3retention	STORAGE	2.591	2.591	0 07:15	4.944	11.867
2_4retention	STORAGE	2.480	2.513	0 07:15	4.765	15.272

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
J1	JUNCTION	20.48	0.108	0.242
2_1Retention	STORAGE	0.01	0.003	0.000
1_retention	STORAGE	33.32	0.455	0.095
2_2Retention	STORAGE	0.01	0.002	0.000
2_3retention	STORAGE	0.01	0.002	0.000
2_4retention	STORAGE	0.01	0.001	0.000

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters

2_1Retention	1.45	0.018	0	08:40	0.020	1.00
2_2Retention	1.39	0.025	0	08:44	0.018	1.00
2_3retention	1.39	0.023	0	08:42	0.018	1.00
2_4retention	0.89	0.012	0	08:52	0.005	1.00

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
2_1Retention	1.881	52	14	3.651	100	0 08:40	0.060
1_retention	3.633	38	17	7.445	78	0 12:25	0.083
2_2Retention	1.880	51	8	3.651	100	0 08:42	0.174
2_3retention	1.879	51	5	3.651	100	0 08:41	0.245
2_4retention	1.870	51	4	3.651	100	0 08:52	0.132

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
OF1	96.10	0.147	0.214	23.533
System	96.10	0.147	0.214	23.533

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

C2	CONDUIT	0.132	0	09:21	3.94	0.04	0.18
C1	CONDUIT	0.083	0	12:25	2.10	1.32	0.75
C3	CONDUIT	0.214	0	10:38	3.70	0.03	0.13
C4	CONDUIT	0.174	0	07:26	0.32	3.78	1.00
C5	CONDUIT	0.189	0	07:27	0.52	1.55	1.00
C6	CONDUIT	0.149	0	07:48	0.23	3.24	1.00
OR1	ORIFICE	0.083	0	12:25			1.00
OR2_4	ORIFICE	0.132	0	09:21			1.00

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
		--- Fraction of Time in Flow Class ----								
C2	1.00	0.03	0.04	0.00	0.01	0.92	0.00	0.00	3.99	0.0000
C1	1.00	0.03	0.00	0.00	0.00	0.97	0.00	0.00	1.61	0.0009
C3	1.00	0.03	0.00	0.00	0.00	0.97	0.00	0.00	3.66	0.0000
C4	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.02	0.0004
C5	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.05	0.0003
C6	1.00	0.07	0.00	0.00	0.93	0.00	0.00	0.00	0.07	0.0004

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	0.01	0.01	0.01	26.11	0.01
C4	1.39	1.39	1.39	0.40	0.15
C5	1.37	1.37	1.37	0.23	0.03
C6	0.89	0.89	0.89	33.83	0.89

Analysis begun on: Thu Apr 07 11:39:23 2016
Analysis ended on: Thu Apr 07 11:39:23 2016
Total elapsed time: < 1 sec

```
[TITLE]
Transmark Post Development - 100 Yr 24 hr Storm
Allowable Release based on 5 Yr Storm is 0.217 cu. m/sec.


[OPTIONS]
FLOW_UNITS           CMS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         DYNWAVE
START_DATE           04/01/2016
START_TIME           00:00:00
REPORT_START_DATE    04/01/2016
REPORT_START_TIME    00:00:00
END_DATE             04/03/2016
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          0:01:00
WET_STEP             0:05:00
DRY_STEP             0:05:00
ROUTING_STEP         5
ALLOW_PONDING        YES
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0

[EVAPORATION]
;;Type           Parameters
;;-------------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time    Snow    Data
;;Name           Type      Intrvl  Catch   Source
;;-------------- --------- ------ ------ ----------
5yr4hr           INTENSITY 0:05   1.0    TIMESERIES 5yr4hr
100yr24hr        INTENSITY 0:05   1.0    TIMESERIES 100yr24hr
ZeroRainfall     INTENSITY 0:05   1.0    TIMESERIES ZeroRainfall
```

[SUBCATCHMENTS]

;;Name	Raingage	Outlet	Total Area	Pcnt. Imperv	Width	Pcnt. Slope	Curb Length	Snow Pack
1a	100yr24hr	1_retention	13.42	73.4	303.62	0.4	0	
S2_4	100yr24hr	2_4retention	8.7642	28	1252.029	0.5	0	
1_offsite	ZeroRainfall	1_offsite	7.7298	0	209.48	0.8	0	
2_offsite	ZeroRainfall	2_offsite	28.957	0	552.615	0.4	0	
S2_2	100yr24hr	2_2Retention	8.1692	30	1167.029	0.5	0	
S2_1	100yr24hr	2_1Retention	7.7887	32	1112.671	0.5	0	
S2_3	100yr24hr	2_3retention	9.3693	26	1338.471	0.5	0	

[SUBAREAS]

;;Subcatchment	N-Imperv	N-Perv	S-Imperv	S-Perv	PctZero	RouteTo	PctRouted
1a	0.1	0.1	5	5	25	OUTLET	
S2_4	0.1	0.1	2	3	25	OUTLET	
1_offsite	0.1	0.1	2	3	25	OUTLET	
2_offsite	0.1	0.1	2	3	25	OUTLET	
S2_2	0.1	0.1	2	3	25	OUTLET	
S2_1	0.1	0.1	2	3	25	OUTLET	
S2_3	0.1	0.1	2	3	25	OUTLET	

[INFILTRATION]

;;Subcatchment	Suction	HydCon	IMDmax
1a	253	3.5	0.25
S2_4	253	3.5	0.5
1_offsite	253	3.5	0.25
2_offsite	253	3.5	0.25
S2_2	253	3.5	0.5
S2_1	253	3.5	0.5
S2_3	253	3.5	0.5

[JUNCTIONS]

;;Name	Invert Elev.	Max. Depth	Init. Depth	Surcharge Depth	Ponded Area
J2	933	1	0	0	0
J1	930.4	0.6	0	0	0
J3	930.2	1.6	0	0	0

[OUTFALLS]

;;Name	Invert Elev.	Outfall Type	Stage/Table Time Series	Tide Gate

```
;;-------------- ---------- ---------- ---------------- ----
OF1              929        FREE                        NO

[STORAGE]
;;               Invert     Max.       Init.      Storage     Curve                    Ponded     Evap.
;;Name          Elev.      Depth      Depth      Curve       Params                   Area       Frac.      Infiltration Parameters
;;-------------- ---------- ---------- ---------- ----------- ------------------------ ---------- ---------- ----------------------
2_1Retention     933        1          0          TABULAR     2_Retention              7802       0          253        3.5        0.25
1_retention      930.4      0.8        0          TABULAR     1_Retention              7802       0          253        3.5        0.25
2_2Retention     933        1          0          TABULAR     2_Retention              7802       0          253        3.5        0.25
2_3retention     933        1          0          TABULAR     2_Retention              7802       0          253        3.5        0.25
2_4retention     933        1          0          TABULAR     2_Retention              7802       0          253        3.5        0.25

[CONDUITS]
;;               Inlet              Outlet                    Manning    Inlet      Outlet     Init.      Max.
;;Name          Node               Node               Length N          Offset     Offset     Flow       Flow
;;-------------- ------------------ ------------------ ---------- ---------- ---------- ---------- ---------- ----------
C2               J2                 J3                 20         0.01       0          0          0          0
C1               J1                 J3                 30         0.01       0          0          0          0
C3               J3                 OF1                30         0.01       0          0          0          0
C4               2_1Retention       2_2Retention       140        0.01       0          0          0          0
C5               2_2Retention       2_3retention       20         0.01       0          0          0          0
C6               2_3retention       2_4retention       140        0.01       0          0          0          0

[ORIFICES]
;;               Inlet              Outlet             Orifice    Crest      Disch.     Flap Open/Close
;;Name          Node               Node               Type       Height     Coeff.     Gate Time
;;-------------- ------------------ ------------------ ---------- ---------- ---------- ---- ----------
OR1              1_retention        J1                 SIDE       0          0.65       NO   0
OR2_4            2_4retention       J2                 SIDE       0          0.65       NO   0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;-------------- ------------ ---------------- ---------- ---------- ---------- ----------
C2               CIRCULAR     0.6              0          0          0          1
C1               CIRCULAR     0.25             0          0          0          1
C3               CIRCULAR     1                0          0          0          1
C4               CIRCULAR     1                0          0          0          1
C5               CIRCULAR     1                0          0          0          1
C6               CIRCULAR     1                0          0          0          1
OR1              CIRCULAR     0.25             0          0          0
OR2_4            CIRCULAR     0.25             0          0          0

[TRANSECTS]

NC 0.01     0.01     0.01
```

```
X1 swale            3        0.0       0.0       0.0       0.0       0.0       0.0       0.0
GR 0        0        -0.3      1.2       0         2.4

[LOSSES]
;;Link            Inlet      Outlet     Average    Flap Gate
;;--------------- ---------- ---------- ---------- ----------

[CURVES]
;;Name            Type       X-Value    Y-Value
;;--------------- ---------- ---------- ----------
slough            Storage    0          251
slough                        .5         1785
slough                        1          3925
slough                        1.5        8530

1_Retention       Storage    0          128
1_Retention                   .2         6519
1_Retention                   .4         11970
1_Retention                   .6         17376
1_Retention                   .8         23891
;2x storage of one - one retention area on each lot

2_Retention       Storage    0          2187
2_Retention                   .5         3650
2_Retention                   1          5117

[TIMESERIES]
;;Name            Date       Time       Value
;;--------------- ---------- ---------- ----------
5yr4hr                       0:00       0
5yr4hr                       0:05       2.4
5yr4hr                       0:10       2.6
5yr4hr                       0:15       2.8
5yr4hr                       0:20       3
5yr4hr                       0:25       3.4
5yr4hr                       0:30       3.7
5yr4hr                       0:35       4.2
5yr4hr                       0:40       4.9
5yr4hr                       0:45       5.8
5yr4hr                       0:50       7.3
5yr4hr                       0:55       9.8
5yr4hr                       1:00       15.5
5yr4hr                       1:05       37.6
5yr4hr                       1:10       122.3
5yr4hr                       1:15       51
5yr4hr                       1:20       28
```

APPENDIX C

LETTER FROM SMRID TO LETHBRIDGE COUNTY

St. Mary River Irrigation District

525 - 40th Street South, Lethbridge, AB T1J 4M1
Telephone: 403-328-4401 Fax: 403-328-4460 Email: smrid@smrid.ab.ca

May 18th, 2016

403-328-2728
Attention: Mark

E-MAILED
May 18/16

Lethbridge County
#100, 905 - 4th Avenue South
Lethbridge, AB
T1J4E4

Attention: Hilary Janzen

Re: W ½ 27-07-20-W4
Assigned Bylaw No. 1466
Land Use Bylaw Amendment

The St. Mary River Irrigation District has a letter from Transmark (see attached) that they will install a control gate on their outgoing storm water from their property.

As long as Transmark is willing to allow the Lethbridge County to lock the gate in the closed position until SMRID can direct the water down Six Mile Coulee Drain, or dependent on downstream reservoir levels, accept it into the Main Canal.

If they are will to accept the above conditions, than SMRID has no objection to the subdivision.

If you have any further questions, please contact me in the Lethbridge office at 403-328-4401 (Extension 117).

Yours truly,

Jan Tamminga, C.E.T.
Manager of Operations

JT:lp

pc. Terrence Lazarus
Mark Hasegawa, Hasegawa Engineering

2016-05-17

RE: SW – 27 – 7 – 20 – W4

Jan Tamminga, CET

Manager of Operation

This letter is acknowledgement that Transmark will put in a gate closer on the culvert going under the Vietrra track in order to hold back water during times of excessive water flow. When instructed by the SMRID it will be either closed or opened until further notification from the SMRID.

Dallas Sherwood

General Manager