

REGULAR COUNCIL MEETING AGENDA

Tuesday, July 11, 2017		9:00 AM	Council Chambe Administration Buildi	
#1	CALL TO ORDER			
#2	ADOPTION OF AGENDA			1
#3	MINUTES	3.1 Regular Council Meeting minutes held June to be adopted.	27, 2017 –	3
		3.2 Business Arising from the Minutes		
#4	PUBLIC HEARING			
#5	DELEGATION			
#6	BYLAWS	6.1 Bylaw 17-784 Schedule of Fees	:	11
#7	OLD BUSINESS			
#8	NEW BUSINESS	8.1 Grovedale Fishpond Upgrades	÷	33
		8.2 Strategic Plan	:	35
		8.3 Grande Cache Doctors	!	53
		8.4 Sturgeon Area Water Point Potential Location	ons	67
		8.5 CAO/Managers Reports	2	222
#9	COUNCILLORS BUSINESS & REPORTS			
#10	CODDECDONDENCE	2020 All anta Summan Campa		

#10 CORRESPONDENCE • 2020 Alberta Summer Games

- Peace Library Systems
- Town of Fox Creek Agreement Request
- Peace Wapiti Public School Division Concerns
- June Report for Peace Officer Services

#11 IN CAMERA

11.1 Personnel

#12 ADJOURNMENT

Minutes of a REGULAR COUNCIL MEETING MUNICIPAL DISTRICT OF GREENVIEW NO. 16

M.D. Administration Building, Valleyview, Alberta, on Tuesday, June 27th, 2017

# 1: CALL TO ORDER	Reeve Dale Gervais called the meeting to order at 9:00 a.m.	
PRESENT	Reeve Deputy Reeve Councillors	Dale Gervais Roxie Rutt Tom Burton George Delorme Dave Hay Les Urness Bill Smith Dale Smith
ATTENDING	Chief Administrative Officer General Manager, Corporate Services General Manager, Community Services General Manager, Infrastructure & Planning Municipal Intern Communications Officer Recording Secretary	Mike Haugen Rosemary Offrey Dennis Mueller Grant Gyurkovits Danie Lagemaat Diane Carter Lianne Kruger
ABSENT		
#2: AGENDA	MOTION: 17.06.244. Moved by: DEPUTY REEVE ROXIE RUTT That Council adopt the June 27 th , 2017 Regular Council Agenda	a as presented. CARRIED
#3.1 REGULAR COUNCIL MEETING MINUTES	MOTION: 17.06.245. Moved by: COUNCILLOR DALE SMITH That Council adopt the Minutes of the Regular Council Meeting June 23 rd , 2017 as corrected.	g held on Tuesday,
		CARRIED
#3.2 BUSINESS ARISING FROM MINUTES	3.2 BUSINESS ARISING FROM MINUTES:	
#4 PUBLIC HEARING	4.0 PUBLIC HEARING	
	There was no Public Hearing presented.	

	Minutes of a Regular Council Meeting M.D. of Greenview No. 16 Page 2	June 27, 20	017
#5 DELEGATIONS	5.0 DELEGATIONS		
	5.1 DEVELOPMENT PERMIT PRESENTATION		
Walker Development	MOTION: 17.06.246. Moved by: COUNCILLOR TON That Council accept the presentation from A information.		Bonny Walker as
			CARRIED
#6 BYLAWS	6.0 BYLAWS		
	6.1 BYLAW 17-779 LAND USE BYLAW		
BYLAW 17-779 FIRST READING	MOTION: 17.06.247. Moved by: COUNCILLOR TON That Council give First Reading to Land Use Bylaw		CARRIED
BYLAW 17-779 PUBLIC HEARING	MOTION: 17.06.248. Moved by: DEPUTY REEVE R That Council schedule a Public Hearing for Land U August 22 nd , 2017, at 10:30 a.m.		
			CARRIED
	6.2 BYLAW 17-785 GROVEDALE AREA STRUCTUR	E PLAN	
BYLAW 17-785 FIRST READING	MOTION: 17.06.249. Moved by: COUNCILLOR TON That Council give First Reading to Grovedale Area		Plan Bylaw 17-785. CARRIED
BYLAW 17-785 PUBLIC HEARING	MOTION: 17.06.250. Moved by: COUNCILLOR TON That Council schedule a Public Hearing for Groved to be held in Grovedale at the Public Services Bu 7:00 p.m.	ale Area St	
			CARRIED
#7 OLD BUSINESS	7.0 OLD BUSINESS		
	There was no Old Business presented.		
	Reeve Gervais recessed the meeting at 9:58 a.m. Reeve Gervais reconvened the meeting at 10:18 a	ı.m.	

	Minutes of a Regular Council Meeting M.D. of Greenview No. 16 Page 3	June 27, 2017
#8 NEW BUSINESS	8.0 NEW BUSINESS	
	8.1 TOWN OF FOX CREEK – LETTER OF OFFICER	SUPPORT FOR AN ADDITIONAL RCMP
LETTER OF SUPPORT	MOTION: 17.06.251. Moved by: COUNCIL That Council authorizes Administration to Alberta in support of an additional RCMP	o submit a letter to the Government of
	8.2 TEEPEE CREEK STAMPEDE – FUNDING	G REQUEST
TEEPEE CREEK FUNDING REQUEST	MOTION: 17.06.252. Moved by: COUNCIL That Council provide sponsorship in the Creek Stampede Association with funds to	amount of \$10,000.00 to the Teepee
	8.3 GREENVIEW REGIONAL MULTIPLEX E	BOARD MEMBERS-AT-LARGE
	8.3 GREENVIEW REGIONAL MULTIPLEX E Councillor Dale Smith vacated the meeting	
GREENVIEW REGIONAL MULTIPLEX BOARD – MEMBERS AT LARGE		ng declaring pecuniary interest. LOR TOM BURTON ady Smith to serve as Greenview board
REGIONAL MULTIPLEX BOARD	Councillor Dale Smith vacated the meetin MOTION: 17.06.253. Moved by: COUNCIL That Council appoint Mary Wilson and Ju	ng declaring pecuniary interest. LOR TOM BURTON ady Smith to serve as Greenview board
REGIONAL MULTIPLEX BOARD – MEMBERS AT	Councillor Dale Smith vacated the meetin MOTION: 17.06.253. Moved by: COUNCIL That Council appoint Mary Wilson and Ju	ng declaring pecuniary interest. LOR TOM BURTON udy Smith to serve as Greenview board Itiplex Board. CARRIED
REGIONAL MULTIPLEX BOARD – MEMBERS AT	Councillor Dale Smith vacated the meetin MOTION: 17.06.253. Moved by: COUNCIL That Council appoint Mary Wilson and Ju members on the Greenview Regional Mu	ng declaring pecuniary interest. LOR TOM BURTON ady Smith to serve as Greenview board litiplex Board. CARRIED eeting. REEVE ROXIE RUTT s and Councillor Les Urness to serve as
REGIONAL MULTIPLEX BOARD – MEMBERS AT LARGE GREENVIEW REGIONAL MULTIPLEX BOARD – COUNCIL	Councillor Dale Smith vacated the meetin MOTION: 17.06.253. Moved by: COUNCIL That Council appoint Mary Wilson and Ju members on the Greenview Regional Mu Councillor Dale Smith returned to the me MOTION: 17.06.254. Moved by: DEPUTY That Council appoint Reeve Dale Gervais	ng declaring pecuniary interest. LOR TOM BURTON ady Smith to serve as Greenview board litiplex Board. CARRIED eeting. REEVE ROXIE RUTT s and Councillor Les Urness to serve as aview Regional Multiplex Board. CARRIED
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CARRIED

8.5 FORESTRY TRUNK ROAD PHASE 4

PHASE 4 – FORESTRY TRUNK ROAD MOTION: 17.06.256. Moved by: COUNCILLOR DAVE HAY That Council approve to use the Provincial Grant funding under the Alberta Government's Strategic Transportation Infrastructure Program for the preliminary survey, design, tendering and contract administration of Phase 4 on the Forestry Trunk Road between km 129.5 to km 137.1.

CARRIED

8.6 REQUEST TO WAIVE 2017 PENALTIES ON SPROCKET ENERGY CORPORATION TAX ROLLS

REQUEST TO WAIVE PENALTIES ON TAX ROLL MOTION: 17.06.257. Moved by: COUNCILLOR GEORGE DELORME That Council deny the request from Sprocket Energy Corporation to waive the 2017 penalties on all of their tax rolls in the amount of \$51,698.58 as per the attached request.

CARRIED

8.7 TAX RECOVERY – PUBLIC SALE OF LAND

ACCUrate Assessment Group with reserve bid prices as follows: MOTION: 17.06.258. Moved by: DEPUTY REEVE ROXIE RUTT That Council set the terms and conditions that apply to the public sale of land as per the attached advertisement and adopt the "Opinion of Value" prepared by Accurate Assessment Group with reserve bid prices as follows:

Roll #150814	SE-21-69-6-W6	Opinion
Roll #181782	SW-26-65-21-W5	Opinion
Roll #225901	NE-24-71-20-W5	Opinion
Roll #38357	NW-32-69-23-W5	Opinion

CARRIED

\$225,000 \$420,000 \$65,000 \$130,000

AUCTION DATE MOTION: 17.06.259. Moved by: DEPUTY REEVE ROXIE RUTT That Council set September 14th, 2017 at 9:00 a.m. as the Public Auction Date for the sale of the following properties:

Roll #150814	SE-21-69-6-W6	Opinion \$225,000
Roll #181782	SW-26-65-21-W5	Opinion \$420,000
Roll #225901	NE-24-71-20-W5	Opinion \$ 65,000
Roll #38357	NW-32-69-23-W5	Opinion \$130,000

CARRIED

	Minutes of a Regular Council Meeting M.D. of Greenview No. 16 Page 5	June 27, 2017
	8.8 COUNCIL REMUNERATION	
COUNCIL REMUNERATION	MOTION: 17.06.260. Moved by: COUN That Council receive for information th	
	8.9 REQUEST TO WAIVE ADDITIONAL 132	L FEES FOR DEVELOPMENT PERMIT D17-
DEVELOPOMENT PERMIT	MOTION: 17.06.261. Moved by: COUN That Council waive the additional fee permit prior to construction, for Devel	e for not obtaining a valid development
	8.10 LETTER OF PERMISSION FOR CL GENERAL STORE)/CLASS D LIQUOR LI	AIM JUMPER HOLDINGS (LITTLE SMOKY CENSE
LETTER OF PERMISSION		E DALE GERVAIS n to write a letter permitting the Claim h a Class D General Merchandise Liquor
		CARRIED
#9 COUNCILLORS BUSINESS & REPORTS	9.1 COUNCILLORS' BUSINESS & REPO	RTS
	9.2 MEMBERS' REPORT: Council provattended, including the following:	vided an update on activities and events
WARD 1	COUNCILLOR GEORGE DELORME upda include: Municipal Planning Commission Meeti	ated Council on his recent activities, which
WARD 3	COUNCILLOR LES URNESS updated include: Valleyview Ratepayer BBQ Municipal Planning Commission Meeti Greenview Multiplex Tour Conference Call with ABR Committee of the Whole Meeting Grovedale Ratepayer BBQ	Council on his recent activities, which

	Minutes of a Regular Council Meeting M.D. of Greenview No. 16 Page 6		June 27, 2017
	Tri-Municipal Industrial Partnershi	p Meeting	
WARD 7	DEPUTY REEVE ROXIE RUTT upd include:	ated Council on	her recent activities, which
	Valleyview Ratepayer BBQ		
	Municipal Planning Commission M	eeting	
	United Way Presentation		
	Dare Presentation at Harry Grey		
	Lakeview Tour		
	Greenview Staff BBQ		
	Committee of the Whole Meeting		
	Grovedale Ratepayer BBQ		
	FCSS Meeting		
	Tri-Municipal Industrial Partnershi	pivieeting	
	Grande Spirit Foundation Meeting South Peace Regional Archives Me	oting	
	Hillside High School Graduation Ce	U	
	This de Fign School Graddation Ce	remony	
WARD 4	COUNCILLOR DAVE HAY updated Valleyview Ratepayer BBQ	Council on his rec	ent activities, which include:
	Municipal Planning Commission M	leeting	
	Committee of the Whole Meeting	leeting	
	Grovedale Ratepayer BBQ		
	FCSS Meeting		
RAIL ROCK GRAVEL	MOTION: 17.06.263. Moved by: C	OUNCILLOR DAVE	HAY
PIT	That Council direct Administration	to investigate th	e acquisition of the Rail Rock
	Gravel Pit.		
			CARRIED
WARD 5			
WARD 5	COUNCILLOR DALE SMITH update	ed Council on his	recent activities,
	which include:		
	Valleyview Ratepayer BBQ Municipal Planning Commission N	looting	
	Greenview Staff BBQ	leeting	
	Committee of the Whole Meeting		
	Grovedale Ratepayer BBQ		
WARD 6	COUNCILLOR TOM BURTON upd	ated Council on	his recent activities, which
	include:		
	Valleyview Ratepayer BBQ		
	Grande Prairie Regional Recreation	n Meeting	

	Minutes of a Regular Council Meeting June 27, 2017 M.D. of Greenview No. 16 Page 7
	Greenview Staff BBQ Committee of the Whole Meeting Tri-Municipal Industrial Partnership Meeting
WARD 8	COUNCILLOR BILL SMITH updated Council on his recent activities, which include: Grovedale Area Structure Plan Tri-Municipal Industrial Partnership Meeting Greenview Specification Book Review Community Readiness Project Meeting Grande Prairie Regional Tourism Meeting Committee of the Whole Meeting Grovedale Ratepayer BBQ Reeve Gervais recessed the meeting at 11:57 a.m. Reeve Gervais reconvened the meeting at 1:08 p.m.
REEVE'S REPORT	9.1 REEVE'S REPORT:
WARD 2	REEVE DALE GERVAIS updated Council on his recent activities, which include: Valleyview Ratepayer BBQ Municipal Planning Commission Meeting Little Smoky Cemetery Meeting Committee of the Whole Meeting Grovedale Ratepayer BBQ Greenview Regional Waste Management Commission Meeting Tri-Municipal Industrial Partnership Meeting Multiplex Sponsorship
#10 CORRESPONDENCE	10.0 CORRESPONDENCE
	MOTION: 17.06.264. Moved by: COUNCILLOR TOM BURTON That Council accept the correspondence for information, as presented. CARRIED
#11 IN CAMERA	11.0 IN CAMERA
IN CAMERA	MOTION: 17.06.265. Moved by: DEPUTY REEVE ROXIE RUTT That the meeting go to In-Camera, at 1:23 p.m., pursuant to Section 197 of the Municipal Government Act, 2000, Chapter M-26 and amendments thereto, and Division 2 of Part 1 of the Freedom of Information and Protection of Privacy Act, Revised Statutes of Alberta 2000, Chapter F-25 and amendments thereto, to discuss Privileged Information with regards to the In Camera.

	CARRIED
	11.1 DISCLOSURE HARMFUL TO BUSINESS INTERESTS OF A THIRD PARTY (FOIPP; Section 16)
	11.2 DISCLOSURE HARMFUL TO INTERGOVERNMENTAL RELATIONS (FOIPP; Section 21)
OUT OF CAMERA	MOTION: 17.06.266. Moved by: COUNCILLOR BILL SMITH That, in compliance with Section 197(2) of the Municipal Government Act, this meeting come Out of Camera at 2:19 p.m. CARRIED
ALBERTA ELECTORAL BOUNDARIES	MOTION: 17.06.267. Moved by: COUNCILLOR DALE SMITH That Council direct Administration to create a submission to the July 17 th , 2017 Alberta Electoral Boundaries Commission recommending no change to the existing ridings. CARRIED
ALBERTA ELECTORAL BOUNDARIES PUBLIC HEARING	MOTION: 17.06.268. Moved by: COUNCILLOR TOM BURTON That Council assign Reeve Dale Gervais to present the submission at the July 17 th , 2017 Electoral Boundaries Commission public hearing in Grande Prairie. CARRIED
	12.0 ADJOURNMENT

#12 ADJOURNMENT MOTION: 17.06.269. Moved by: DEPUTY REEVE ROXIE RUTT That this meeting adjourn at 2:13 p.m.

CARRIED

CHIEF ADMINISTRATIVE OFFICER

REEVE



REQUEST FOR DECISION

SUBJECT:Schedule of Fees BylawSUBMISSION TO:REGULAR COUNCIL MEETINGMEETING DATE:June 13, 2017DEPARTMENT:INFRASTRUCTURE & PLANNING

REVIEWED AND APPROVED FOR SUBMISSION CAO: MH MANAGER: GM: GG PRESENTER: GG

RELEVANT LEGISLATION: **Provincial** (cite) – N/A

Council Bylaw/Policy (cite) – Schedule of Fees Bylaw

RECOMMENDED ACTION: MOTION: That Council give first reading to Bylaw 17-784 Schedule of Fees Bylaw.

BACKGROUND/PROPOSAL:

Administration has made the necessary changes and revised the Schedule of Fees as per Council's request.

At the regular scheduled Council meeting on May 23rd Council tabled this RFD with *MOTION: 17.05.203. That Council table the revised 2017 Schedule of Fees Bylaw 12-673 until the June 13th, 2017 Council Meeting.*

Each year, Greenview department managers review the Schedule of Fees Bylaw for modifications or additions needed to the Schedule of Fees. Infrastructure & Planning is requesting Council's approval early this year, due to the changes in the process when dealing with the access approach installations located inside Greenview's Right of Ways. This process does not pertain to multi lot subdivisions, those are handled through a Developer's Agreement.

Agriculture Services has provided additional rental equipment in **Schedule "D"** of the Schedule of Fees for Council's review.

Listed below are Infrastructure & Planning's suggested modifications and additions to the schedule of Fees. These changes are also provided for Council's review within the attached document.

Approaches

Section 15(a) Approach Application fee (non-refundable).The rational to increase the application fee will help offset the cost of creating the estimate for the applicant.

Section 15(b) Gravel Approach. \$2,000.00

Section 15(c) Paved Approach. \$5,000.00

Section 15(d) Relocation/Upgrade. \$2,500.00 relocation and upgrades are new approaches that have an extra \$500.00 attached for additional time spent onsite by the contractor to decommission the old approach for relocation and/or remove existing to upgrade.

Land Acquisition

Section 21(b) Right-of-Way from properties over 40 acres. The rational to increase the price per acre for properties over 40 acres will help negotiations while requesting to purchase Right of Way for needed road widening. The suggested increase will change all related parcel sizes within Schedule (E). Upward of \$600.00 per acre.

BENEFITS OF THE RECOMMENDED ACTION:

1. The benefit of Council adopting the revised 2017 Schedule of Fees Bylaw 12-673 is that it will allow Administration to implement the suggested additions to the Schedule of Fees Bylaw.

DISADVANTAGES OF THE RECOMMENDED ACTION:

1. The disadvantage of Council adopting the revised 2017 Schedule of Fees Bylaw 12-673 is that the Schedule of Fees may need to come back for Councils approval for any additional suggested changes from Planning & Development.

ALTERNATIVES CONSIDERED:

Alternative #1: Council has the alternative to table the Motion until Planning & Development has introduced their modifications to the Bylaw.

FINANCIAL IMPLICATION:

Direct Costs: No direct costs associated from the recommendation.

Ongoing / Future Costs: No ongoing or future costs associated from the recommendation.

STAFFING IMPLICATION:

No additional staffing from the recommendation.

PUBLIC ENGAGEMENT LEVEL:

INCREASING LEVEL OF PUBLIC IMPACT

Inform

PUBLIC PARTICIPATION GOAL

Inform - To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.

PROMISE TO THE PUBLIC

Inform - We will keep you informed.

FOLLOW UP ACTIONS: Administration will advertise the revised Schedule of Fees Bylaw where applicable.

ATTACHMENT(S):

• Schedule of Fees Bylaw 12-673

(IMPOSED BY BYLAW NO. 12-673)

Amended:

The amount which the Municipal District of Greenview No. 16 may charge for the supply of information, goods and services, shall be the amounts set out opposite the section number and/or description below, plus Goods and Services Tax where applicable:

SECTION		DESCRIPTION	FEE IN \$
1 (a)	Е	Tax certificate to registered landowner	N/C
1 (b)	Е	Tax certificate to others per roll number	\$ 50.00
1 (c)	Е	Tax Search to others per roll number	\$ 50.00
1 (d)	E	Online Tax Certificate to others	\$ 25.00
1 (e)	E	Online Tax Search	\$ 15.00
2 (a)	Е	Assessment record to landowner per roll number	\$ 5.00
2 (b)	E	Assessment record to others per roll number	\$ 10.00
3		Planning & Development:)
3 (a)	E	Certificate of Compliance	\$ 100.00
3 (b)	E	Development Permit Applications, \$50 per \$100,000 or portion thereof	\$ 50.00
3 (c)	Е	Development Appeal Fee (refundable if successful)	\$ 500.00
3 (d)	Е	Land Use Bylaw Amendment Application	\$ 800.00

3 (e)	Е	Subdivision Applications, first parcel out	\$ 450.00
3 (f)	Е	 each additional parcel created 	\$ 150.00
3 (g)	Е	Subdivision Endorsement Fees, per Title Created	\$ 150.00
3 (h)	Е	Subdivision Appeal Fee (refundable if successful)	\$ 500.00
3 (i)	E	Business License Fee - new application	\$ 20.00
3 (j)	E	Business License Fee - annual renewal	\$ 10.00
		Development Permit Fees (Section 3 (k) to 3 (s): If construction	
		commences before obtaining a Development Permit the following	
		fees shall be applied:	
3 (k)	E	Single Family Dwellings/Manufactured Homes & accessory	
		buildings or structures. Floor Area: Equal to or greater than 1076	\$ 1,000.00
		sq. ft. (Per Permit)	
3 (I)	E	Multiple Residential (Per Unit)	\$ 1,000.00
3 (m)	Е	Minor Home Occupations (Per Permit)	\$ 200.00
3 (n)	E	Major Home Occupations (Per Permit)	\$ 5,000.00
3 (o)	E	Commercial (Per Permit)	\$ 5,000.00
3 (p)	E	Industrial (Per Permit)	\$ 5 <i>,</i> 000.00
3 (q)	E	Signs (Per Permit)	\$ 500.00
3 (r)	E	Accessory Buildings, detached garages & structures Floor Area:	
		Less Than: 225 sq. ft. (Per Permit)	\$ 100.00
3 (s)	Е	Accessory Buildings, detached garages & structures Floor Area:	
		Greater Than: 225 sq. ft. (Per Permit)	\$ 1,000.00

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E= Exempt from Goods & Services Tax.

(IMPOSED BY BYLAW NO. 12-673)

		(IMPOSED BY BYLAW NO. 12-673)	
Amended:			
3 (s)	E	Rural Addressing Signage New/ Replacement (Per Sign)	\$ 50.00
3 (t)	E	Individual Lot Sign (Per Sign)	\$ 50.00
3 (u)	E	Large Address Sign with address Tab for Subdivisions of 4 lots or	\$ 800.00
		greater (Per Sign)	
4 (a)	Е	Tax Notification Charges	\$ 75.00
5		Photocopying	
5 (a)	Т	Tax, Utilities, and other documents, per page	0.50
5 (b)	т	Minutes or Bylaws, per page	\$ 1.00
6	т	Documents:	
6 (a)	т	Planning or otherwise, any size	\$ 10.00
6 (b)	т	Faxed Copies, per page (incoming/outgoing)	\$ 1.00
6 (c)	т	Access to Information (FOIP), Research - per hour	\$ 25.00
- (-)			
7 (a)	Е	N.S.F. cheques or closed account cheques	\$ 50.00
. (,	-		
8		Maps and Photos:	
8(a)	т	- Ortho Printing and Plotting - refer to Schedule "A" attached	
8(b)	Ē	- GIS Maps - refer to Schedule "B" attached	
8(c)	Т	- Cadastral Maps - refer to Schedule "C" attached	
0(0)		- Cadastral Maps - Telef to Schedule 'e' attached	
	т	Picnic Tables:	
8(d)	Ť	- Non-profit organizations - community event	no charge
8(e)		- Private affair, non-public event - \$10 per table per day up to	\$1 <mark>9</mark> 0.00/day
8(8)		maximum of 10 days	Ş1 0 0.00/uay
0(f)	-		ć 2.00/lum
8(f)	E	- Delivery charge, per loaded kilometer	\$ 2.00/km
		Parhagua	
$P(\alpha)$		Barbecue:	no chargo
8 (g)		- Non-profit organizations - community event	no charge
8 (h)		- Private affair, non-public event - \$100 per day, up to-maximum	\$100.00 / day
0 (1)		of <u>5 days</u>	ć 200.00
8 (i)		Deposit (all organizations) (Motion #04.08.278)	\$ 200.00
8 (j)		Delivery charge, per loaded kilometer	\$ 2.00
9	_	Road Allowance Permit License	<i>.</i>
9 (a)	E	Road Allowance License, application fee	\$ 100.00
		plus advertising costs, plus per quarter section or portion	
		thereof, per year:	\$ 10.00
10		Road Closure	
10 (a)		Application Fee	\$ 1,500.00
10 (b)		Sale of Road Allowance for the purpose of road closure. As	Fair Market
		determined by Accurate Assessment.	Value

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E= Exempt from Goods & Services Tax.

(IMPOSED BY BYLAW NO. 12-673)

		(IMPOSED BY BYLAW NO. 12-673)		
nended:		Snownlowing Signs		
11	-	Snowplowing Signs;	650.00	
11(a)	Т	Any driveway beyond 400 meters shall be invoiced $\frac{53}{2}$ 0.00 plus	<u>\$50.00</u>	
	-	\$100.00 per hour for time over the first ½ hour.	\$ 30.00	Formatted: Font color: Red, Strikethrough
11(b)	Т	Lost or replacement signs, each	\$ 30.00	
12	Т	Culverts - used or salvaged		
12(a)		- 500 mm or less, per meter	\$ 13.00	
12(b)		- 600 mm, per meter	\$ 15.00	
12(c)		- 700 mm, per meter	\$ 16.00	
L2(d)		- 800 mm, per meter	\$ 25.00	
L2(e)		- 900 mm, per meter	\$ 28.00	
L2(f)		- 1000 mm, per meter	\$ 29.00	
.2(g)		- 1200 mm or greater, per meter	\$ 30.00	
13	т	Grader blades, used, each	\$ 5.00	
4		Dust Control		
L4(a)	Е	Dust Control (set annually), per application of calcium product –		
		for residents and landowners / per 200 meters / plus \$5.35/m	\$ 150.00	
		sections over 200 m	/200m	
		(up to April 15 th each year)		
L4(b)		Dust Control (set annually), per application of calcium product –	\$ 100.00/	
		for multi-parcel subdivisions:	100m	
L4(c)	Е	Dust Control (set annually), per application of calcium product –		
		for <i>industrial and road use agreement holders</i> per 300 meters/	\$ 1605.00	
		plus \$5.50 /m sections over 300 m	/300 m	
		(up to April 15 th each year)		
15		Approaches		Formatted: Font color: Red, Strikethrough
5(a)	E	Private Approach Construction Application Request fee (non-	\$175.00 \$100. 🔩	Formatted: Font color: Red
- (- /		refundable)	/per approach	Formatted: Font color: Red, Strikethrough
		Subdivision Approach Security Deposit(s) will be established by	, re oppose	Formatted Table
		the approach installation estimate. Any unused security deposit		Formatted: Font color: Red, Strikethrough
		will be refunded back to the applicant within 30 days of last		Formatted: Font color: Red, Strikethrough
		dated invoice.		Formatted: Font color: Auto, Not Strikethrough
.5(b)		Gravel Approach	\$2,000.00	Formatted: Font color: Red, Strikethrough
			\$ 8,000.00	Formatted: Font color: Auto, Not Strikethrough
<u>5 (c)</u>		Gravel Approach Relocation/Upgrade (additional)	\$500.00	Formatted: Not Strikethrough
.5(e <u>d)</u>		Asphalt Approach	\$5,000.00	Formatted: Font color: Auto, Not Strikethrough
.5(d e) 15		Asphalt Relocation/Upgrade (additional)	\$500.00	Formatted: Not Strikethrough
13(de)13 1 6 16		Inspections	\$200.00	Formatted: Font color: Auto
L6(a)	Е	Seismic pre-inspections, per occurrence	\$ 100.00	Formatted: Font color: Red, Strikethrough
L6(b)	E	Seismic pre-inspections, per occurrence	\$ 100.00 \$ 100.00	Formatted: Font color: Red, Strikethrough
	E		\$ 100.00 \$ 100.00	Formatted: Font color: Red, Strikethrough
16(c)	E	Seismic non-compliance, per inspection	\$ 100.00	Simatea. Font color. Rea, Strikethough

(IMPOSED BY BYLAW NO. 12-673)

17 17 (a) 17(b) 17(c)	E	Road Ban Overload Road Ban Fees (non-refundable payment) <i>Plus</i> Security Deposit (refundable subject to final inspections) Fixed Fee for the TRAVIS MJ Permitting System	\$1,125.00/km \$6,375.00/km \$ 15.00 per permit		
18 18(a) 18(b)		Haying or Pasturing Permits Application fee <i>plus</i> per acre charge (per year)	\$ 100.00 + \$ 15.00		
19 19(a)	E	Community Aggregate Community Aggregate Payment Levy, per tonne	0.25		Formatted: Font color: Auto
20		Agricultural Rental Equipment - as per attached Schedule "D" / Rental Equipment Listing			Formatted: Font color: Auto Formatted: Font color: Auto
,20(a)	Ŧ	Weeds of the West Book	<u>\$ 32.79</u>	_	Formatted: Font color: Auto
20(a b)	Т	Guide to Crop Protection - Chemical/Cultural	\$ 12.00	\frown	Formatted: Font color: Auto
20(be)	Т	Weed Seedling Guide	\$ 10.00	$\backslash /$	Formatted: Font color: Auto
20(cd)	Т	Nutrition and Feeding Management for Horse Owners	\$ 20.00		Formatted: Font color: Auto
20(d e)	Т	Horse Health	\$ 15.00	\mathbb{N}	Formatted: Font color: Auto
			1		Formatted: Font color: Auto
21	Т	Land Acquisition		11/1	Formatted: Font color: Auto
21(a)	Т	Right of Way from properties up to 40 acres – See Schedule "E"		1///	Formatted: Font color: Auto
21(b)	Т	Right of Way from properties over 40 acres	1,800.00 \$2,		Formatted: Font color: Auto
			400 /acre		
21(c)	Т	Right - of-Way: from properties minimum payment, per	\$ 150.00		Formatted: Font color: Auto
		occurrence		/	Formatted: Font color: Auto
					Formatted: Font color: Auto
21(d)		On parcels more than 40 acres, where an existing residence is on the property, for up to 50 meters each side of the residential	\$ 3,000/acre		Formatted: Font color: Auto
24(-)	-	driveway Design Dit Association	ć 1 00 / ³		
21(e)	Т	Borrow Pit Acquisition	\$ 1.00/ m ³		
22	-	To the second			
22	T	Fencing:	ć 2.000 /il-		
22(a)	т	Removal of old fence by landowner	\$ 2,000/mile		
22(1)	-		(1,250/km)		
22(b)	Т	Removal of old fence by M.D. without replacement	\$ 1,000/mile		
22(-)	-	Deale server at a fail famou ha landar man sith MD sound is a	(625/km)		
22(c)	Т	Replacement of old fence by landowner with MD supplying	\$ 4,000/mile		
22 (1)	_	material	(2,500/km)		
22(d)	Т	Replacement of old fence by landowner including labour and	\$ 8,000/mile		
22(-)	-	materials	(5,000/km)		
22(e)	Т	Replacement of old fence by M.D.	No Compensation		
			compensation		

23 Home Support E= Exempt from Goods & Services Tax.

Amended:

SCHEDULE OF FEES (IMPOSED BY BYLAW NO. 12-673)

Amended: Е *This fee can be varied as evaluated and approved by the FCSS \$ 20.00 * 23(a) Manager. 24 Е Adult Wolf Carcass \$ 300.00 25 Spray Exemption Signs 25(a) т Spray Exemption Signs (One-time fee only) Free 25(b) т Lost or Replacement Signs, each \$ 30.00

E= Exempt from Goods & Services Tax.

(IMPOSED BY BYLAW NO. 12-673)

Amended:

<u>SCHEDULE "A"</u> ORTHO PRINTING & PLOTTING PRICING Based on size and quality of paper, image and graphics.

Standard Laser, Black & White - Letter size

8 ½" x 11" graphics 8 ½" x 11" photo 8 ½" x 11" photo and graphics

Color Laser - Letter size 8 ½" x 11" colour graphics 8 ½" x 11" photo 8 ½" x 11" photo, colour graphics \$ 3 residents, \$5 non-residential
\$ 3 residents, \$ 5 non-residential
\$ 3 residents, \$ 5 non-residential

\$ 5 residents, \$10 non-residential
\$ 5 residents, \$10 non-residential
\$ 5 residents, \$10 non-residential

\$15 residence, \$20 non-residence

\$15 residence, \$20 non-residence

\$20 residence, \$25 non-residence

\$15 residence, \$20 non-residence

\$20 residence, \$25 non-residence

\$25 residence, \$35 non-residence

\$20 residence, \$30 non-residence

\$25 residence, \$30 non-residence

\$35 residence, \$45 non-residence

\$20 residence, \$30 non-residence

\$25 residence, \$30 non-residence

\$35 residence, \$45 non-residence

\$35 residence, \$45 non-residence

\$45 residence, \$65 non-residence

\$55 residence, \$85 non-residence

 Plotter on High Quality Paper - Letter size (ANSI A)

 8 ½" x 11" colour graphics
 \$ 5 residence, \$10 non-residence

 8 ½" x 11" photo, B/W
 \$ 5 residence, \$10 non-residence

 8 ½" x 11" photo, colour graphics
 \$ 10 residence, \$10 non-residence

 8 ½" x 11" photo, colour graphics
 \$ 10 residence, \$15 non-residence

 9 ½" x 11" photo, colour graphics
 \$ 10 residence, \$15 non-residence

Plotter on High Quality Paper - Ledger Paper (ANSI B) 11" x 17" colour graphics 11" x 17" photo 11" x 17" photo colour graphics

Plotter on High Quality Paper - Small Plot (ANSI C) 17" x 22" colour graphics 17" x 22" photo 17" x 22" photo colour graphics

Plotter on High Quality Paper - Medium Plot (ANSI D) 22" x 34" colour graphics 22" x 34" photo 22" x 34" photo colour graphics

Plotter on High Quality Paper - Medium Plot (ANSI E) 22" x 34" colour graphics 22" x 34" photo 22" x 34" photo colour graphics

Plotter on High Quality Paper - Medium Plot (ANSI F) 28" x 40" colour graphics 28" x 40" photo 28" x 40" photo colour graphics

E= Exempt from Goods & Services Tax.

SCHEDULE OF FEES (IMPOSED BY BYLAW NO. 12-673)

Amended:

SCHEDULE "B"

GIS MAP PRICING

	Per Township	AltaLIS	Per
		License	Layer
Photo	End User License from Municipality/Tarin Ortho Imagery (Air Photos)		\$ 400.00
AltaLIS 1:5K	End user License from AltaLIS Cadastre	\$ 200.00	\$ 250
1:20 К	ATS Grid (Township, Range & Sections Grids) Hydrography (rivers, lakes) Transportation (roads) Geo-Administrative (Town boundaries, etc.) Contours (elevations)	\$ 16 \$ 16 \$ 16 \$ 16 \$ 16 \$ 20	\$ 30 \$ 30 \$ 30 \$ 350 \$ 35
Muni	End User License from Municipality Farmland Polygons Improvement Points Industrial Data Digital Pictures of Improvements		\$ 50 \$ 40 \$ 40 \$ 30
EUB	End user License from Insight Wells Well Production Pipeline Facilities (Gas Plants)		\$ 40 \$ 40 \$ 50 \$ 30
Lease	End user License from Municipality Disposition (land Leased from Crown)		\$ 800
	TOTALS Per Township		\$ 1,925

There will be a processing charge of \$75.00

Above prices include G.S.T.

E= Exempt from Goods & Services Tax.

(IMPOSED BY BYLAW NO. 12-673)

SCHEDULE "C"

CADASTRAL MAP PRICING

Base Maps		Legal / Roads	/ Lakes / Rivers	/ Subdivisions	/ Contours
Format		Single License	Кеу Мар	Per Sheet	Bundle (8)
Hardcopy			\$ 25	\$ 20	\$ 75
Digital (Pdf)	No printing privileges	View Only	\$ 30	\$ 20	\$ 150
Digital (Pdf)	With printing privileges	View Only	\$ 50	\$ 30	\$ 200
Ownership Maps		U .	s / Lakes / River es / Map Points		•
Format		Single License	Кеу Мар	Per Sheet	Bundle (4)
Hardcopy			\$ 25	\$ 20	\$ 90
Digital (Pdf)	No printing privileges	View Only	\$ 30	\$ 30	\$ 100
Digital (Pdf)	With printing privileges	View Only	\$ 50	\$ 50	\$ 150
Oil and Gas Wells		. .	/ Lakes / Rivers ity Location / Si	-	
Format		Single License	Кеу Мар	Per Sheet	Bundle (8)
Hardcopy			\$ 25	\$ 50	\$ 300
Digital (Pdf)	No printing privileges	View Only	\$ 30	\$ 70	\$ 400
Digital (Pdf)	With printing privileges	View Only	\$ 50	\$ 100	\$ 600
Oil and Gas Wells /	⁷ Pipeline	U .	s / Lakes / River y & Pipeline Lo	•	•
Format		Single License	Кеу Мар	Per Sheet	Bundle (8)
Hardcopy			\$ 25	\$ 300	\$ 1,000
Digital (Pdf)	No printing privileges	View Only	\$ 30	\$ 350	\$ 1,200
Distal (Dalf)	Addala in stratter a	Mary Order	ć 50	ć 500	ć 4 E00

View Only

E= Exempt from Goods & Services Tax.

Digital (Pdf)

With printing

privileges

Amended:

T = Tax Applicable; charge G.S.T. over and above the price shown.

\$ 50

\$ 500

\$ 1,500

Amended:

<u>SCHEDULE "D"</u> RENTAL EQUIPMENT PRICING

Equipment Type	Location	2016 Schedule of Fees	Other Regulations		
WEED & INS	ECT CONTROL	EQUIPMENT	_		
FIELD SPRAYER c/w GPS	All Location	\$ 50.00 + G.S.T. Each Day (3 Days Maximum if Lineup)			
BOOMLESS SPRAYER S	Valleyview	\$ 20.00 + G.S.T. E Maximum if Line			
WATER TANK ON TRAILER (FOR SPRAYING)	Valleyview Grovedale	\$ 25.00 + G.S.T. E Maximum if Line			
ESTATE SPRAYER-(PULL TYPE)	All Locations	\$ 20.00 + G.S.T. E Maximum if Line	,, ,		
ESTATE SPRAYER (3 POINT HITCH)	Valleyview	\$ 20.00 + G.S.T. E Maximum if Line			
QUAD WICK APPLICATOR	All Locations	\$ 10.00 + G.S.T. E Maximum if Line	, , ,		
QUAD MOUNT SPRAYER	All Locations	\$ 10.00 + G.S.T. E Maximum if Line	,,,,,		
BACKPACK SPRAYER 15 Liter	All Locations	\$ 5.00 + G.S.T. Ea if Lineup)	ch Day (3 Days Maximum		
HAND WICK APPLICATOR Holds 600 ml.	All Locations	Free First 3 Days, Additional Day. (3 Days Maximun	\$ 5.00 + G.S.T. Each n if Lineup)		
GRANULAR PESTICIDE BAIT APPLICATOR Holds 135 lbs. Bran	Valleyview	\$ 30.00 + G.S.T. E Maximum if Line			

	SPREADERS	
MANURE SPREADER	Valleyview	\$ 200.00 + G.S.T. Each Day (3 Days
	Grovedale	Maximum if Lineup)
FERTILIZER SPREADER	Valleyview	\$ 100.00 + G.S.T. Each Day (3 Days
		Maximum if Lineup)

Amended:

SCHEDULE "D"

Equipment Type	Location	2016 Schedule of	Other Regulations
		Fees	

EARTH MOVING EQUIPMENT					
1000 EARTH MOVER	Valleyview	\$ 200.00 + G.S.T. Each Day (3 Days			
	Crooked	Maximum if Lineup)			
	Creek				
900 EARTH MOVER	Grovedale	\$ 150.00 + G.S.T. Each Day (3 Days			
		Maximum if Lineup)			
425 EARTH MOVER	Grovedale	\$ 100.00 + G.S.T. Each Day (3 Days			
		Maximum if Lineup)			
12' PULL-TYPE BLADE	Valleyview	\$ 50.00 + G.S.T. Each Day (3 Days			
		Maximum if Lineup)			
VEE DITCHER	Valleyview	\$ 50.00 + G.S.T. Each Day (3 Days			
		Maximum if Lineup)			

POST POUNDERS					
POST POUNDER	All Location	\$ 125.00 + G.S.T. Each Day (3 Days Maximum if Lineup) (1/2 Day Rental Available)			

BIN CRANE					
BIN CRANE	Valleyview	\$ 100.00 + G.S.T. Each Day (3 Days			
	Grovedale	Maximum if Lineup)			

CATTLE EQUIPMENT								
CATTLE SQUEEZE	All Locations							
		if Lineup)						
LOADING CHUTE	All Locations	\$ 25.00 + G.S.T. Each Day (3 Days Maximum						
		if Lineup)						
PANEL TRAILER	Valleyview	\$ 25.00 + G.S.T. Each Day (3 Days Maximum						
	Grovedale	if Lineup)						
SPARE PANELS	Crooked	Free First 3 Days, \$ 5.00 + G.S.T. Each						
	Creek	Additional Day						
	Grovedale							
DEHORNERS GOUGERS	Valleyview	Free First 3 Days, \$ 5.00 + G.S.T. Each						
BURDIZZO CLAMPS		Additional Day						
TAG READER	Valleyview	Free, \$ 100 Deposit Required. (3 Days						
		Maximum if Lineup)						

Amended:

SCHEDULE "D"

Equipment Type	Location	2016 Schedule of	Other Regulations
		Fees	

CON			
50' HEAVY HARROW WITH GRANULAR	Valleyview	\$ 150.00 + G.S.T. Each Day (3 Days	
APPLICATOR		Maximum if Lineup)	
33' HEAVY HARROW WITH GRANULAR	Grovedale	\$ 150.00 + G.S.T. Each Day (3 Days	
APPLICATOR		Maximum if Lineup)	
30' LAND ROLLER	Valleyview	\$ 200.00 + G.S.T. Each Day (3 Days	
	Grovedale	Maximum if Lineup)	Formatted: Font color: Auto
14' DISC	Grovedale	\$ 400.00 + G.S.T. Each Day (3 Days	
		Maximum if Lineup)	

BROADCAST SEEDERS						
TRUCK MOUNT SEEDER	Valleyview	\$ 10.00 + G.S.T. Each Day (3 Days Maximum if Lineup)				
QUAD MOUNT SEEDER	Valleyview	\$ 10.00 + G.S.T. Each Day (3 Days Maximum				
		if Lineup)				
HAND SEEDER	Valleyview	Free First 3 Days, \$5.00 + G.S.T. Each				
		Additional Day				

WATER PUMPING EQUIPMENT								
WATER PUMP AND PIPE TRAILER - AB.	Valleyview	\$ 250.00 + G.S.T Each Day (3 Days Maximum						
Agriculture Unit		if Lineup)						

MISCI	ELLANEOUS EQU	UIPMENT	
BAG ROLLER	Valleyview	\$ 125.00 + G.S.T. Each Day (3 Days	Formatted: Font color: Auto
		Maximum if Lineup)	
SURVEY EQUIPMENT	Valleyview	\$ 10.00 + G.S.T. Each Day (3 Days Maximum	
		if Lineup)	
METAL DETECTOR	Valleyview	\$ 10.00 + G.S.T. Each Day (3 Days Maximum	
		if Lineup)	
HAY SAMPLER, MEASURING WHEEL,	Valleyview	Free First 3 Days, \$ 5.00 + G.S.T. Each	
BIN PROBE, SOIL SAMPLER		Additional Day	
SCARE CANNONS	Valleyview	Free First 3 Days, \$ 5.00 + G.S.T. Each	
		Additional Day	
RODENT TRAPS (TWO STYLES)	Valleyview	\$ 10.00 + G.S.T. Each Day (3 Days Maximum	
		if Lineup)	
		(\$ 100.00 DEPOSIT REQUIRED)	
No Till Drill	Valleyview	\$150.00 + G.S.T. Each Day (3 day max if	
		lineup)	

Valleyview	\$50.00 + G.S.T. Each Day (3 day max if lineup)	
Valleyview	\$150.00 + G.S.T. Each Day (3 day max if	
	,	lineup)

SCHEDULE "D"

Equipment Type	Location	2016 Schedule of	Other Regulations
		Fees	

RECOVERY OF A.S.B. EQUIPMENT		
MINIMUM ONE HOUR CHARGE FOR RECOVERY OF	EQUIPMENT	
RECOVERY OF RENTAL EQUIPMENT REQUIRING 1-TON MIN. FOR TRANSPORT	\$ 100.00 /hr + G.S.T.	
RECOVERY OF RENTAL EQUIPMENT REQUIRING VEHICLE UNDER 1- TON FOR TRANSPORT	\$ 75.00 /hr + G.S.T.	
CLEANING (WHEN EQUIPMENT IS RETURNED UNCLEAN)	\$ 60.00 /hr + G.S.T.	
All decisions being at the Agricultural Fieldsman's discretion		

All decisions being at the *l* ١g

Amended:

SCHEDULE "E"

VALLEYVIEW AREA

Owner Parcel Size in Acres		RIGHT OF W	/AY F	OR PROPERTIES U	IP TO 40 ACRES		
	Phase 1	Phase 2		Phase 3	Phase 4	Phase 5	Commented [LT1]: Updated all amounts increased by \$600.00
0-1	\$ 24,000-30,000	\$ 22,000-22,600	Ş	16,000-16,600	\$ 13,000 13,60	0 \$ 12,000 12,600	
1-3	\$ 12,000 12,600	\$ 11,400-12,000	Ş	8,150- 8,750	\$ 6,750 7,350	\$ 6,675 -7,275	
3-5	\$ 8,300-<mark>8,900</mark>	\$ 8,000-<mark>8,600</mark>	Ş	5,700-<mark>6,300</mark>	\$ 4 ,700 5,300	\$ 4,650-5,250	
5-10	\$ 5,500-6,100	\$ 5,250- 5,850	Ş	3,750-4,350	\$ 3,100 3,700	\$ 3,050-3,650	
10-20	\$ 3,300 3,900	\$ 3,200-3,900	Ş	2,250- 2,850	\$ 2,100-2,700	\$ 2,000 2,600	
20-30	\$ 2,200-2,800	\$ 2,150-2,750	Ş	2,100-2,700	\$ 2,000-2,600	\$ 1,950 2,550	
30-40	\$ 1,900-2,500	\$ 1,900-2,500	\$	1,900 2,500	\$ 1,900-2,500	\$-1,900-2,500	
40+	\$ 1,800-2,400	\$ 1,800-2,400	Ş	1,800-2,400	\$ 1,800-2,400	\$- <u>1,800-2,400</u>	

DEBOLT AREA

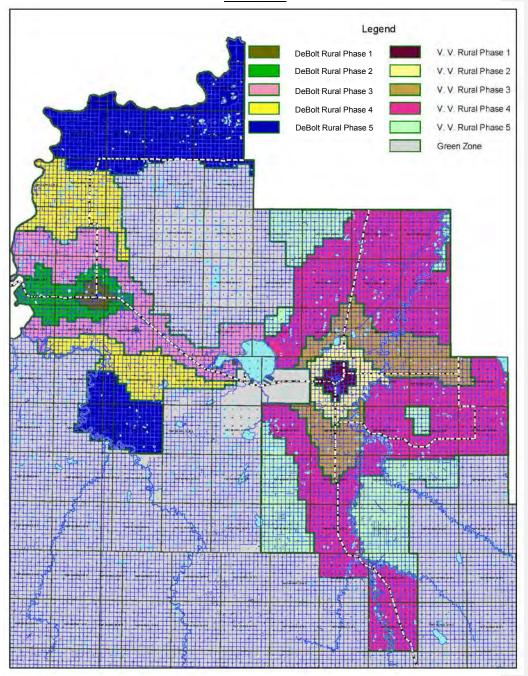
Owner Parcel Size in Acres	RIGHT OF WAY FOR PROPERTIES UP TO 40 ACRES									
	Phase 1	Phase 1 Phase 2 Phase 3 Phase 4								
0-1	\$ 40,000-40,600	36,000-36,600	\$ 32,000 32,600	\$ 24,000 24,600	\$ 16,000 16,600					
1-3	\$ 20,000 20,600	18,000-18,600	\$ 15,800 16,400	\$ 12,000 12,600	\$ 8,000-8,600					
3-5	\$ 14,150 14,750	12,650 13,250	\$ 11,000 11,600	\$ 8,450 9,050	\$ 5,600 6,200					
5-10	\$ 9,300 9,900	8,300 8,900	\$ 7,250 7,850	\$ - 5,550 6,150	\$ 3,650 4,250					
10-20	\$ 5,650-6,250	5,050 5,650	\$ 4,400 5,000	\$ 3,350 3,950	\$ 2,250 2,850					
20-30	\$ 3,750 3,810	3,350 <mark>3,9</mark>50	\$ 2,950 3,550	\$ -2,250 2,850	\$ 2,100 2,700					
30-40	\$ 2,850-3,450	2,550 3,150	\$ 2,200 2,800	\$ -1,900 2,500	\$ 1,900-2,500					
40+	\$ 1,800-2,400	1,800 2,400	\$ 1,800 2, 400	\$ 1,800 2,400	\$ 1,800-2,400					

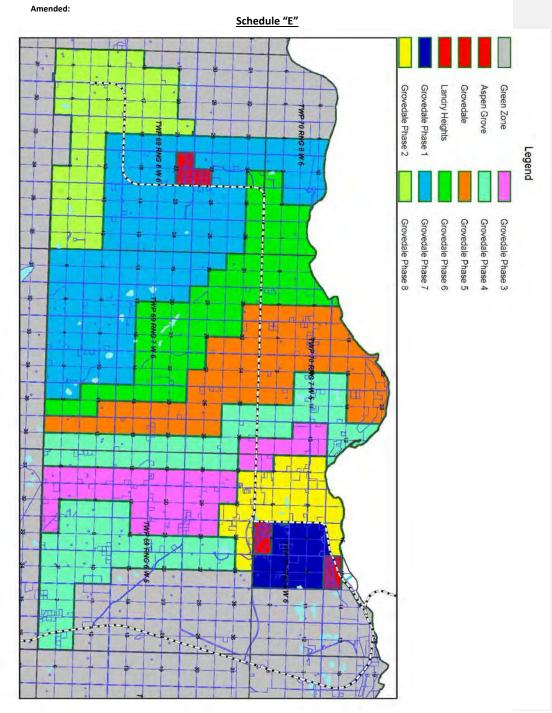
GROVEDALE AREA

Owner Parcel	Landry Heights Price/Acre	Grovedale Price/Acre	Aspen Grove Price/Acre	RIGHT OF WAY FOR PROPERTIES UP TO 40 ACRES					
Size in									
Acres				Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
0-1	\$ 55,000 55,600	\$ 4 3,000 43,600	\$ 23,000 23,600	\$ 4 9,000 49,000	\$ 47,000 47,600	\$ 30,000 30,600	\$ 28,50029,100	\$26,000-26,600	25,000-25,600
1-3	\$ 27,300 27,900	\$ 21,600 22,200	\$ 11,800 12,400	\$ 24,50025,100	\$ 23,50024,100	\$ 14,800 15,400	\$ 14,30014,900	\$13,10013,700	12,650 13,250
3-5	\$ 19,150-19,750	\$ 15,150 15,750	\$ -8,300-8,900	\$ 17,15017,750	\$ 16,50017,100	\$ 10,35010,950	\$ 10,00010,600	\$9,200 9,800	8,850 9,450
5-10	\$ 12,550-13,150	\$ 9,950-10,550	\$ - 5,450 6,050	\$ 11,25011,850	\$ 10,85011,450	\$ 6,800 7,400	\$ 6,600 7,200	\$6,0506,650	5,8506,450
10-20	\$ 7,650 8,250	\$ 6,050 6,650	\$ 3,300 3,900	\$ 6,8507,450	\$ 6,600 7,200	\$ 4,1504 ,750	\$ 4,0004,600	\$3,6504,250	3,5504,150
20-30	\$ 5,100-5,700	\$ 4,000 4,600	\$ -2,200 2,800	\$ 4,6005,200	\$ 4,4005,000	\$ 2,8003,400	\$ 2,700 3,300	\$2,4503,050	2,3502,950
30-40	\$ 4,000-4,600	\$ 3,000 3,600	\$ 1,900-2,500	\$ 3,4504,050	\$ 3,300 3,900	\$ 2,1002,700	\$ 2,000 2,600	\$1,9002,500	1,9002,500
40+	\$ 1,800 2,400	\$ 1,800 2,400	\$ 1,800 2,400	\$ 1,8002,400	\$ 1,800 2,400	\$ 1,800 2,400	\$ 1,800 2,400	\$1,800 2,400	1,8002,400

Amended:

Schedule "E"





Amended:

SCHEDULE "F"

WATER CONSUMPTION FEES FOR ALL M.D. OF GREENVIEW WATER DISTRIBUTION SYSTEMS All fees are effective as of January 1st, 2015.

Utility Accounts Late Fee Penalty		
		Formatted: Font color: Auto
Accounts for metered services and bulk accounts	1.5% Penalty/monthly	Formatted: Font color: Auto
if not paid within 30 days of the billing date will		
incurred a 1.5% penalty monthly.		
		Formatted: Font color: Auto
Work Done at Cost		Formatted: Font color: Auto
Where work is done at cost, the cost will include	1.5% Penalty/monthly	Formatted: Font color: Auto
the amount expended by Greenview for all		
expenditures incurred doing the work, including		
administration. All invoices will be paid within 30		
days of billing. If not paid within 30 of billing, are		
subject to interest.		
A		Formatted: Font color: Auto
Requested Turn on/Shut off of Service Curb Stop		Formatted: Font color: Auto
Regular Hours	\$20.00 Flat Rate	Formatted: Font color: Auto
After Hours	\$80.00/per hour	Formatted: Font color: Auto
		Formatted: Font color: Auto
Hamlet Water Distribution Systems (DeBolt & Ridgevalley)		Formatted: Font color: Auto
Residential Users Rate	\$ 3.50 per m3	Formatted: Font color: Auto
(0 - 30 m3/month)		Formatted: Font color: Auto
Residential Rate (Over 30m3/month)	\$ 4.00	Formatted: Font color: Auto
Non Residential Users Rate	\$ 4.00 per m3	Formatted: Font color: Auto
Installation Fee	\$ 8,000.00 deposit (based on actual invoice)	Formatted: Font color: Auto
Connection Fee	\$ 500.00 per service	
Utilities Account Deposit	\$ 100.00	Formatted: Font color: Auto
Hamlet Water Distribution System (Little Smoky)		Formatted: Font color: Auto
Residential Rate (0-30 m3/month)	\$ 3.50 per m3	Formatted: Font color: Auto
Residential Rate (Over 30m3/month)	\$ 4.00 per m3	Formatted: Font color: Auto
Non Residential Rate	\$ 4.00 per m3	
Connection Fee	\$ 12,500.00	Formatted: Font color: Auto
Utilities Account Deposit	\$ 100.00	Formatted: Font color: Auto
		Formatted: Font color: Auto
Rural Water Distribution System (Valleyview)		Formatted: Font color: Auto
Valleyview Rural Water Line Users		
Residential Rate (0-30 m3/month)	\$ 3.50 per m3	Formatted: Font color: Auto
Residential Rate (Over 30m3/month)	\$ 10.00 per m3	Formatted: Font color: Auto
Non Residential Rate	\$ 10.00 per m3	Formatted: Font color: Auto
Connection Fee	\$ 12,500.00 connection fee/per service	Formatted: Font color: Auto
Utilities Account Deposit	\$ 100.00	Formatted: Font color: Auto
Water Meter Damage (Owner Responsibility)	based on actual replacement costs	

Rural Water Distribution System (Crooked Cree	•	Formatted: Font color: Auto
Residential Rate (0-30 m3/month)	\$ 3.50 per m3	Formatted: Font color: Auto
Residential Rate (Over 30m3/month)	\$ 10.00 per m3	Formatted: Font color: Auto
Non Residential Rate	\$ 10.00 per m3	Formatted: Font color: Auto
Connection Fee	\$ 12,500.00	Formatted: Font color: Auto
Utilities Account Deposit	\$ 100.00	Formatted: Font color: Auto
		Formatted: Font color: Auto
Rural Water Distribution System (Ridgevalley)	¢ 2.50 mm m2	Formatted: Font color: Auto
Residential Rate (0-30 m3/month)	\$ 3.50 per m3	Formatted: Font color: Auto
Residential Rate (Over 30m3/month)	\$ 10.00 \$ 10.00 per m2	Formatted: Font color: Auto
Non Residential Rate	\$ 10.00 per m3	Formatted: Font color: Auto
Connection Fee	\$ 12,500.00	
Utilities Account Deposit	\$ 100.00	Formatted: Font color: Auto
Nator Doint Excilition		Formatted: Font color: Auto
Water Point Facilities	ć 2 50 subis motor	Formatted: Font color: Auto
Potable Water Points Residential/Agriculture	\$ 3.50 cubic meter	
Potable Water Points Commercial	\$ 8.50 cubic meter	
Non-Potable Water Points	\$ 2.00 cubic meter	
Gravity Wastewater Collection System (DeBolt 8	& Ridgevalley)	Formatted: Font color: Auto
Sanitary Service Installation Fee	\$ 8,000,00 denosit (based on actual invoice)	
	\$ 8,000.00 deposit (based on actual invoice) \$ 500.00 per service	
	\$ 8,000.00 deposit (based on actual invoice) \$ 500.00 per service	
Connection Fee	\$ 500.00 per service	Connection of Constanting Auto
Connection Fee .ow Pressure Wastewater Collection System (Li	\$ 500.00 per service ttle Smoky & Grovedale & Ridgevalley)	Formatted: Font color: Auto
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mended:		
Royal Canadian Legion Hall	\$ 24.00	Formatted: Font color: Auto
Senior Citizen's Drop-In Centre	\$ 24.00	Formatted: Font color: Auto
Wastewater Lagoon		Formatted: Font color: Auto
Commercial/Industrial Tipping Rate	\$ 7.50 per m3	Formatted: Font color: Auto
Lagoon Keys		Formatted: Font color: Auto
Initial Key	\$ 150.00	Formatted: Font color: Auto
Replacement Keys	\$ 50.00	Formatted: Font color: Auto
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A Bylaw of the Municipal District of Greenview No. 16, in the Province of Alberta, for the purpose of adopting a revised Schedule of Fees, as attached to this bylaw.

Whereas, the Council of the Municipal District of Greenview No. 16, duly assembled, deems it expedient from time to revise the Schedule of Fees for the municipality.

Therefore, be it resolved that in accordance with the Municipal Government Act, Chapter M-26, R.S.A. and amendments thereto; the Planning Act, Chapter P-9, R.S.A. and amendments thereto; and the Municipal Taxation Act, Chapter M-31, R.S.A. and amendments thereto; that Council adopts the Schedule of Fees, attached to and forming of this bylaw.

Municipal District of Greenview Bylaw Number 12-673 is hereby repealed.

This bylaw shall come into force and effect upon the passing of third and final reading.

Read a first time this 13th day of June A.D., 2017.

Read a second time this ____ day of _____, A.D., 2017.

Read a third time and passed this ____ day of _____, A.D., 2017.

REEVE

CHIEF ADMINISTRATIVE OFFICER



REQUEST FOR DECISION

SUBJECT:Grovedale Fishpond UpgradesSUBMISSION TO:REGULAR COUNCIL MEETINGMEETING DATE:July 11, 2017DEPARTMENT:RECREATION

REVIEWED AND APPROVED FOR SUBMISSIONCAO:MHMANAGER:GM:ROPRESENTER:RO

RELEVANT LEGISLATION: **Provincial** (cite) – N/A

Council Bylaw/Policy (cite) - N/A

RECOMMENDED ACTION:

MOTION: That Council direct Administration to add \$154,039.24 to the 2017 Capital Budget to cover the purchases under Job ID RE16005 - Grovedale Fish Pond Upgrades, with funds to come from the Project Carry Forward Reserve.

BACKGROUND/PROPOSAL:

In 2016, the cook house was budgeted and ordered. The invoice for this order was not received until 2017. As this was anticipated Administration intended to set up an accrual and carryover the money from 2016 to 2017.

The \$161,000.00 remaining in the 2016 budget for this project was listed in the carryover column of the Recreation Enhancement 2017 Capital Summary, which led the new manager to think the funding was available to use in 2017. However, the \$161,000.00 was not included as 2017 expenditure, despite it having been presented to and approved by Council. Since this money was not included in the 2017 budget, the funds were added to the Project Carry Forward Reserves.

Finance did receive an email indicating that these funds should be carried over to 2017, however the addition was only added to the carryover column and not included in the 2017 column. In conclusion, it appears that timing may have caused this oversight.

BENEFITS OF THE RECOMMENDED ACTION:

- 1. The benefit of the recommended motion is to ensure that Council has given clear direction to Administration regarding this item, thus following best practices.
- 2. Added benefit of the recommended motion is to ensure that this expenditure is within the Council approved 2017 Capital Budget.

DISADVANTAGES OF THE RECOMMENDED ACTION:

1. There are no perceived disadvantages to the recommended motion.

ALTERNATIVES CONSIDERED:

Alternative #1: Administration considered requesting Council's permission to leave the expenditure as a 2017 unbudgeted capital expenditure. However, due to capital budgets being specific to projects, this is not recommended by Administration.

Note: Historically, Council has approved the addition to the current year's budget.

FINANCIAL IMPLICATION:

With Council's permission the funding will come from the 2017 Recreation Enhancement Capital Budget. **Direct Costs: \$154,039.24**

Ongoing / Future Costs: Annual budget will be around \$1,500.00 with a potential replacement in 20 years.

STAFFING IMPLICATION:

There are no staffing implications based on the recommended action.

PUBLIC ENGAGEMENT LEVEL:

Greenview has adopted the IAP2 Framework for public consultation.

INCREASING LEVEL OF PUBLIC IMPACT

Inform

PUBLIC PARTICIPATION GOAL

Inform - To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.

PROMISE TO THE PUBLIC

Inform - We will keep you informed.

FOLLOW UP ACTIONS:

Administration will add the approved funds to the 2017 Recreational Enhancement Capital Budget.

ATTACHMENT(S):

None



REQUEST FOR DECISION

SUBJECT:Draft Strategic PlanSUBMISSION TO:REGULAR COUNCIL MEETINGMEETING DATE:July 11, 2017DEPARTMENT:CAO SERVICES

REVIEWED AND APPROVED FOR SUBMISSION CAO: MH MANAGER: GM: PRESENTER:

RELEVANT LEGISLATION: Provincial (cite) – NA

Council Bylaw/Policy (cite) - NA

RECOMMENDED ACTION: MOTION: That Council adopt the 2017 Strategic Plan as presented.

BACKGROUND/PROPOSAL:

Please find attached the Strategic Plan – 2017. Since the last presentation to Council the Plan has undergone final formatting. As per Council direction, some wording changes have been made so as to more directly identify industry as a partner and stakeholder.

The document captures the items discussed by Council and will serve to provide information to the public and direction to Administration. Even though the plan has not been formally adopted, Administration is following many of the strategies outlined. Adoption of the final plan will also help provide continuity during the transition from the current Council to the new Council in October.

The document outlines Greenview's strategic goals as: Infrastructure; Regional Co-operation; Development; Quality of Life; and, Inter-government Relations with related strategies under each heading.

Once the Plan is adopted, Administration will be returning to Council to have more specific discussions regarding parts of the plan and steps moving forward. The Plan will be utilized during the upcoming budget processes.

BENEFITS OF THE RECOMMENDED ACTION:

1. Once approved, a formal document will exist that will provide guidance to Council, the public, and Administration.

DISADVANTAGES OF THE RECOMMENDED ACTION:

1. The plan was developed based on discussions and directions provided by Council. As such, there are no perceived disadvantages to the recommended motion.

ALTERNATIVES CONSIDERED:

Alternative #1: Council may choose to make further alterations to the plan or to redo the Plan entirely. This is not recommended as the current Plan reflects the stated desires of Council and, even though not formally adopted, has been acted upon by Administration.

FINANCIAL IMPLICATION: Direct Costs: NA Ongoing / Future Costs: NA

STAFFING IMPLICATION: None

PUBLIC ENGAGEMENT LEVEL:

Greenview has adopted the IAP2 Framework for public consultation.

INCREASING LEVEL OF PUBLIC IMPACT

Inform

PUBLIC PARTICIPATION GOAL

Inform - To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.

PROMISE TO THE PUBLIC

Inform - We will keep you informed.

FOLLOW UP ACTIONS:

Administration will develop follow up discussions with Council regarding some aspects of the Plan. The creation of priority lists and Department Action Plans will commence.

ATTACHMENT(S):

• Proposed Strategic Plan - 2017

STRATEGIC PLAN June 2017



M.D. of Greenview #16 Expand Your Vision www.mdgreenview.ab.ca

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Municipal District of Greenview No. 16

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Who We Are

In the Municipal District of Greenview (Greenview) residents experience adventure right in their backyards. Lakes, rivers, rocky mountain peaks and vast prairie offer a year-round outdoor playground for all ages. Curling and hockey rinks and outdoor pools provide a hub for indoor recreation and social activity. Year round indoor recreation centres are open in Grande Cache and are soon to open in Fox Creek and Valleyview. There's never a shortage of activities and events for the whole family. Seasonal farmer's markets throughout the region promise a selection of local fruits and vegetables, farm fresh foods and handcrafted items.

Greenview's economy is strengthened by its diversity, a talented workforce and an entrepreneurial spirit that is second to none. Our vast endowment of natural resources – agriculture, forestry, and oil and gas – have transformed into world-class industries. The opportunities for supporting companies in transportation, information technology, communications, engineering, business and manufacturing are tremendous.

We've got the space to grow and a business-friendly climate. Businesses in Greenview have a competitive edge with the municipal government establishing one of the lowest commercial and industrial tax rates in Alberta.

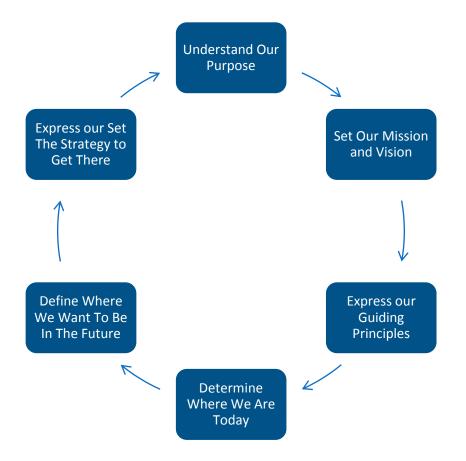
The area is serviced by the CANAMEX Trade Corridor, a provincial highway network that runs through Greenview and links local businesses to markets in the United States and Mexico. Passenger, cargo and medical flights fly in and out of the Grande Prairie Airport – Alberta's fourth largest airport – connecting to destinations within Alberta's borders and beyond. Rail connects business and industry in Greenview to ports in British Columbia, in both Prince Rupert and Vancouver.

We are a diverse community full of opportunities and people willing to make the most of them.

The Strategic Planning Process

In preparing the Municipal District of Greenview's 2017 Strategic Plan Council conducted a two day retreat focused on creating a road-map to the future. Council recognizes that without a plan the municipality can only react to what is happening around us and to be truly proactive there needs to a Plan in place.

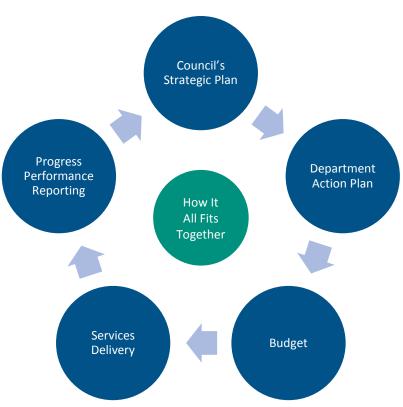
The approach taken by Council is depicted in the following diagram.



Each of the topics identified in the chart were discussed and debated by Greenview Council during the strategic planning process. In the following sections we present a summary of our plan for the future.

The Strategic Planning Process

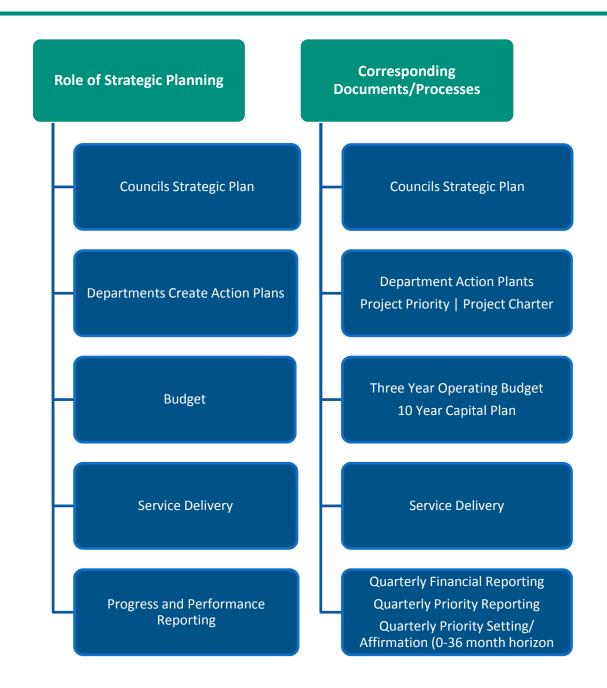
The 2017 Strategic Plan sits at the top of the overall plan for the municipality. All other operational plans, including the budget, flow from this plan. The role of strategic planning is depicted in the following diagram:



THE ROLE OF STRATEGIC PLANNING

It is important to realize that strategic planning is an on-going process, not just an event that happens periodically. As we go about our business there will be unforeseen occurrences that will materially affect what we do and how we do it. Similarly we will measure our progress and performance towards our strategic goals and take actions to ensure we remain on course.

The Strategic Planning Process



Our Stakeholders

Stakeholders, individually and collectively are what make our community what it is today and what it could be in the future. We all share a common goal of growth and sustainability for our region and together we are stronger and more capable of achieving a sustainable, safe and healthy place to live.

The following list of stakeholders was in the forefront of our minds as Council prepared this Strategic Plan:

Residents – those who reside, recreate and work in our community.

Municipalities within our boundaries – Towns of Grande Cache, Fox Creek, and Valleyview.

Adjacent Municipalities – The municipalities that share external borders with Greenview as well as those municipalities in the northwest Alberta region.

Businesses – the various industries and commercial enterprises that conduct their affairs in and around Greenview.

Community Groups – the vast array of organizations that contribute to our quality of life.

Greenview Employees – the staff who deliver the services provided by the municipality.

Other Orders of Government – the Governments of Alberta and Canada.



Our Mission

Our purpose as a Council is to make decisions and take actions that result in the delivery of needed services for our stakeholders.

Our Mission Statement was developed a number of years ago and remains the same:

Providing strong, transparent leadership and quality services that are responsive to our communities' needs.

The Mission Statement speaks to the two distinct roles that local government must play:

Leadership – local government resolutions and actions will provide guidance and judgement that lead to safe, viable and healthy communities.

Services - to the greatest extent possible, local government should provide the services that are required by the stakeholders in a cost effective and sustainable manner.

The Role of Council

Council's role is to set direction, assign priorities and provide resources to carry out the mission. Council is responsible for the appropriate use of the Greenview's resources and as such is accountable to the electors of the municipality.

The Role of Administration

Administration's role is to carry out Council's Strategic Plan and determine the most effective and efficient deployment of the resources allocated through the budgeting process.

These roles are mutually exclusive and legitimized through Alberta's *Municipal Government Act*.

Our Vision and Guiding Principles

Vision

The Vision is a statement about a desired future; one that speaks to an ideal that is attainable through dedication and pursuit. The vision, unlike the Mission, will evolve over time. In an ever changing world, the needs and wants of our stakeholders will also evolve and the Vision must be adapted to reflect these realities.

The Vision Statement was re-crafted during the preparation of the 2017 Strategic Plan:

The Municipal District of Greenview exemplifies sustainable, healthy and safe communities that enhance quality of life.

Guiding Principles

Council's guiding principles are used in the preparation of the Strategic Plan and the on-going decisions that Council makes. These principles include:

Leadership – Council and Administration will act in an open and transparent manner that is characterized by respect, compassion and integrity towards all.

Regional Collaboration – Greenview will continue to be viewed as a model for working together as a regional community.

Quality of Services – We will provide needed services that meet or exceed minimum standards, at a service level that is cost effective and sustainable.

Communities – We continue to support communities and groups that enhance the quality of life in the region.

Economic Development – We provide a positive environment for development as we continue to diversify the economic base of the region.

Environment – We are stewards of the environment and respect the need to balance growth and development with protection of this asset.

Strategic Goals

Strategic Goals – 2017

Council has identified five goal areas of strategic importance to Greenview that form the focus of the 2017 Strategic Plan.

The goals are all high priority areas necessary to achieve the Greenview's vision:

- Regional Cooperation
- Infrastructure
- Development
- Quality of Life
- Intergovernmental Relations



Regional Cooperation

The Municipal District of Greenview has played a leadership role in the region through its support of the towns within its boundaries. The model we have developed emphasizes the strength of the region and there is an opportunity to leverage this strength in the pursuit of development opportunities and in negotiating with other orders of government.

Similarly there is an opportunity to further expand this leadership role through co-operation with the municipalities that are adjacent to Greenview's borders and share similar interests and industries.

Strategic Goal: Be recognized as a model of reasonable and well-planned regional cooperation.

- Expand our model to include adjacent municipalities.
- Develop a strategy to work effectively with the City of Grande Prairie.
- Continue to develop clear partnership frameworks with other governments and industry based on mutual benefit.
- Broadcast our brand through the two municipal associations: Alberta Association of Municipal Districts and Counties (AAMDC) and Alberta Urban Municipalities Association (AUMA).
- Work with the towns within Greenview's borders to actively seek out recognition through vehicles such as awards offered by the Provincial Government.
- Communicate the Greenview's regional cooperation success story through other media outlets such as 'Municipal World'.

Infrastructure

Infrastructure is a cornerstone of all municipalities. Whether it is the road network, the municipal buildings or the facilities that are built and maintained by Greenview, municipal infrastructure is used and seen by residents and ratepayers every day.

Infrastructure also includes public utilities and Greenview remains committed to upgrading and maintaining these facilities to a level that meets or exceeds established standards. There is a commitment to invest in these necessary services to ensure an appropriate quality of life.

Strategic Goal: We have well-built and well maintained infrastructure that is sustainable and contributes to quality of life in the region.

- Prioritized setting aside of funds for the future investment in infrastructure.
- Examine opportunities to partner with other municipalities and with the private sector to deliver needed services.
- Prioritize capital spending that balances quality of life with long-term sustainable preservation of infrastructure.
- Examine revenue generation opportunities when making infrastructure investments.
- Consider priority on investment in the Forestry Trunk Road to support industry in Greenview.

Development

The Municipal District of Greenview is open for business. We recognize that to grow and prosper we need to attract and retain business and industry that is well-planned and preserves the nature of the community. Greenview will foster a development environment that promotes efficiency and understanding with clearly established processes and requirements for developers to follow.

We have a wealth of natural assets and existing investments in infrastructure that provide significant opportunities to support development.

Strategic Goal: We will have a diverse economy that decreases our dependency on the petroleum industry.

- Foster start-ups through the development of support programs.
- Be viewed as being business friendly.
- Invest in infrastructure that will encourage and support start-ups.
- Utilize a consistent, positive message in response to development opportunities.
- Be proactive in broadcasting our message and seeking business opportunities in the marketplace.
- Introduce business ready planning and infrastructure development.

Development

While we currently depend upon the oil and gas industry to generate a significant portion of Greenview's revenue, we see opportunities to expand this base and diversify into other sectors to further support the quality of life in this region. Our spectacular natural attractions are an untapped resource that we need to evaluate and determine the best way to approach future development as a tourism and recreation destination.

Strategic Goal: The Municipal District of Greenview is viewed as a destination for the Tourism Industry.

- Put in-house resources in place to evaluate economic development opportunities.
- Conduct a feasibility assessment of tourism as a business opportunity.
- Develop a tourism strategy based on the business opportunity assessment.



Quality of Life

The Municipal District of Greenview is home to communities with exceptional quality of life. The services we provide are designed to meet the needs of the people who live here and our mission and vision support this view. Our investments in infrastructure, recreation, and culture are a commitment to the future. Our support of social programs is constantly being evaluated to ensure that we are providing the right services and the right level of service.

We recognize the importance of balancing the needs and desires of our stakeholders, both in the present and in the future, so that we may continue to enjoy an unparalleled quality of life that includes all our communities.

Strategic Goal: Provide services that exceed the basic needs of our stakeholders and accommodate diverse lifestyles.

- Plan, provide and support a diverse set of community living options ranging from rural to urban.
- Continue to actively assess what services are needed by our stakeholders.
- Respond to stakeholder feedback on the quality and levels of service we provide.



Intergovernmental Relations

The Municipal District of Greenview views other orders of government as partners in the sustainability of region. The Government of Alberta in particular is in a position to significantly affect our future and our prosperity. We believe it is vitally important that we have a say in the decisions that affect us.

With the recent change in governments both federally and provincially, we see a need to develop relationships that recognize us as equal partners.

Strategic Goal: Be recognized as an important contributor to decision making affecting the region.

- Proactively lobby the provincial government on local issues collectively through the Alberta Association of Municipal Districts and Counties and individually as representatives of the region.
- Develop position papers on important issues.
- Seek positive results by providing 'solutions' to issues.
- Participate in provincially sponsored boards and committees where local involvement is sought.
- Actively pursue opportunities to develop relationships both administratively and politically.





REQUEST FOR DECISION

SUBJECT:	Town of Grande Cache Funding Request – Re Doctors			
SUBMISSION TO:	REGULAR COUNCIL MEETING	REVIEWED AND APP	ROVED FOR SUBMISSION	
MEETING DATE:	July 11, 2017	CAO: MH	MANAGER:	
DEPARTMENT:	CAO SERVICES	GM:	PRESENTER: MH	

RELEVANT LEGISLATION: **Provincial** (cite) – NA

Council Bylaw/Policy (cite) - NA

RECOMMENDED ACTION:

MOTION: That Council direct Administration to work with the Town of Grande Cache towards the creation of an agreement regarding medical clinic operations in the Town of Grande Cache.

BACKGROUND/PROPOSAL:

Please see the three pieces of attached correspondence regarding this issue.

Greenview and the Town of Grande Cache have been working with the doctors of Grande Cache as well as the current landlord of the medical clinic. The confirmed plan was to assess the ability/willingness of the landlord to suitably renovate the existing (and perhaps additional) space to meet the doctors' needs. It is believed that this would be possible and once completed the municipalities would rent the space and sublet to the doctors on a cost recovery basis. This option was being pursued as an alternative to the municipalities constructing a new clinic at a cost of roughly \$2 Million.

The first is a letter to the Town of Grande Cache and Alberta Health Services from Dr. Gillett. In the letter, Dr. Gillett indicates his feeling that doctors in Grande Cache are not treated as well as doctors in other communities and that his situation is emotionally and financially unsustainable. Dr. Gillett states that if a suitable arrangement is not made within 10 days of his letter, that he will close his practice in the fall.

The MD was included on this letter and upon receipt Administration contacted the Town to discuss it. Administration conveyed their desire to be a part of the discussion with the doctors moving forward as well as be involved in discussions with AHS regarding recruitment. Greenview was not included in further discussions and the Town responded to the doctors after holding a Special Council Meeting to discuss the issue. The letter in question is that of June 23, 2017. Letters were also sent to the doctors and a reply to Dr. Gillett (attached).

The June 23, 2017 letter states that the Town is prepared to cover overhead costs of the facility up to \$20,0000.00 per month starting July 1, 2017. We do not yet know if this proposal was accepted by some of

the doctors. In his attached response, Dr. Gillett has indicated that the proposals are not specific enough for him to accept at this point.

On June 27, 2017 Greenview received correspondence from the Town (attached) advising Greenview of the Town's decision. The letter indicates that because of the speed with which discussions moved forward, the Town was unable to include Greenview in them, but is not asking if Greenview would be interested in assisting the Town to cover any costs associated with this proposal. If so, the exact details would worked out as part of an agreement.

Administration is currently seeking clarification on a couple of items such as the costs included in "overhead".

As a note, the current landlord recently met with Greenview and Town staff as well as the doctors regarding potential renovations to the current clinic.

Administration is recommending that Greenview work with the Town towards an agreement and that some funding be provided. This is consistent with the direction that Greenview was moving in prior to the June 7, 2017 letter from Dr. Gillett. Providing support of this nature would also be consistent with clinic operations in both the Town of Valleyview and the Town of Grande Cache. Administration would approach this on the basis of looking for a cost recovery type of model as well as Greenview providing a smaller contribution than the Town, given the respective population numbers served.

Separate from this process, it is also suggested that Greenview should address its disappointment with the Town in not including Greenview in this process.

BENEFITS OF THE RECOMMENDED ACTION:

- 1. The action is a step towards the continued provision of medical services in the Grande Cache area.
- 2. The recommended action is consistent with Greenview initiatives in other communities.
- 3. The recommended action supports Council's goal of enhancing regional partnerships.

DISADVANTAGES OF THE RECOMMENDED ACTION:

1. Medical Services are not an area of municipal responsibility. Further, physicians and medical clinics are forms of private enterprise. As such, Administration is recommending that costs incurred be done so as part of a cost recovery model.

ALTERNATIVES CONSIDERED:

Alternative #1: Council may opt to not engage the Town on this topic at this time.

Alternative #2: Council may choose to engage the Town on terms other than those presented by Administration (ex: disregard cost-recovery, provide equal funding).

FINANCIAL IMPLICATION:

Direct Costs: To be determined.

Ongoing / Future Costs: To be determined.

STAFFING IMPLICATION:

The time and resources necessary will be met through current staffing levels.

PUBLIC ENGAGEMENT LEVEL:

Greenview has adopted the IAP2 Framework for public consultation.

INCREASING LEVEL OF PUBLIC IMPACT

Inform

PUBLIC PARTICIPATION GOAL

Inform - To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.

PROMISE TO THE PUBLIC

Inform - We will keep you informed.

FOLLOW UP ACTIONS:

Administration will inform the Town of Grande Cache of Council's Decision

ATTACHMENT(S):

- June 7, 2017 letter sent by Doctor Gillett
- June 23, 2017 letter sent by Town of Grande Cache
- June 27, 2017 letter sent by Town of Grande Cache

Dr. JOHN GILLETT BOX 540 GRANDE CACHE AB TOE 0Y0 TEL: 780-827-6268

7th June 2016

Dr. Kevin Worry Medical Director – Alberta Health Services – North Zone Kevin.Worry@albertahealthservices.ca

Ms. Loretta Thompson CAO Town of Grande Cache Loretta.Thompson@grandecache.ca

Dear Dr Worry and Ms. Thompson

It is with regret that I wish to inform Alberta Health Services and the Town of Grande Cache that I will not be able to continue serving the patients of Grande Cache under current conditions.

Dr. van den berg left us in May of this year and Dr. Walton notified us officially today that she will be relocating to Lethbridge. Both left due to work opportunities for their respective husbands.

Their departures put an extreme burden on my colleagues (Dr. Barnard and Dr. Viviers-Fourie) and me.

The time has come for me to make a decision on my future. Grande Cache has been home to me and my family for more than 20 years. My wife and I came to Grande Cache when there were no permanent doctors working in this town.

Keeping the practice open at all times, even when we were down to 2 doctors has been emotionally stressful and financially burdensome. The clinic was kept open to assist AHS and the Town with recruitment. I personally am not prepared to take on that risk again.

In fact, the time has come for Alberta health Services and the Town of Grande Cache to together decide on a future sustainable plan for primary care delivery in Grande Cache. It is my understanding that other rural and remote towns and MD's , along with AHS, support their physicians better than my colleagues or I have been treated in Grande Cache over the past 20 years.

I am also not prepared to continue as a family Physician with the restraints put on me by the College of Physicians and Surgeons of Alberta. They, the CPSA, expect every family Doctor to be available either personally or with prior arrangement with a colleague, 24 hours per day and 7 days per week for their patients. With just me and one other colleague taking call this will be unattainable. A few years ago when the town last had a physician shortage I was, at one point, on call 16 out of 21 days. I will never do that again. It was unfair to my patients, my family and myself. Locum coverage is not always available and is not an ideal way of delivering primary healthcare to the people of Grande Cache. If Alberta Health Services and the Town of Grande Cache wish to have me continue the practice of medicine in Grande Cache then they (AHS and the Town) will need to present an acceptable, written proposal to me by 17th June 2017.

Failing the above, I will notify my patients that I will be closing my practice at the end of September 2017.

Please note that this letter is sent in my personal capacity as a Family Physician and has no bearing on my affiliation with AHS as Community Medical Director or Associate Zone Medical Director for Area 3 – North Zone

Yours sincerely,

10.111

John Gillett



June 16, 2017

Dr. John Gillett P. O. Box 540 Grande Cache, AB TOE 0Y0

Dear Mr. Gillettt:

Council for the Town of Grande Cache discussed your letter of June 7, 2017 with both Dr. Worry and yourself. Council recognizes you have served the community for many years and that you are at a point where you will be deciding your future. They also appreciate that you want to ensure the Town maintains a quality medical service regardless of your decision about your future.

TOWN OF GRANDE CACHE

Box 300, 10001 Hoppe Ave. Grande Cache, Alberta TOE 0Y0

In your letter of June 7, 2017 you asked that the Town of Grande Cache decide on a future sustainable plan for primary care delivery in Grande Cache. Keeping in mind the Town's economic situation, Council developed a plan for primary care delivery in Grande Cache. Their plan is presented as two options with the intent that the physicians would choose which option suited their needs most appropriately. The options are:

Option I

- a. Maintain a medical clinic with 5 doctors and continue to work with Alberta Heath Services to recruit and retain a full complement of doctors in Grande Cache.
- b. Offset the physicians overhead, as they leave or arrive, with the overhead being calculated on a per physician bases. The offset will be based on five doctors practicing in Grande Cache.
- c. Continue to work with the Municipal District of Greenview No. 16 to ensure the required expansion of space and renovations occur at the current medical clinic to meet the physician's requirements with the goal of the two municipalities assuming the lease and subleasing the area to the physicians practicing in Grande Cache. The lease fee would be calculated on a per physician basis.
- d. Achieve full cost recovery through the leasing of the medical clinic to the physicians with the full complement of doctors.
- e. In the future, assume the administration of the clinic.

Option II

- a. Maintain a medical clinic with 5 doctors and to continue to work with Alberta Health Services to recruit and retain a full complement of doctors in Grande Cache.
- b. Offset the physicians overhead, as they leave or arrive, with the overhead being calculated on a per physician bases. While the ultimate goal will be to maintain a complement of five doctors, the offset of the physicians overhead will be based on four physicians practicing in Grande Cache, i.e., paying the overhead when the number of physicians practicing in Grande Cache falls below four.
- c. Continue to work with the Municipal District of Greenview No. 16 to ensure the required expansion of space and renovations occur at the current medical clinic to meet the physician's requirements with the goal of the two municipalities assuming the lease and subleasing the area to the physicians practicing in Grande Cache.
- d. Achieve full cost recovery through the leasing of the medical clinic to the physicians with the full complement of doctors. The full complement of physicians being five.
- e. In the future, assume the administration of the clinic.

Both options would be supported by the physicians providing financial proof of overhead costs.

Council would appreciate your review of the two options provided and advise which one would be acceptable to the physicians.

Sincerely,

Novella Thompson

Loretta Thompson, MPA Chief Administrative Officer

John Gillett Box 540 Grande Cache AB TOE 0Y0 Tel: 780-827-6268 email: jageb@telus.net JUN 2 0 2017

19th June 2017

Ms. Loretta Thompson Chief Administrative officer Town of Grande Cache

Dear Ms. Thompson

Thank you for your letter dated 16th June 2017.

I have reviewed the two options laid out by the Council for Primary Care delivery in Grande Cache.

- Option two is virtually identical to option one except for the offset of physicians overhead being based on four physicians and not the five as proposed in Option 1.
- There is no indication of what the office space rent will be.
- Point #4 is very vague and with no start date.

Neither one of these options are specific enough for me to accept.

I have forwarded the letter to Dr Barnard and Dr. Viviers–Fourie for their comments.

Yours sincerely,

Gillett

cc. Dr. Kevin Worry – Alberta Health Services Dr. Barnard Dr Viviers-Fourie



TOWN OF GRANDE CACHE

OFFICE OF THE MAYOR Provincial Building ~ 10001 Hoppe Avenue Box 300 ~ Grande Cache, Alberta ~ T0E 0Y0

June 23, 2017

Dr. Viviers-Fourie and Dr. Barnard Box 540 Grande Cache, Alberta T0E 0Y0

Dear Dr. Viviers-Fourie and Dr. Barnard

Re: Grande Cache Medical Clinic/Doctors Agreement

On behalf of Council, thank you for meeting with Council to further discuss the agreement between the Town and doctors.

Council passed the following resolution regarding the agreement:

Resolved that Council authorizes entering into an agreement with the doctors at the Grande Cache Medical Clinic including the following:

- a) there will be five doctors providing medical care in the Medical Clinic;
- b) there will be four doctors doing call on;
- c) each doctor pays \$4,000 per month towards the operating costs of the Medical Clinic for a period of three years;
- d) for every doctor less than five doctors providing medical care in the Medical Clinic, the Town of Grande Cache will cover the monthly overhead cost(s) to a maximum of \$20,000.00;
- e) monthly overhead costs exceeding \$20,000.00 per month will require pre-approval from Council;
- f) the Primary Care Network income per month will be applied to the monthly operating costs;
- g) the start date for this agreement is July 1, 2017, with the Town of Grande Cache assuming the rental costs for the medical clinic on this date;
- h) the agreement is to be reviewed annually; and
- i) as part of the monthly overhead costs, an amount of \$600 per month will be paid to the owners of the existing equipment in the Medical Clinic until the Town exercises their option to either purchase this equipment or chooses to purchase new equipment. During the rental period, the owners are responsible for any replacement of equipment.

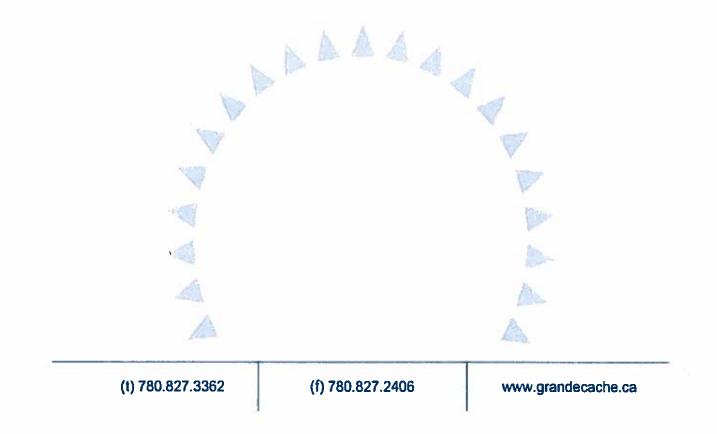
An Agreement will be drafted and forwarded for you to review.

If you have any questions, please contact Loretta Thompson, CAO at loretta.thompson@grandecache.ca or 780.827.3362, x26.

Yours truly,

1771

Herb Castle, Mayor





TOWN OF GRANDE CACHE

OFFICE OF THE MAYOR Provincial Building ~ 10001 Hoppe Avenue Box 300 ~ Grande Cache, Alberta ~ T0E 0Y0

June 23, 2017

Dr. Viviers-Fourie and Dr. Barnard Box 540 Grande Cache, Alberta T0E 0Y0

Dear Dr. Viviers-Fourie and Dr. Barnard

Re: Grande Cache Medical Clinic/Doctors Agreement

On behalf of Council, thank you for meeting with Council to further discuss the agreement between the Town and doctors.

Council passed the following resolution regarding the agreement:

Resolved that Council authorizes entering into an agreement with the doctors at the Grande Cache Medical Clinic including the following:

- a) there will be five doctors providing medical care in the Medical Clinic;
- b) there will be four doctors doing call on;
- c) each doctor pays \$4,000 per month towards the operating costs of the Medical Clinic for a period of three years;
- d) for every doctor less than five doctors providing medical care in the Medical Clinic, the Town of Grande Cache will cover the monthly overhead cost(s) to a maximum of \$20,000.00;
- e) monthly overhead costs exceeding \$20,000.00 per month will require pre-approval from Council;
- f) the Primary Care Network income per month will be applied to the monthly operating costs;
- g) the start date for this agreement is July 1, 2017, with the Town of Grande Cache assuming the rental costs for the medical clinic on this date;
- h) the agreement is to be reviewed annually; and
- i) as part of the monthly overhead costs, an amount of \$600 per month will be paid to the owners of the existing equipment in the Medical Clinic until the Town exercises their option to either purchase this equipment or chooses to purchase new equipment. During the rental period, the owners are responsible for any replacement of equipment.

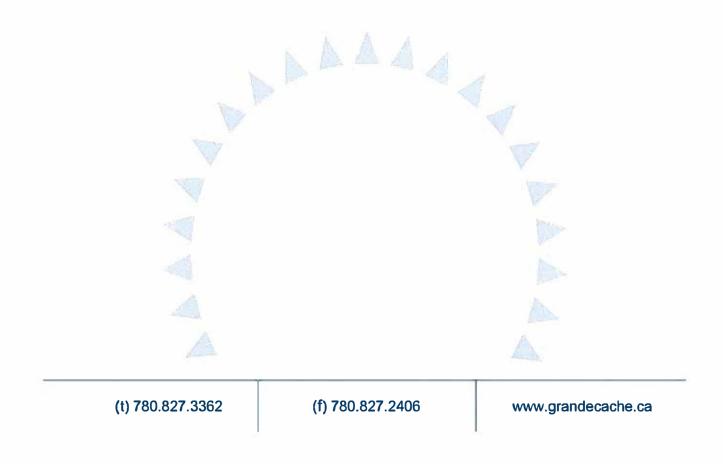
An Agreement will be drafted and forwarded for you to review.

If you have any questions, please contact Loretta Thompson, CAO at loretta.thompson@grandecache.ca or 780.827.3362, x26.

Yours truly,

7:4

Herb Castle, Mayor





June 27, 2017

TOWN OF GRANDE CACHE

Box 300, 10001 Hoppe Ave. Grande Cache, Alberta TOE OYO

Mike Haugen Chief Administrative Officer Municipal District of Greenview No. 16 P. O. Box 1079 Valleyview, AB T0H 3N0

Dear Mr. Haugen:

RE: Grande Cache Medical Clinic

On June 7, 2017 Council received a letter from Dr. Gillett advising the Town of Grande Cache and Alberta Health Services that he would not be able to continue serving the patients of Grande Cache under current conditions. One doctor left in May 2017 and one doctor recently gave notice that she will be relocating. Dr. Gillett stated that their leaving put an extreme burden on himself, Dr. Barnard and Dr. Viviers-Fourie, the remaining doctors. He also stated he believed it was time Alberta Health Services and the Town of Grande Cache together decide on a future sustainable plan for primary care delivery in Grande Cache. Dr. Gillett's position was that if Alberta Health Services and the Town of Grande Cache wanted him to continue practicing in Grande Cache, they will need to present an acceptable, written proposal to him by June 17, 2017. A copy of this letter was provided to Ms. Zeller on June 12, 2017 and is attached to this letter.

After a lengthy discussion with Dr. Worry, Council developed a plan in response to Dr. Gillett's letter. This letter was emailed to him at 5:05 PM June 16, 2017. A copy of this letter is attached for your information. Also attached is Dr. Gillett's response dated June 19, 2017.

Following receipt of Dr. Gillett's letter of June 19, 2017 an email was received from Drs. Barnard and Viviers Fourie requesting a meeting with Council. A Special Council meeting was held on June 21, 2017 and again on June 23, 2017 to discuss Council's plan to retain and attract doctors to Grande Cache. Attached please find a copy of the letter to Dr. Viviers-Fourie and Dr. Barnard outlining in detail what the Town of Grande Cache was prepared to do to in this regard. From the receipt of Dr. Gillett's letter of June 7, 2017 the discussions moved forward very quickly to the Special Council meeting held June 23, 2017. Because of the short time frame and the potential impact on medical services in Grande Cache, Council was not able to discuss Dr. Gillett's request with the Municipal District of Greenview No. 16 (M.D.) prior to making a decision. As the Town and the M.D. are working toward assuming the lease agreement for the medical clinic and subleasing to the doctors, would the M.D. consider assisting the Town in covering the costs of the agreed on plan to retain and attract doctors to Grande Cache? If so, perhaps Administration could discuss what this assistance would look like for presentation to our respective Council's.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

Corettes Thompson, MPA

Chief Administrative Officer



SUBJECT:	Sturgeon Area Water Point Potential Locations			
SUBMISSION TO:	REGULAR COUNCIL MEETING	REVIEWED AND AP	PROVED FOR SUBMISSION	
MEETING DATE:	July 11, 2017	CAO: MH	MANAGER: GC	
DEPARTMENT:	ENVIRONMENTAL SERVICES	GM: GG	PRESENTER: GC	

RELEVANT LEGISLATION: **Provincial** (cite) –*N/A*

Council Bylaw/Policy (cite) -N/A

RECOMMENDED ACTION:

MOTION: That Council approve the exploration of an alternative location for a proposed water point in the Sturgeon Heights area, and direct staff to hold preliminary negotiations with landowners in the area if necessary to secure new location.

BACKGROUND/PROPOSAL:

Administration has been investigating alternate sites to propose a new water point for the Sturgeon Heights area.

The current Sturgeon Heights well has very poor quality (unfit for consumption) and low yield (only 8 gal/min). It was proposed that we drill a new well on the current site, but this is not recommended by both the hydrogeologist and our drilling contractors. It is believed that the current site is not conducive to suppling either high quality water or high yield water.

Sturgeon Heights was identified as one of the Greenview's highest water demand areas (especially seasonal) in the 2016 "Feasibility Study of Upgrading Water Points". With 217 permanent and 382 seasonal residents and it was determined that a water point would be desired.

A water use survey was performed in 2016 also to determine the water needs of the residents. Sturgeon Heights saw the greatest number of respondents in terms of identifying a potential future water point. A total of 56% of the residents that completed the survey indicated the current water points located in Valleyview and Crooked Creek were too far from their homes. The vast majority of these respondents were from the Sturgeon Heights area. For information, please see the attached Water Use Survey Technical Memorandum.

Administration had a property of interest to locate a new water point, and potential well, but setbacks from an abandoned landfill made it unfeasible. Administration has had very optimistic preliminary discussions with property owners in the area and would like to pursue them further. One potential property is requesting conditions that are in line with Greenview's vision to provide local residents and seasonal lot owners with quality water. The property owners are willing to offer a 2 acre parcel, as a lease agreement, to allow for a waterpoint if we were successful at drilling a test well.

Initially, Administration was considering a portable water point to gauge usage but it is apparent from the surveys that the use of a Sturgeon Heights water source would be high. It is believed operational costs of hauling water to supply it would be excessive at an estimated \$65,000.00 + annually. All costs associated with the waterpoint would be consistent whether it was supplied by truck or stand alone with its own well other than the treatment process determined. The treatment process needed for a well can be as simple as chlorination and economical if the water source quality is high. The treatment method cannot be determined until a test well is drilled to ensure that the source has the quality necessary. Samples from private wells are being obtained by Greenview to assist with the determination of potential water quantity and quality in the Sturgeon Heights area.

In summary, Administration is seeking Council's endorsement to explore options regarding a new water point. Once data has been collected, Administration will return to Council with costs and a recommendation regarding the provision of water point service to the Sturgeon Heights community.

BENEFITS OF THE RECOMMENDED ACTION:

1. The benefit of the recommended motion is the potential long term provision of a quality water source for the Sturgeon heights area would be advanced.

DISADVANTAGES OF THE RECOMMENDED ACTION:

1. There are no perceived disadvantages of the recommended motion. Additional costs would be incurred should Council move forward with construction of a new water point.

ALTERNATIVES CONSIDERED:

Alternative #1: Council has the alternative to not approve Administration to explore alternative locations for a new water point. However the residents in the area would not have secure water source within a reasonable distance

Alternative #2: Council has the alternative of constructing a water point that is supplied by trucking water and keeping the site full for residents. However the minimum trucking cost to keep the site full of water is estimated at \$65,000.00 year (\$250.00/day, 5 days per week, 52 weeks/yr.) The costs to drill and develop a well would be off set in two to three years.

FINANCIAL IMPLICATION:

Funding for the proposed water point would be from the 2017 Environmental Services Capital Budget. If successful at drilling the well, Administration may require additional funds in 2018 to complete the water point depending on treatment required as original budget did not include the well development.

Direct Costs: Well drilling and development.

Ongoing / Future Costs: Annual lease, power, heat, and maintenance would be anticipated ongoing costs and funded by Environmental Services Operational Budget.

STAFFING IMPLICATION:

The recommended action will not have any implications on new staffing.

PUBLIC ENGAGEMENT LEVEL:

Greenview has adopted the IAP2 Framework for public consultation.

Using that framework outline the proposed level of public engagement associated with the recommended action.

INCREASING LEVEL OF PUBLIC IMPACT

Inform

PUBLIC PARTICIPATION GOAL

Inform - To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.

PROMISE TO THE PUBLIC

Inform - We will keep you informed.

FOLLOW UP ACTIONS:

Continue discussions with driller and local property owners to secure a viable location.

Consult legal for potential lease agreement needs.

Drill and develop test well.

Determine water quality and treatment options.

ATTACHMENT(S):

- Water Point Feasibility Document
- Water Use Survey



REPORT

M.D. of Greenview No. 16

Feasibility Study of Upgrading Watering Points to Potable Water Truckfills



March 2016



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REPORT

Executive Summary

INTRODUCTION 1

The Municipal District of Greenview (the MD) initiated this Watering Point Feasibility study to determine the treatment required to provide high quality, potable water at four watering point sites in the Northeast region of the MD and at one potential watering point site in the Grande Cache region of the MD.

The four watering points throughout the northeast region of the MD that provide non-potable water from a truckfill station include:

- Puskwaskau Sandy Bay
- Goodwin

- Sturgeon Heights

Each of the watering points has one service well providing water to a truckfill station that dispenses nonpotable water. For the purpose of this report, a "watering point" is defined as a truckfill station that provides non-potable water.

In addition, in the southwest region of the MD, (the Grand Cache area), there are currently seven (7) cooperatives within 40 km of each other. The Co-operatives include the following:

- Muskeg SeePee Cooperative
- Susa Creek Cooperative
- Victor Lake Cooperative
- Grande Cache Lake Kamisak Enterprise (Kamisak)
- Joachim Enterprise
- Wanyandie Flats Cooperative West
- Wanyandie Flats Cooperative East

There are currently no watering points in the Grande Cache area operated by the MD.

2 **REVIEW OF EXISTING SYSTEMS**

The four water points located in the North-East portion of the MD outlined in this report currently utilize some basic components ranging from buildings containing chlorination systems to outdoor coin operated water points that provide raw water, directly from the well with no chemical addition. All of these existing watering points currently supply their users with non-potable groundwater of varying quality.

Puskwaskau and Goodwin watering points both have one raw water well and a building with water storage. At both of these locations there is a chlorine dosing system, however the daily calculations for CT are not done. Sturgeon Heights and Sandy Bay watering points both have one raw water well and the raw groundwater is supplied to the user with no chemical addition.



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Based on the data provided by the MD, the summary of maximum monthly usage at each of the four existing watering points is provided in the table below:

Location	Maximum Monthly Usage (Date)	Maximum Monthly Usage Volume (m ³ /month)
Puskwaskau	October, 2014	61
Goodwin	June, 2012	578
Sandy Bay	May, 2015	78
Sturgeon Heights	July, 2015	27

A summary of the well diversion licences for the existing wells at the watering points are provided in the table below:

Location	Purpose	Annual Diversion (m³/year)	Maximum Diversion (m ³ /day)	Expiration
Puskwaskau	Domestic Community Water Supply	8,630	52	Does not expire
Goodwin	Municipal Supply	8,637	65	Does not expire
Sandy Bay	Commercial (Water Hauling)	24,000	65	August 27, 2028
Sturgeon Heights		Currently, N	lo Licence	

There are currently no watering points operated by the MD in the Grande Cache area. However, Hydrogeological Consultants Ltd. completed a review of all the wells on the Victor Lake, Kamisak, Susa Creek, and Muskeg SeePee Co-operatives that are registered to the MD in October of 2014. The recommendations from the HCL reports should be reviewed and implemented by the MD.

3 WATER QUALITY STANDARDS

The Guidelines for Canadian Drinking Water Quality (GCDWQ) and Alberta Environment and Parks (AEP) were used as the standard for water quality assessment. Health related parameters (MAC) as well as aesthetic objective (AO) that would affect the treatability and palatability of the water were considered. For groundwater disinfection, 4.0-log inactivation for viruses was used in accordance with the AEP Standards and Guidelines.

4 RAW WATER QUALITY ASSESSMENT

Associated Engineering (AE) conducted a raw water treatability review as part of this feasibility study. This included sampling, analysis, and quality assessment of the groundwater of four existing raw water points and two wells in the Grande Cache area located within the MD. The water sampling in the Grande Cache area was done in the Susa Creek locality for an indication of the groundwater quality in the Grande Cache area. The water samples were sent to an external laboratory for water quality testing.

The water samples that were collected during the site visit were brought to AE's water quality lab for chlorine demand tests to determine breakpoint chlorination requirements. In addition, a simulated distribution test was conducted on all of the raw water samples to determine the disinfection by-product formation potential.

The results from the onsite testing, laboratory results, chlorine demand test and the simulated distribution test were used to determine the mandatory treatment objectives (MAC) limit and secondary treatment objectives (AO) for each raw water source.

The table below is a summary of the mandatory and secondary treatment objectives for each raw water sample taken.

Location	Mandatory Treatment Objective	Secondary Treatment Objectives
Puskwaskau	 Iron Disinfection (4.0-log Virus) Disinfection by-product mitigation (TOC) Ammonia 	 Total Dissolved Solids Sodium
Goodwin	 Iron Manganese Disinfection (4.0-log Virus) Disinfection by-product mitigation (TOC) 	 Total Dissolved Solids Sodium
Sandy Bay	 Disinfection (4.0-log Virus) Disinfection by-product mitigation (TOC) – Only for distribution system 	 Total Dissolved Solids Sodium
Sturgeon Heights	Further water quality required as screening test for Rad	lionuclide was positive
Grande Cache 1	 Iron Manganese Disinfection (4.0-log Virus) 	
Grande Cache 3	· Disinfection (4.0-log Virus)	



5 TREATMENT RECOMMENDATIONS

Based on the water quality and treatability review a summary of the treatment recommendations to meet both the mandatory and secondary treatment objectives identified for each location is presented in the table below:

Puskwaskau	Goodwin	Sandy Bay	Sturgeon Heights ¹	Grande Cache 1	Grande Cache 3
Greensand Filters	Greensand Filters		TBD	Greensand Filters	
Reverse Osmosis	Reverse Osmosis		TBD		
Chlorination	Chlorination	Chlorination	TBD	Chlorination	Chlorination
Pilot	Pilot		TBD		

¹ Further water quality analysis required to determine treatment recommendations.

The water quality screening at Sturgeon Heights for the presence of radionuclide was positive for Gross Alpha and previous water quality data indicated that the fluoride concentration is over the MAC. Therefore, further water quality data is required to determine the appropriate treatment for this raw water source.

6 **DESIGN CRITERIA**

It is assumed that the majority of residents within the service areas of the watering points are currently using individual wells as their water source. The design criteria for a water treatment plant with truck fill service only (no distribution system) were established, using the following method:

- Creating a proposed service areas for each location;
- Using the 2015 Land Ownership Maps provided by the MD together with stats Canada 2.7 residents per dwelling to determine the population within the service area and assuming that 100% of the population in the service are will use the truckfill for domestic water;
- Applying a 1% annual growth rate for 10 and 25 year demand; and
- Using a 180 L/c/d demand to ultimately estimate treated water demand.

Typically, the water demand can be determined using historical water consumption data. However, in this particular project the watering points currently provide non-potable water so the data on water usage will not directly relate to the usage once the water points are providing high quality potable water. The following table shows the population breakdown for each watering point location:

Leastian	Current Population			10-Year Projection			25-Year Projections		
Location	Perm	Seasonal	Total	Perm	Seasonal	Total	Perm	Seasonal	Total
Puskwaskau	208	30	238	230	33	263	267	39	306
Goodwin	568	41	609	627	46	673	728	53	781
Sandy Bay	77	147	224	85	163	248	98	189	288
Sturgeon Heights	257	382	638	283	422	705	329	490	819
Grande Cache Area ¹	_	_	404	_	_	446	_	_	518

¹ Total population for all Co-operatives in the Grande Cache area.

7 TREATED WATER DEMAND

Based on the design criteria, the table below shows the current average day demand, the 10-year projected average day demand and the 25-year projected average day demand for each location. These demands will be used as the threshold demand for each location.

	Current	10-Year	25-Year
Location	Total Pop Avg Day (m ³ /d)	Total Pop Avg Day (m³/d)	Total Pop Avg Day (m ³ /d)
Puskwaskau	43	48	56
Goodwin	110	122	141
Sandy Bay	41	45	52
Grande Cache ¹	73	81	95

¹ Total demand for all Co-operatives in the Grande Cache area.

8 RAW WATER DEMAND

With any treatment process there are water losses throughout the process. The water losses through each recommended process was used to determine the raw water demand for each location.



Location	Licence Annual Diversion	Licence Average Day Diversion	Licence Maximum Diversion	Projected Current Raw Water Demand	Projected 10-Year Raw Water Demand	Projected 25-Year Raw Water Demand
	(m³/year)	(m³/day)	(m³/day)	(m³/day)	(m³/day)	(m³/day)
Puskwaskau	8,630	23.6	52	54	60	70
Goodwin	8,637	23.7	65	158	174	201
Sandy Bay	24,000	65	65	41	45	52
Grande Cache ¹	TBD	TBD	TBD	77	84	98

The current well licence for Puskwaskau and Goodwin are insufficient to provide the required raw water to meet even the current projected raw water demands for a potable water truckfill. It is assumed that a new well will be completed as required in the Grande Cache area.

9 WATERING POINT OPTIONS

It was assumed that the water treatment facilities would be designed so that the infrastructure such as the building and reservoir were sized to accommodate the 25 year threshold capacity. The initial process train would be sized to accommodate the current projected threshold capacity with the flexibility to add an additional process train in the future if required.

The capital cost estimate, contingency and engineering fees and life cycle costs for each option is presented in the following table. The total lifecycle cost over 25 years was calculated using an operations and maintenance cost inflation of 2% a year, and a discount rate of 2% to determine the net present value.

Description	Capital Cost	Contingency	Engineering	Total	Annual O&M	Life Cycle Cost
Puskwaskau	\$1,800,000	\$540,000	\$281,000	\$2,621,000	\$120,000	\$4,516,000
Goodwin Option 1	\$1,940,000	\$582,000	\$303,000	\$2,825,000	\$147,000	\$5,220,000
Goodwin Option 2 (Pipe from Debolt)	\$2,000,000	\$600,000	\$312,000	\$2,912,000	\$10,000	\$2,912,000
Sandy Bay	\$530,000	\$160,000	\$83,000	\$773,000	\$94,000	\$2,395,000
Grande Cache Option 1	\$1,115,000	\$334,000	\$174,000	\$1,623,000	\$118,000	\$3,576,000
Grande Cache Option 2 (Pipe Grande Cache)	\$2,775,000	\$832,500	\$433,000	\$4,040,500	\$10,000	\$2,975,000

10 RECOMMENDATIONS

With the options reviewed, there are some general recommendations for all locations and specific recommendations for each location that should be reviewed and executed by the MD Prior to proceeding to the next steps for any of the locations reviewed in this study.

11 OTHER CONSIDERATIONS

Although implementing the options reviewed is a viable possibility. Further review of opportunities to reduce the operational attention and stress and increase the potential for funding may be considered by the MD. Further study to compose a master plan or a migration path for the MD with respect to water supply within the entire MD may be considered.



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Closure

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REPORT

1 Introduction

1.1 OBJECTIVES

The MD of Greenview (MD) initiated this Watering Point Feasibility study to determine the water quality at four watering point sites in the Northeast region of the MD and one potential watering point site in the Grande Cache region of the MD and the treatment required to provide high quality potable water at each of the sites.

This feasibility study report serves as a high level planning tool to help conceptualize a path moving forward. The report outlines the locations being considered for potable water supply points, the existing system at each location, the design criteria to be considered for a water treatment plant, a water quality assessment for the existing wells at each of the locations, and the water treatment recommendations for the raw water supply wells at each of the locations based on the water quality assessment.

1.2 BACKGROUND

The MD currently has four watering points throughout the northeast region of the MD providing non-potable water from a truckfill station. These watering points include:

- Puskwaskau;
- Goodwin;
- Sandy Bay; and
- Sturgeon Heights.

Each of the watering points has one service well providing water to a truckfill station that dispenses nonpotable water. For the purpose of this report, a "watering point" is defined as a truckfill station that provides non-potable water.

Figure 1-1 shows a map with all the watering points (non-potable water), truckfill stations (potable water), and water treatment plants with no truckfill within the northeast region of the MD. The watering points included in this study are identified with a green marker.

In addition, in the southwest region of the MD, (the Grand Cache area), there are currently seven (7) cooperatives within a 40 km of each other, that to the best of the MD's knowledge, are currently supplied with water from individual wells. The cooperatives include the following:

- Grande Cache Lake Kamisak Enterprise (Kamisak)
- Muskeg SeePee Cooperative
- Susa Creek Cooperative
- Victor Lake Cooperative
- Joachim Enterprise
- Wanyandie Flats Cooperative (East and West)



Figure 1-2 shows a map with the 7 Co-operatives in the Grande Cache area within the MD.

There are currently no watering points in the Grande Cache area operated by the MD. Although there are numerous wells located in the Grande Cache area and it was confirmed in previous reports completed by Hydrogeological Consultants Ltd. (HCL) that some of the wells are owned by the MD. Joachim Enterprise and Wanyandie Flats Cooperative (East and West) did not participate in the water well confirmation work completed by HCL.

1.3 SCOPE OF WORK

The MD is interested in installing a water treatment system in each of the four existing watering points and the Grande Cache area locations so that rural residents have access to treated potable water that meets the water quality standards of Alberta Environment and Parks (AEP) Standards and Health Canada Guidelines for the Canadian Drinking Water Quality (GCDWQ).

The MD is also interested in exploring the feasibility of a regional water supply pipeline from the Grande Cache Water Treatment Plant (WTP) for the Grande Cache location.

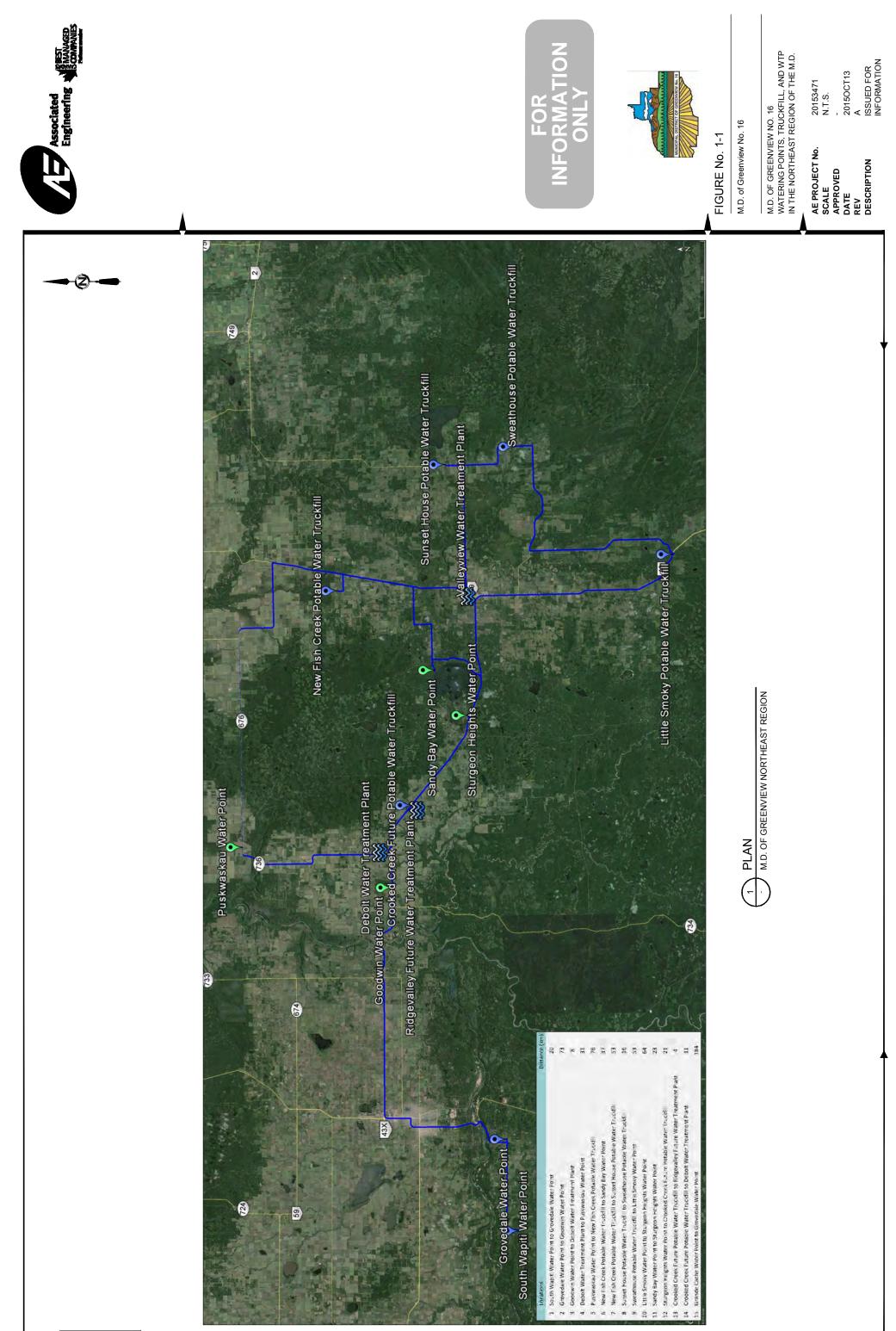
The scope of work for this study includes the following:

- Background information review to obtain service area boundaries, service population, and historical water use for each site.
- Water needs assessment to determine the projected treated water demands, treatment capacity needs (10 and 25 year projections) and groundwater diversion requirements.
- Raw water quality assessment at the 5 sites to establish base line chemistry and confirmation of any contaminants present, and their concentrations to determine the water treatment objectives and aid in the selection of a suitable process to meet the MD of Greenview's treatment expectations, all Provincial regulatory standards, and the GCDWQ.
- Water treatment options, evaluation based on the quantitative and qualitative factors.
- Recommendations and identification of the next steps for each location based on the evaluations.

1.4 PREVIOUS STUDIES

The following are recent studies related to this feasibility study:

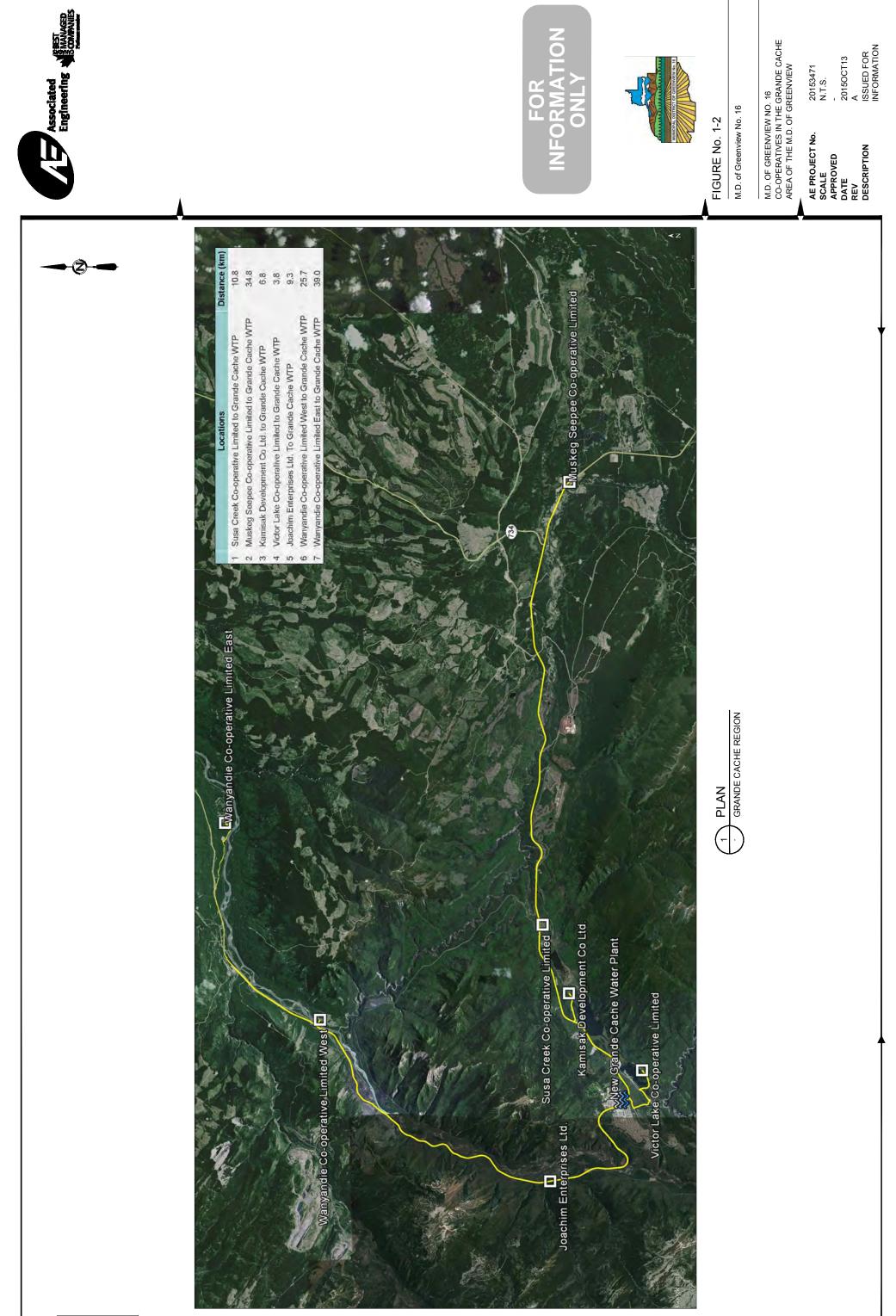
- Water Well Confirmation Susa Creek Cooperative (HCL)
- Water Well Confirmation Muskeg SeePee Cooperative (HCL)
- Water Well Confirmation Victor Lake Cooperative (HCL)
- Water Well Confirmation Grande Cache Lake (HCL)
- 2014 Update of the Sturgeon 2009 Water Supply Well Sturgeon Area (HCL)
- 2014 Update of the 1983 Water Supply Well Goodwin Area (HCL)
- 2014 Update of the 1983 Water Supply Well Puskwaskau Area (HCL)



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2 Review of Existing Systems

The four water points located in the North-East portion of the MD outlined in this report currently utilize some basic components ranging from buildings containing chlorination systems to outdoor coin operated water points that provide raw water, directly from the well with no chemical addition. All of these existing watering points supply their users with non-potable groundwater of varying quality.

In the Grande Cache area, two of the three wells that were included in this study are currently not in use. The one well that is in use is the Susa Creek School well. None of the wells in the Grande Cache area included in this study currently have a truckfill station.

2.1 PUSKWASKAU

The Puskwaskau watering point is located south of Highway 676 with access from Range Road 10 as shown in Figure 2-1. This watering point consists of a raw water well and pump and a small building.



Figure 2-1 Puskwaskau Water Point Location

(Google Earth-Pro, 2013)

2.1.1 Puskwaskau Raw Water Well

In December of 2014, HCL prepared an *Update of the 1983 Water Supply well for the Puskwaskau Area*. The technical review of the Puskwaskau supply well indicated that that there are no potential contaminant sources identified within 100 m of the well. The recommendations from the HCL report are as follows:

- Download and calibrate the data logger (installed in October, 2014) twice per year and replace after 7 years.
- Sample the groundwater annually and analyze for routine and microbiological parameters.
- Measure and record the groundwater diversion monthly and enter into the AEP Water Use Reporting System (WUR).



The MD has a Diversion Licence No. 00030671-00-00 for the Puskwaskau well, which does not expire. The diversion licence is for the purpose of a domestic community water supply. The licence allocation is for an annual diversion of 8,630 m³ per year which is approximately 23.6 m³ per day, with a maximum diversion of 52 m³ per day. The Puskwaskau well diversion licence and amendment are in Appendix A.

2.1.2 Puskwaskau Watering Point Components

The building at the watering point has double door access on the south side of building. There is some damage to the exterior of the building near the fill hose. There is a coin operated truckfill and dispensing hose on the eastside of the building. The building is powered by single phase power and houses the following components:

- A raw water flow meter
- Chlorine dosing system
- Two (2) underground galvanized metal water storage tanks (in poor condition)
- A natural gas unit heater

Although chlorine is being dosed, the daily CT calculations are not conducted to ensure the 4.0-log virus reduction is being achieved. There is no online chlorine analyzer. The chlorine residual is being manually measured and recorded on site infrequently. There is a sign posted near the fill hose on the exterior building that states "Caution Non-Potable Water Not for Drinking".

Photos of the exterior and interior of the Puskwaskau watering point are shown in Figure 2-2.



Figure 2-2 Puskwaskau Watering Point Photos

2.1.3 Puskwaskau Usage

Monthly water use information from January 2012 to September 2015 was provided by the MD and this data is shown in Figure 2-3. The data suggests that peak use generally occurs in the months of May, June, and July. Data for the full year of 2015 was not available at the time of writing this report.

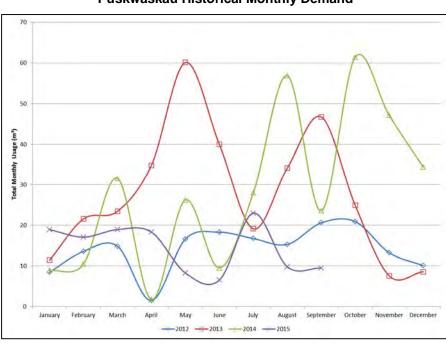


Figure 2-3 Puskwaskau Historical Monthly Demand

The maximum, average, and minimum monthly values for each year are shown in Table 2-1.

Table 2-1Puskwaskau Historic Demand 2012 to 2015

Demand	2012 (m ³ /month)	2013 (m ³ /month)	2014 (m ³ /month)	2015 ¹ (m ³ /month)
Maximum Month	21	60	61	23
Average Month	14	27	28	11
Minimum Month	1.5	7.5	1.8	6.5

¹ Data only available for January to September.

The month that had the greatest usage of 61 m³ was October, 2014.

2.2 GOODWIN

The Goodwin watering point is located on the north side of Highway 43 with access from an approach on Range Road 15 and shown in Figure 2-4. This watering point consists of a raw water well and pump and a building.



Figure 2-4 Goodwin Watering Point Location



2.2.1 Goodwin Raw Water Well

In December of 2014, HCL prepared an *Update of the 1983 Water Supply well for the Goodwin Area*. The technical review of the Goodwin supply well indicated that that there is standing water, two dugouts, within 100 m of well but the chemical analysis results verify that the surface water is not directly entering the well. The recommendations from the HCL report are as follows:

- The data logger that was installed in October, 2014 be downloaded and calibrated twice per year and replaced after 7 years.
- The groundwater be sampled annually and analyzed for routine and microbiological parameters.
- Measure and record the groundwater diversion monthly and entered into the AEP Water Use Reporting System (WUR).

The MD has a Diversion Licence No. 00030739-00-00 with no expiration date for the Goodwin well. The diversion licence is for the purpose of municipal supply. The licence allocation is for an annual diversion of 8,637 m³ per year which is approximately 24 m³ per day, with a maximum diversion of 65 m³ per day. The Goodwin well diversion Licence and Amendment No. 00030739-00-01 are shown in Appendix A.

2.2.2 Goodwin Watering Point Components

The building at the watering point has overhead door and single man door access on the west side of the building. There is a Flowpoint pin pad operated truckfill and dispensing hose on the eastside of the building. The building is powered by single phase power and houses the following components:

- Flow meter on the truckfill line;
- Chlorine dosing system;
- Two (2) above ground HDPE water storage tanks;
- One (1) truckfill pump; and a natural gas unit heater.

Although chlorine is being dosed, the daily CT calculations are not conducted to ensure the 4.0-log virus reduction is being achieved. There is no online chlorine analyzer. There is a sign posted near the fill hose on the exterior building that states "Caution Non-Potable Water Not for Drinking". There is another sign for water haulers stating that it is illegal to fill sprayers directly and that the maximum allowable amount is 500 gallons per day. Photos of the exterior and interior of the Goodwin watering point are shown in Figure 2-5.

Figure 2-5 Goodwin Watering Point Photos



2.2.3 Goodwin Usage

The maximum, average, and minimum monthly values for each year are shown in Table 2-2. Monthly water use information from January 2012 to July 2013 and from January 2014 to September 2015 was provided by the MD, and this data is shown in Figure 2-6. The data suggests that peak use generally occurs in the months of May, June, and July.

Demand	2012 (m ³ /month)	2013 ¹ (m ³ /month)	2014 (m ³ /month)	2015 ² (m ³ /month)
Maximum Month	578	249	292	363
Average Month	234	170	195	215
Minimum Month	87	64	117	60

Table 2-2Goodwin Historic Demand 2012 to 2015`

¹ Data only available for January to July.

² Data only available for January to September.

The month that had the greatest usage of 578 m³ was June of 2012.



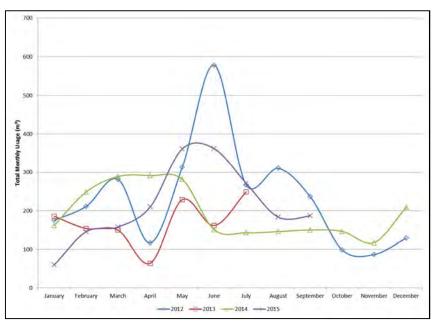


Figure 2-6 Goodwin Historical Monthly Demand

2.3 SANDY BAY

The Sandy Bay watering point is located on the north of Township Road 711A on the northeast shore of Sturgeon Lake as shown in Figure 2-7. This watering point consists of a raw water well and raw water raw water pump directly below a metal frame for the fill station.



Figure 2-7 Sandy bay Watering Point Location

2.3.1 Sandy Bay Raw Water Well

The HCL report for the Sandy Bay raw water well is not available. The well does appear on the AEP groundwater well database with the Owner information listed as the MD. A licence for this well was found using the AEP approval viewer. The drilling report and the licence are in Appendix A.

The MD has a Diversion Licence No. 00200240-00-00 for the Sandy Bay well which expires August 27, 2028. The diversion licence is for the purpose of commercial (water hauling). The licence allocation is for an annual diversion of 24,000 m³ per year which is approximately 65 m³ per day, with a maximum diversion of 65 m³ per day. The Sandy Bay well diversion licence and Amendment No. 00200240-00-01 are in Appendix A.

Conditions of the licence are as follows:

- Monitor and record the total number of cubic meters of water diverted from the site on a monthly basis;
- Measure the water levels while the pump is operating;
- · Obtain water samples and conduct chemical analyses for annual submission to the Director; and
- Submit monthly measurements of water levels to the Director.

2.3.2 Sandy Bay Watering Point Components

There is a metal frame around the groundwater well from which the fill hose extends. There is a coin operated truckfill. The raw groundwater is pumped from the well directly out through the dispensing hose.

There is a sign posted near the fill hose on the exterior building that states "Caution Non-Potable Water Not for Drinking". There is another sign stating "This water does not meet Canadian Drinking Water Guidelines".

Photos of the Sandy Bay watering point are shown in Figure 2-8.



Figure 2-8 Sandy Bay Watering Point Photos



2.3.3 Sandy Bay Usage

Monthly water use information for 2015 from May to September was provided by the MD and this limited data is shown in Figure 2-9. There is no flow monitoring system at this watering point, so the flow data was estimated based on the money collected from the coin operated truckfill.

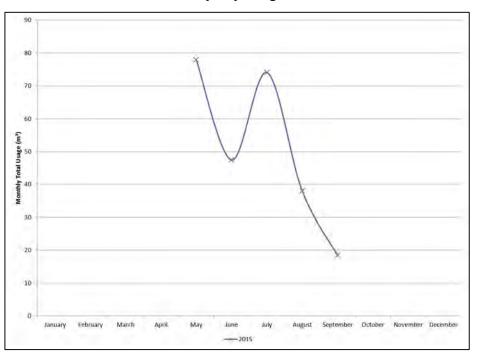


Figure 2-9 Sandy Bay Usage

The maximum average and minimum monthly values for the available data is shown in Table 2-3.

Table 2-3Sandy Bay Historic Demand

Demand	2015 ¹ (m ³ /month)	
Maximum Month	78	
Average Month	52	
Minimum Month	19	

¹ Data only available for May to September.

The month that had the greatest usage of 78 m³ was May of 2015.

2.4 STURGEON HEIGHTS

The Sturgeon Heights watering point is located north of Highway 43 on the southside of Township Road 704, as shown in Figure 2-10. This watering point consists of a raw water well and raw water raw water pump directly below a metal frame for the fill station.

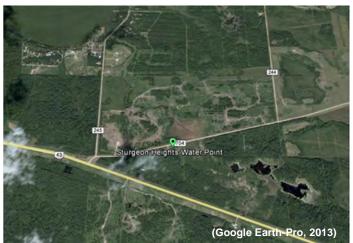


Figure 2-10 Sturgeon Heights Watering Point Location

2.4.1 Sturgeon Heights Raw Water Well

In December of 2014, HCL prepared an *Update of the Sturgeon 2009 Water Supply well for the Sturgeon Area*. The technical review of this well indicated that the long term yield for the well is 13 m³/day.

Issues with this well identified by HCl are as follows:

- The well is currently not licenced with AEP to divert water
- The non-pumping water level is lower than reported on original drilling report
- The casing stick-up is 0.1 m above ground level
- The fluoride levels exceed the Guidelines for Canadian Drinking Water Quality (GCDWQ)
 Maximum Allowable Concentration (MAC)

The recommendations from the HCL report are as follows:

- Apply to AEP to licence the use of groundwater and that diversion from the well will be discontinued until AEP has issued a licence.
- Download and calibrate the data logger (installed in November, 2014) twice per year and replace after 7 years.
- Review water level data every year to ensure well is not being over pumped.
- Sample and analyze the groundwater annually for routine and microbiological parameters.



Extend the casing stick-up from 0.1 m to a minimum of 0.2 m above ground level in order to be in compliance with regulation.

Notify users that the drinking the groundwater could affect their long-term health.

2.4.2 Sturgeon Heights Watering Point Components

There is a metal frame around the groundwater well from which the fill hose extends. There is a coin operated truckfill. The raw groundwater is pumped from the well directly out through the dispensing hose. There is a sign posted near the fill hose on the exterior building that states a warning "Water contains high fluoride levels unfit for human consumption"

Photos of the Sturgeon Heights watering point are shown in Figure 2-11.



Figure 2-11 Sturgeon Heights Watering Point Photos

2.4.3 Sturgeon Heights Usage

Monthly water use information for 2015 from May to September was provided by the MD and this limited data is shown in Figure 2-12. There is no flow monitoring system at this watering point, so the flow data was estimated based on the money collected from the coin operated truckfill.

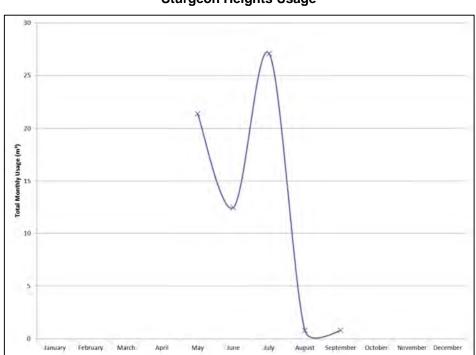


Figure 2-12 Sturgeon Heights Usage

The maximum, average, and minimum monthly values for the available data are shown in Table 2-4.

Demand	2015 ¹ (m³/month)	
Maximum Month	27	
Average Month	13	
Minimum Month	0.8	

Table 2-4 Sturgeon Heights Historic Demand

¹ Data only available for May to September.

The month that had the greatest usage of 27 m³ was July of 2015.

2.5 GRANDE CACHE AREA

There are currently no watering points operated by the MD in the Grande Cache area. The MD reported that the residents of the Co-operatives are using individual wells for water supply with the exception of two homes that have cisterns. Some background information from four of the Co-operatives which participated in the water well confirmation work completed by HCL.



2.5.1 Grande Cache Lake (Kamasik Enterprise)

The Kamasik Enterprise Cooperative is located 7 km northeast of the Town of Grande Cache. A study completed by Hydrogeological Consultants Ltd. in October, 2014 reviewed all the wells on the Grande Cache Lake parcel of land that included sections 07, and 08 of 057-07 W6M. The HCL report identified 14 wells that are registered to the MD of Greenview name. Of the 14 wells:

- Four (4) wells are not currently in use and should/could be reclaimed (refer to original report for detailed recommendations);
- Two (2) wells in use pose a risk from groundwater contamination and require attention (refer to original report for detailed recommendations); and
- Six (6) records for wells in the database could not be located or confirmed in the field.

HCL recommended that all the water wells in use be sampled annually and analyzed for routine potability by an accredited laboratory as well as microbiological analysis by the local health unit. HCL also recommended that all water wells currently in use be chlorinated by a qualified journeyman water well driller at least once per year.

2.5.2 Muskeg SeePee Cooperative

The Muskeg SeePee Cooperative is located approximately 35 km east of the Town of Grande Cache. A study completed by Hydrogeological Consultants Ltd. in October, 2014 reviewed all the wells on the Muskeg SeePee parcel of land that included sections 10, 11 and 15 of 057-05 W6M. This report identified 17 wells that are under the MD of Greenview name. Of the 17 wells:

- Eight (8) wells are not currently in use and should/could be reclaimed (refer to original report for detailed recommendations);
- Five (5) wells that in use pose a risk for groundwater contamination and require attention (refer to original report for detailed recommendations); and
- Ten (10) records for wells in the database could not be located or confirmed in the field.

HCL recommended that all the water wells in use be sampled annually and analyzed for routine potability by an accredited laboratory as well as microbiological analysis by the local health unit. HCL recommendations also included that all water wells currently in use be chlorinated by a qualified journeyman water well driller at least once per year.

2.5.3 Susa Creek Cooperative

The Susa Creek Cooperative is located approximately11 km northeast of the Town of Grande Cache. A study completed by Hydrogeological Consultants Ltd. in October, 2014 reviewed all the wells on the Susa Creek Cooperative parcel of land that included sections 15 and 16 of 057-07 W6M. This report identified 27 wells that are under the MD of Greenview name. Of the 27 wells:

Three (3) wells are not currently in use and should be reclaimed (refer to original report for detailed recommendations);

- Seven (7) wells in use pose a risk for groundwater contamination and require attention (refer to original report for detailed recommendations); and
- The Susa Creek School Water Well should be licensed through AEP.

HCL recommended that all the water wells in use be sampled annually and analyzed for routine potability by an accredited laboratory as well as microbiological analysis by the local health unit. HCL recommended all water wells currently in use be chlorinated by a qualified journeyman water well driller at least once per year.

2.5.4 Victor Lake Cooperative

The Victor Lake Cooperative is located approximately 4 km southeast of the Town of Grande Cache. A study completed by Hydrogeological Consultants Ltd. in October, 2014 reviewed all the wells on the Victor Lake Cooperative parcel of land that included sections 27, 37 and 35 of 056-08 W6M. This report identified landowner's water wells that are on the list for the Victor Lake Cooperative. The water well confirmation program identified 14 water wells. Of the 14 wells:

- Three (3) wells are not currently in use and should/could be reclaimed (refer to original report for detailed recommendations);
- Three (3) wells that in use pose a risk for groundwater contamination and require attention (refer to original report for detailed recommendations); and
- Thirteen (13) records for wells in the database could not be located or confirmed in the field.

HCL recommended that all the water wells in use be sampled annually and analyzed for routine potability by an accredited laboratory as well as microbiological analysis by the local health unit. HCL recommendations also included that all water wells currently in use be chlorinated by a qualified journeyman water well driller at least once per year.

In discussions with AEP, concern was expressed that the shallow wells near Victor Lake are under the influence of surface water.



3 Treated Water Quality Standards

AEP characterizes groundwater into two types; Groundwater and Groundwater Under Direct Influence of Surface Water (GWUDI). Groundwater not under the direct influence of surface water (non-GWUDI) is located in an aquifer that is isolated from the surface, or the subsurface soils act as an effective filter to remove micro-organism and other particles to result in high quality raw water. GWUDI requires treatment equivalent to a surface water source.

The groundwater quality data collected in this study indicates that the groundwater is non-GWUDI. Therefore, the potable water truckfills that the MD is interesting in pursuing would be regulated under Alberta Health Services since they have fewer than 15 service connection and are not removing any health related parameters. If there were more than 15 service connections, the facilities would be regulated by an AEP Code of Practice. A facility treating for health related parameters would operate under an AEP approval.

All of the groundwater data collected in this study was compared to AEP's Standards and Guidelines and the GCDWQ. Based on this review, the following parameters are considered treatment objectives.

3.1 HEALTH RELATED TREATMENT OBJECTIVES

Ammonia and total organic carbon (TOC) are parameters were identified at one or more sites to be over the maximum allowable concentration (MAC) or related to MACs in the GCDWQ.

3.1.1 Ammonia

Ammonia levels are not directly related to the GCDWQ. However, the GCDWQ Guideline Technical Document for ammonia states that good operational practices include limiting excess free ammonia entering the distribution system to below 0.05 mg/L. The ammonia has implications on the chlorine demand for disinfection. In addition, ammonia is the precursor of the high nitrite levels in the treated water, as a result of incomplete nitrification.

3.1.2 Total Organic Carbon

Total organic carbon (TOC) is not directly related to the GCDWQ regulatory limits. However, it is a disinfection by-product precursor and has consequential effects on Disinfection By-products (DBP) formation, which is in direct relation to the regulatory limits. Based on AE's experience with organic laden water, a concentration of 10 mg/L or higher can present issues with DBPs. It is known that reducing the TOC to < 2 mg/L can limit the potential of Haloacetic Acids (HAAs) and Trihalomethanes (THMs) to below 0.08 mg/L and 0.1 mg/L, respectively, following chlorination.



3.1.3 Disinfection

For high quality groundwater sources, the Guidelines for the Canadian Drinking Water Quality (GCDWQ) and AEP's Standards require disinfection to achieve a minimum of 4-log reduction of viruses.

3.1.4 Turbidity

The GCDWQ suggests ensuring effectiveness of disinfection; it is recommended that the turbidity level be 1 mg/L or less, for systems that are not required.

3.2 AESTHETIC TREATMENT OBJECTIVES

The following treatment objectives were identified to be over the maximum allowable concentration (MAC) or related to MACs in the GCDWQ.

3.2.1 Iron

The GCDWQ aesthetic limit (AO) for iron is ≤ 0.3 mg/L. This limit is set based on taste and staining of laundry and plumbing fixtures. The AEP Standards and Guidelines state that if iron reduction is practice, then the treated water concentration for iron shall be 0.3 mg/L.

3.2.2 Manganese

The GCDWQ AO limit for manganese is \leq 0.05 mg/L. This limit is set based on taste and staining concerns. The AEP Standards and Guidelines state that if manganese reduction is practice, then the treated water concentration for manganese shall be 0.08 mg/L.

3.2.3 Sodium

The GCDWQ AO limit for sodium is 200 mg/L. Concentrations over this limit can become a concern for individuals, who may be on a sodium restricted diet.

3.2.4 Total Dissolved Solids

The GCDWQ AO limit for TDS is \leq 500 mg/L. This is based on taste and excessive scaling in components of a water system.

3.3 CONTACT TIME FOR DISINFECTION

The AEP Standards and Guidelines state that groundwater systems shall provide disinfection to achieve a minimum of 4.0-log reduction of viruses.

The storage volume necessary to achieve the required contact time for disinfection using free chlorine is dependent on factors, such as the raw water flow rate, baffling condition in the treated water reservoir, the target chlorine residual, temperature, and pH of the raw water. As conservative assumptions, the following values will be used to determine the required contact volume to meet the 4.0-log virus reduction; temperature of 0.5° C, a pH level of between 6 and 9, and a free chlorine residual of 1 mg/L.

Chloramination for disinfection is difficult to operate and requires high operator attention. If chloramination were used for disinfection, the storage volume required would be in the order of magnitude of 80 times greater than free chlorine after treatment. UV for disinfection without treatment is not a viable option when the Ultraviolet Transmittance is less than 80% for.



4 Raw Water Quality Assessment

Associated Engineering (AE) conducted a raw water treatability review as part of this feasibility study. This included sampling, analysis, and quality assessment of the groundwater of four existing raw water points and two wells in the Grande Cache area located within the MD. In the Grande Cache area, Grande Cache 1 (Susa Creek Church), and Grande Cache 3 (Susa Creek School Well) were sampled. The Grande Cache 2 well was excluded from this analysis as the well pumped put out clay during sampling. The water sampling in the Grande Cache area was only done in the Susa Creek area to get an indication of the groundwater quality in the Grande Cache area.

Through subsequent discussion with AEP, it was noted that the shallow wells around Victor Lake cannot be considered sources of high quality groundwater (HQGW) since they are likely under direct influence (GUDI) of surface water. Given the water quality results for the Susa Creek wells, for the purpose of this report, it will be assumed that the groundwater in the Grande Cache area, other than Victor Lake, is not groundwater under the direct influence (non-GUDI) of surface water. Prior to any next steps further sampling is recommended to ensure the groundwater source for a potable water truckfill is not GUDI. If the groundwater is found to be GUDI, more stringent treatment is required to meet surface water treatment objectives.

AE collected the groundwater samples from Puskwaskau, Goodwin, Sandy Bay, and Sturgeon Heights' watering points and two wells in the Grande Cache area. The water samples were sent to an external laboratory for water quality testing. The groundwater quality was compared to GCDWQ that are grouped into two categories: Maximum Acceptable Concentrations (MAC) or Aesthetic Objectives (AO). The MAC levels have been established for certain substances that are known or suspected to cause adverse effects on health. The concentrations have been set at values intended to safeguard health on the basis of lifetime consumption. The AO apply to certain substances or characteristics of drinking water that can affect its acceptance by consumers.

The water samples that were collected during the site visit were brought to AE's water quality lab for chlorine demand tests to determine breakpoint chlorination requirements. The samples were dosed with known concentrations of sodium hypochlorite and were allowed to sit for thirty minutes before tested for free and total chlorine residual concentrations. The free and total chlorine results were plotted against chlorine dosage and the breakpoint chlorination was determined graphically. The results are presented for each location in subsequent sections of this report.

A simulated distribution test was conducted on all of the raw water samples to determine the disinfection by-product formation potential. Trihalomethane (THM) and Haloacetic Acid (HAA) are the disinfection by-products (DBP) that are formed from the reaction of organics with chlorine. THM and HAA are both regulated by GCDWQ with maximum acceptable concentration (MAC) of 0.100 and 0.080 mg/L, respectively. The results are presented for each location in subsequent sections.



4.1 PUSKWASKAU TREATMENT OBJECTIVES

The data from the analysis is provided in Appendix A in its entirety. Table 4-1 shows only the parameters exceeding the GCDWQ MAC and AO limits or the limits that require attention with respect to treatability.

Analyte	Unit	GCDWQ Limit ¹	GCDWQ MAC/AO	Puskwaskau Raw Water 25-Jun-15
Iron (Fe) ³	mg/L	0.3	AO	0.37
Sodium (Na)	mg/L	200	AO	460
Ammonia-nitrogen ³	mg/L	—	_	1.16
Dissolved Organic Carbon	mg/L	—	—	8.1
Total Dissolved Solids	mg/L	500	AO	1100
Turbidity ³	NTU	1.0	—	3.12
Ultraviolet Transmittance	%	_	_	56.2
Ultraviolet Transmittance, Filtered ²	%	—	—	56.4

 Table 4-1

 Puskwaskau Raw Water Treatment Objectives

¹ Limits stipulated in the Guidelines for the Canadian Drinking Water Quality. A results indicate exceed the GCDWQ limits or the levels require attention with respect to treatability.

² Indicates dissolved content, filtered through a 0.45 micron filter paper.

³ Results from onsite testing.

4.1.1 Chlorine Demand

Figure 4-1 shows the chlorine demand curve for the raw groundwater at the Puskwaskau watering point.

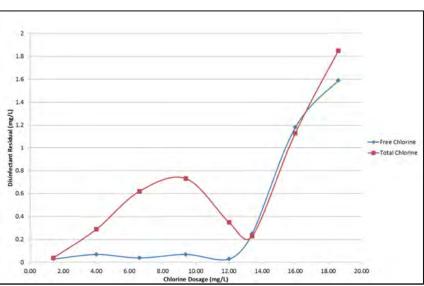


Figure 4-1 Puskwaskau Chlorine Demand Curve

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The chlorine demand curve suggests significant ammonia interference is anticipated in the water and high chlorine demand is required to maintain free chlorine residual. Breakpoint chlorination is feasible for this system using high chlorine dose in the order of 15 mg/L. However, for such high doses of chlorine, Alberta Environment and Water (AEP) would require the MD to monitor additional parameters. Therefore, ammonia reduction may be considered as priority.

4.1.2 Simulated Distribution System Test

AE conducted a 7-day simulated distribution system test to determine THM and HAA formation potential. The 7-day monitoring of DBP is the water industry norm. The test was conducted at 12°C with free chlorine residual of 1.0 mg/L. After seven days, THM concentration was 0.270 mg/L and HAA concentration was 0.085 mg/L. After 3 days during the simulated distribution test, the free chlorine residual had decreased to 0.11 mg/L. At the end of the simulated distribution system test, the free chlorine residual was 0.04 mg/L. Based on the simulated distribution system test, the dissolved organic carbon concentration of 8.1 mg/L showed a significant demand for free chlorine residual which led to a high disinfection by-product concentration.

Based on the simulated distribution system test results, the treated water is anticipated to produce DBPs that may be in excess of the respective limits unless the organics present in the well water is partially or fully removed or an alternate disinfectant is used. For this community, treated water is will be stored onsite in a treated water storage tank from which the truckfill will draw the water. For this system, disinfection by-product formation may be an issue, as the chlorine demand testing indicated a rapid decay of free chlorine residual. The treatment system may need to implement disinfection by-product controls to limit the formation of THM and HAA in the distribution system.

4.1.3 Mandatory Treatment Objectives

The common groundwater treatment objectives such as iron, in this well source, are above the aesthetic limits of GCDWQ and will require treatment. The target limits are shown in parenthesis:

- Iron (<0.30 mg/L aesthetic objective);
- Total organic Carbon Reduction (<2.0 mg/L, preferred) for Disinfection By-product Mitigation (<0.100 mg/L THM and <0.080 mg/L HAA);
- Ammonia reduction to < 0.8 mg/L to bring the applied chlorine dose to less than 10 mg/L (NSF limit) and avoid additional water quality monitoring; and
- A 4.0-log virus inactivation.

The elevated turbidity (3.12 NTU) requires attention. The GCDWQ suggests that to ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less. For systems that are not required to filter by the appropriate authority, a higher turbidity level may be considered acceptable, provided that it does not hinder disinfection. This requires review of the filtration exemption with Alberta Environment and Parks (AEP).



4.1.4 Secondary Treatment Objectives

The following aesthetic parameter may be considered optional treatment objectives for the proposed water treatment plant upgrades.

- Sodium (<200 mg/L aesthetic objective); and
- Total dissolved solids (<500 mg/L aesthetic objective).

4.2 GOODWIN TREATMENT OBJECTIVES

The data from the analysis is provided in Appendix A in its entirety. Table 4-2 shows only the parameters that present a value greater than the GCDWQ MAC and AO limits or the limits that require attention with respect to treatability.

Analyte	Unit GCDWQ		GCDWQ	Goodwin Raw Water
		Limit ¹	MAC/AO	25-Jun-15
Iron (Fe) ³	mg/L	0.3	AO	0.30
Manganese (Mn) ³	mg/L	0.05	AO	0.098
Sodium (Na)	mg/L	200	AO	290
Ammonia-nitrogen	mg/L	—		1.00
Dissolved Organic Carbon	mg/L	—	—	20
Total Dissolved Solids	mg/L	500	AO	730
Ultraviolet Transmittance ³	%	—		17.8
Ultraviolet Transmittance, Filtered 2,3	%	_	_	18.2

 Table 4-2

 Goodwin Raw Water Treatment Objectives

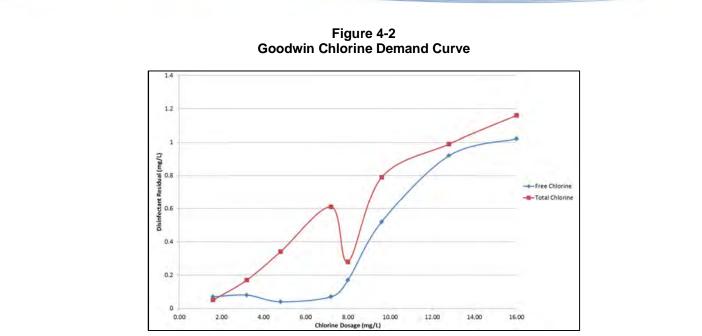
¹ Limits stipulated in the Guidelines for the Canadian Drinking Water Quality. All results exceed the GCDWQ limits or the levels require attention with respect to treatability.

² Indicates dissolved content, filtered through a 0.45 micron filter paper.

³ Results from onsite testing.

4.2.1 Chlorine Demand

Figure 4-2 shows the chlorine demand curve for the raw groundwater at the Goodwin watering point.



The chlorine demand curve suggests significant ammonia interference is anticipated in the water and moderate chlorine demand is required to maintain free chlorine residual. Breakpoint chlorination is feasible for this system using moderate chlorine dose.

4.2.2 Simulated Distribution System Test

AE conducted a 7-day simulated distribution system test to determine THM and HAA formation potential. The 7-day monitoring of DBP is the water industry norm. The test was conducted at 12°C with free chlorine residual of 1.0 mg/L. After seven days, THM concentration was 0.220 mg/L and HAA concentration was 0.160 mg/L. After 3 days during the simulated distribution test, the free chlorine residual had decreased to 0.17 mg/L. At the end of the simulated distribution system test, the free chlorine residual was 0.07 mg/L. Based on the simulated distribution system; the dissolved organic carbon concentration of 20 mg/L showed a significant demand for free chlorine residual which led to a high disinfection by-product concentration.

Based on the simulated distribution system test results, the treated water is anticipated to produce DBPs that may be in excess of the respective limits unless the organics present in the well water are partially or fully removed or an alternate disinfectant is used.

For this community, treated water is going to be stored onsite in a treated water storage tank from which the truckfill is going to draw the water from. For this system disinfection by-product formation may be an issue, as the chlorine demand testing indicated a rapid decay of free chlorine residual. Therefore, the proposed treatment system should incorporate DBP controls to limit the subsequent formation of THM and HAA.



4.2.3 Mandatory Treatment Objectives

Based on the water quality review the following parameters are determined to be the treatment objectives:

- Iron (<0.30 mg/L aesthetic objective);
- Manganese (<0.05 mg/L aesthetic objective);
- Total organic Carbon Reduction (<2.0 mg/L, preferred) for Disinfection By-product Mitigation (<0.100 mg/L THM and <0.080 mg/L HAA); and
- A 4.0-log virus inactivation.

While the iron and manganese are considered as AO parameters, removals of such constituents are necessary in order to make the potable water aesthetically pleasing and palatable to consumers.

4.2.4 Secondary Treatment Objectives

In addition to the mandatory treatment objectives, the following aesthetic parameters may be also considered as optional treatment objectives for the proposed water treatment plant upgrades.

- Sodium (<200 mg/L aesthetic objective); and
 - Total dissolved solids (<500 mg/L aesthetic objective).

4.3 SANDY BAY TREATMENT OBJECTIVES

The data from the analysis is provided in Appendix A in its entirety. Table 4-3 shows only the parameters that present a value greater than the GCDWQ MAC and AO limits or the limits that require attention with respect to treatability.

Analyte	Unit	GCDWQ Limit ¹	GCDWQ MAC/AO	Sandy Bay Raw Water		
		Linin		24-Jun-15		
Sodium (Na)	mg/L	200	AO	400		
Dissolved Organic Carbon	mg/L	—	_	5.7		
Total Dissolved Solids	mg/L	500	AO	960		

 Table 4-3

 Sandy Bay Water Treatment Objectives

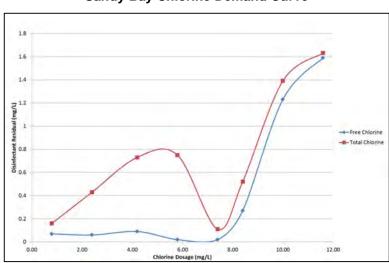
¹ Limits stipulated in the Guidelines for the Canadian Drinking Water Quality. All results exceeded the GCDWQ limits or the levels require attention with respect to treatability.

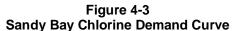
² Indicates dissolved content, filtered through a 0.45 micron filter paper.

³ Results from onsite testing.

4.3.1 Chlorine Demand Curve

Figure 4-3 shows the chlorine demand curve for the raw groundwater at the Sandy Bay watering point.





The chlorine demand curve suggests significant ammonia interference is anticipated in the water and moderate chlorine demand is required to maintain free chlorine residual. Breakpoint chlorination is feasible for this system using moderate chlorine dose.

4.3.2 Simulated Distribution System Test

AE conducted a 7-day simulated distribution system test to determine THM and HAA formation potential. The 7-day monitoring of DBP is the water industry norm. The test was conducted at 12°C with free chlorine residual of 2.0 mg/L. After seven days, THM concentration was 0.096 mg/L and HAA concentration was 0.053 mg/L. At the end of the simulated distribution system test, the free chlorine residual was 0.79 mg/L.

Based on the simulated distribution system test results, the treated water is anticipated to produce DBPs that may be close to the limits. For a truckfill system disinfection by-product formation should not be an issue. However, if there is treated water storage as part of the water treatment system, then the residence time in the storage tank should be maintained below 7 days in order to maintain the DBPs below the limits. Given the small community size and the storage tank sizing based on peak day long-term (25 year needs), the residence time may likely exceed 7 days. If the residence time review suggests that more than 7-day storage is likely, then the treatment scheme should incorporate organics control. If the MD decides to connect water treatment system to the distribution system, the treatment system may need to implement disinfection by-product controls to limit the formation of THM or HAA in the distribution system.



4.3.3 Mandatory Treatment Objectives

AEP requires the system to meet the following disinfection criteria:

Groundwater system shall provide disinfection to achieve a minimum of 4-log reduction of viruses.
 A disinfectant residual (total chlorine not less than 0.1 mg/L) shall be maintained in the water distribution system.

If AEP requires filtration for turbidity control, turbidity removal will become an objective.

4.3.4 Secondary Treatment Objectives

The common groundwater treatment parameters such as iron and manganese, in this well source, are below the aesthetic limits of GCDWQ and do not require treatment. However, the following aesthetic parameters may be considered as optional treatment objectives for the proposed water treatment plant.

The target limits are also shown in parenthesis:

- Sodium (<200 mg/L aesthetic objective); and
- Total dissolved solids (<500 mg/L aesthetic objective).

The treatment objectives will vary depending whether the MD of Greenview decides to implement a WTP with truckfill only system or a WTP with a distribution system with truckfill.

4.4 STURGEON HEIGHTS TREATMENT OBJECTIVES

The data from the analysis is provided in Appendix A in its entirety. Table 4-4 shows only the parameters that present a value greater than the GCDWQ MAC and AO limits or the limits that require attention with respect to treatability.

Analyte	Unit GCDWQ Limit ¹		GCDWQ	Sturgeon Heights Raw Water	
·			MAC/AO	25-Jun-15	
Manganese (Mn)	mg/L	0.05	AO	0.058	
Sodium (Na)	mg/L	200	AO	230	
Dissolved Organic Carbon	mg/L	—	—	6.4	
Total Dissolved Solids	mg/L	500	AO	530	
Turbidity	NTU	1.0	—	1.77	

 Table 4-4

 Sturgeon Heights Raw Water Treatment Objectives

Analyte	Unit GCDWQ Limit ¹		GCDWQ	Sturgeon Heights Raw Water	
			MAC/AO	25-Jun-15	
Ultraviolet Transmittance	%	_	_	31.7	
Ultraviolet Transmittance, Filtered ²	%	_	_	33.5	
Gross Alpha	Bq/L	0.5	Screening ³	0.9	

Limits stipulated in the Guidelines for the Canadian Drinking Water Quality. All results exceeded the GCDWQ limits or the levels require attention with respect to treatability.

² Indicates dissolved content, filtered through a 0.45 micron filter paper.

³ GCDWQ has specific MACs based on exposure to specific radionuclides. Water analysis was conducted to screen for the presence of radionuclides based on gross alpha and gross beta. If gross alpha or gross beta exceed screening limit, an assessment of individual radionuclide should be conducted.

4.4.1 Chlorine Demand Curve

Figure 4-4 shows the chlorine demand curve for the raw groundwater at the Sturgeon Heights watering point.

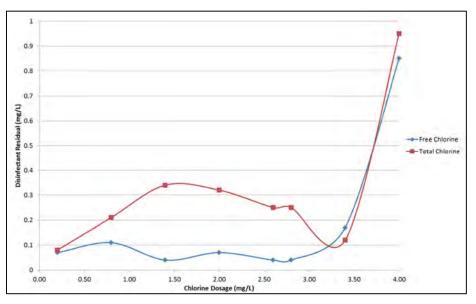


Figure 4-4 Sturgeon Heights Chlorine Demand Curve

The chlorine demand curve suggests some ammonia interference is anticipated in the water and low chlorine demand is required to maintain free chlorine residual. Breakpoint chlorination is feasible for this system using low chlorine dose.



4.4.2 Simulated Distribution System Test

AE conducted a 7-day simulated distribution system test to determine THM and HAA formation potential. The 7-day monitoring of DBP is the water industry norm. The test was conducted at 12°C with free chlorine residual of 1.0 mg/L. After seven days, THM concentration was 0.068 mg/L and HAA concentration was 0.043 mg/L. After 3 days during the simulated distribution test, the free chlorine residual had decreased to 0.11 mg/L. After end of the simulated distribution system test, the free chlorine residual was 0.08 mg/L. Based on the simulated distribution system testing, the dissolved organic carbon concentration of 6.4 mg/L showed a significant demand for free chlorine residual which led to high disinfection by-product concentration.

Based on the simulated distribution system test results, the treated water is anticipated to produce DBPs that may be in excess of the respective limits unless the organics present in the well water is partially or fully removed or an alternate disinfectant is used. For a truck fill system disinfection by-product formation may be an issue, as the chlorine demand testing indicated a rapid decay of free chlorine residual.

4.4.3 Mandatory Treatment Objectives

Screening analytical testing was done on the water samples for Gross Alpha and Gross Beta radionuclides. Radionuclides in drinking water may cause health problems if present in amounts greater than the MAC in the GCDWQ.

The initial screening results showed a Gross Alpha level greater than the MAC. People who drink water containing alpha emitters in excess of the MAC over many years may have an increased risk of getting cancer.

The screening testing that was done indicated that there are Gross Alpha radionuclides present in a concentration greater than the MAC. Further, more detailed radiological parameter testing is required and recommended. In addition it was noted in the HCL report that fluoride is present in this water in concentrations greater than the MAC. Further testing to confirm the fluoride levels in the water is also recommended.

Prior to the selection of a treatment process candidate schemes for this groundwater source, specific radionuclide testing and confirmation testing for fluoride is required.

4.5 GRANDE CACHE AREA TREATMENT OBJECTIVES

The data from the analysis is provided in Appendix A in its entirety. Table 4-5 shows only the parameters above the GCDW MAC and AO limits or the limits that require attention with respect to treatability. Based on the raw water quality, it appears that the Grande Cache 3 raw water data displays characteristics of typical groundwater quality. Grande Cache 1 raw water data shows some quality characteristics of surface water.

Grande Cache 1 **Grande Cache 3** GCDWQ GCDWQ **Raw Water Raw Water** Analyte Unit Limit¹ MAC/AO 24-Jun-15 5Jun-15 Iron (Fe)⁵ mg/L 0.3 AO 0.20 1.68 Manganese (Mn)⁵ AO mg/L 0.05 0.127 0.026 Turbidity⁴ 12.6^{3} NTU 0.5 MAC 0.21

 Table 4-5

 Grande Cache Raw Water Treatment Objectives

¹ Limits stipulated in the Guidelines for the Canadian Drinking Water Quality, rows highlighted in red colour indicates a value exceeded the GCDWQ limits or the levels require attention with respect to treatability.

² Indicates dissolved content, filtered through a 0.45 micron filter paper.

³ High turbidity due to precipitation from the high levels of iron and manganese in the water.

⁴ Results from onsite testing.

4.5.1 Chlorine Demand

Figures 4-5 and 4-6 show the chlorine demand curve for the raw groundwater at the Grande Cache 1 and Grande Cache 2 wells, respectively.

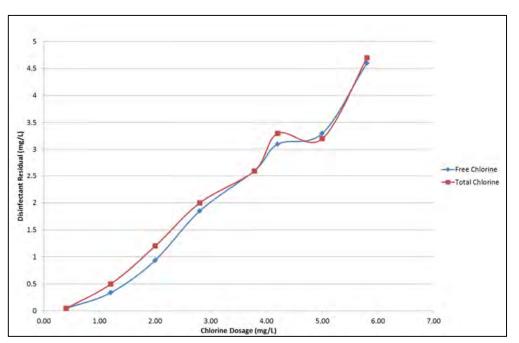


Figure 4-5 Grande Cache 1 Chlorine Demand Curve



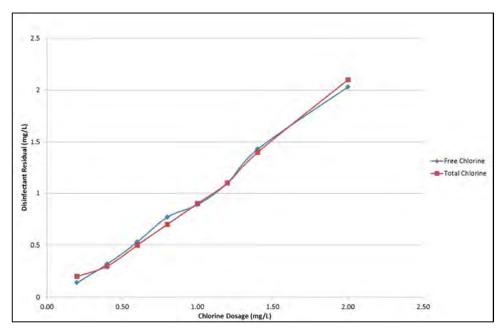


Figure 4-6 Grande Cache 3 Chlorine Demand Curve

Both of the Grande Cache chlorine demand curve suggests low ammonia interference is anticipated in the water and low chlorine demand is required to maintain free chlorine residual. Disinfection, using free chlorine, is feasible for this system, using a low chlorine dose.

4.5.2 Simulated Distribution System Test

AE conducted a 7-day simulated distribution system test to determine THM and HAA formation potential. The 7-day monitoring of DBP is the water industry norm. The test was conducted at 12°C with free chlorine residual of 1.0 mg/L. After seven days, THM concentration was 0.019 mg/L and 0.013 mg/L for Grande Cache 1 and 3, respectively. After seven days, HAA concentration was non-detect for both wells. At the end of the simulated distribution system test, the free chlorine residual was 1.49 mg/L and 1.68 mg/L respectively. Therefore, the treatment system would not need to implement disinfection by-product controls to limit the formation of THM or HAA in the distribution system.

4.5.3 Mandatory Treatment Objectives

For Grande Cache 1 well, the common groundwater treatment objectives such as iron and manganese, in this well source, are above the aesthetic limits of GCDWQ and will require treatment. The target limits are shown in parenthesis:

- Iron (<0.30 mg/L aesthetic objective); and
- Manganese (<0.05 mg/L aesthetic objective).

In addition, AEP requires the system to meet the following disinfection criteria:

Groundwater system shall provide disinfection to achieve a minimum of 4-log reduction of viruses. A disinfectant residual (total chlorine not less than 0.1 mg/L) shall be maintained in the water distribution system.

The elevated turbidity (12.6 NTU) requires attention. It may be that the well has not been used for some time and that the turbidity is falsely elevated. The GCDWQ suggests that to ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less. For systems that are not required to filter by the appropriate authority, a higher turbidity level may be considered acceptable, provided that it does not hinder disinfection. This requires review of the filtration exemption with AEP.

Grande Cache 3 well does not require treatment except for chlorination for disinfection.



5 Treatment Process Evaluation

Table 5-1 summarizes the advantages and disadvantages of the unit processes that could be used to achieve the treatment objectives identified in the raw water quality review at the various locations.

Unit Process	Description	Advantages	Disadvantages
Greensand Filters	Iron and manganese removal through precipitation by oxidation using chemical addition (chlorine or potassium permanganate)	 Removal of turbidity, iron, manganese Compact equipment size Ease of operation Cost effective Low maintenance 	 Permanganate or chlorine feed system required Does not provide filtration credits for protozoa and virus.
Breakpoint Chlorination	Process where chlorine reacts first with ammonia to form chloramines that are oxidized until free chlorine is formed	 Ease of operation Leaves a residual in the distribution system Low maintenance 	 Reacts with organic matter to form DBPs
Chloramination	Process where ammonia reacts with hypochlorite to form chloramines (no free chlorine residual is formed)	 Leaves a residual in the distribution system Does not react with organic matter to form DBPs 	 Difficult to operate High level of operator attention needed Ammonia feed required Residual loss if proper chemistry is not used
UV Disinfection	Process utilizes the germicidal effect of specific wavelengths of electromagnetic radiation to inactivate micro-organisms through the denaturing of their nucleic acids (i.e. DNA).	 Simplicity of operation. Effective inactivation of virus 	 Does not leave a disinfectant residual in the distribution system Higher operating energy requirements than chemical disinfection
Nanofiltration	Membrane process that removes suspended and dissolved solids by through a membrane material using pressure	 Removal of TOC, Turbidity, iron, manganese and hardness removal 	 ~75% water recovery (25% water loss) Higher O&M cost than conventional technologies Higher level of skill and operator training Periodic membrane cleans with different chemical Treated water could become more corrosive. Partial NF treatment and blending may be required Requires pre-treatment where iron and manganese are present

 Table 5-1

 Unit Process Description and Advantages and Disadvantages



Unit Process	Description	Advantages	Disadvantages
Reverse Osmosis	Membrane process that separated dissolved solutes by through a membrane material using high pressure	 Removal of TOC Removal of sodium, chlorides, ammonia and TDS 	 ~50% water recovery (50% water loss) Higher O&M cost than conventional technologies Higher level of skill and operator training Periodic membrane cleans with different chemical Treated water could become more corrosive. Partial RO treatment and blending may be required Requires pre-treatment where iron and manganese are present

6 Water Treatment Candidate Process Schemes

6.1 PUSKWASKAU

Based on the treatment objectives, the following candidate process or schemes can be considered for Puskwaskau. Table 6-1 summarizes the treatment objectives and corresponding unit processes that can be used to achieve the treatment objectives.

Treatment Objective	Chemically Assisted Process	Filtration Process					
Mandatory Objective							
Iron	Potassium Permanganate Oxidation with Greensand Filter	Greensand Filter					
Disinfection (4-log virus)	Breakpoint Chlorination or UV Disinfection	—					
Disinfection By-product Mitigation (Total Organic Carbon)	Chloramination and UV Disinfection to meet disinfection requirement	Nanofiltration or Reverse Osmosis					
Ammonia	_	Reverse Osmosis					
Secondary Objectives							
Total Dissolved Solids (Optional)	_	Reverse Osmosis					
Sodium (Optional)	_	Reverse Osmosis					

Table 6-1 Puskwaskau Candidate Treatment Process

The following treatment scheme was proposed, based on the information summarized in Table 5-1 and Table 6-1:

Green sand/Reverse Osmosis (RO)/Chlorination (meets mandatory and secondary treatment objectives).

6.2 GOODWIN

Based on the treatment objectives, following candidate process or schemes can be considered for Goodwin. Table 6-2 summarizes the treatment objectives and corresponding unit processes that can be used to achieve the treatment objectives.



Treatment Objective	Chemically Assisted Process	Filtration Process
Mandatory Objective		
Iron	Potassium Permanganate Oxidation with Greensand Filter	Greensand Filter
Manganese	Potassium Permanganate Oxidation with Greensand Filter	Greensand Filter
Disinfection (4-log virus)	Breakpoint Chlorination or UV Disinfection	_
Disinfection By-product Mitigation	Chloramination and UV Disinfection	Nanofiltration or
(Total Organic Carbon)	to meet disinfection requirement	Reverse Osmosis
Secondary Objectives		
Total Dissolved Solids (Optional)	—	Reverse Osmosis
Sodium (Optional)	—	Reverse Osmosis

 Table 6-2

 Goodwin Candidate Treatment Options

Three treatment options were defined based on the information summarized in Table 5-1and Table 6-2 consist of the following treatment options:

- Mandatory Treatment Objectives:
 - Option 1 Greensand/UV Disinfection/Chloramination.
 - Option 2 Greensand/Nanofiltration (NF) /Chlorination.
- Secondary Treatment Objectives:
 - Option 3 Greensand/Reverse Osmosis (RO)/Chlorination (meets mandatory and secondary treatment objectives).

6.3 SANDY BAY

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Based on the treatment objectives, following candidate process or schemes can be considered for Sandy Bay. Table 6-3 summarizes the treatment objectives and corresponding unit processes that can be used to achieve the treatment objectives.

Treatment Objective	Chemically Assisted Process	Filtration Process
Mandatory Objective – Truckfill and/or	Distribution System	
Disinfection (4-log virus)	Breakpoint Chlorination	_
Mandatory Objectives – Distribution S	ystem	
Total Organic Carbon	_	Nanofiltration or Reverse Osmosis
Secondary Objectives		
Total Dissolved Solids (Optional)	_	Reverse Osmosis
Sodium (Optional)	_	Reverse Osmosis

 Table 6-3

 Sandy Bay Candidate Treatment Options

Three treatment options were defined based on the information summarized in Tables 5-1 and 6-3 consist of the following treatment options:

- Mandatory Treatment for both truckfill and distribution system: Chlorination.
- Mandatory Treatment if a piped distribution system connected to the WTP: THM Mitigation.
- Optional Treatment: Reverse Osmosis/Chlorination.
- Conditional Treatment: UV Disinfection/Chloramination.

6.4 STURGEON HEIGHTS

Further water quality analysis required to determine treatment process requirements.

6.5 GRANDE CACHE

Based on the treatment objectives, following candidate process or schemes can be considered for Grande Cache 1 well. Only the disinfection is applicable for Grande Cache 3 well. Table 6-4 summarizes the treatment objectives and corresponding unit processes that can be used to achieve the treatment objectives.



Treatment Objective	Chemically Assisted Process	Filtration Process
Mandatory Objective		
Iron	Potassium Permanganate Oxidation with Greensand Filter	Greensand Filter
Manganese	Potassium Permanganate Oxidation with Greensand Filter	Greensand Filter
Disinfection (4-log virus)	Breakpoint Chlorination or UV Disinfection	—

 Table 6-4

 Grande Cache Candidate Treatment Options

One treatment option was defined based on the information summarized in Table 5-1 and Table 6-4 and consists of the following:

- Grande Cache 1 well mandatory treatment objectives: Greensand filtration/Chlorination.
- Grande Cache 3 well mandatory treatment objectives: Chlorination.

REPORT

7 Treatment Recommendations

7.1 PUSKWASKAU

Based on the water quality and treatability review, AE recommends the following for Puskwaskau:

- Implement a Greensand/Reverse Osmosis/Chlorination treatment scheme. Such as:
 - A bypass to RO up to 40% of the greensand filtered water with up to 60% of the RO treated water is suggested in order to meet 200 mg/L sodium, 0.8 mg/L ammonia, 500 mg/L TDS and 2 mg/L TOC in the blended water. The suggested bypass percentage requires confirmation through pilot testing.
- Conduct a pilot testing to confirm treatability.

7.2 GOODWIN

Based on the water quality and treatability review, AE recommends the following for Goodwin:

To meet the mandatory treatment objectives and the aesthetic objectives for optional removal of TDS and sodium from the well water then Option 3 - Greensand/Reverse Osmosis/Chlorination is recommended. The Greensand/NF/Chlorination Option which will only meet the mandatory treatment objectives will essentially be the same footprint and same capital cost of the option with the RO. The only difference is there is potentially more reject of water through an RO. However, with the blending this is minimized.

A bypass to RO up to 10% of the greensand filtered water with up to 90% of the RO treated water is suggested in order to meet 200 mg/L sodium, 500 mg/L TDS and 2 mg/L TOC in the blended water. The suggested bypass percentage requires confirmation through pilot testing.

7.3 SANDY BAY

Based on the water quality and treatability review, AE recommends the following for Sandy Bay:

During a meeting on October 26, 2015 with the MD, if was confirmed that there is no desire to provide a distribution system to Sandy Lake community. Therefore, chlorination will be the only treatment required.

7.4 STURGEON HEIGHTS

Further water quality analysis is recommended to determine the treatment requirement for the Sturgeon Heights raw water source. The MD indicated that they do not wish to pursue further testing at this time.



7.5 GRANDE CACHE AREA

Based on the water quality and treatability review, AE recommends the following for the Grande Cache area wells:

Grande Cache 1 well:

Greensand filtration/Chlorination

Grande Cache 3 well:

Chlorination

A new well will need to be drilled and licenced for the Grande Cache area and water quality confirmed. The water sampling done for the purpose of this report was to get an indication of the water quality from aquifers in the area. When a hydrogeological exploration is conducted to find a source for the water treatment and truckfill facility, the same aquifer that is the source for Well 3 should be sought after.

The additional information that Associated Engineering received from AEP indicating that the wells around Victor Lake are likely under the direct influence of surface water indicates that a water treatment facility in the Victor Lake area would be similar to a surface water treatment facility. If the MD is interested in having multiple water treatment and water points with the Grande Cache area, the water treatment process in Victor Lake would require pre-treatment and ultrafiltration membranes.

7.6 WATER TREATMENT SUMMARY

Table 7-1 is a summary of the treatment recommendations to meet both the mandatory and secondary treatment objectives identified for each location.

Puskwaskau	Goodwin	Sandy Bay	Sturgeon Heights ¹	Grande Cache 1	Grande Cache 3
GSF	GSF		TBD	GSF	
RO	RO		TBD		
Cl ₂	Cl ₂	Cl ₂	TBD	CI_2	Cl ₂
Pilot	Pilot	Pilot	TBD		

 Table 7-1

 Summary of Treatment Recommendations to Meet All Treatment Objectives

¹ Further water quality analysis required to determine treatment recommendations.

8 Design Criteria

The design criteria for a water treatment plant with truck fill service only (no distribution system) is established using the service area, the population within the service area, the projected population growth, peak day factors, and ultimately the treated water demand. Typically, the water demand can be determined using historical water consumption data. However, in this particular project the water points currently provide non-potable water so the data on water usage will not directly relate to the usage once the water points are providing high quality potable water. Some assumptions are therefore necessary to ascertain the expected treated water demand at each location and will be clearly stated throughout the report. The design criteria will be used to determine a threshold potable water demand for each location for planning purposes.

8.1 SERVICE AREA AND POPULATION

The watering points in the North-East portion of the MD; Puskwaskau, Goodwin, Sandy Bay, and Sturgeon Heights, currently provide non-potable water of varying quality. The service areas for the proposed potable water truckfill locations needs to be estimated, as there will likely be more consumers of potable water than the current non-potable water. The service areas are estimated by placing a logical boundary around each of the four watering points. The boundaries were determined considering proximity to other potable water service points, and capturing the likely users of the potable water truckfill.

The 2014 Land Ownership Maps provided by the MD were used to determine the number of permanent dwellings and seasonal dwellings within the within each service area. The total number of dwellings (both permanent and seasonal) in each of the proposed service areas is used in combination with the assumption of 2.7 residents per dwelling (According to the Statistics Canada Census, from 2001 to 2011, the M.D. of Greenview had an average population density of 2.7 people per household) which provides the estimated population to be served with potable water within each service area. For the purpose of this report it is assumed that 100% of the population will use the potable water truckfill for domestic use.

The future 10-year and 25-year population projections were determined using a 1.0% annual growth rate. Figure 8-1 shows the Puskwaskau proposed service area.

Figure 8-2 shows the Goodwin proposed service area. The service area for Goodwin is large and contains the highest population. This is considering that there is currently no truckfill at Debolt or Ridgevalley so the nearest future potable water truckfill will be at Crooked Creek.

Figure 8-3 shows the Sandy Bay proposed service area, and Figure 8-4 shows the Sturgeon Heights proposed service area.



The 2014 Land Ownership Map, as shown in Figure 8-5, reveals that in the Grande Cache area, within the southwest region of the MD, has 142 lots located within the six cooperatives. Using the assumption that there is an average of 2.7 residents per lot (refer back to above for explanation); approximately 384 people are within the service area. An MD representative confirmed that the service population for the Grande Cache service are is 400 people. An annual population increase of 1% is assumed to project the 10 year and 25 year service populations.

The populations for each of the service areas are summarized in Table 8-1.

Leasting	Current Population		10-Year Projection			25-Year Projections			
Location	Perm	Seasonal	Total	Perm	Seasonal	Total	Perm	Seasonal	Total
Puskwaskau	208	30	238	230	33	263	267	39	306
Goodwin	568	41	609	627	46	673	728	53	781
Sandy Bay	77	147	224	85	163	248	98	189	288
Sturgeon Heights	257	382	638	283	422	705	329	490	819
Grande Cache Area ¹	_	_	404	—	_	446	—	_	518

 Table 8-1

 Populations for Each Service Area

¹ Total for all 7 Co-operatives.

The total population projections are shown graphically in Figure 8-1.

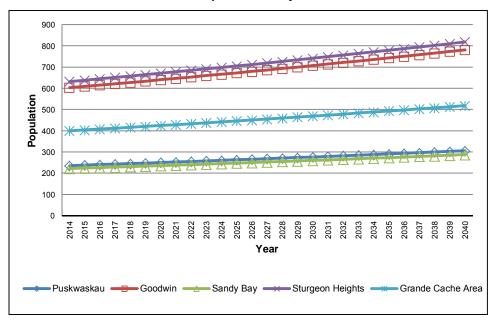
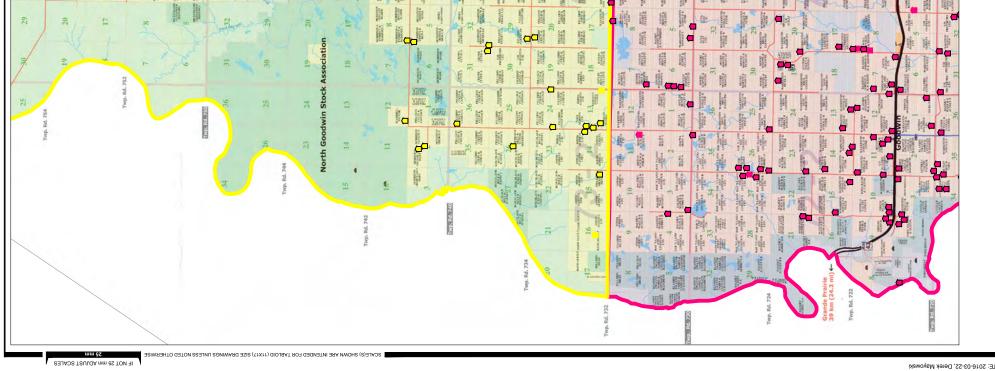


Figure 8-1 Total Population Projections

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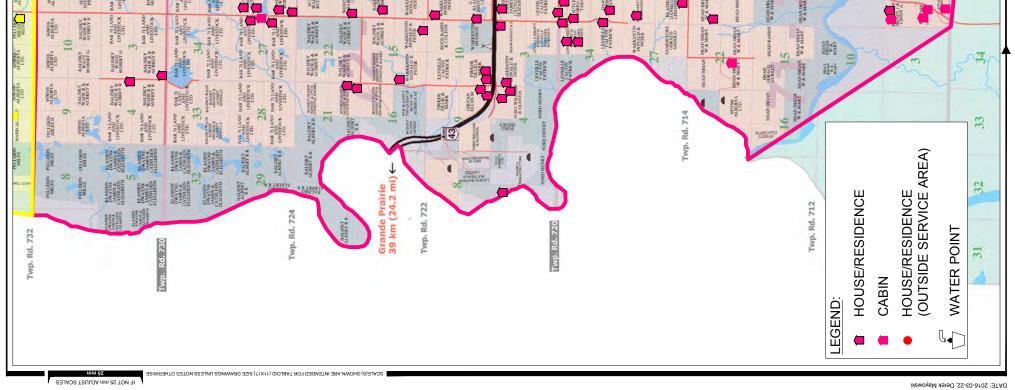
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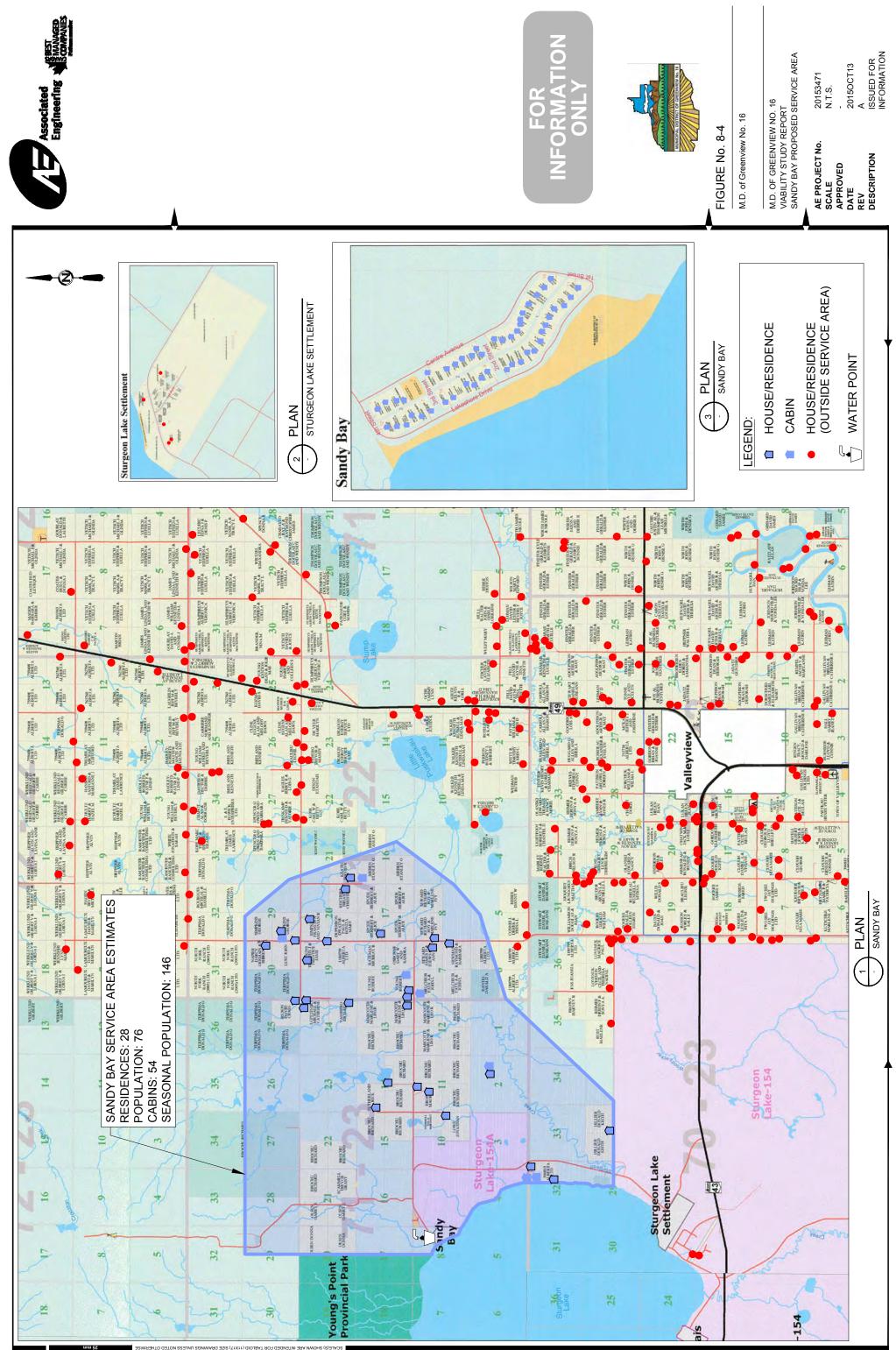


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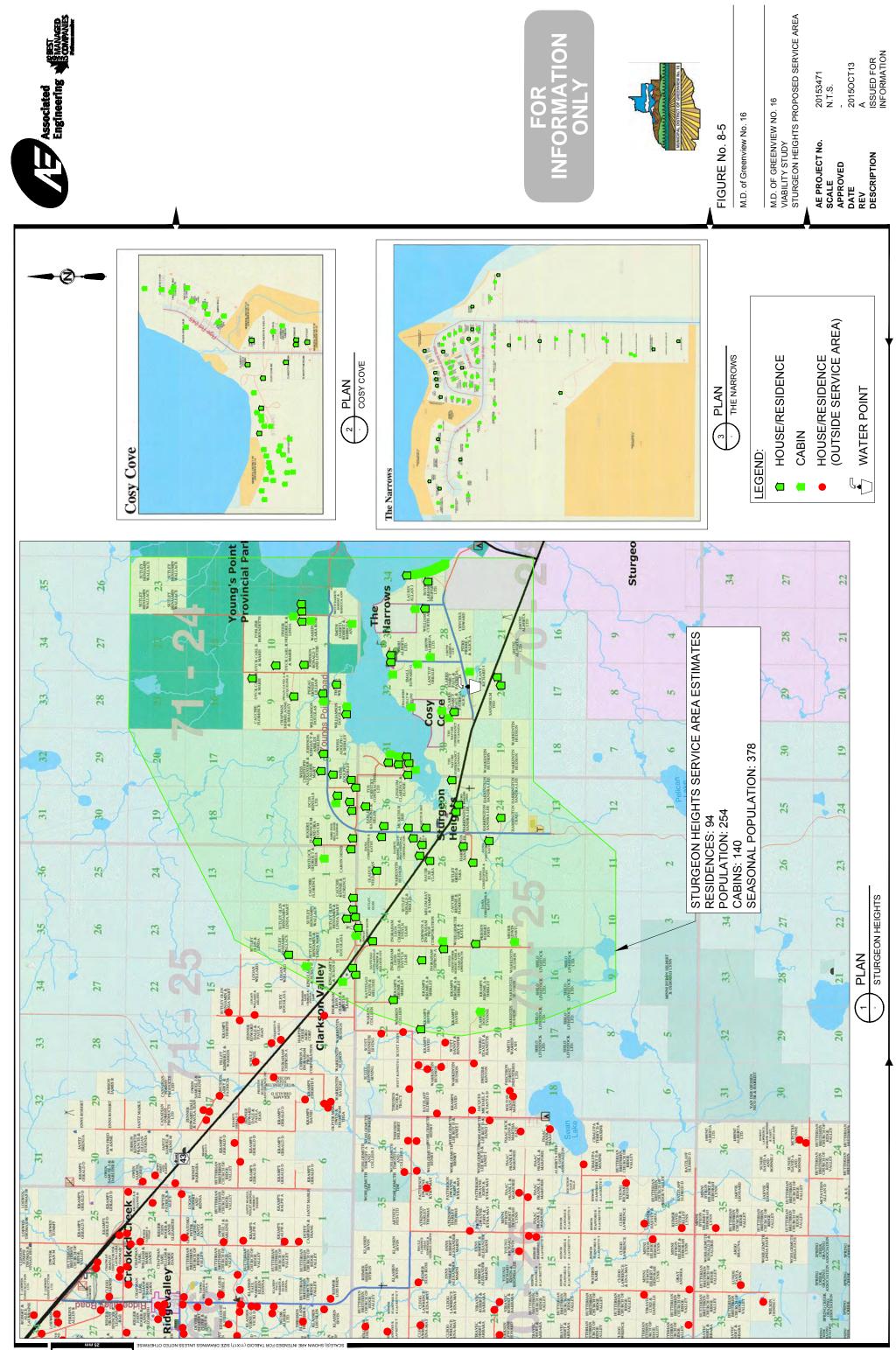
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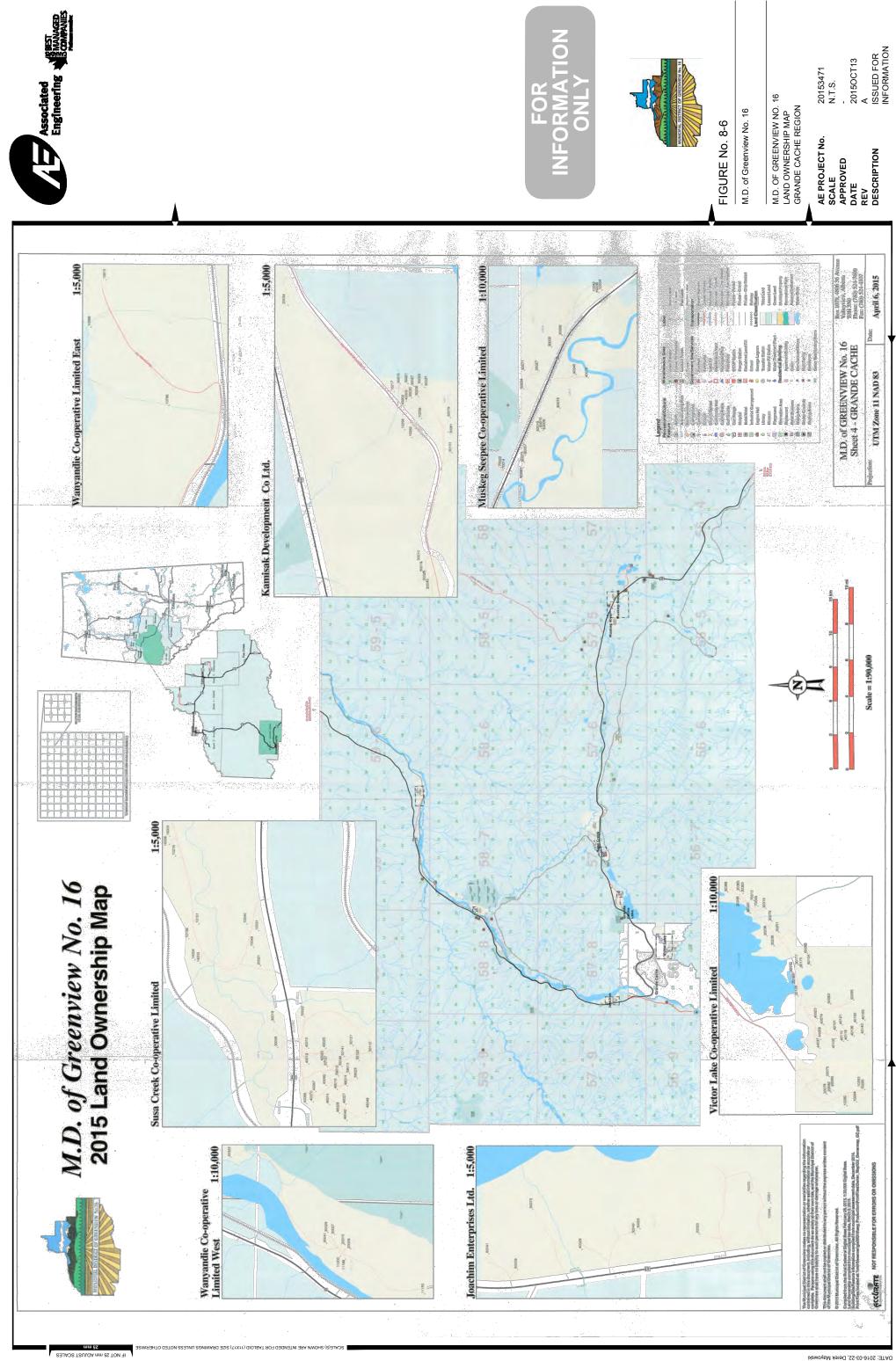
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A comparison was done cross referencing the Alberta Groundwater Well Data Base with the information on the Land Ownership Maps to determine how many dwellings are likely currently using personal wells as a water supply. It was determined that approximately 60% of the land owners have registered wells. It can be assumed that not all wells are registered and licenced and therefore omitted from the Well Data Base, so it is a reasonable assumption that 75% of homes have personal wells. For the purpose of this report we will assume 100% of the total population in the service area will use the potable water truckfill on a regular basis. A next step for the MD would be to survey the service populations to help determine what the actual demand for potable water will be.

Grande Cache area population was broken down per Co-operative to determine where the population is concentrated. The populations for each service area in the Grand Cache area are summarized in Table 8-2. For the purpose of this report, we will assume 100% of the total population in the service area will use the potable water truckfill on a regular basis.

Location	Current Population	10-Year Projection	25-Year Projections
Joachim Enterprises Ltd.	27	30	35
Victor Lake	115	127	148
Kamisak	57	64	74
Susa Creek	104	115	133
Muskeg SeePee	52	58	67
Wanyandie West	25	28	32
Wanyandie East	9	10	12

Table 8-2						
Grande Cache Service Areas						

The population density is the highest in the southern Co-operatives; Victor Lake, Kamisak, Susa Creek and Muskeg SeePee. The total population projections for the Grande Cache area Co-operatives are shown graphically in Figure 8-7.



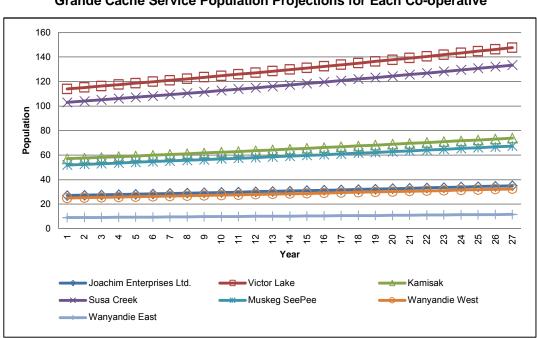


Figure 8-7 Grande Cache Service Population Projections for Each Co-operative

8.2 TREATED WATER DEMAND

The threshold demand for each potential truck fill location is determined using the design standard of similar northern projects, where the intended use is exclusively for domestic use. An estimate of 180 Liters Per Capita per Day (L/C/D) is used in combination with the population projections to estimate the average daily treated water consumption in each service area.

The projected threshold treated water demand for the total estimated service population is presented in Table 8-3.

	Current	10-Year	25-Year
Location	Total Pop Avg Day (m³/d)	Total Pop Avg Day (m ³ /d)	Total Pop Avg Day (m ³ /d)
Puskwaskau	43	48	56
Goodwin	110	122	141
Sandy Bay	41	45	52
Grande Cache ¹	73	81	95

Table 8-3Projected Treated Water Threshold Demands

¹ Total for all seven co-operatives.

	Current	10-Year	25-Year	
Location	Total Pop Avg Day (m ³ /d)	Total Pop Avg Day (m ³ /d)	Total Pop Avg Day (m ³ /d)	
Joachim Enterprises Ltd.	5	6	7	
Victor Lake	21	23	27	
Kamisak	11	12	14	
Susa Creek	19	21	25	
Muskeg SeePee	10	11	13	
Wanyandie West	5	6	6	
Wanyandie East	2	2	3	

 Table 8-4

 Projected Treated Water Threshold Demands for Co-operatives

8.3 TREATED WATER STORAGE

The total treated water storage capacity of a truckfill needs to include two major factors of potable water supply; demand and contact time storage volume (for disinfection). AEP 2006 Standards and Guidelines require a minimum of 4.0-log reduction of viruses for groundwater source not under direct influence of surface water which is all of the groundwater sources in this study.

The storage volume necessary to achieve the required contact time for disinfection is dependent on factors such as the raw water flow rate, baffling condition in the treated water reservoir, the target chlorine residual, temperature, and pH of the raw water. Assuming an unbaffled condition ($T_{10}/T = 0.1$), a temperature of 0.5°C, a pH level of between 6 and 9, and a free chlorine residual of 1 mg/L, the required contact volume for groundwater is determined.

In addition, the water demand from the truckfill is considered when sizing the treated water storage. The size of trucks filling, time to fill each truck and the expected number of trucks filling per day need to be considered in sizing the treated water reservoir.

Location	25-Year Average Day (m ³ /day)	•	
Puskwaskau	56	15	71
Goodwin	148	42	190
Sandy Bay	52	11	63
Grande Cache 1	95	20	115

 Table 8-5

 Treated Water Storage Requirements



8.4 RAW WATER DEMAND

With any water treatment process there are water losses throughout the process. The raw water demand is determined by the sum of the treated water demand and the water lost through the entire water treatment process scheme. For each location and the recommended treatment scheme for that particular location, the 10-year and 25-year raw water demands are shown in Table 8-6.

Location	Well Licence Annual Diversion (m ³ /year)	Well Licence Average Day Diversion (m ³ /day)	Well Licence Maximum Diversion (m ³ /day)	Projected Current Raw Water Demand (m ³ /day)	Projected 10-Year Raw Water Demand (m ³ /day)	Projected 25-Year Raw Water Demand (m ³ /day)
Puskwaskau	8,630	23.6	52	54	60	70
Goodwin	8,637	23.7	65	158	174	201
Sandy Bay	24,000	65	65	41	45	52
Grande Cache 1	TBD	TBD	TBD	77	84	98

 Table 8-6

 Well Licence and Raw Water Demand for Each Location

The projected raw water demand in Puskwaskau and Goodwin for the current, 10-year, and 25-year are greater than the current diversion licence for the existing well. Either the current well will need to be pump tested to ascertain if it is capable of a higher yield, or an additional well will be required to meet the project raw water demands in Puskwaskau and Goodwin. For the purpose of this report and the capital cost estimate, it will be assumed that a new well is required.

The Sandy Bay well current licence is sufficient to meet the current, 10-year and 25-year raw water demand projections.

For the Grande Cache area, it is assumed that a new well is required.

9 Cost Estimates for Potable Water Supply

The following were factors considered when developing options with the MD for each location:

- Distance residents would need to travel to the nearest potable water truckfill.
- Population density.
- Minimizing the number of water treatment facilities within the MD.

9.1 PUSKWASKAU

Given the location of Puskwaskau being isolated from any other water source, having a potable water source in Puskwaskau is desired by the MD. The intention of this water point is to service the population as indicated in Figure 8-2. This includes the population north, east and west of the water point to the MD boundary and south of the watering point halfway between Goodwin and Puskwaskau.

9.1.1 Puskwaskau Option

The capital cost for this option includes the following:

- New raw water well and pump to meet the projected raw water demand.
- Underground concrete treated water reservoir to meet the 25 year demand. Two isolated cells to manage turnover.
- New pre-engineering building above the treated water reservoir. The building size considered is large enough to accommodate the addition of a second process train should the demand increase.
- Recommended treatment process (GSF/RO/Chlorination) and ancillary equipment to meet the 10-year demand.
- Chemical feed systems.
- Truckfill pumps (duty/standby).
- Code activated truckfill system (Flow Point).
- HVAC system upgrade.
- Upgrades to the Electrical Instrumentation and Controls.

A layout of the equipment and approximate building size for Puskwaskau are provided in Figure 9-1.

9.2 GOODWIN

Through discussion with the MD and being mindful of minimizing the number of water treatment facilities in the MD, there are two potential options to consider for the Goodwin watering point:

Upgrade the facility with a water treatment system to provide potable water at this location. Upgrade the Debolt Water Treatment Plant and run a pipeline from Debolt to Goodwin to supply potable water.

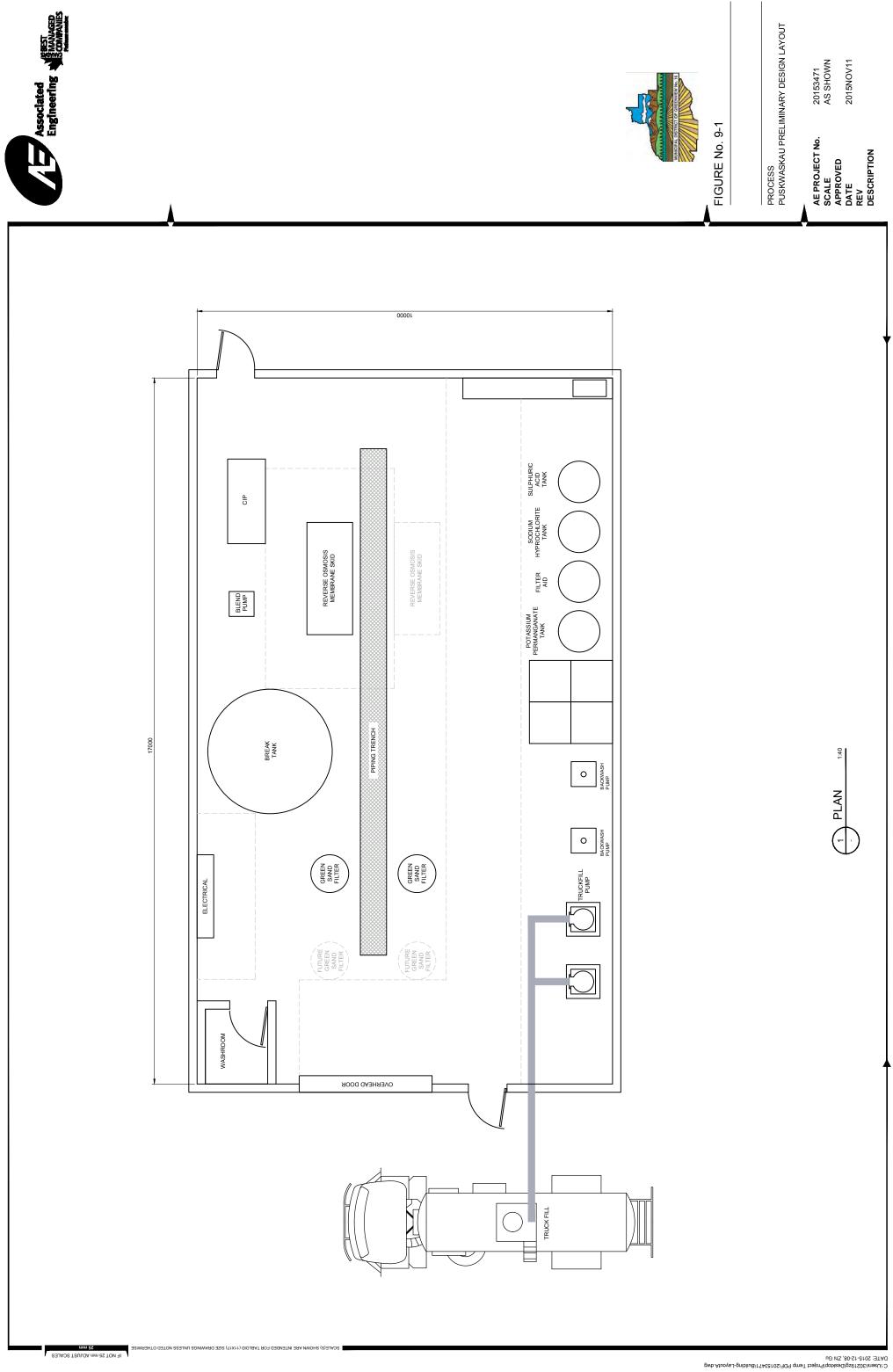


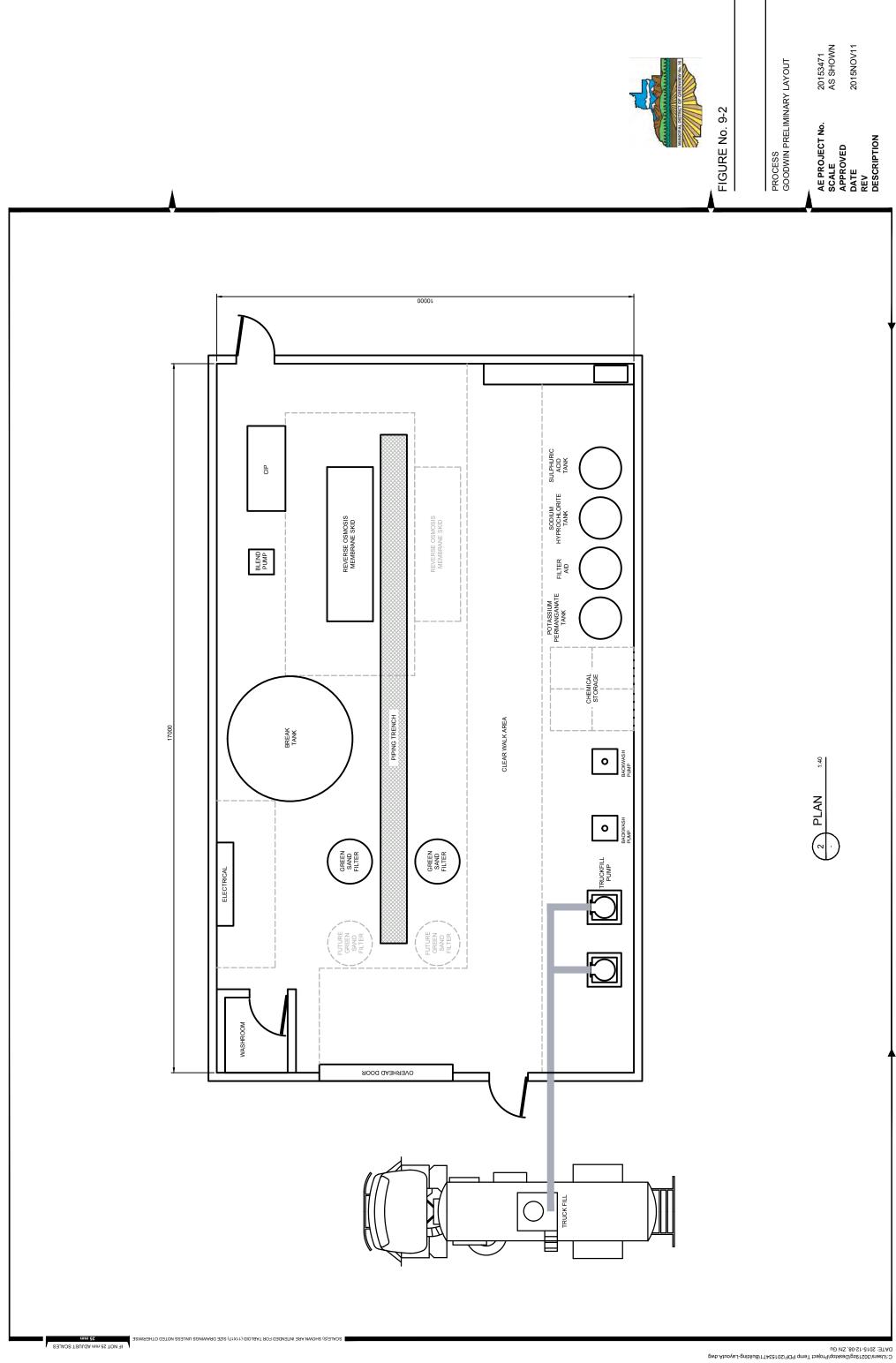
9.2.1 Goodwin Option 1

The capital cost for this option includes:

- New raw water well and pump to meet the projected raw water demand.
- Underground concrete treated water reservoir to meet the 25 year demand. Two isolated cells to manage turnover.
- New pre-engineered building above the treated water reservoir. The building size considered is large enough to accommodate the addition of a second process train should the demand increase.
- Recommended treatment process (GSF/RO/Chlorination) and ancillary equipment to meet the 10 year demand.
- Chemical feed systems.
- Truckfill pumps (duty/standby).
- Code activated truckfill system (Flow Point).
- HVAC system upgrade.
- Upgrades to the Electrical, Instrumentation and Controls.

A layout of the equipment and approximate building size for Goodwin Option 1 is provided in Figure 9-2.





9.2.2 Goodwin Option 2

Goodwin Option 2 is a pipeline from Debolt to the Goodwin watering point, which is approximately 8 km. This option is conditional on the Debolt Water Treatment Plant undergoing an upgrade to be able to supply potable water to the Goodwin in addition to keeping up with the demand of the distribution system at Debolt. If the Debolt Water Treatment Plant is able supply water to Goodwin, this option would eliminate one potential water treatment facility within the MD.

9.3 SANDY BAY

Sandy Bay has a large seasonal population. However, the water treatment and truckfill system needs to be handle the high season and therefore is considering the total population for Sandy Bay. If the MD decides to eliminate the watering point at Sturgeon Heights, Sandy Bay utilization may potentially increase.

9.3.1 Sandy Bay Option

The capital cost for this option includes the following:

- Underground concrete treated water reservoir to meet the 25 year demand. Two isolated cells to manage turnover.
- New pre-engineering building above the treated water reservoir.
- Recommended treatment process (Chlorination) and ancillary equipment to meet the 25 year demand.
- Chemical feed system.
- Truckfill pumps (duty/standby).
- Code activated truckfill system (Flow Point).
- HVAC system upgrade.
- Upgrades to the Electrical, Instrumentation, and Controls.

A layout of the equipment and approximate building size for Sandy Bay are provided in Figure 9-3.

9.4 STURGEON HEIGHTS

If the MD wishes to pursue a potable water truckfill at this location, further water quality analysis is required. Given the location of this watering point and the proximity to the future potable water truckfill at Crooked Creek and the potential potable water truckfill at Sandy Bay, the MD may consider closing this watering point down or keeping it as a non-potable water point.



9.5 GRANDE CACHE REGION

Through discussions with the MD representatives two potential options for the Grande Cache area were discussed:

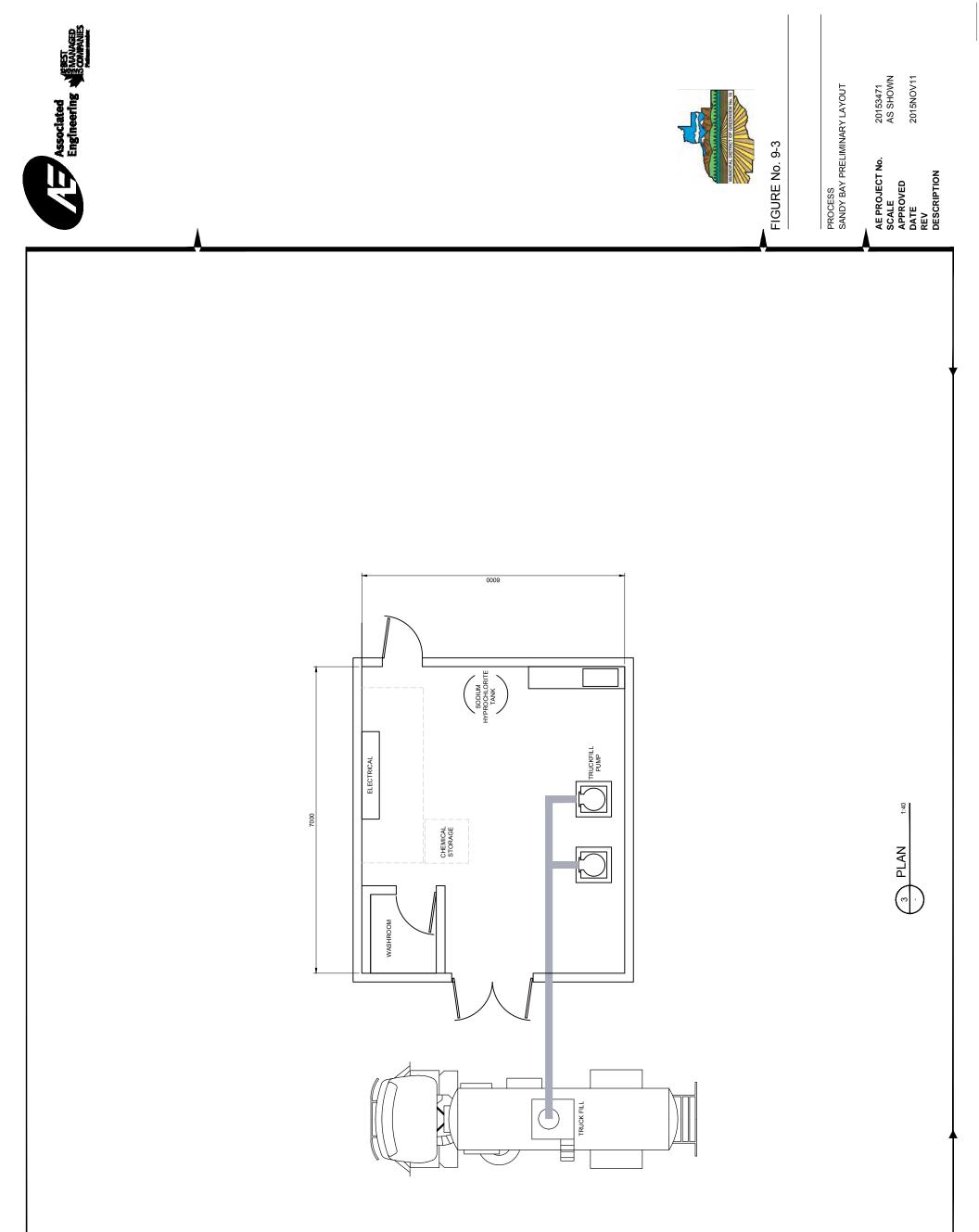
- 1. A water treatment facility and truckfill in a central location amongst the Co-operatives in close proximity to the highest population density.
- 2. Piping water from the future Grande Cache Water Treatment Plant to a central location amongst the Co-operatives Operatives in close proximity to the highest population density.

9.5.1 Grande Cache Region Option 1

The capital cost for this option includes the following:

- New raw water well and pump to meet the projected raw water demand.
- Underground concrete treated water reservoir to meet the 25 year demand. Two isolated cells to manage turnover.
- New pre-engineering building above the treated water reservoir. The building size considered is large enough to accommodate the addition of a second process train should the demand increase.
- Recommended treatment process (GSF/Chlorination) and ancillary equipment to meet the 10 year demand.
- Chemical feed systems.
- Truckfill pumps (duty/standby).
- Code activated truckfill system (Flow Point).
- HVAC system upgrade.
- Upgrades to the Electrical, Instrumentation and Controls.

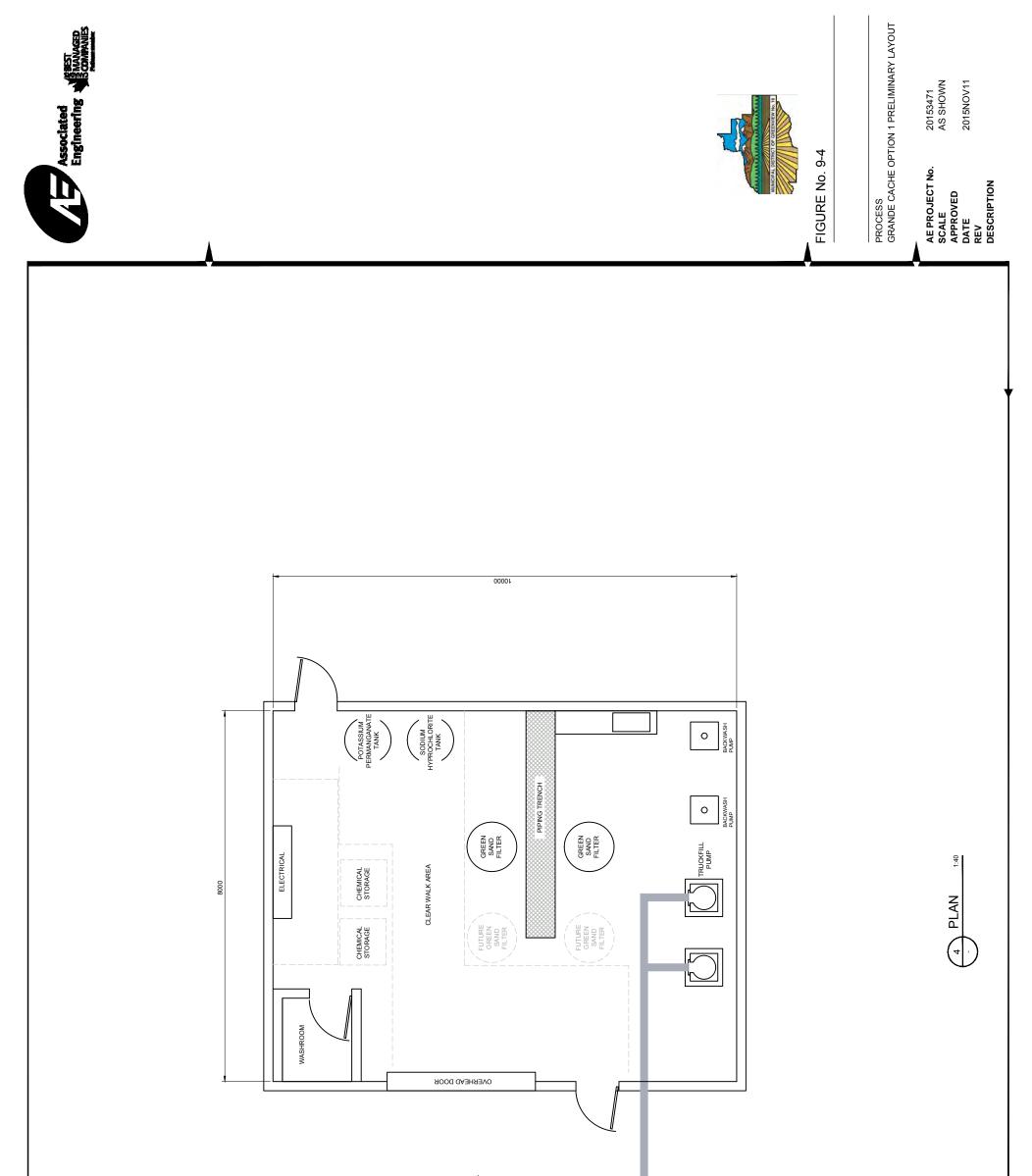
A layout of the equipment and approximate building size for Grande Cache are provided in Figure 9-4.

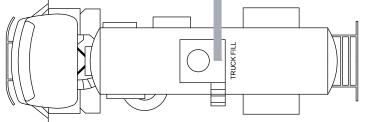


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9.5.2 Grande Cache Region Option 2

Grande Cache Option 2 is a pipeline from the new Grande Cache Water Treatment Plant to the Susa Creek Co-operative. Susa Creek is approximately 11 km from the Grande Cache Water Treatment plant. The objective of this option is to bring potable water closer to the population density.

9.6 COST SUMMARY OF OPTIONS

The table below is a summary of the capital cost, contingency, engineering, annual O&M and lifecycle cost for each option. Life cycle costs were calculated assuming a life cycle of 25 years, and operations and maintenance cost inflation of 2% a year, and a discount rate of 2%.

Description	Capital Cost	Contingency	Engineering	Total	Annual O&M	Life Cycle Cost
Puskwaskau	\$1,800,000	\$540,000	\$281,000	\$2,621,000	\$120,000	\$4,516,000
Goodwin Option 1	\$1,940,000	\$582,000	\$303,000	\$2,825,000	\$147,000	\$5,220,000
Goodwin Option 2	\$2,000,000	\$600,000	\$312,000	\$2,912,000	\$10,000	\$2,912,000
Sandy Bay	\$530,000	\$160,000	\$83,000	\$773,000	\$94,000	\$2,395,000
Grande Cache Option 1	\$1,115,000	\$334,000	\$174,000	\$1,623,000	\$118,000	\$3,576,000
Grande Cache Option 2	\$2,775,000	\$832,500	\$433,000	\$4,040,500	\$10,000	\$2,975,000

 Table 9-1

 Summary of Cost Estimate for All Options



10 Recommendations

The objective of this report was to determine the cost to produce potable water at the four existing watering points; Puskwaskau, Goodwin, Sturgeon Heights and Sandy Bay, as well as in the Grande Cache area. Prior to proceeding to the next steps for developing the non-potable watering points into water treatment facilities with truckfills, the MD should execute the following recommendations.

10.1 GENERAL FOR ALL LOCATIONS

- The assumption for the purpose of this report is that 100% of the population in the identified service area for each watering point will use the truckfill for domestic use. This assumption provides a worst case scenario and ensures the cost estimate would cover this condition. If the flow decreases by 25%, this does not substantially affect the cost estimate. The MD should take steps to confirm the service area and service population for each watering point to determine the number of residents that will use the truckfill regularly for domestic use and those that will continue to use personal wells. This is important to ensure that there is adequate turnover of the water in the truckfill reservoir.
 - Determine if there will be users other than residents for domestic use, such as industrial or agricultural. An allowance can be added to account for these users.

10.2 PUSKWASKAU

- Ensure through hydrogeological review and investigation that there is sufficient water quantity at Puskwaskau, and that the MD can acquire a diversion licence for the required quantity prior to proceeding to next steps for a treatment facility at this location.
- Pilot testing for the Puskwaskau treatment process is recommended to ensure the water quality and rejection rate of the process scheme is as anticipated.

10.3 GOODWIN

10.3.1 Option 1

- Ensure through hydrogeological review and investigation that there is sufficient water quantity at Goodwin, and that the MD can acquire a diversion licence for the required quantity prior to proceeding to next steps for a treatment facility at this location.
- Pilot testing for the Goodwin treatment process is recommended to ensure the water quality and rejection rate of the process scheme is as anticipated.

10.3.2 Option 2

For Option 2, where Goodwin Truckfill would be supplied by Debolt water treatment plant. Further detailed investigation into the raw water supply quantity, the treatment capacity, and the treated water storage capacity, at Debolt, is required prior to proceeding with this option.



10.4 STURGEON HEIGHTS

- Further water quality testing for the Sturgeon Heights groundwater if the MD wishes to pursue having a potable water truckfill at this location. Additional water quality data is required to determine the treatment process required.
- The MD mentioned that given the water quality at Sturgeon Heights it may consider closing this watering point, or maintaining it as a non-potable water source.

10.5 SANDY BAY

• If the MD considers closing the watering point at Sturgeon Heights, the service population allocated for the Sandy Bay location in this report may increase given its proximity to Sturgeon Heights.

10.6 **GRANDE CACHE**

10.6.1 Option 1

- When the hydrogeological exploration for a source well for the Grande Cache area takes place, the aquifer that supplies Well 3 should be sought after. The water quality data from Well 3 displays water quality characteristics typical of HQGW.
- Confirmation of the water quality in Grande Cache once the MD had determined which well/aquifer they are going to use to supply the water treatment/truckfill facility.
- Ensure through hydrogeological review and testing that there is sufficient water quantity at Grande Cache and that the MD can acquire a diversion licence for the required quantity prior to proceeding to next steps for a treatment facility.

10.6.2 Option 2

Determine the exact location for the truckfill within the MD.

11 Other Considerations

Although constructing a water treatment facility at each of the water point locations is doable, there are some limitations of this strategy that should be considered. Adding water treatment facilities to the number of treatment facilities that already exist in the MD will require more operational attention. This may increase the challenge that already exists in the MD with operators travelling between facilities and providing the attentiveness required at each facility. There may be opportunities for the MD to alleviate some of the operations stress by considering an alternative approach.

The general initiative within the Province of Alberta is to reduce the quantity of water treatment facilities and have larger water treatment hubs with transmission pipelines. This regionalization approach is encouraged by the Province through funding programs such as Water for Life, where there is the opportunity to receive funding up to 90% of the total project cost. Given the situation within the MD and challenges of providing high quality potable water to all residents spread over a large area, a regional servicing strategy may be a consideration.

The advantages of an alternative regionalized approach include:

- Simplified operations with lower operating stress;
- Lower operating and maintenance costs;
- Opportunities for funding for regional systems; and
- Approved regional projects have the potential to receive a higher percentage of provincial funding than a non-regional project.

Further study to compose a master plan or a migration path for the MD with respect to water supply within the entire MD may be considered.

AE will await direction from the MD on how they wish to proceed.



REPORT

Closure

This report was prepared for the M.D. of Greenview No. 16 to determine the treatment required to provide high quality, potable water at four watering point sites in the Northeast region of the MD and one potential watering point site in the Grande Cache region of the MD.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted, Associated Engineering Alberta Ltd.



Marianne Lund, P.Eng. Process Engineer



Nicholai Kristel, P.Eng. Process Engineer

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Haur Wa	e
31 March 3	2016
	Hans Wa





Appendix A – Water Well Licences





to DIVERT AND USE WATER

ENVIRONMENT

Pursuant to the WATER RESOURCES ACT

File No. 20671

Priority No. 1984-11-09-01

Purpose Domestic Drainage Basin Peace River First Issued 1986 08 11 Her Majesty in ri

Her Majesty in right of Alberta as presented by the Minister of Municipal Affairs Edmonton, Alberta

HAVING COMPLIED with the applicable provisions of the Water Resources Act and the regulations thereunder and Interim Licence No. 13439 , a copy of which is attached hereto and incorporated herein,

IS HEREBY GRANTED LICENCE to divert and use the quantities of water prescribed in the Interim Licence in accordance with and subject to all other applicable provisions of that Act and the regulations thereunder, and the terms and conditions attached hereto and incorporated herein, at locations described in the Interim Licence,

BY MEANS AND THROUGH works and undertakings described in the Interim Licence.

1986 08 11

Date

Controller of Water Resources

0333x

WR 4 (Feb/86)

Government of Alberta

Environment

LICENCE AMENDMENT

PURSUANT TO THE PROVISIONS OF THE WATER ACT

LICENCE No.	Dated 1986 08 11
FILE No.	20671
PRIORITY No.	1984-11-09-001
EFFECTIVE DATE	March 31, 2011
AMENDMENT No.	00030739-00-01

Municipal District of Greenview No. 16

The licence is amended as follows:

- Change the Licence Holder (the "Licensee") from Her Majesty in right of Alberta as represented by the Minister of Municipal Affairs to the Municipal District of Greenview No. 16.
- Change the purpose from Domestic to Municipal.
- Delete condition 2 and substitute with the following:
 - 2.0 The Licensee shall equip the production well with a cumulative meter or other device which measures the number of cubic metres pumped.
- Delete condition 5 and substitute with the following:
 - 5.0 The Licensee shall:
 - (a) monitor the total number of cubic metres of water diverted; and
 - (b) record the total number of cubic metres of water diverted

from the production well on a monthly basis.

AMENDMENT

- 5.1 The Licensee shall record and retain all of the following information for a minimum of 5 years after being collected:
 - (a) the place, date and time of all monitoring and measuring; and
 - (b) the results obtained pursuant to 5.0.
- 5.2 The Licensee shall report to the Director the results of the measuring and monitoring required in 5.0 using the "Water Use Reporting System" and any other information required in writing by the Director.
- 5.3 The Licensee shall submit the report required in 5.2 on or before the end of the month following the month in which the information is based upon was collected.
- 5.4 "Water Use Reporting System" means the secure internet website provided by Alberta Environment at <u>http://www.environment.alberta.ca/01301.html</u> for submitting measuring and monitoring results electronically to the Director.
- 5.5 The Licensee shall comply with the terms and conditions of the "Water Use Reporting System User Consent".

Designated Director under the Act Gary Sasseville, M.Eng., P.Eng.

2011-03- 0/ Dated (Y/M/D)



INTERIM LICENCE

Pursuant to the WATER RESOURCES ACT

Nº 13439

Her Majesty in right of Alberta as represented by the Minister of Municipal Affairs Edmonton, Alberta

File No. 20671 Priority No. 1984-11-09-01

having complied with the applicable provisions of the Water Resources Act and the regulations thereunder is hereby authorized, as soon as right-of-way is obtained:

A. To construct works as shown on plans and reports filed, approved and identified in departmental records as:

20671-R1	Peace River Basin Plan 1984 Assessment of Municipal Groundwater
	Supplies Hamlet of Goodwin
20671-1	Approximate Water Well Location Alberta Municipal Affairs
	LSD 13-5-72-1-6

B. To divert and use water as hereinafter specified and described subject to the terms and conditions attached hereto and incorporated herein:

PURPOSE: Domestic (Community Water Supply

SOURCE OF SUPPLY: Aquifer

GROSS DIVERSION: Up to 7 acre-feet (1.9 million Canadian gallons) per annum consisting of:

- Estimated Consumptive Use: 1.9 million gallons
- Estimated Losses: NIL
- 3. Estimated Return Flow: NIL

POINT OF	WELL	PRODUCTION	MAXIMUM	MAXIMUM ANNUAL
DIVERSION	NUMBER	INTERVAL	PUMP RATE	DIVERSION
13-5-72-1-6	84-11-09-01	260'-280' 300'-320'	10 Cgpm	1.9 mCg

The term within which construction is to be completed expires on 1985 12 03

1984 12 03

Date Issued

In Controller of Water Resources

Original — Department Copy — Licensee (See over for excerpts) WR2 (Aug. 84) 0504i

File: 20671

TERMS AND CONDITIONS INTERIM LICENCE NO. 13439

 If deemed necessary by the Controller of Water Resources, the licensee may be required to measure the water levels in the production well(s), while the pump is operating, on a monthly or weekly basis and to make such modifications to the well(s) as necessary to obtain the water level(s).

*If deemed necessary by the Controller of Water Resources, the **The** production well(s) shall be equipped with a cumulative meter which registers the number of gallons or cubic metres pumped.

If deemed necessary by the Controller of Water Resources the licensee shall obtain water samples for purposes of chemical analyses from the production well(s). The analyses must include total dissolved solids, pH, Ca, Mg, Na+K, CO₃, HCO₃, SO₄, Cl, Fe and NO₃.

4. If deemed necessary by the Controller of Water Resources, the licensee may be required to install an observation well or wells, completed in the same aquifer as the production well(s), to provide data for the evaluation of the effect of this withdrawal on the aquifer and the effect on other ground water users.

*If deemed necessary by the Controller of Water Resources, the ¥he licensee shall submit an annual return to the Controller of Water Resources on or before January 31 in each year for the preceding year including:

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5.

2.

AMENDED .

DATED

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CONTROLLER



AMENDED .

DATED

a) Monthly readings of the number of Canadian gallons or cubic metres pumped from the well(s) as per clause 2.

(b) The total annual quantity pumped expressed in Canadian gallons or cubic metres,

and such other information as may from time to time be required.

- Clause 5 may be waived upon completion of three (3) years of production providing complete and accurate annual returns have been submitted as required by this clause.
- 7. When requested to do so by the Controller of Water Resources, the licensee shall have the annual return detailed in clause 5 prepared, in whole or in part, by a qualified ground water consultant who is a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
- The rights and privileges hereby granted are subject to periodic review and to modification to ensure the most beneficial use of the water in the public interest and more particularly to ensure preservation of the rights of other water users.

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- The rights and privileges hereby granted can only be extended, modified, transferred or assigned with the approval of the Controller of Water Resources and are subject to cancellation or modification as provided in the Water Resources Act.
- Following completion of the works herein authorized this interim licence and its terms and conditions shall be attached to and become part of the licence to use water issued under provisions of Section 33 of the Water Resources Act.

1984 12 03 Dated at Edmonton

for Water Resources Controller of

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2014 Update of the Sturgeon 2009 Water Supply Well

Sturgeon Area SW 29-070-24 W5M

> Prepared for M.D. of Greenview

MUNICIPAL DISTRICT OF GREENVIEW No. 16 RECEIVED

JAN 1 3 2015

VALLEYVIEW

Prepared by hydrogeological consultants ltd. (HCL) 1.800.661.7972

HCL Project No.: 14-0273.01

PERMIT TO PRACTICE HYDROGEOLOGIC ANTS LTD. Signature Date_ PERMIT NUMBER P 385 The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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December 2014

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1. Introduction

1.1. Preamble

The M.D. of Greenview (Greenview) requires a technical review of its 2009 Water Supply Well (2009 WSW) at the Greenview Sturgeon Water Supply Facility in SW 29-070-24 W5M.

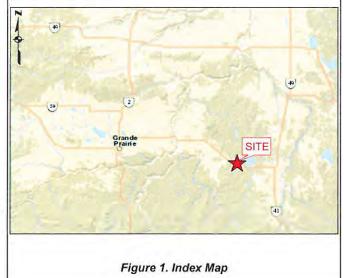
Hydrogeological Consultants Ltd. (HCL) prepared a scope of work and a cost estimate. The cost estimate was submitted to Greenview on August 6, 2014. On August 15, 2014, Greenview approved the scope of work and

returned the cost estimate with two formal contracts. The work associated with the two contracts is to be completed by December 31, 2014.

The 2009 WSW is in SW 29-070-24 W5M, 76 kilometres southeast of the City of Grande Prairie, Alberta.

1.2. Purpose

Greenview contracted HCL to collect readily available hydrogeological data from the 2009 WSW to determine the present status of the water supply well and to identify any changes in the performance of the 2009 WSW. Data from the 2009 WSW will be collected and compared to historical data available.



1.3. Scope

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The present program will include the following:

- Collection of historical data from Greenview
- Site reconnaissance survey of the Sturgeon Water Supply Facility
- Installation of monitoring tube "if necessary"
- Installation of a data logger in the 2009 WSW to measure and record water levels
- Completion of an aquifer test with the 2009 WSW
- Collection of groundwater samples from the 2009 WSW

In the office, HCL will process the field data, update The Groundwater Centre (TGWC) database, review the data and prepare a covering report.

The area of study (AOS) for this project was a 5x5 section area centred on the 2009 WSW. The area of interest (AOI) was the area within 800 metres of the 2009 WSW.

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2. Background

2.1. General Hydrogeology

The upper bedrock in the AOS is defined by HCL as the Lower Horseshoe Canyon Formation; the surficial deposits are generally less than 20 metres thick. The hydrogeological map for the area (Borneuf, 1980) indicates that the upper bedrock is the Wapiti Formation; water wells completed in the Wapiti Formation have yields that are generally in the order of 5 to 30 m³/day. Groundwater from the Wapiti Formation is expected to have total dissolved solids (TDS) concentrations of 1,000 milligrams per litre (mg/L). The base of groundwater protection (BGWP) is 487 metres below ground level (BGL).

2.2. 2009 Water Supply Well

The 2009 WSW was drilled by Hopper Water Well Drilling Ltd. (Hopper) to a total depth of 97.5 metres below ground level (BGL) between July 10, 2009 and July 17, 2009. The 2009 WSW was completed with steel 141.2-millimetre (mm) outside-diameter (OD) surface casing reported to have been set to a depth of 42.7 metres BGL. The water well was completed with a 114.3-mm OD plastic liner perforated in the depth interval of 79.2 to 91.4 metres BGL. The non-pumping water level (NPWL) reported at the time of water well completion was 8.4 metres, assumed to be below top of casing (BTOC). The metric water well drilling report is in Appendix B.

The adjacent site diagram shows the position of the 2009 WSW relative to nearby features.

2.2.1. Aquifer Test I

The main source of groundwater is a confined sandstone aquifer, saturated in the depth interval of 81.7 to 91.4 metres BGL on the SW 29-070-24 W5M site. The non-pumping water level (NPWL) was 8.4 metres below top of casing (BTOC) on July 17, 2009, and the casing stick-up was 0.1 metres when the 2009 WSW was completed. All details have been obtained from the water well drilling report prepared by Hopper.

Aquifer Test (AT) I with the 2009 WSW was a preliminary aquifer test consisting of pumping an average of 36.4 litres per minute (Lpm) for 120 minutes followed by 120 minutes of recovery. Analysis of the aquifer test data indicate that the 2009 WSW is completed in a confined sandstone aquifer with an aquifer (early) transmissivity of 0.3 metres squared per day (m²/day) and an effective (late) transmissivity of 1.2 m²/day. The details for AT I are in Appendix B.



3. Methodology

3.1. Existing Data

The local hydrogeological data are based on (1) regional hydrogeological data, (2) data provided by Greenview, and (3) water wells within the AOS. Parameters for the aquifer in which the 2009 WSW is completed will be determined from available aquifer test data using the Jacob Method.

Data were collected and compiled from a variety of existing hydrogeological and administrative sources. These sources included the following:

- The M.D. of Greenview
- The Groundwater Centre (TGWC) database
- HCL Hydrogeology Database
- Alberta Environment and Sustainable Resource Development (ESRD) Water Well Information Database
- ESRD Authorization/Approval Viewer
- ESRD Water Use Reporting System (WUR)
- Groundwater Under the Direct Influence of Surface Water (GWUDI) Guidelines
- Alberta Geological Survey (AGS)

3.1.1. Maps and Aerial Imagery

The AOS is situated within the 83N 1:250,000 National Topographic Series map sheet, with local detail available from the 1:50,000 83N04 map sheet. Digital topographic control is from the 1:20,000 digital elevation model (DEM) prepared by the Spatial Data Warehouse.

Digital imagery for the present program has been obtained from the AbaData website on November 27, 2014.

3.1.2. The Groundwater Centre (TGWC) Database

TGWC database¹ is an enhanced version of the Alberta ESRD Water Well Information Database². TGWC database for the AOS will also house hydrogeological data collected during the present program and is available to the public unless restricted by the client.

3.1.3. HCL Hydrogeology Database

HCL maintains a database of geologic units (geounits) for the geologically undisturbed part of the province. The database includes structure contours for the tops of individual geounits; these surfaces will be used for cross-sections and various figures in this report.

The hydrogeology database also includes limited information for hydraulic parameters of the individual aquifers and chemical quality of the groundwaters below the BGWP.

Information in the database is also used in the enhanced Mow-Tech Groundwater Query (gwQuery).

3.1.4. ESRD Water Well Information Database

TGWC database was updated, where needed, from data in the ESRD Water Well Information Database.

www.tgwc.com http://www.envinfo.gov.ab.ca/GroundWater/

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3.1.5. ESRD Authorization/Approval Viewer

The ESRD Approval Viewer website (<u>https://avw.alberta.ca/ApprovalViewer.aspx</u>) was searched on December 14, 2014 for any active licences associated with the 2009 WSW.

3.1.6. ESRD WUR System

The ESRD WUR System will be reviewed to confirm if WUR conditions for an existing licence have been updated.

3.1.7. Groundwater Under the Direct Influence of Surface Water (GWUDI) Guidelines

The level of potable groundwater treatment required is dependent on whether the raw groundwater is under the direct influence of surface water (GWUDI). If the groundwater is not GWUDI, only disinfection is required as an additional health-risk barrier. Groundwater that is a GWUDI source is required to undergo both filtration and disinfection, which is the same treatment that is required for surface water.

The criteria used to determine whether or not a groundwater source is under the direct influence of surface water are detailed in Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems – Appendix E (Alberta Government, January 2006). The criteria include four phases. The first phase (Phase 1) is a GWUDI Screening Assessment. The purpose of the screening is to rapidly identify obvious non-GWUDI groundwater sources that do not require a detailed assessment. The screening includes the following:

- Setting sensitivity
- Proximity to surface water
- Water well construction
- Groundwater quality

Should a groundwater source that provides drinking water fail to meet any of the conditions associated with the above criteria, the source is flagged as potentially GWUDI and further assessment is required as outlined in the January 2006 reference above.

High-quality groundwater is groundwater where Health Canada aesthetic objectives (AOs) and maximum acceptable concentrations (MACs) are not exceeded.

Microbial pathogens generally do not survive in the subsurface for more than 90 days (Wallace, 2009).

3.1.8. Alberta Geological Survey (AGS)

Regional hydrogeology reports were obtained from the AGS and used in the preparation of the Background Hydrogeology section of this report. Various shapefiles from the AGS are used at various times and are identified when used.

3.2. Published and Unpublished Reports

Published and unpublished documents used in this report are referenced in the report and listed in the Bibliography section of this report.

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3.3. New Data

3.3.1. Data from Greenview

Greenview allowed HCL to go through its historical files to copy historical data that were available. HCL focused on the following historical data:

- Chemical analyses
- Aquifer test(s)
- Other information related to the 2009 WSW

3.3.2. Site Reconnaissance Survey

HCL conducted a site reconnaissance survey of the Greenview Sturgeon Water Supply Facility in SW 29-070-24 W5M on September 3, 2014. The following details were to be collected:

- Confirm that the water well drilling report was for the water well on-site
- Take site pictures
- Obtain GPS spatial coordinates
- Attempt to measure the NPWL
- Measure the water well casing stick-up
- Review site for potential issues and potential contamination sources

The results obtained from the 2009 WSW from the September 3, 2014, reconnaissance survey are included in Appendix B.

3.3.3. Monitoring Tube/Data Logger

A monitoring tube may be installed in the water supply well, depending on on-site conditions.

A LevelTROLL data logger is to be installed in the water supply well to measure and record water levels. The LevelTROLL data logger will be calibrated and programmed to measure and record a water level in the water well once every hour. The typical lifespan of a LevelTROLL data logger is 5 to 7 years.

3.3.4. Aquifer Testing

An aquifer test will be conducted with the water supply well. The water well will be pumped at a constant rate for a time that is optimum for the on-site conditions, and then the water well will be allowed to recover for an optimum length of time. The groundwater diversion will be measured with a water meter and the water levels will be measured by the LevelTROLL 500 data logger installed in the water well.

3.3.5. Groundwater Sampling

A groundwater sample will be collected for routine potability, dissolved metals, and microbiological analysis. The groundwater sample will be sent to Exova Canada Inc. (Exova) for analysis.

3.4. Data Processing

All horizontal spatial coordinates were based on a 10-degree Transverse Mercator projection, with the central Meridian of 115 degrees west, using the 1983 North American Datum. The vertical spatial coordinates were obtained from the digital elevation model provided by the Spatial Data Warehouse.

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Most vertical measurements are provided in the report to one decimal place. The exception is water levels measured by or on behalf of HCL, which are reported to two decimal places. Vertical measurements may be determined to two decimal places, but other than water levels, will be presented in the report with only one decimal place. The data presented in the attachments and in tables may not reflect the presentation in the report.

Parameters for the aquifer in which the 2009 WSW is completed were determined from Aquifer Test II (AT II) data using the Jacob Method of analysis.

3.4.1. Calculation of Transmissivity Values

Transmissivity values from the aquifer test data from the pumped water well were calculated using the Cooper-Jacob approximation of the Theis non-equilibrium equation:

$$T = \frac{2.3 \cdot Q}{4 \cdot \pi \cdot \Delta s}$$

Where:

Т

= transmissivity in m²/day

Q = discharge in m³/day

 Δs = metres of drawdown per log cycle

Transmissivity from specific capacity was calculated based on the following equation:

$$\frac{Q}{s} = \frac{4 \cdot \pi \cdot T}{2.3 \cdot \log_{10} \left(\frac{2.25 \cdot T \cdot t}{S \cdot r^2}\right)}$$

Where:

Т

Q = discharge in m³/day

s = drawdown in metres

= transmissivity in m²/day

S = storativity, assumed to be 0.0001

t = time since discharge started in days

= effective radius of the water well in metres

3.4.2. Calculation of Drawdown

Drawdowns at various times and distances from the groundwater discharge point were calculated using the Theis non-equilibrium equation based on approximations of W(u):

$$\mathbf{s} = \frac{\mathbf{Q} \cdot \mathbf{W}(\mathbf{u})}{\mathbf{4} \cdot \boldsymbol{\pi} \cdot \mathbf{T}}$$

Where:

S

Т

= drawdown in metres

Q = discharge in m³/day

W(u) = well function for non-leaky artesian aquifers

= transmissivity in m²/day

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And

$$u = \frac{r^2 \cdot S}{4 \cdot T \cdot t}$$

Where:

r

t

- = effective radius of the water well in metres
- S = aquifer storativity, dimensionless
- T = transmissivity in m²/day
 - = time since discharge started in days

For approximations of W(u) for values of u greater than zero and less than one, the following approximation was used:

 $W(u) = -\ln u + (-0.57721556) + (0.99999193)^{*}u + (-0.24991055)^{*}u^{2} + (0.05519968)^{*}u^{3} + (-0.000976004)^{*}u^{4} + (0.00107857)^{*}u^{5}$

Where:

In = natural logarithm

For values of 1 < u < infinity, the following approximation was used:

$$W(\mu) = \frac{1}{u \cdot e^{u}} \cdot \frac{0.250621 + 2.334733 \cdot u + u^2}{1.681534 + 3.330657 \cdot u + u^2}$$

Where:

e = the base of the natural logarithm

When multiple groundwater discharge points were involved, the principle of superposition was used. The multiple discharge points could be at various locations or at one location.

3.4.3. Calculation of Storativity

The storage coefficient for a confined aquifer represents water derived relative to (1) the expansion of water as the aquifer is depressurized and (2) compression of the aquifer. In a confined aquifer setting, the load on top of an aquifer is supported by the solid rock skeleton and the hydraulic pressure exerted by the groundwater. The value for storativity (S) was calculated using the following:

$$u = \frac{r^2 \cdot S}{4 \cdot T \cdot t}$$

Where:

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u

r

T t = from non-leaky artesian equation

= effective radius of the water well in metres

= transmissivity in m²/day

= time since discharge started in days

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3.4.4. Calculation of Theoretical Long-Term Yield

Theoretical long-term yield was calculated from the Modified Moell Method (Alberta Government, March 2011), using the following equation:

$$Q_{20} = \frac{(Q)(H_a)0.7}{s_{100\min} + (s_{20yrs} - s_{100\min})_{Theor}}$$

Where:

 Q20
 = sustainable yield for 20 years

 Q
 = pumping rate during the aquifer tests

 Ha
 = available drawdown

 s100min
 = measured drawdown in metres after 100 minutes of pumping

 s100min Theor
 = calculated theoretical drawdown in metres after 100 minutes of pumping Q using effective transmissivity

 s20yrs Theor
 = calculated theoretical drawdown in metres after 20 years of pumping Q using effective transmissivity

 0.7
 = safety factor

When the aquifer is fully confined, the available drawdown (H_a) is the linear distance from the NPWL to the top of the aquifer. When the aquifer is not fully confined, the available drawdown (H_a) is two thirds of the linear distance from the NPWL to the bottom of the aquifer.

For confined aquifers only, the theoretical long-term yield can also be calculated from the Farvolden Method (Alberta Government, March 2011), using the following equation:

$$Q_{20} = 0.68(T)(H_a)0.7$$

Where:

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Ha

= available drawdown

Q₂₀ = sustainable yield for 20 years

0.7 = safety factor

T = transmissivity in m²/day

4. Results

4.1. Physiography

The AOS is in the Boreal natural region of Alberta. The highest ground elevation is 760 metres above mean sea level (AMSL) and the lowest ground elevation is 680 metres AMSL. There is one significant standing natural surface water body in the AOI, 600 metres east of the 2009 WSW. The SW 29-070-24 W5M site is less than 1,600 metres from Sturgeon Lake.

The upper bedrock in the AOS is the Lower Horseshoe Canyon Formation. This geounit at the Sturgeon site is approximately 20 metres thick, with the base of the geounit at an elevation of 650 metres AMSL.

The surficial deposits in the AOS are expected to consist of morainal deposits (Balzer et al, 1995) and have a maximum thickness of 20 metres; the AGS report (Borneuf, 1980) indicates that there are no significant buried bedrock valleys in the AOS.

4.2. ESRD Licence Search

The 2009 WSW is not currently authorized by Alberta Environment and Sustainable Resource Development (ESRD) to divert groundwater for Domestic (Community Water Supply) use.

4.3. AOI Water Wells

TGWC database records show that there are two water wells in the AOI, including the 2009 WSW. The other water well is a Domestic Water Well in SW 29-070-24 W5M; the water well may not be completed in the same aquifer as the 2009 WSW.

4.4. Site Reconnaissance Survey

Greenview provided access to its historical records to obtain background data. Two historical chemical analysis results were obtained. The chemical analysis report dates are July 22, 2009 and July 31, 2012. Five microbiological analyses (Provincial Laboratory for Public Health [Microbiology]) were also obtained that were analysed between October 31, 2012 and May 23, 2013.

A casing stick-up of 0.1 metres in the 2009 WSW was measured on September 3, 2014 during the site reconnaissance. Also, no potential contaminant sources were identified within 100 metres of the 2009 WSW.

4.5. Monitoring Tube/Data Logger

On November 5, 2014, HCL supervised Brad Saville Enterprises Ltd. (BSE) during the removal of the existing submersible pump from the 2009 WSW. A 25.4-mm PVC monitoring tube was attached to the drop pipe immediately above the submersible pump. The submersible pump and the monitoring tube were then reinstalled in the 2009 WSW.

On November 5, 2014, HCL personnel installed a LevelTROLL 500 data logger on an 85.0-metre length of poly vented twist-lock cable in the 2009 WSW inside the monitoring tube. The LevelTroll 500 was calibrated and programmed to measure and record a water level in the 2009 WSW once every hour. Details for the data logger are in Appendix C.

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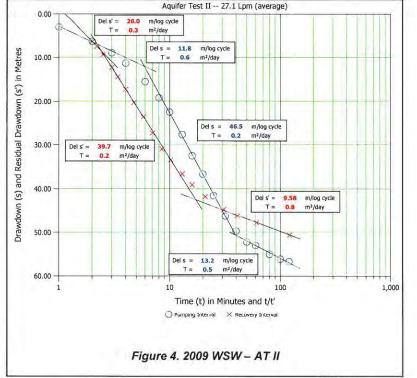
4.6. Aquifer Testing

4.6.1. AT II

AT II with the 2009 WSW was a pumping-and-recovery-type aquifer test that was started on November 5, 2014, and consisted of 120 minutes of pumping at an average of 27.1 Lpm (42 m3/day) followed by 120 minutes of recovery. The NPWL measured prior to the start of groundwater discharge was 12.83 metres BTOC. The adjacent graph shows that the pumping and recovery data of Aguifer Test II indicate an aquifer (early) transmissivity of 0.2 m²/day, and an average effective (late) transmissivity of 0.4 m²/day. The recovery data project to a water level that is above the pre-test water level at t/t' =1.

4.7. Groundwater Quality

The groundwater samples collected on November 5, 2014 near the end of AT II were sent to Exova for routine potability, dissolved metals, and microbiological



analyses. The dissolved metals samples were field filtered and preserved in the field at the time of sampling.

4.7.1. Chemical and Physical

Over the last five years, three groundwater samples from the 2009 WSW were collected and analyzed (excluding microbiological analyses). The three samples are as follows:

- Date Reported: July 22, 2009 (Bodycote Testing Group)
- Date Reported: July 31, 2012 (Exova)
- Date Reported: November 13, 2014 (Exova)

Copies of the analysis results are in Appendix B.

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The adjacent Piper tri-linear diagram shows the three chemical analyses from the 2009 WSW over the last five years.

The results of the chemical analyses of the three groundwater samples collected from the 2009 WSW are very similar to each other; the groundwater is classified as sodiumbicarbonate-type groundwater, as shown on the adjacent Piper tri-linear diagram.

4.7.2. Microbiological

Six microbiological analysis results obtained from Greenview all report an "Absent" result for Total Coliforms and Fecal Coliforms. The analyses were between 2009 and 2013.

The groundwater sample collected during the present program was analyzed for Total Coliforms and E.coli. The results of the

Ca Figure 5. Piper Tri-Linear Diagram for 2009 WSW Groundwater Samples

analyses showed that both bacteria were absent from the sample.

4.8. Groundwater Use/WUR Reporting

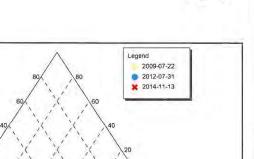
Records of groundwater use are not available for the 2009 WSW. The ESRD WUR system was reviewed by HCL on December 15, 2014; because the 2009 WSW does not have an active licence, no WUR account has been established for the water supply well.

A desktop water well survey identified one other water well in the AOI, completed at approximately the same depth as the 2009 WSW. A significant standing natural surface water body is Sturgeon Lake which has an elevation of 678 metres AMSL.

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5. Interpretation

5.1. Water-Level Comparison

There has been a 4.45-metre decline in the NPWL in the 2009 WSW between July 17, 2009 and November 5, 2014. The change in water level may be a reflection of the low permeability of the aquifer. Ongoing water-level monitoring will indicate if the water supply well is being over-produced.

5.2. Chemical Quality

There has been no significant change in the chemical quality of the groundwater from the 2009 WSW between July 2009 and November 2014.

A fluoride concentration of 3.17 mg/L was reported by Exova on the chemical analysis report dated November 13, 2014. For fluoride, the Health Canada maximum acceptable concentration (MAC) is 1.5 mg/L, while the Alberta Government (2012) considers a fluoride concentration of up to 2.4 mg/L as acceptable for public supplies, if the fluoride source is naturally occurring.

5.3. GWUDI

The 2009 WSW passes the GWUDI screening criteria except for the water well drilling report. There is no indication on the water well drilling report that the annulus between the liner and the borehole was filled with bentonite or if there is a packer installed at the top of the completion interval. However, the historical microbiological analyses indicate that no coliforms have been detected in the groundwater from the water well. Also, the chemical quality of the groundwater is representative of groundwater from a bedrock aquifer, indicating that surface water is not directly entering the 2009 WSW.

The Water Ministerial Regulations (Alberta Regulation 205/1998) states that a water well must be constructed so that the casing extends (i) not less than 0.20 metres above the pump house floor or the established ground surface, and (ii) at least 0.60 metres above the highest flood record in the area, if the water well is not to be equipped with a watertight cap (Appendix A).

5.4. Yield Calculations

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The long-term yield is based on an aquifer that is homogeneous, isotropic and of infinite areal extent. To determine a long-term yield, a safety factor is used that limits the drawdown over 20 years to 70% of the available drawdown. The ESRD Modified Moell Method of analysis has been used to determine a long-term yield for the 2009 WSW. Based on the above and the following conditions observed in the 2009 WSW during AT II, the calculated long-term yield (Q_{20}) for the 2009 WSW is 13 m³/day.

Available drawdown (H _a):	69.0 metres
AT II discharge rate (Q):	27.1 Lpm
Measured drawdown after 100 minutes (s100 min):	56.12 metres
Calculated drawdown after 100 minutes (s100 min Theor):	91.3 metres
Calculated drawdown after 20 years (s20 years Theor):	181.0 metres
Average Effective transmissivity:	0.4 m²/day

The available drawdown of 69.0 metres is based on a confined aquifer.

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5.5. Predicted Impact

The calculated drawdown is 11.9 metres at a distance of 800 metres from the 2009 WSW after pumping the 2009 WSW at 13 m³/day for 20 years, based on aquifer parameters determined from AT II, which included an average (late) effective transmissivity of 0.4 m²/day and a corresponding storativity of 0.0001.

6. Issues

The 2009 WSW is not currently licensed with ESRD to divert groundwater.

The NPWL measured at the start of AT II on November 5, 2014 is 4.45 metres lower than the reported NPWL from AT I reported by Hopper at the time of the water well completion.

The 2009 WSW has a casing stick-up that was measurd to be 0.1 metres above ground level.

The groundwater sample collected from the 2009 WSW with a report date of November 13, 2014 exceeded the Health Canada MAC for fluoride.

7. Conclusions

The Sturgeon 2009 Water Supply Well, owned by the M.D. of Greenview, is completed in a sandstone aquifer in the depth interval of 81.7 to 91.4 metres BGL and is currently not licensed with ESRD to divert groundwater for municipal purposes at the Sturgeon Water Supply Facility.

The data collected from AT II indicate that the long-term yield (Q₂₀) for the 2009 WSW is 13 m³/day.

The present data indicate that groundwater from the 2009 WSW is not GWUDI.

8. Recommendations

It is recommended that the M.D. of Greenview apply to Alberta Environment and Sustainable Resource Development to license the use of groundwater from the 2009 WSW and that the diversion from the 2009 WSW be discontinued until ESRD has issued a licence.

It is recommended that the LevelTROLL data logger that was installed in the 2009 WSW on November 5, 2014 be downloaded and calibrated twice per year. The water-level data should be reviewed each year to ensure that the water supply well is not being over-pumped. A groundwater sample from the 2009 WSW should be collected annually and submitted to an accredited laboratory for routine and microbiological analyses.

It is recommended that the casing stick-up be extended from 0.10 metres to at least 0.2 metres above ground level to be in compliance with the Water (Ministerial) Regulation.

The present indications are that the fluoride concentration in the groundwater is above MAC for potable water. Users of the groundwater should be notified that drinking the groundwater could affect their long-term health.

The typical lifespan of a LevelTROLL data logger is 5 to 7 years. HCL recommends a scheduled LevelTROLL data logger replacement every 7 years.

Prepared by:

Syears -

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Assisted by:

Jessica Oszust, B.Sc., G.I.T. Junior Hydrogeologist

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3 http://environment.gov.ab.ca/info/library/8555.pdf

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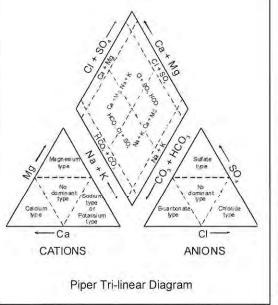
vdrogeological consultants ltd.

10. Supplementary Information

10.1. Glossary of Terms

aesthetic objective	Health Canada aesthetic quality guidelines addressing parameters that may affect consumer acceptance of drinking water, such as taste, odour and colour	
aquifer	a formation, group of formations or part of a formation that contains saturated permeable rocks capable of transmitting groundwater to water wells or springs in economical quantities	
available drawdown	in a confined aquifer, the distance between the non-pumping water level and the top of the aquifer	
	in an unconfined aquifer (water table aquifer), two thirds of the saturated thickness of the aquifer and water level within 5 metres of the top of the aquifer	
base of groundwater		
protection	the depth below which groundwater is expected to have a total dissolved solids concentration of more than 4,000 milligrams per litre	
geounit	a geologic unit categorized by a similarity in geological feature(s) such as stratigraphic interval, depositional environment or hydrogeological properties	
hydraulic conductivity	the rate of flow of water through a unit cross-section under a unit hydraulic gradient; units are length/time	
maximum acceptable		
concentration	the highest level of chemical substances determined by Health Canada to be allowable in drinking water supplies; these substances are generally only a concern if exposure above guideline levels occurs over an extended time	
Piper tri-linear diagram	a method to show the composition of water based on major cation and anion composition. This diagram allows	

groupings or trends the in chemical-quality data to be identified. In Alberta, surface water and shallow groundwater are typically a Ca+Mg-HCO₃-type upper water, bedrock groundwaters are a Na+K-HCO3type water and deep groundwaters are a Na+K-CI-type water.



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area of aquifer per unit decline in hydraulic head (dimensionless)
all sediments above the bedrock surface
the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient; a measure of the ease with which groundwater can move through the aquifer
apparent transmissivity: the value determined from a summary of aquifer test data usually involving only two water-level readings
effective transmissivity: the value determined from late pumping and/or late recovery water-level data from an aquifer test
<u>aquifer transmissivity</u> : the value determined by multiplying the hydrauli conductivity of an aquifer by the thickness of the aquifer
a regional analysis term referring to the rate at which a properly completed wate well could be pumped, if fully penetrating the aquifer
apparent yield: based mainly on apparent transmissivity
long-term yield: based on effective transmissivity
sustainable yield: based on aquifer parameters determined from long-term water level and groundwater production monitoring
sustainable yield: based on aquifer parameters determined from long-term water level and groundwater production monitoring

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10.2. Glossary of Commonly Used Abbreviations, Acronyms and Symbols

AMSL	above mean sea level
AO	aesthetic objective
AOI	area of interest
AOS	area of study
BGL	below ground level
BGWP	base of groundwater protection
втос	below top of casing
ESRD	Alberta Environment and Sustainable Resource Development (formerly Alberta Environment, Alberta Environment and Water)
GPS	global positioning system receiver
km	kilometre(s)
km ²	square kilometre(s)
Lpm	litre(s) per minute
Lpm/metre	litre(s) per minute per metre
LSD	legal subdivision
m	metre(s)
MAC	maximum acceptable concentration
m²	metre(s) squared
m²/day	metre(s) squared per day
m³	cubic metre(s)
m³/day	cubic metre(s) per day
m³/year	cubic metre(s) per year
mg/L	milligram(s) per litre
NAD83	North American Datum of 1983
NPWL	non-pumping water level
TGWC	The Groundwater Centre www.tgwc.com
10000	
TDS	total dissolved solids

10.3. Stratigraphy of the "Undisturbed" Geology of Alberta

(as used by Hydrogeological Consultants Ltd.)

(as i	used by Hydrogeological Consultants Ltd.)
	upper surficial
	lower surficial
	Cypress Hills Fm
	Dalehurst Member
	upper part of Lacombe Member
	lower part of Lacombe Member
	Haynes Member
	upper part of Scollard Fm
	lower part of Scollard Fm
	Battle/Whitemud Fms
	upper part of Horseshoe Canyon Fm
	middle part of Horseshoe Canyon Fm
	lower part of Horseshoe Canyon Fm
	Bearpaw Fm
	Oldman Fm
	Foremost Fm
	Lea Park Fm
	Milk River Fm
	Colorado Shale
	Cardium Fm
	Kaskapau Fm
	Dunvegan Fm
	Shaftesbury Fm
	Viking Fm
	Joli Fou Fm
	upper part of Mannville Grp
1.000	middle part of Mannville Grp
	lower part of Mannville Grp
	Jurassic
	Triassic
	upper part of Paleozoic
	Banff Fm
1	Wabamun Group
	Winterburn Group
	Woodbend Group
	Beaverhill Lake Group
	Elk Point Group
	Precambrian

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10.4. Guidelines for Canadian Drinking Water Quality - Summary Table

Constituent	AO	MAC
pH (pH units)	6.5 - 8.5	
Conductivity (µS/cm)	-	
Total Dissolved Solids	500	-
Sodium	200	<u> </u>
Potassium		_
Calcium	<u>6</u>	
Magnesium	-	<u> </u>
Total Hardness	_	
Manganese	0.05	
Carbonate	-	
Bicarbonate	_	<u> </u>
Total Alkalinity	-	
Sulfate	500	
Chloride	250	
Fluoride		1.5
Iron	0.3	-
Nitrate (as N)	-	10
Nitrate		45
Nitrite (as N)	—	1
Nitrite		3.2
Nitrate + Nitrite (as N)		10
Total Coliforms (CFU/100 mL)		0
Fecal Coliforms (CFU/100 mL)	-	0
Escherichia coli (CFU/100 mL)	-	0
Ionic Balance (%)		

Concentrations are in milligrams per litre unless otherwise stated. Note: Constituents marked with — do not have a recommended maximum concentration associated with them.

Concentrations are in milligrams per litre unless otherwise stated. **CFU/100 mL** - Colony Forming Units per 100 millilitres **AO** - Aesthetic Objective **MAC** - Maximum Acceptable Concentration

GCDWQ-ST - Guildlines for Canadian Drinking Water Quality – Summary Table, Health Canada. 2014

10.5. Conversions

Multiply	by	To Obtain
Length/Area		
feet	0.304 78	5 metres
metres	3.281 00	0 feet
hectares	2.471 05	
centimetre	0.032 80	8 feet
centimetre	0.393 70	
acres	0.404 68	
inches	25.400 00	Carl Carl Carl Carl Carl Carl Carl Carl
miles (statute)	1.609 34	
kilometres	0.621 37	
square feet (ft²)	0.092 90	
square metres (m ²)	10.763 91	
square metres (m ²)	0.000 00	
	0.000 00	- square kilometres (kill)
Concentration		
grains/gallon (UK)	14.270 05	0 parts per million (ppm)
parts per million (ppm)	0.998 85	
milligrams per litre (mg/L)	1.001 14	
	11001 11	z parts per minor (ppm)
Volume (capacity)		
acre feet	1233.481 83	8 cubic metres
cubic feet	0.028 31	
cubic metres	35.314 66	
cubic metres	219.969 24	
cubic metres	264.172 05	
cubic metres	1000.000 00	
cubic metres	6.290 00	
imperial gallons (UK)	0.200 00	
imperial gallons (UK)	4.546 00	
	4.540 00	0 mies
Rate		
litres per minute	0.219 97	4 imperial gallons per minute (ipgm)
litres per minute	1.440 00	1 5 1 (15)
imperial gallons per minute (igpm)	6.546 30	
cubic metres/day (m³/day)		 9 imperial gallons per minute (ipgm)
cubic menes/day (m /day)	0.132 75	3 impenarganons per minute (ipgin)
Pressure		
pound per square inch (psi)	6.894 75	7 kilopascal (kpa)
kilopascal (kpa)	0.145 03	
(hpa)	0.143 03	o pound per square men (psi)
Miscellaneous		
Celsius	$F^{\circ} = 9/5 (C^{\circ} + 32)$	Fahrenheit
Fahrenheit	$C^{\circ} = (F^{\circ} - 32) * 5/9$	Celsius
degrees	C = (F - 32) - 3/5 0.017 45	

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Appendix A – Useful Information

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Minimum Recommended Length of Aquifer Test	4

Excerpts from the Water (Ministerial) Regulations

Part 7

Water Wells

Water well site specifications

"44(1) The driller and the owner of a water well must locate the water well site so that

- (a) the water well is accessible for cleaning, treatment, repair, testing, maintenance and inspection,
- (b) the area immediately surrounding the water well may be kept in a sanitary condition,
- (c) surface water does not collect or form a pond in the vicinity of the water well, and
- (d) the water well is at least 3.25 metres away from the nearest building.
- (2) No person shall locate a water well in a pit."

Distance from sources of contamination

- "46(1) No person shall locate or drill a water well for the diversion of groundwater, other than saline groundwater, closer to a thing described in Column 1 of Table 1 than the distance specified in Column 2 of Table 1.
 - (2) If the diversion of water from a water well is licensed for municipal purposes, no person shall locate or drill the water well closer than 100 metres from anything listed in Column 1 of Table 1."

Table 1		
Column 1 - Source of Substance	Column 2 - Minimum Distance Required	
Watertight septic tank or sewage holding tank	10 metres	
Sub-surface weeping tile effluent disposal field of an evaporation mound	15 metres	
Sewage effluent discharge to the ground surface	50 metres	
Sewage lagoon	100 metres	
Above ground storage tanks containing petroleum substances	50 metres	

Table 1

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Construction requirements

47 The driller of a water well must ensure that the water well meets the following requirements:

- (a) the water well must be constructed so that surface water or substances can not enter any aquifer;
- (b) the water well must be designed and developed so as to allow production consistent with the water well owner's water requirements, taking into account the production potential of the aquifer being used;
- (c) the water well must be constructed so that the casing extends
 - (i) not less than 20 centimetres above the pumphouse floor or the established ground surface, and
 - (ii) at least 60 centimetres above the highest flood record in the area, if the water well is not to be equipped with a watertight cap;

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Minimum Recommended Length of Aquifer Test

APPENDIX 4: Minimum Recommended Length of Aquifer Test and Information Required for the Maximum Water Diversion/Drainage

Government of Alberta **m**

Daily Pumping Rate	y Pumping Rate Number of Days Maximum Yearly Water Requirement Length of Pumping and Recovery Period at Anticpated Maximum Pumping Rate		Observation/ Monitoring Site	Information Required under Section 2	
up to 10 m ^{1/} day (2200 lgpd) (1.5 lgpm)	365	3650 m³ (803,000 lg)	2 - 2 hours" (or longer) and at least 90% recovery	0	2.1 2.2.3 2.2.6 (A) to (M) 2.2.10
> 10 to 35 m ³ /day (2200 to 7700 lgpd) (1.5 to 5.3 lgpm)	applicant to enter	applicant to enter	24 + 24 hours (or longer) and at least 90% recovery	0–1	All of Section 2
> 35 to 65 m²/day (7700 to 14,300 (gpd) (5.3 to 10.0 (gpm)	applicant to enter	applicant to enter	24 + 24 hours (or longer) and at least 90% recovery	1	All of Section 2
> 65 to 265 m ² /day 14,300 to 60,500 Igpd) (10.0 to 40.0 (gpm)	applicant to enter	applicant to enter	48 + 48 hours (or longer) and at least 90% recovery	1-2	All of Section 2
> 265 m³/day	applicant to enter	applicant to enter	72 + 72 hours (or longer) and at least 90% recovery	1-2	All of Section 2

*In some cases, more information or longer aquifer tests may be required.

LEGEND:

g = gallons

m³ = cubic metre = 220 Imperial gallons

Igpd = Imperial gallons per day

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> = greater than

lopm = Imperial gallons per minute

Appendix B - Water Well Details

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2009 Water Supply Well

SW 29-070-24 W5M (M40293.645597)



Well Spatial Location:

Easting: -167,727 Northing: 6,104,800 :::spatial accuracy MT GPS -- (0TM NAD83)

Ground Elevation AMSL (m): 694 ::(elevation accuracy MT DEM)

Date Completed: July 17, 2009

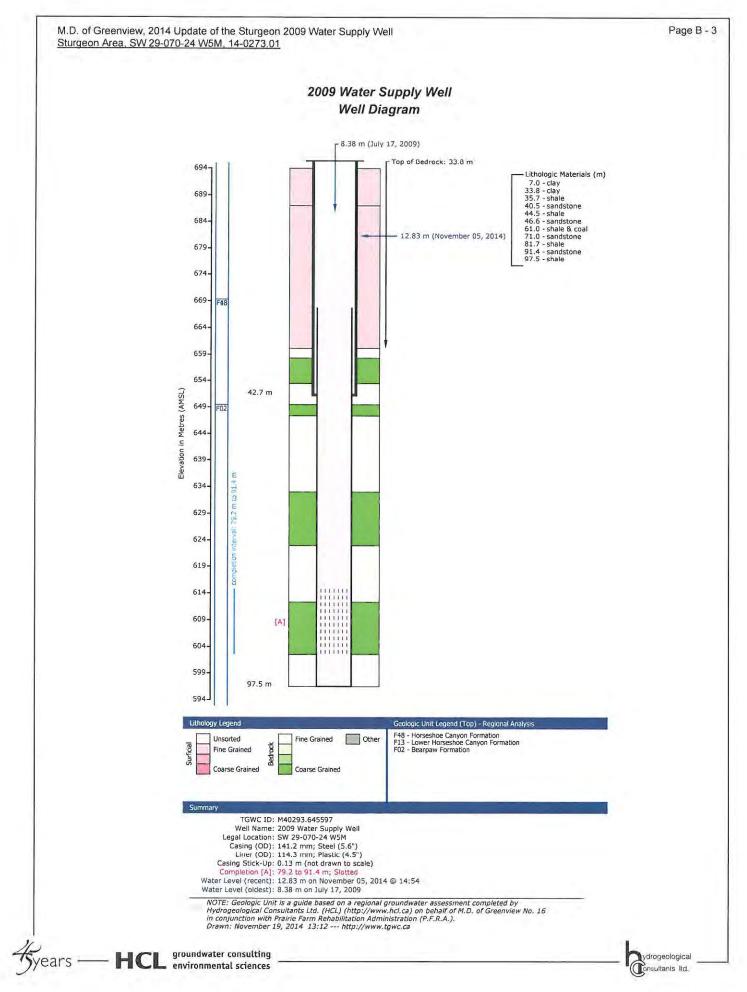
Depth Drilled (m): 97.5

Completion Interval (m): 79.2 — 91.4 * :::* 7GWG determined value!

Most Recent Water Level (m): 12.83 — November 05, 2014 Earliest Water Level (m): 8.38 — July 17, 2009

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Owner: M.D. of Greenview No. 16 PO Box 1079, Valleyview, AB T0H 3N0			M	ETRIC	REPORT		SW 29-0	70-24 W5	5M
Contractor: Hopper Water Well Drilling Ltd	L.		Easting Northing		-167,727.01 **	75/80	M4029	93.64559	7
Name: 2009 Water Supply Well			Elevation	(m):	694 ***	11	195358 - 2		Goo
Field Survey: September 03, 2014 - Confin Work Type: New Well		July 10, 2009	В	Lot: lock:		1	Elog Taken: No Gamma Taken: No	D	
Drilling Method: Rotary Proposed Use: Other	Date Complet	ted: July 17, 2009	· · · · · · · · · · · · · · · · · · ·	Plan:			Flowing: No Stick Up (m): 0.1		
Completion Type: Casing/Perforated Liner	Well Status: F Feature Class		Presence of Presence of			_			
General Details Depth Completed (m)*: 91.4	The state of the s		Lithology D						
Depth Drilled (m): 97.5	Top of Bedrock (m) Completion Interva): 33.8 * l (m): 79.2 — 91.4 *	Elevation (AMSL)	Depth (BGL)		Lithology	Descriptions (rate	Lpm)	
			687.0 660.2		Sandy Clay Compacted Clay				
Completion Details			658.4 653.5	35.7 40.5	Shale Sandstone				
Surface Casing: Steel - 141.2 mm (O.D.) x			649.5 647.4	44.5					
Liner: Plastic — 114.3 mm (O.D.) x 6.02 mi	n (thick); Top: 26.6 (m); Bottom: :	97.5 (m)	633.1	61.0	Shale & Coal				
			623.0 612.4	81.7					
Intervals			602.6 596.5	91.4 97.5	Water-Bearing San Shale	dstone			
Slotted: 79.2 to 91.4 m - 0.010 x 0.010 - Met	hod: Machine								
Chemistry Summary Details (mg/L, exce		(most recent	first)						
Sampling Details: November 05, 2014 (7 Analysis Details: November 13, 2014 - Exov	9.2 to 91.4 m) /a Canada Inc. (1037861-1)								
Constituent Result	Constituent Result	Constituent Rese	<u>uit</u>						
Conductivity (µS/cm): 871 TDS (Calculated): 534	Nitrate as N: < 0.01 Nitrite as N: < 0.005	Colour (TCU):> 60 Turbidity (NTU):9.2							
Hardness (as CaCO3): 8.5 T-Alkalinity (as CaCO3): 505	pH (pH Unit): 8.87 Ion Balance (%): 97	Fluoride: 3.17** Carbonate: 31							
P-Alkalinity (as CaCO3): 26	Total Coliforms**: < 1	Bicarbonate:552							
Nitrate + Nitrite as N: < 0.01 Total Suspended Solids:	Fecal Coliforms**: Escherichia coli**: < 1	Hydroxide:< 5 Total Iron:							
Sulfate Reducing Bacteria*: Iron Related Bacteria**:		Total Mn: Temperature (°C):17.4							
Constituent Extractable Dissolved		solved							
Calcium: 3.4 2 Chloride: 3.2		005							
Iron: 0.25 < 0.01 Manganese: 0.02 0.006	Magnesium: < 0.2 < 0 Sodium: 224 23	0.2 page 10.2	(1/3)						
Aluminum: < 0.002 Arsenic: 0.0017	Potassium: 0.5 0.5	5 null - jite							
Barium: 0.027	Strontium: 0.0	olve dive	General Co	mments	Observations				
Beryllium: < 0.0001 Cadmium: < 0.00001	Zinc: 0.0	<i>лог</i> ш							
Chromium: < 0.0005 Cobalt: 0.0002			'N/mL 'U/mL						
Sulfate: < 0.9 Comments: Sample collected by hydrogeolog	ical consultants #d (HCL)								
, , . , , , , , , , , , , ,									
			-						_
**Exceeded the maximum acceptable concentri Drinking Water Quality – Summary Table. Wate Environments and Consumer Sofety Branch, H	r, Air and Climate Change Bureau, I		Most Recent	Water Le	vel (m): 12.83 m —	Novemb	er 05, 2014		
Environments and Consumer Safety Branch, H	eann Canada, Ottawa, Ontario.								
Aquifer Tests							-		
Date & Time Testing Method		on (minutes) <u>Avg. Rat</u> ng <u>Recovery</u> (Lpm)		awdown netres)		(m³/day)		issivity (m²/day Aquifer Effect	
2 2014-11-05 14:54 Pump	79.2 to 91.4 120	120 27.1	12.8	56.7	91.4 17	2	10.7 0.7	0.2	0.4
1 2009-07-17 Pump	79.2 to 91.4 120	120 36.4	8.4	42.8	- 34.	1	1.3	0.4	0.:
Alias IDs					* The Groundw	vater Cen	tre (TGWC) calcula		
ESRD - GIC (WELLID): 1375226 ESRD - GIC (WellReportID): 11683661								NT GPS — 107 DEM — {Groui	
Long - Gio (Weintepontio): 77083667							10.000	- 2.1 - 2.1 - 2.1 - 2.1	

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Exces 7217 Roper Road NW Estmonton, Alberta TI/B 3J4, Canada

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Analytical Report

Bill To: Hydrogeological Consultants Project: Report To: Hydrogeological Consultants ID: 14-0273.01 17740 - 118 Avenue Name: Edmonton, AB, Canada Location: Sturgeon Area T5S 2W3 LSD: Attn: Tara Parker P.O.: 17532 Sampled By: Chris Hoffman Acct code: Company: HCL

Reference Number

Sample Date

Sample Time

Sample Matrix

Sample Location Sample Description

Water Supply Well Review SW 29-070-24 W5M

> 1037861-1 November 05, 2014

NA

M40293 645597-2009 WSW / 1.2°C Water

Nominal Detection

Control Number: Date Received: Nov 6, 2014 Date Reported: Nov 13, 2014 Report Number: 1966487

Guideline

Guideline

Lot ID: 1037861

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Exova

Analyte		Units	Result	Limit	Limit	Comment
Metals Dissolved						
Silicon	Dissolved	mg/L	3.43	0.05		
Sulfur	Dissolved	mg/L	<0.3	0.3		
Aluminum	Dissolved	mg/L	< 0.002	0.002	0.1	Below OC
Antimony	Dissolved	mg/L	0.0004	0.0002	0.006	Below MA
Arsenic	Dissolved	mg/L	0.0017	0.0002	0.01	Below MA
Barium	Dissolved	mg/L	0.027	0.001	1	Below MA
Beryllium	Dissolved	mg/L	< 0.0001	0.0001		
Bismuth	Dissolved	mg/L	< 0.0005	0.0005		
Boron	Dissolved	mg/L	1.16	0.002	5	Below MA
Cadmium	Dissolved	mg/L	< 0.00001	0.00001	0.005	Below MA
Chromium	Dissolved	mg/L	< 0.0005	0.0005	0.05	Below MA
Cobalt	Dissolved	mg/L	0.0002	0.0001		a transferra
Copper	Dissolved	mg/L	< 0.001	0.001	1	Below AC
Lead	Dissolved	mg/L	< 0.0001	0.0001	0.01	Below MA
Lithium	Dissolved	mg/L	0.040	0.001		
Molybdenum	Dissolved	mg/L	0.005	0.001		
Nickel	Dissolved	mg/L	< 0.0005	0.0005		
Selenium	Dissolved	mg/L	< 0.0002	0.0002	0.05	Below MA
Silver	Dissolved	mg/L	< 0.00001	0.00001		
Strontium	Dissolved	mg/L	0.027	0.001		
Thallium	Dissolved	mg/L	<0.00005	0.00005		
Tin	Dissolved	mg/L	< 0.001	0.001		
Titanium	Dissolved	mg/L	0.0039	0.0005		
Uranium	Dissolved	mg/L	< 0.0005	0.0005	0.02	Below MA
Vanadium	Dissolved	mg/L	< 0.0001	0.0001		
Zinc	Dissolved	mg/L	0.002	0.001	5	Below AC
Subsample	Field Filtered	1.4	Field Filtered			
Microbiological Analysis						
Total Coliforms	Membrane Filtration	CFU/100 mL	<1	1	0	Below MA
Escherichia coli	Membrane Filtration	CFU/100 mL	<1	1	0	Below MA
Physical and Aggregate I	Properties					
Colour	Apparent, Potable	Colour units	>60	5	15	Above A
Turbidity		NTU	9.2	0.1	0.1	Above O
Routine Water						
pH			8.87		6.5 - 8.5	Above A
Temperature of observed		°C	17.4			

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Analytical Report

Exova 7217 Roper Road NV Edmonton, Alberta T6B 334, Cenada

Bill To:	Hydrogeological Consultants	Project:		Lot ID:	1037861
Report To:	Hydrogeological Consultants	ID;	14-0273.01	Control Number:	103/001
	17740 - 118 Avenue	Name:	Water Supply Well Review	Date Received:	Nov 6, 2014
	Edmonton, AB, Canada	Location:	Sturgeon Area	Date Reported:	Nov 13, 2014
	T5S 2W3	LSD:	SW 29-070-24 W5M	Report Number:	1966487
Attn:	Tara Parker	P.O.:	17532	Report Number.	1900407
Sampled By:	Chris Hoffman	Acct code:			
Company:	HCL				

		Reference Number Sample Date Sample Time Sample Location Sample Description Sample Matrix	1037861-1 November 0 NA M40293.645 Water	95, 2014 5597-2009 WSW / 1.2°C		
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Contin	ued		105140			
pH						
Electrical Conductivity		µS/cm at 25 C	871	1		
Calcium	Dissolved	mg/L	2.0	0.2		
Calcium	Extractable	mg/L	3.4	0.2		
Magnesium	Dissolved	mg/L	<0.2	0,2		
Magnesium	Extractable	mg/L	<0.2	0.2		
Sodium	Dissolved	mg/L	235	0.4	200	Above AO
Sodium	Extractable	mg/L	224	0.4	200	Above AO
Potassium	Dissolved	mg/L	0.5	0.4		
Potassium	Extractable	mg/L	0.5	0.4		
Iron	Dissolved	mg/L	< 0.01	0.01	0.3	Below AO
Iron	Extractable	mg/L	0.25	0.01	0.3	Below AO
Manganese	Dissolved	mg/L	0.006	0.005	0.05	Below AO
Manganese	Extractable	mg/L	0.020	0.005	0.05	Below AO
Chloride	Dissolved	mg/L	3.2	0.4	250	Below AO
Fluoride		mg/L	3.17	0.05	1.5	Above MAC
Nitrate - N		mg/L	<0.01	0.01	10	Below MAC
Nitrite - N		mg/L	<0.005	0.005	1	Below MAC
Nitrate and Nitrite - N		mg/L	< 0.01	0.01	10	Below MAC
Sulfate (SO4)		mg/L	<0.9	0.9	500	Below AO
Hydroxide		mg/L	<5	5		
Carbonate		mg/L	31	6		
Bicarbonate		mg/L	552	5		
P-Alkalinity	as CaCO3	mg/L	26	5		
T-Alkalinity	as CaCO3	mg/L	505	5		
Total Dissolved Solids		mg/L	534	1	500	Above AO
Hardness	as CaCO3	mg/L	8.5			
Ionic Balance		%	97			

Anthony Neuman

Approved by:

Anthony Neumann, MSc

Laboratory Operations Manager

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS). Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process

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M.D. of Greenview, 2014 Update of the Sturgeon 2009 Water Supply Well Sturgeon Area, SW 29-070-24 W5M, 14-0273.01

Faina 2217 Roper Rood No. Elimonico, Abdela Toli SJA, Carlos 1 41 (780) 430-6673 F 41 (720) 438-0306 F Elmonton between com C Association

Analytical Report

Bill To:	M.D. of Greenview #16
Report To:	M.D. of Greenview #16
	Box 1079
	3605 - 46 Street
	Valleyview, AB, Canada
	TOH 3NO
Attn:	Jennifer Besinger
Sampled By:	
Company:	M.D. of Greenview

Project. ID: Name: Location: LSD: P.O.: Acct code:

Sturgeon Heights

Lot ID: **883762** Control Number: A255422 Date Received: Jul 25, 2012

Page 1 of 4

Exova

Date Received: Jul 25, 2012 Date Reported: Jul 31, 2012 Report Number: 1753925

	s	ference Number Sample Date Sample Time ample Location ople Description Sample Matrix	883762-1 July 25, 2012 NA Sturgeon Heig Water	hts / 18.1 C		
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Inorganic Nonmetallic Pa	rameters	Units	Resource			oonnenis
Ammonium - N		mg/L	0.37	0.05		
Organic Carbon	Total Nonpurgeable	mg/L	9.4	0.5		
Metals Extractable	, J., J.			0.0		
Mercury	Extractable	mg/L	< 0.0001	0.0001	0.001	Below MAC
Aluminum	Extractable	mg/L	0.198	0.002	0.1	Above OG
Antimony	Extractable	mg/L	0.0007	0.0002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0101	0.0002	0.01	Above MAC
Barium	Extractable	mg/L	0.077	0.001	1	Below MAC
Boron	Extractable	mg/L	1.27	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.005	Below MAC
Chromium	Extractable	mg/L	0.0051	0.0005	0.05	Below MAC
Copper	Extractable	mg/L	0.003	0.001	1	Below AO
Lead	Extractable	mg/L	0.0043	0.0001	0.01	Below MAC
Selenium	Extractable	mg/L	0.0006	0.0002	0.01	Below MAC
Silver	Extractable	mg/L	0.00008	0.00001	1000	Dulott the lo
Uranium	Extractable	mg/L	0.0017	0.0005	0.02	Below MAC
Zinc	Extractable	mg/L	0.001	0.001	5	Below AO
Physical and Aggregate F	Properties			2020		
Colour	Apparent, Potable	Colour units	>60	5	15	Above AO
Turbidity		NTU	2.3	0.1	0.1	Above OG
Routine Water			2.6			
рH			8.77		6.5 - 8.5	Above AO
Temperature of observed pH		°C	19.4		0.000.014	
Electrical Conductivity		µS/cm at 25 C	852	1		
Calcium	Extractable	mg/L	3.4	0.2		
Magnesium	Extractable	mg/L	<0.2	0.2		
Sodium	Extractable	mg/L	217	0.4	200	Above AO
Potassium	Extractable	mg/L	0.6	0.4		
Iron	Extractable	mg/L	0.48	0.01	0.3	Above AO
Manganese	Extractable	mg/L	0.031	0.005	0.05	Below AO
Chloride	Dissolved	mg/L	3.1	0.4	250	Below AO
Fluoride		mg/L	3.36	0.05	1.5	Above MAC
Nitrate - N		mg/L	<0.01	0.01	10	Below MAC
Nitrile - N		mg/L	<0.005	0.005	1	Below MAC
Nitrate and Nitrite - N		mg/L	<0.01	0.01	10	Below MAC

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M.D. of Greenview, 2014 Update of the Sturgeon 2009 Water Supply Well Sturgeon Area, SW 29-070-24 W5M, 14-0273.01

Frano 7217 Roper Road NV/ Edmonton, Alberta TGB 3J4, Canada

1 +1 (780) 438-5522 F +1 (780) 438-0386 E: Edmonton@+xova.com W: www.er.or.a.com

Analytical Report

	Bill To:	M.D. of Greenview #16
	Report To:	M.D. of Greenview #16
		Box 1079
		3605 - 46 Street
		Valleyview, AB, Canada
		TOH 3NO
	Attn:	Jennifer Besinger
-	Sampled By:	
	Company:	M.D. of Greenview

Location: P.O.: Acct code:

Project:

Name:

LSD:

ID:

Sturgeon Heights

Lot ID: 883762 Control Number: A255422 Date Received: Jul 25, 2012 Date Reported: Jul 31, 2012 Report Number: 1753925

Page 2 of 4

Exova

		Reference Number Sample Date Sample Time Sample Location Sample Description Sample Matrix	883762-1 July 25, 201 NA Sturgeon He Water	2 sights / 18.1 C		
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Con	tinued					
Sulfate (SO4)		mg/L	<0.9	0.9	500	Below AO
Hydroxide		mg/L	<5	5		
Carbonate		mg/L	25	6		
Bicarbonate		mg/L	563	5		
P-Alkalinity	as CaCO3	mg/L	21	5		
T-Alkalinity	as CaCO3	mg/L	503	5		
Total Dissolved Solid	s	mg/L	526	1	500	Above AO
Hardness	as CaCO3	mg/L	8.4			a served a
Ionic Balance		%	95			

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Approved by: Randy Neumann, BSc General Manager

groundwater consulting - HC environmental sciences

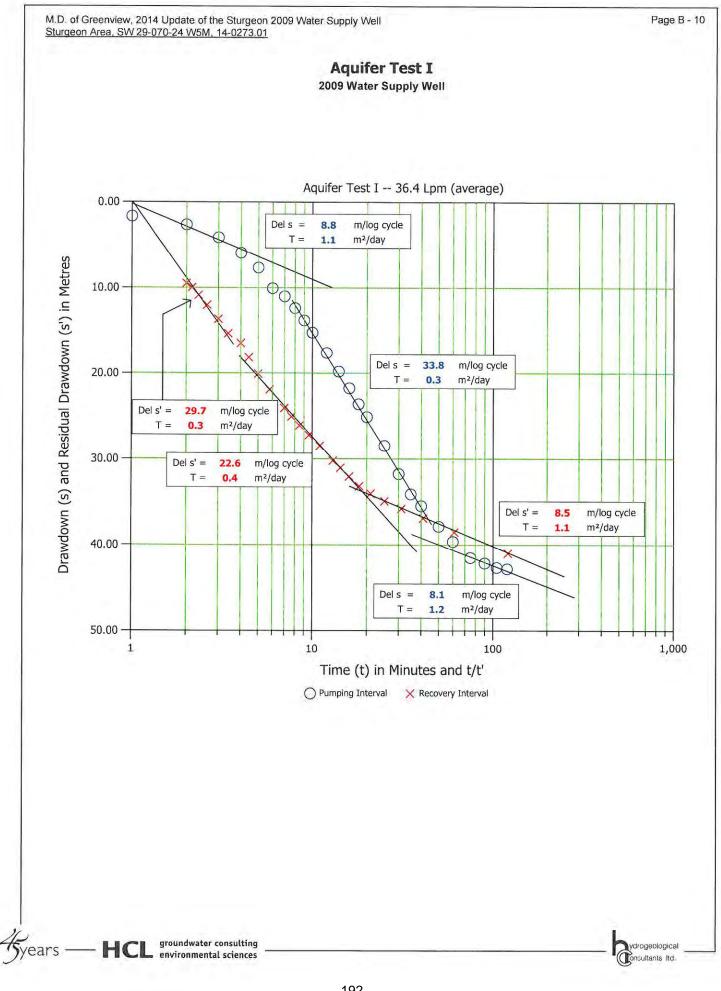
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Body	cote TESTING GROU	JP.			Pag	e2of3 i	
,			Analytical Re	port		1	
Report To:	Hopper Water Well Drilling Hopper Water Wall Drilling 11031-92 Avo. Grande Prairie, AS, Canada TAV 3J3 Stewart Gille J. Lvokie	Projeci; ID: Name: Locallon: LSD: P.O.; Acct code;	Cooy Cove Water Sf Sturgeon Lake, MD V Cosy Cove SW 29-70-24 W5M	Vell Date F	Lot ID; 6928 Number: A0508 Received: Jul 17. Reported: Jul 22. Number: 12357	12 2009 2009	
	Hopper Water Well	1100 0000					
		Reference Number Sample Date Sample Time Sample Location Sample Description Sample Matrix	July 17, 2009	st			
Analyte		Unite	Result	Nominal Detection Limit	Quidellne Limit	Guldeline Comments	15
Routine Water - Carbonale Brearbonate P-Alkathrity T-Alkalinity Total Oissowed S Hardness Iohic Balance	as CrCO3 as CaCO3	mg/L mg/L mg/L mg/L mg/L %	38 509 32 480 522 18 100	6 9 5 1	500	п/а n/a n/a n/э Above AO п/а л/а	F
							1
			Αρριονι	nd by: Darren Crieblon Operations Che		te	
Desystera Testing Crubb 7217 Roper Road NW - Ec Temia and Conditions:	างระหม่งแบ่งรูออโอะวิลาทุ พระ imonuon - คลิ - T6B 314 - Ganada - Tak www.badyoniulesbng.chniviermak.cong	(4,1)9(1/coin(14)(14),2011 +1 (780) 438-6622 - Fax; +1 Pilons	1 (700) \$38-0396				
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	groundwater consulting environmental science					h	irogeolo

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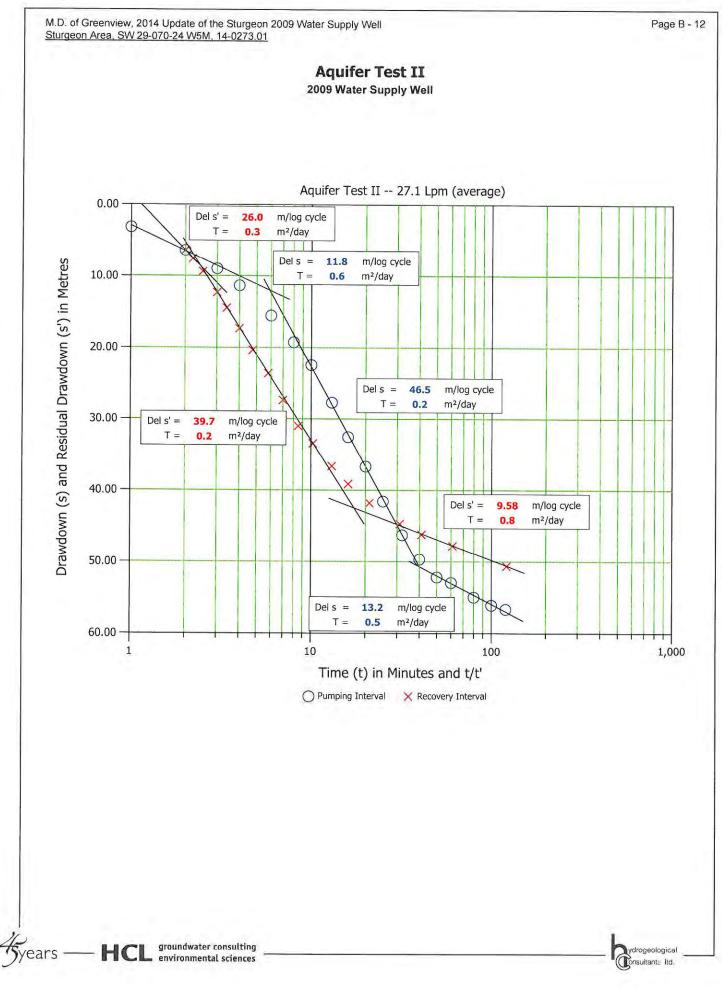


	2014 Update of the Stur 29-070-24 W5M, 14-02	geon 2009 Water Supply 73.01	Well		Page B
	Let the state of t				
		Aquit	er Test I		
		2009 Wate	er Supply Well		
		SW 29-	070-24 W5M		
Averag	e Discharge (Lpm):	36.4	Pre-Test Water Level - N	NPWL (m): 8.38	
Date T	est Started:	July 17, 2009	Depth to Pump Intake (r	n): N/A	
Time T	est Started (hours):	N/A	Test Interval - Top (m)		
	ng Interval (minutes):	120	Test Interval — Bottom		
	ery Interval (minutes):	120	Top of Main Aquifer (m):	C. N. C. S.	
NCCOW.	ery interval (minutes).	120	Top of Main Aquiler (III).	* N/A	
	This report was denerated o	Reference: M- * TGWC calcula	ation Not Available 40293.645597 (AT 1) ted or determined value. s"; no warranty either expressed or implied.	@TGWC Page 1 of 1	
	N		1		
	Pumping Interva		Re	ecovery Interval	
N	leasurement Point: [unkno	wn]	Meas	urement Point: [unknown]	
Time (t) Since			Time (t') Since		Residual
umping Started	Drawdown (s)	Discharge	Pumping Stopped		Drawdown (s')
(minutes)	(metres)	(Lpm)	(minutes)	<u>(t/t')</u>	(metres)
1	1.65	36.4	1	121	40.99
2	2.62	36.4	2	61	38.52
3	4.11	36.4	3	41	36.91
4	5.91	36.4	4	31	35.81
5	7.65	36.4	5	25	34.93
6	10.06	36.4	6	21	34.04
7	11.00	36.4	7	18.1	33.19
8	12.37	36.4	6	16.0	32.06
9	13.81	36.4	9	14.3	31.06
10	15.24	36.4	10	13.0	30.23
12	17.62	36.4	12	11.0	28.50
14	19.81	36.4	14	9.6	27.25
16	21.76	36.4	16	8.5	26.12
10	23.62	36.4	18	7.7	25.08
20	25.11	36.4	20	7.0	24.03
25	28.47	36.4	25	5.8	21.91
30	31.76	36.4	30	5.0	20.09
35	34.11	36.4	35	4.4	15.17
40	35.48	36.4	40	4.0	16.46
50	37.85	36.4	50	3.4	15.33
60	39.62	36.4	60	3.0	13.65
75	41.51	36.4	75	2.6	12.01
	42.15	36.4	90	2.3	10.85
90		20.4		6	10.00
90 105	42.67	36.4	105	2.1	9.97

Test Comments:

Test conducted by Hopper Water Well Drilling Ltd.

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M.D. of Greenview, 2014 Update of the Sturgeon 2009 Water Supply Well Page B - 13 Sturgeon Area, SW 29-070-24 W5M, 14-0273.01 **Aquifer Test II** 2009 Water Supply Well SW 29-070-24 W5M Average Discharge (Lpm): 27.1 Pre-Test Water Level - NPWL (m): 12.83 Date Test Started: November 05, 2014 Depth to Pump Intake (m): 91.4 Time Test Started (hours): 14:54 Test Interval - Top (m): 79.2 Pumping Interval (minutes): 120 Test Interval - Bottom (m): 91.4 Recovery Interval (minutes): 120 Top of Main Aquifer (m):* N/A N/A - Information Not Available Reference: M40293.645597 (AT 2) * TGWC calculated or determined value. This report was generated on: November 19, 2014 — Dala "AS IS"; no warranty either expressed or implied. 💿 IGWC — Page 1 of 1 **Pumping Interval Recovery Interval** Measurement Point: Top of Casing Measurement Point: Top of Casing Time (t) Since Time (t') Since Residual Pumping Started Pumping Stopped Drawdown (s) Drawdown (s') Discharge (minutes) (metres) (minutes) (t/t') (metres) (Lpm) 1 3.14 47.0 1 121 50.64 2 47.77 6.41 37.0 2 61 3 9.00 35.0 3 41 46.19 4 11.37 35.0 4 31 44.69 r. 15.57 34.0 6 21 41.78 3 19.27 33.0 8 16.0 39.13 10 22.49 33.0 10 13.0 36.64 13 27.73 31.0 13 10.2 33.44 16 32.54 32.0 16 8.5 31.02 20 36.69 33.0 20 7.0 27.39 25 41.56 32.0 25 5.0 23.64 32 46.25 30.0 32 4.8 20.34 40 49.70 29.0 40 4.0 17.34 50 52.21 20.0 50 3.4 14.49 60 52.97 26.0 60 3.0 12.33 30 55.00 24.0 0.6 2.5 9.39 100 56.12 24.0 100 2.2 7.58 120 56.69 24.0 120 2.0 6.40 Test Comments: Aquifer test conducted by HCL.

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Appendix C – LevelTROLL 500 Details

TABLE OF CONTENTS

LevelTROLL 500 Calibration Report SN: 384949	2
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M.D. of Greenview, 2014 Update of the Sturgeon 2009 Water Supply Well Sturgeon Area, SW 29-070-24 W5M, 14-0273.01

LevelTROLL 500 Calibration Report SN: 384949



Report Number: 20140923-384949 221 East Lincoln Avenue, Fort Collins, CO 80524 USA 1-970-498-1500, 1-800-446-7488, FAX: 1-970-498-1598 Visit us at www.in-situ.com

Instrument Details:

Instrument Model:	Level TROLL 500
Full Scale Pressure Range:	100 PSI / 70 m / 231 ft / vented
Serial Number:	384949
Hardware Version:	4
Firmware Version:	3
Calibration Details:	

Calibration Result:
Calibration Date:
Nominal Range of Applied Temperature
Temperature Accuracy Specification:
Nominal Range of Applied Pressure:

Pressure Accuracy Specification:

PASS 2014-09-23 02:48:30 (UTC) : -5 C to +50 C +/- 0.1 C From -5 C to +50 C 0 PSI to 100 PSI +/- 0.1 %FS from -5 C to +50 C, +/- 0.05 %FS at +15 C

Post-Calibration Check:

Parameter	Applied	Reported	Deviation	Unit	
Pressure	100.0000	100.0062	0.0062	PSI	
Pressure	40.0000	40.0024	0.0024	PSI	
Pressure	-0.0001	-0.0011	-0.0010	PSI	
Temperature	39.1900	39.2092	0.0192	С	

Calibration Procedures and Equipment Used:

Automated calibration procedures used. Manu Agilent Model 34970A SerialNo MY44015965 Manu Instrulab Model 3312A-14-15-24 SerialNo 31102-(41037) Manu Instrulab Model 406X-0031-01 SerialNo 2-31139 Manu MENSOR Model 600 SerialNo 622004 Manu Agilent Model 53131A-010 SerialNo MY47001136 Manu MENSOR Model 600 SerialNo 623321

Notes:

1. Standards used in this calibration are traceable to the National Institute of Standards and Technology.

2. This calibration report shall not be reproduced, except in full, without the written approval of In-Situ, Inc.

3. A calibration interval of 12 to 18 months is recommended.

Performed By: SR

Report generated 9/30/2014 2:26:39 PM

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Page 1 of 1

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SCANNED

Calibration Report

Page C - 2



to DIVERT AND USE WATER

ENVIRONMENT

Pursuant to the WATER RESOURCES ACT

20741 File No. 1984-07-20-01 Priority No.

Purpose	Domestic		
Drainage Basin	Peace River		
First Issued	1986 08 18		
	Her Majesty in right of Albert as represented by the Minister of Municipal Affairs Edmonton, Alberta		

HAVING COMPLIED with the applicable provisions of the Water Resources Act and the regulations thereunder and Interim Licence No. 13181, a copy of which is attached hereto and incorporated herein,

a

IS HEREBY GRANTED LICENCE to divert and use the quantities of water prescribed in the Interim Licence in accordance with and subject to all other applicable provisions of that Act and the regulations thereunder, and the terms and conditions attached hereto and incorporated herein, at locations described in the Interim Licence,

BY MEANS AND THROUGH works and undertakings described in the Interim Licence.

1986 08 18

Date

Controller of Water Resources

0267z

WR 4 (Feb/86)



INTERIM LICENCE

Pursuant to Section 18 THE WATER RESOURCES ACT Nº 13181

Her Majesty in right of Alberta as represented by the Minister of Municipal Affairs Edmonton, Alberta

File No. 20741 Priority No. 1984-07-20-01

having complied with the applicable provisions of The Water Resources Act and the regulations thereunder is hereby authorized, as soon as right-of-way is obtained:

A. To construct works as shown on plans and reports filed, approved and identified in departmental records as:

20741-1 Approximate Water Well Location Puskwaskau Community LSD 16-36-74-1-6

B. To divert and use water as hereinafter specified and described subject to the terms and conditions attached hereto and incorporated herein:

PURPOSE: Domestic (Community Water Supply)

SOURCE OF SUPPLY: Aquifer

GROSS DIVERSION: Up to 7 acre-feet (1.9 million Canadian gallons) per annum consisting of:

- 1. Estimated Consumptive Use: 1.9 million gallons
- 2. Estimated Losses: NIL
- 3. Estimated Return Flow: NIL

POINT OF	WELL	PRODUCTION	MAXIMUM	MAXIMUM ANNUAL
DIVERSION	NUMBER	INTERVAL	PUMP RATE	DIVERSION
16-36-74-1-6	84-07-20-01	216'-240'	8 Cgpm	1.9 mCg

The construction of the works hereby authorized is to be completed within One year from the date hereof.

1984 08 28

Date Issued

Lewis Controller of Water Resources

0090d

Original — Department Copy — Licensee (See over for excerpts) WR2 (Jan/82)

199

File: 20741

TERMS AND CONDITIONS INTERIM LICENCE NO. 13181

- If deemed necessary by the Controller of Water Resources, the production well(s) shall be equipped with a cumulative meter which registers the number of gallons or cubic metres pumped.
- If deemed necessary by the Controller of Water Resources, the licensee may be required to measure the water levels in the production well(s), while the pump is operating, on a monthly or weekly basis and to make such modifications to the well(s) as necessary to obtain the water level(s).
- If deemed necessary by the Controller of Water Resources the licensee shall obtain water samples for purposes of chemical analyses from the production well(s). The analyses must include total dissolved solids, pH, Ca, Mg, Na+K, CO₃, HCO₃, SO₄, Cl, Fe and NO₃.
- 4. If deemed necessary by the Controller of Water Resources, the licensee may be required to install an observation well or wells, completed in the same aquifer as the production well(s), to provide data for the evaluation of the effect of this withdrawal on the aquifer and the effect on other ground water users.
- 5. When requested to do so by the Controller of Water Resources, the licensee shall submit a water use return in a manner and at a time to be prescribed by the Controller of Water Resources.
- 6. This interim licence and the attached terms and conditions are based on knowledge available at the time of issue and therefore the Controller of Water Resources reserves the right to revise the following portions of the interim licence and attached terms and conditions:
 - (a) Gross diversion;
 - (b) Maximum pumping rate;
 - (c) Number, type and location of observation wells required;
 - (d) Frequency and method of measurement of observation wells,

any time that the Controller of Water Resources has information indicating unreasonable interference with water supplies which cannot be satisfactorily remedied or that damage to aquifer(s) is occurring.

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The licensee shall assume all liability for all damages of any nature

- 2 -

- whatsoever, including any bodily injury or personal damage claim and any damage to or loss of use or loss of any personal or real property caused by or directly attributable to any error, omission or negligence in the operation of the production well(s) and/or observation well(s) by the licensee, its workmen, employees, or agents and shall save Her Majesty in right of Alberta, the Minister of the Environment, their officers, workmen, employees and agents, harmless and keep them indemnified against all claims or demands for any damages, costs, losses and expenses that may be made as a result of any error, omission or negligence on the part of the licensee in the operation of the production well(s) and/or observation well(s) and for any actions or suits that may be brought against Her Majesty in right of Alberta, the Minister, their officers, workmen, employees and agents by reason of all acts or things resulting from any error, omission or negligence on the part of the licensee, its workmen, employees, subcontractors or agents in the operation of the production well(s) and/or observation well(s).
- The rights and privileges hereby granted are subject to periodic review and to modification to ensure the most beneficial use of the water in the public interest and more particularly to ensure preservation of the rights of other water users.
- The rights and privileges hereby granted can only be extended, modified, transferred or assigned with the approval of the Controller of Water Resources and are subject to cancellation or modification as provided in the Water Resources Act.
- Following completion of the works herein authorized this interim licence and its terms and conditions shall be attached to and become part of the licence to use water issued under provisions of Section 33 of the Water Resources Act.
 - 11. This interim licence together with the resulting licence remains valid only as long as the licensee continues to enjoy the right to occupy or otherwise affect the lands required in the operation of this project.

1984 08 28 Dated at Edmonton

7.

Controller of Water Resources

0090d



LICENCE

PURSUANT TO THE PROVISIONS OF THE WATER ACT

LICENCE No. 00200240-00-00

FILE No. 00191329

PRIORITY No. 2003-05-30-001

MD of Greenview 3609-46 Street Valleyview, Alberta T0H 3N0

is authorized to divert 24,000 cubic metres of water annually from the well in NE 08-071-23-W5 for the purpose of agriculture (tank loader facility) subject to the attached conditions.

2028 08 27 Expiry Date (Y/M/D)

Designated Director under the Act

2003 08 28 Dated (Y/M/D)

CONDITIONS

DEFINITIONS

"diversion site" means the production well, dugout, or area determined to be a groundwater source

DIVERSION OF WATER

1. This licence is appurtenant to the following:

LOCATION	PRODUCTION INTERVAL (metres)	MAXIMUM PUMPING RATE (cubic metres per day)
NE 08-071-23-W5	52.4-58.8	65.0

2. The licensee shall undertake the water diversion in accordance with the plans and/or reports filed in the following Departmental records:

NUMBER	TITLE
00191329-P001	Location of Water Well for MD of Greenview NE 08-071-23-W5
00191329-R001	Groundwater Investigation Well Construction and Testing Tankloader Well Municipal District of Greenview No. 16 Sandy Bay, Alberta

- 3. This licence is based on knowledge available at the time of issue, and therefore the Director reserves the right to amend the:
 - (a) maximum annual diversion of water,
 - (b) maximum rate of water diversion,
 - (c) number, type and location of observation wells required,
 - (d) frequency and method of measurement of observation wells,
 - (e) responsibility for investigation of complaints,
 - (f) conditions pertaining to annual water monitoring reports,

any time that the Director has information indicating unreasonable interference with water supplies or that damage to the aquifer is occurring.

CONDITIONS

4. The licensee shall position the pump intake in the production well(s) above the top of the aquifer.

MONITORING AND REPORTING

- 5. The licensee shall:
 - (a) equip the diversion site(s) with a cumulative meter or other device which registers the quantity of water pumped,
 - (b) measure the water levels in the diversion site(s) while the pump is operating,
 - (c) obtain water samples for which a chemical analyses shall be performed that reports the following information:
 - (i) Total Dissolved Solids, Hardness, Alkalinity, pH, Ca, Mg, Na+K, CO₃, HCO₃, SO₄, CI, NO₃, Fe,
 - (ii) water temperature, date, and time of sampling,
 - (iii) date the analyses were performed, and
 - (iv) results of the analyses.
- 6. The licensee shall record and retain for each calendar year the following information and shall provide this information to the Director on or before January 31 of each year:
 - (a) monthly readings of the number of cubic metres of water pumped from the diversion site(s) including dates and times the readings were taken,
 - (b) monthly measurements of water levels from the diversion site(s) including dates and times at which readings were taken,
 - (c) annual submissions of chemical analysis,

and any other information requested by the Director.

COMPLAINT INVESTIGATION

- 7. (1) The licensee shall:
 - (a) investigate all written complaints relating to allegations of surface water and groundwater interference as a result of the diversion site(s) operation within a distance specified by the Director,

CONDITIONS

- (b) provide a report to the Director, within a time specified by the Director, outlining the results of any:
 - (i) investigation relating to the alleged interference,
 - (ii) remediation or mitigative measures as a result of impact due to the operation of the diversion site(s) such as:
 - (A) lowering the intake of the pump to compensate for a drop in water level,
 - (B) re-drilling the water well to an increased depth so as to allow the pump to be installed at a lower depth,
 - (C) drilling a new well which must be pump tested to standards specified by the Director, or
 - (D) providing an alternate water supply satisfactory to the Director.
- (2) The Director may make decision to suspend or cancel this licence if the licensee fails to satisfy the Director of the investigation and mitigative measures relating to alleged interference.

GENERAL

- 8. The licensee shall hold harmless the Minister of Environment or any other agent of the Government of Alberta for damage or damage claims arising out of the water diversion.
- 9. The licensee shall reclaim all abandoned wells or other holes relating to the water diversion under this licence in accordance with the Water (Ministerial) Regulation of the *Water Act*, and shall submit a reclamation report to the Director after completion of the water diversion.
- 10. The rights and privileges granted are subject to periodic review on licence renewal and amendment by the Director to ensure the most beneficial use of the water in the public interest.
- 11. The licensee shall not deposit any substance that will adversely affect the water body.

CONDITIONS

12. Where applicable, the licensee shall only release water to a water body when the quality of water is equal to or better than the quality of water in the receiving water body.

Designated Director under the Act

2003 08 28 Dated (Y/M/D)

Associated Engineering	GLOBAL PERSPECTIVE. LOCAL FOCUS.	Issue Date: Previous Issue Date	December 22, 2016	File:	20153471.01.E.03.00
		То:	Gary Couch		
		From:	Alan Lui/Candice Gott	stein	
		Client:	MD of Greenview		
		Project Name	Rural Water Master Pl	an	
		Project No.	2015-3471		
TECHNICAL MEN	MORANDUM	Subject:	Water Use Survey Re	sult Asse	essment

The MD of Greenview has recently conducted two surveys to determine the water needs of its residents. The information gathered will be used to determine both the potable water needs as well as the level of service requirements. The results will be utilized to help guide the MD in terms of locating future potable watering points. The information may be used to develop the Water Point Viability Study Phase 2 – Rural Water Master Plan, if the MD chooses to proceed at some point in the future. The Plan would determine the most viable and cost effective options for improving potable water supply within the MD.

The initial Water Use Surveys were sent out to Puskwaskau, Goodwin, Crooked Creek, Sturgeon Heights and Sandy Bay and surrounding areas. The Grande Cache, Valleyview, Little Smoky and Fox Creek areas were not included in the survey. Figure 1 identifies the above noted locations within the MD of Greenview.

Overall, the participation rate of the first survey appears to have been fairly low at 18%. A total of 117 households participated in the survey out of 661 total surveys which were mailed out. As such, the MD chose to proceed with a second, online survey in an attempt to increase participation. As well, in-person responses were entered into the on-line system when necessary. A total of 107 household participated in the second survey, of which 31 completed the survey for a second time (based on repeat tax roll numbers). In the initial survey, 106 responses included a roll number and can therefore be mapped. The second survey resulted in 95 surveys which included a tax roll number and can be mapped. Between the two surveys, 165 responses can be mapped, considering the 31 households that completed the survey twice.

For the purpose of assessing the survey results, only those responses which included a tax roll number will be analyzed. This is necessary as it is unknown whether any of the responses which did not return a roll number may be repeat responses. The most recent survey responses have been mapped in the case where both surveys were returned by one household.

Figures were created to graphically display the responses to Questions 2 through 10 and are included for reference. These figures present the mapped responses, compiled from the two survey periods. Only those locations with tax roll numbers provided by the MD of Greenview were mapped. It should be noted that 2 of the 165 residences fell outside of the current mapping area, and are therefore not represented on the figures, however, the responses are included in the assessment breakdown. Considering 165 of 661 possible households, the participation rate increased to 25% based on all mapped responses.



As a relatively small percentage of surveys were returned, it is possible that respondent apathy may have contributed to a lack of responses. This suggests that those people wanting to see a change in service or new potable water points constructed, may have been more motivated to contribute than others. As such, a number of those surveyed may be satisfied with their current level of service, and have chosen not to reply.

SURVEY RESULTS

Question 1: Please provide the legal description of your residence.

Question 1 asked for the legal description of the residence, such that it can be mapped. The second survey clarified this by asking for the tax roll number of the residence. In total, 165 survey responses (excluding duplicates), included legal descriptions or tax roll numbers and can be mapped on the enclosed Question Figures.

Question 2: Where do you acquire your potable water?

Of the total mapped respondents 22/165 (13%) identified self haul or truck haul, whereas 123/165 (75%) identified using bottled water or private wells. For the most part, those using bottled water are thought to be the most likely to utilize a new potable watering point (55/165 or 33%). Those households using wells are considered unlikely to switch sources, unless water quality or quantity issues arise (68/165 or 41%).

There are a number of respondents in the Sturgeon Lake area who use truck or self haul, who could conceivably be serviced via a new potable watering station due to a closer proximity. The Question 2 Figure shows that essentially all water hauling mapped is currently directed to the Sturgeon Heights/Sandy Bay area, based on the survey results.

Question 3: If applicable, why don't you use the MD's potable watering points?

A significant number of people responded Not Applicable (N/A) or "Other" to this question. Over half of those people who responded N/A also identified using private wells in Question 2 (46/70 or 66%). As well, 10/33 (30%) household responded who indicated "other", also identified using private wells.

Of those who indicated one of the responses provided, 15/59 (25%) indicated that they do not have a tank to haul or store water. As such, without a large capital investment on the property owner's part, these residences are considered unlikely to use the MD's potable source. 11/59 (19%) responded that the water was too costly or that the taste was not to their liking.

33/59 (56%) responses indicated that the potable watering points are located too far from their homes. These locations are considered highly likely to use a new potable watering point, should it be located in closer proximity to their homes. The vast majority of these responses were located in the Sturgeon Lake Area.

Therefore, of the houses surveyed, 33/165 (20%) are considered likely to use a new potable watering point due to improved proximity. This does not include those who already may be hauling from other locations, and who may choose to use a closer location.



Question 4: If applicable, where do you acquire your non-potable water?

Of this, 39/165 (24%) indicated that they acquire water from the MD, while 69/165 (42%) indicate through ground water wells or dugout. 57/165 (34%) did not respond, indicated not applicable, or provided a different response. Those who responded that they acquire water from the MD are generally located adjacent to Sturgeon Lake, or along Highway 43.

Question 5: If applicable, how do your store your potable water?

For Question 5. 30 of 165 (18%) indicated the water is stored in cisterns or tanks, while 59/165 (36%) indicated in bottles. 41/165 (25%) indicated that no storage is required, however, not all private well owners appear to have answered the question, presumably as they thought it to be N/A. However, the data indicates that at a minimum, 18% of respondents have a tank with which to store water if necessary.

Question 6: If applicable, how do your store your non-potable water?

A total of 40/165 (24%) respondents indicated using a cistern or tank while 27/165 (16%) indicated a dugout. 41/165 (25%) indicated that no storage is required, while 57/165 (35%) indicated not applicable, a different answer or did not respond.

Question 7: If applicable, how much potable water does your household use on average per day?

For potable water usage, 90/165 (55%) indicated less than 50 gal/day while 38/165 (23%) indicated 50-100 gallons/day. A much smaller number of 17/165 (10%) answered a value greater than. A total of 33% indicated a usage of over 50 gal/day, indicating that a value higher than this should be considered for the design average day water consumption.

Question 8: If applicable, how much non-potable water does your household use on average per day?

These responses were quite varied with 51/165 (31%) using less than 10 gal/day of non-potable water and 114/165 (69%) using less than 100 gal/day. 37/165 (22%) did not respond, presumably not using non-potable water.

Question 9: Would you consider using one of the potential future potable watering points as identified on the figure? If yes, please indicate which potential future potable watering point you would use.

It is no surprise that the responses are very much in line with the proximity to each of the potential future sites. There are a few responses which indicate a site located a great distance from a residence. These responses are believed to be in error.

Of those mapped respondents who listed either Sandy Bay or Sturgeon Heights, 44/63 (70%) indicated Sturgeon Heights, while 19/63 (30%) indicated Sandy Bay. 11/44 (25%) respondents who identified Sturgeon Heights also indicated using private well water while none of those identifying Sandy Bay had identified using private well water. A further 14 residences which selected Sturgeon Heights identified using bottled water, while an additional 5 identified using self haul. These residences are thought likely to utilize a new local source of potable water if provided.

Of the 19 respondents who identified Sandy Bay as their first choice for potable water, 2 indicated using self haul and 2 indicated third party delivery, while the remainder use bottled water. Therefore, all 19 residences are assumed to use a new potable water site if nearby.



Of the 6 mapped respondents who identified Paskwaskau (believed to be correct entries), 3 use bottled water while 2 have private wells. The sixth source is unknown. This is interesting in that it indicates that some well users may consider utilizing MD potable water should it be available and within proximity.

The same can be said for those expressing interest in using a potable water site at Goodwin, where 2/11 mapped respondents have also indicated as using private well water. The remainder of these residences currently use bottled water (although 1 is unknown).

Of those who identified Crooked Creek, approximately 23/35 (66%) of mapped respondents are currently on private well water. This further supports the notion that those on wells cannot be assumed to remain on wells indefinitely. A further 9 respondents utilize water bottles, while 3 are unknown.

Question 10: If you considered using MD supplied potable water, how would you like to see it delivered?

The majority of respondents (67/165 or 41%) indicated self haul. A further 38/165 (23%) respondents identified MD delivery for a fee, while 12/165 (7%) of surveys indicated residence arranged private delivery. 48/165 (29%) provided an alternative response, or did not respond.

SUMMARY AND RECOMMENDATIONS

Puskwaskau

In general, very few responses were received from locations nearby Puskwaskau, which is likely indicative of the low population in the area. None of the mapped respondents indicated using a potable watering point (self or private haul), or using a non-potable watering point. Of those locations within the 20 km radius from Puskwaskau, 5 are currently using bottled water, however, 4 of these locations are also within 20 km of Goodwin. In fact, within the 20 km Puskwaskau radius there are only 34 residences which are beyond a 20 km radius of Goodwin. Based on such a small service area, it is not recommended that the MD of Greenview invest in converting the current non-potable supply at Puskwaskau to potable water.

The concept has been raised to deliver potable water via truck to be accessed at Puskwaskau, however, based on the limited information available, it may make more sense to haul directly to those residents who want it. This would allow the MD to delay any work in the area until it has become clear that there is a long term demand for it.

Goodwin

Although there were overall few responses, Goodwin appears to be a reasonable location for a potable watering point. This is due to the large service area, and the potential to service a number of residents. Of those respondents who indicated a preference for the Goodwin site, 8 of 11 respondents are currently using bottled water.

If the MD were to proceed with supplying potable water from Goodwin, it must be determined whether it preferable to convert the location to potable or to construct a pipeline from DeBolt. This will be investigated further following confirmation that the MD wishes to proceed with potable water provision from Goodwin. It must also be confirmed that constructing a truckfill at DeBolt is not an option.

Crooked Creek



Memo To: Gary Couch December 22, 2016 Page 5

There was a fairly high desire for Crooked Creek as a future potable water source. This bodes well for the new truckfill which is understood to be constructed at this site in the near future. It may be interesting to note that a large proportion of the Goodwin service area could be accommodated by increasing the Crooked Creek service radius to 25 km, if necessary.

Sturgeon Heights

Sturgeon Heights saw the greatest number of respondents in terms of identifying a potential future watering point. This suggests that the residents are motivated to see the Sturgeon Heights non-potable source be converted to potable. There are also a number of people in the area who are using the MD's non-potable watering points, indicating that there is a demand here. Due to the number of responses as well as to the proximity to the highway (relative to Sandy Bay), it is recommended that the MD proceed with further testing of the Sturgeon Heights watering point in order to determine its treatment requirements.

Sandy Bay

A number of respondents identified Sandy Bay as their first choice as a potable watering point. It is located on the east side of Sturgeon Lake, several kilometers off of the highway and as such, its desirability was very localized. However, there were a number of respondents in the area who also identified using the MD's non-potable water points. It is recommended that the Sandy Bay location be retained as a non-potable watering point as there is clearly a demand for it in the Sturgeon Lake area.

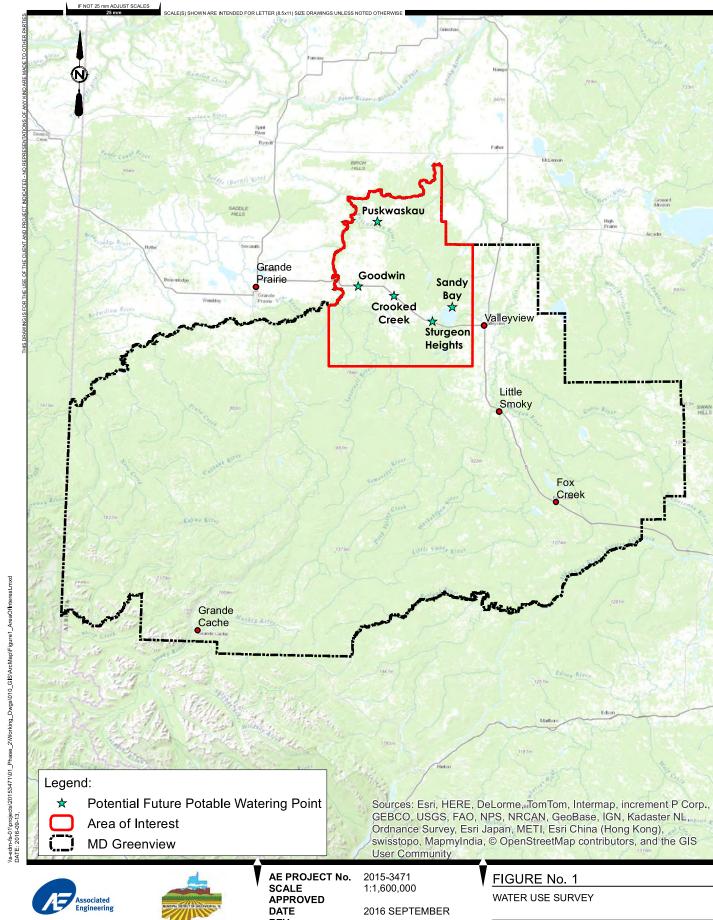
NEXT STEPS

It is our understanding that the MD is satisfied with the survey(s) results/analysis in addition to the previous submitted Water Point Viability Study Phase 1, and will be proceeding with plans for potable water servicing within the study area.

If the MD were to decide to proceed at some point in the future with the Water Point Viability Study Phase 2 – Rural Water Master Plan, the recommended next steps would be as follows:

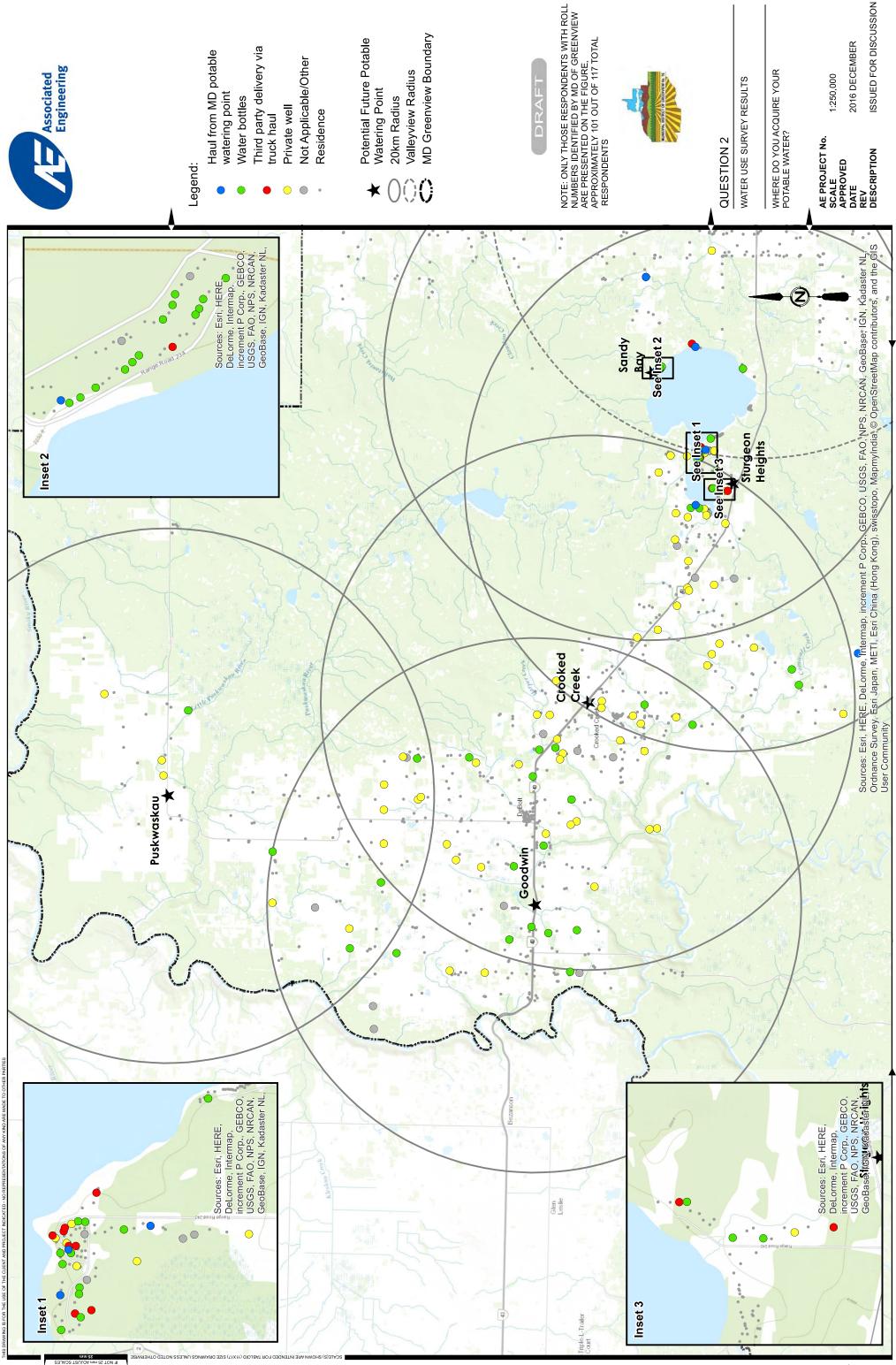
- Establish overall water supply options and strategy
- Develop a staging plan



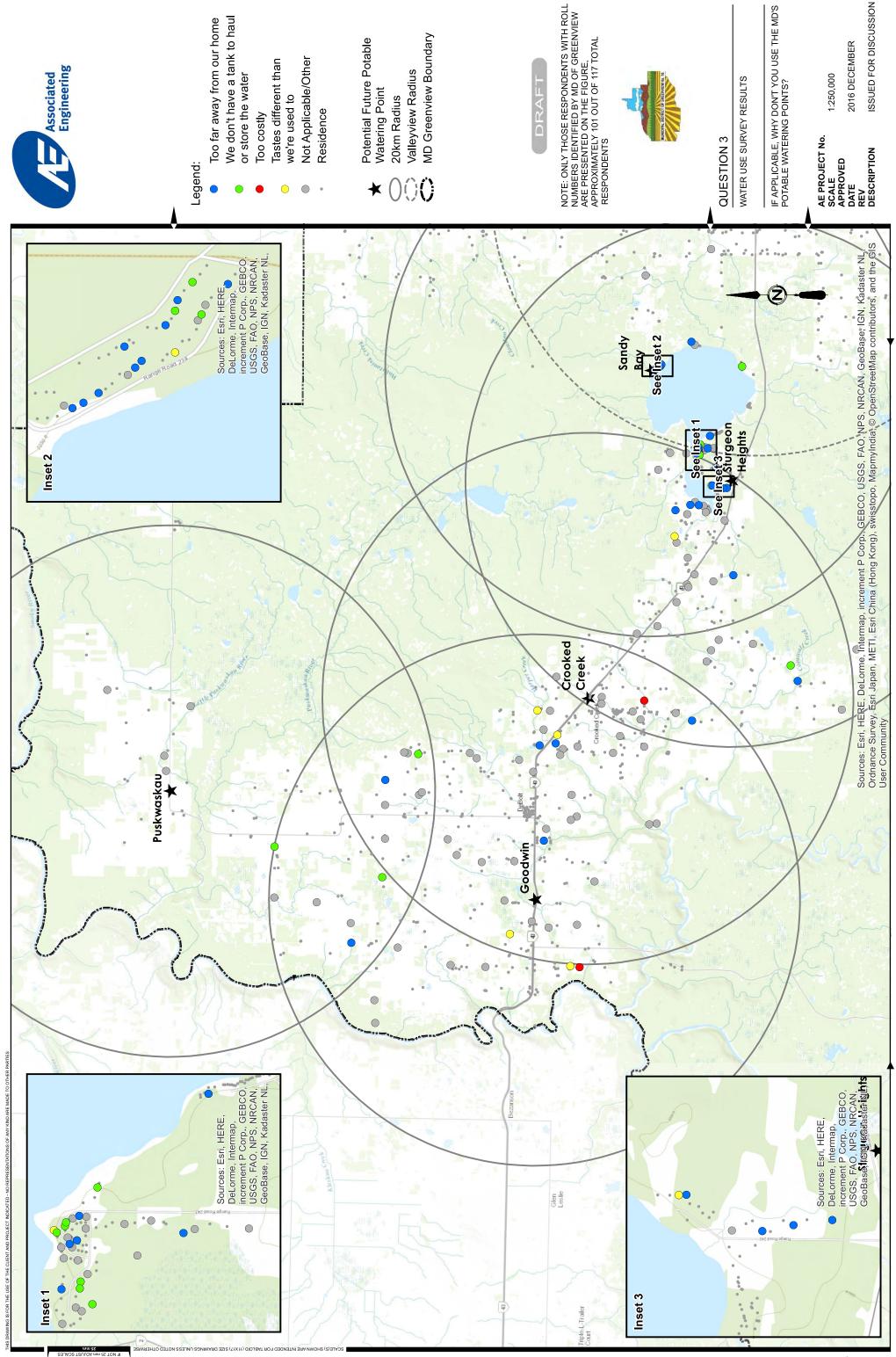


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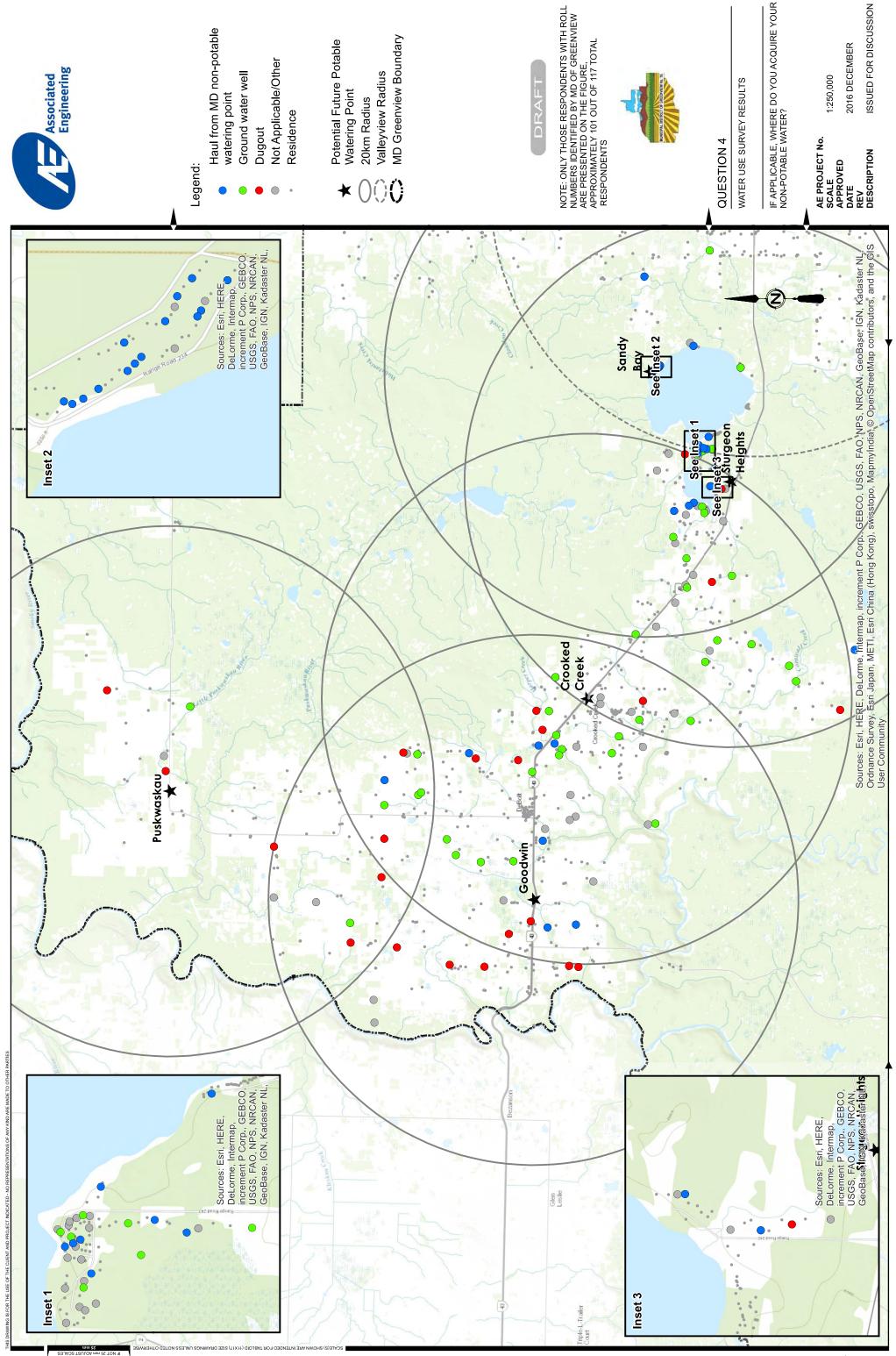
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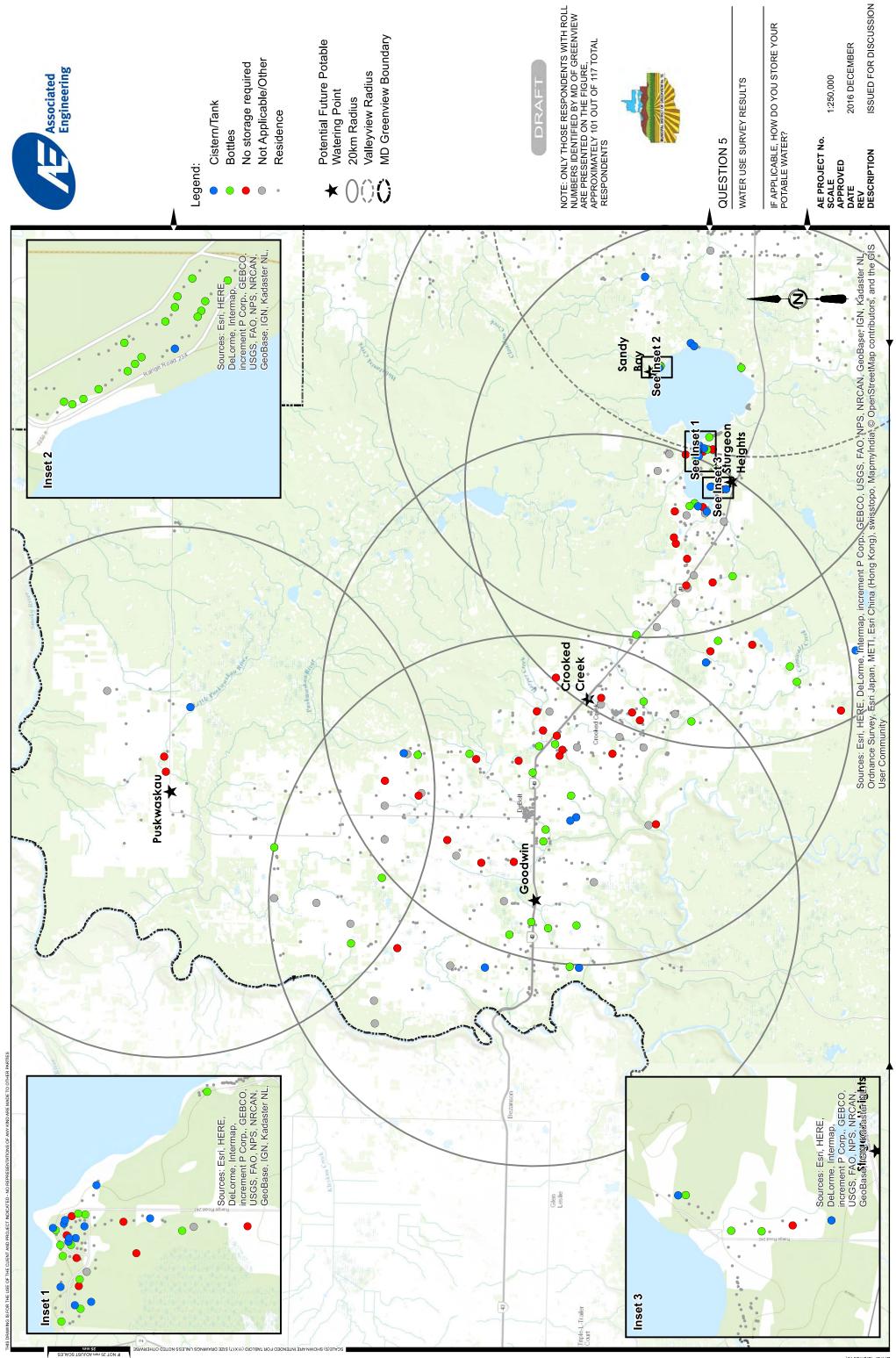
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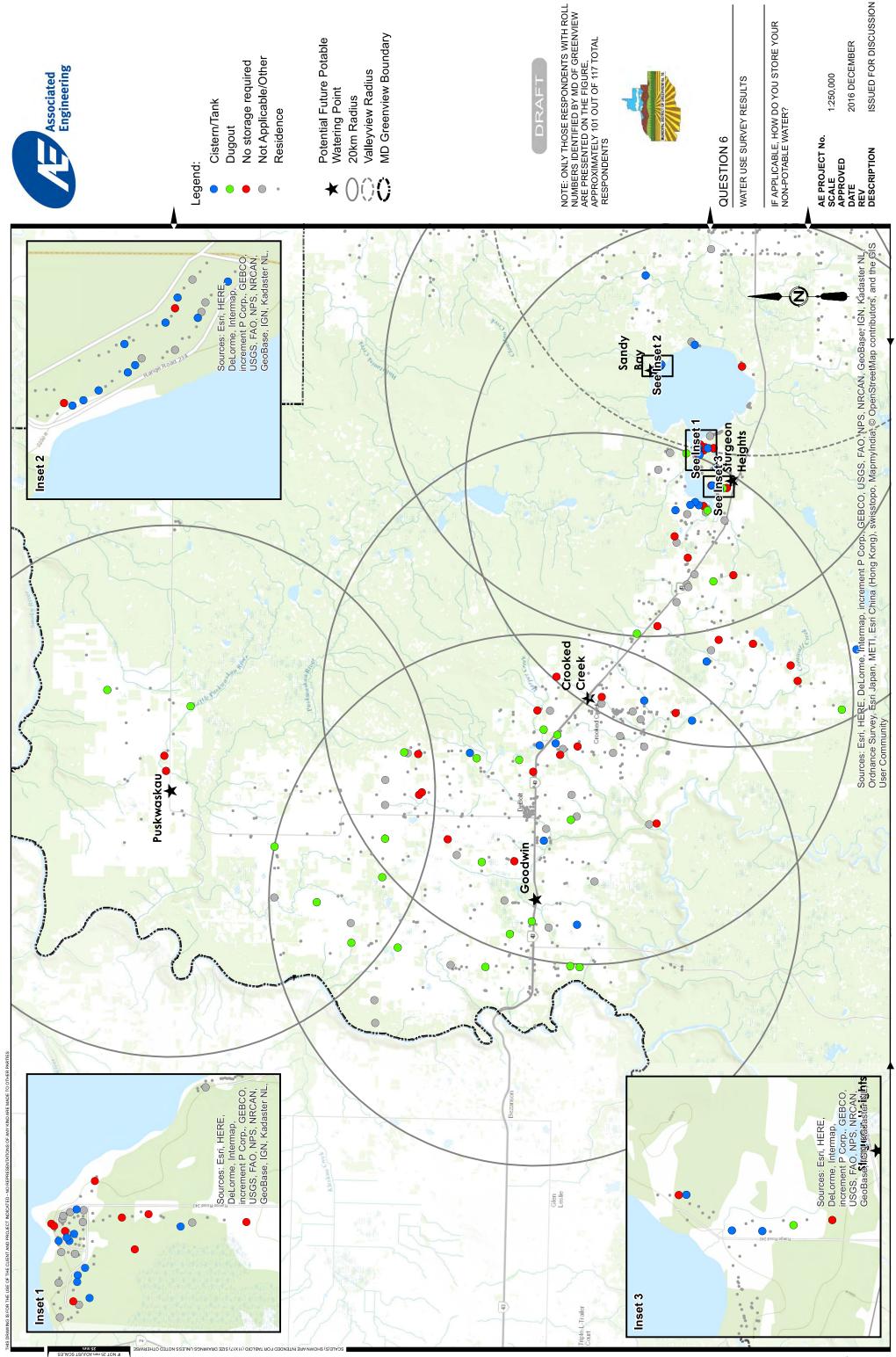
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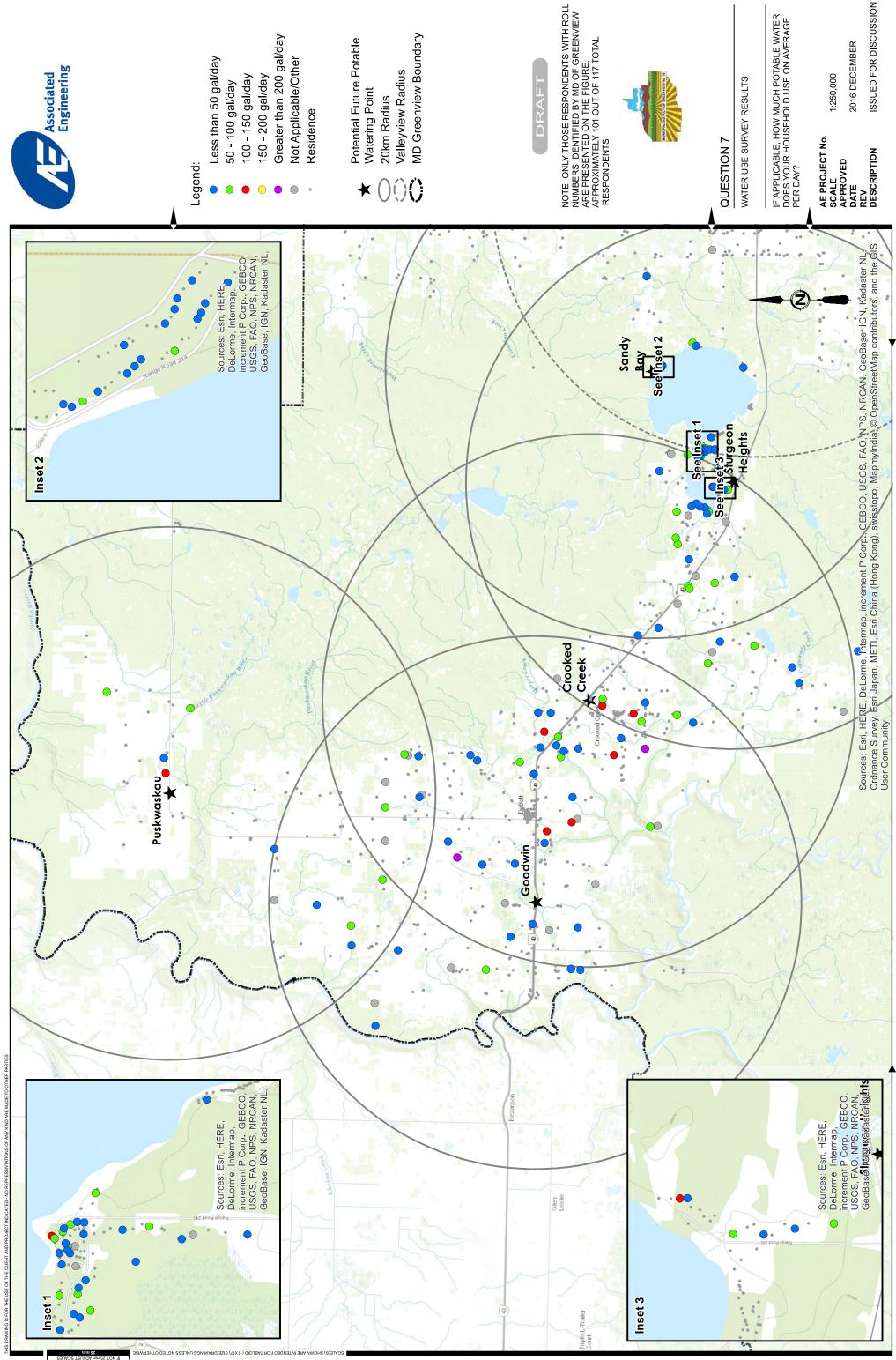


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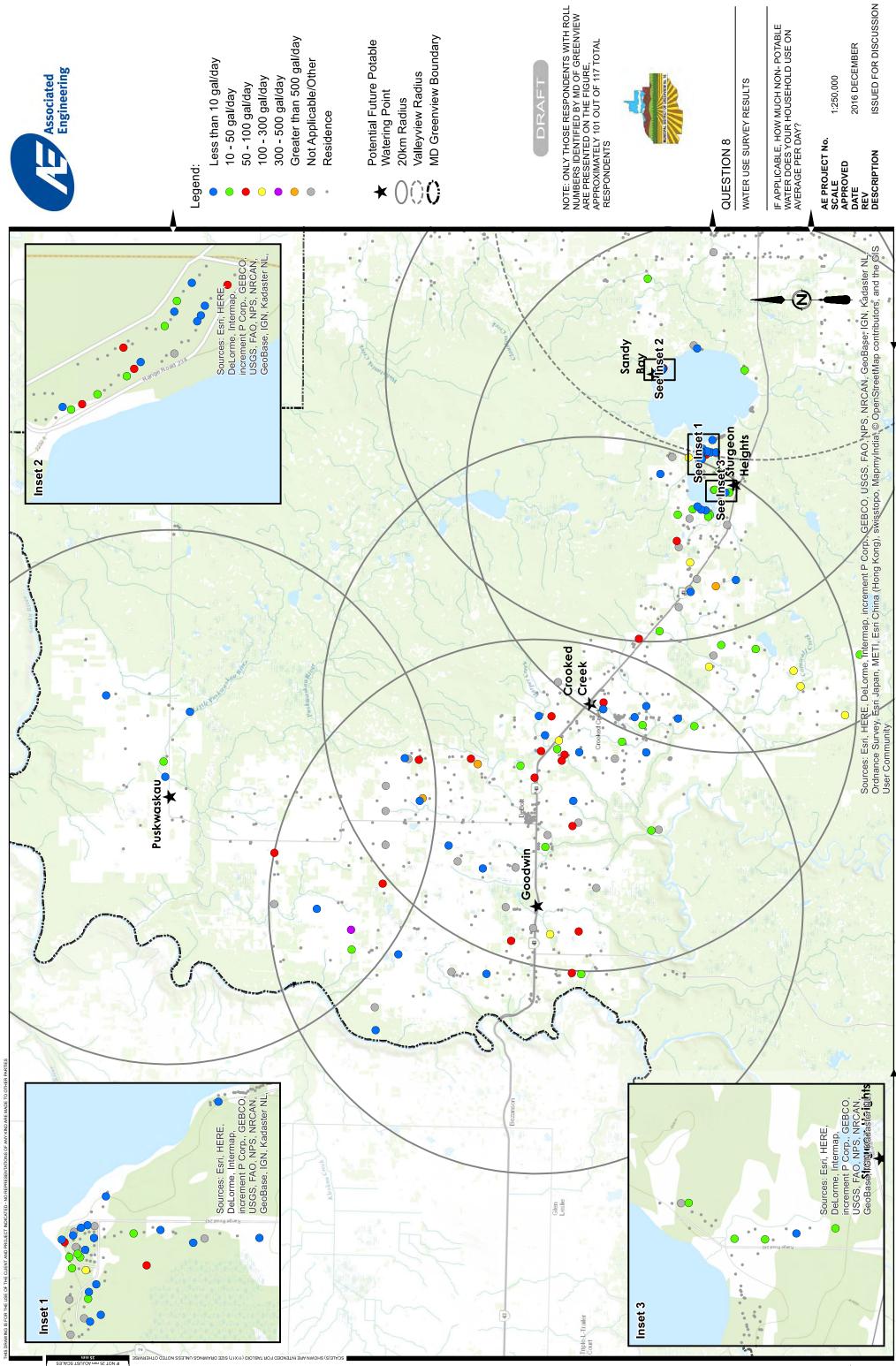


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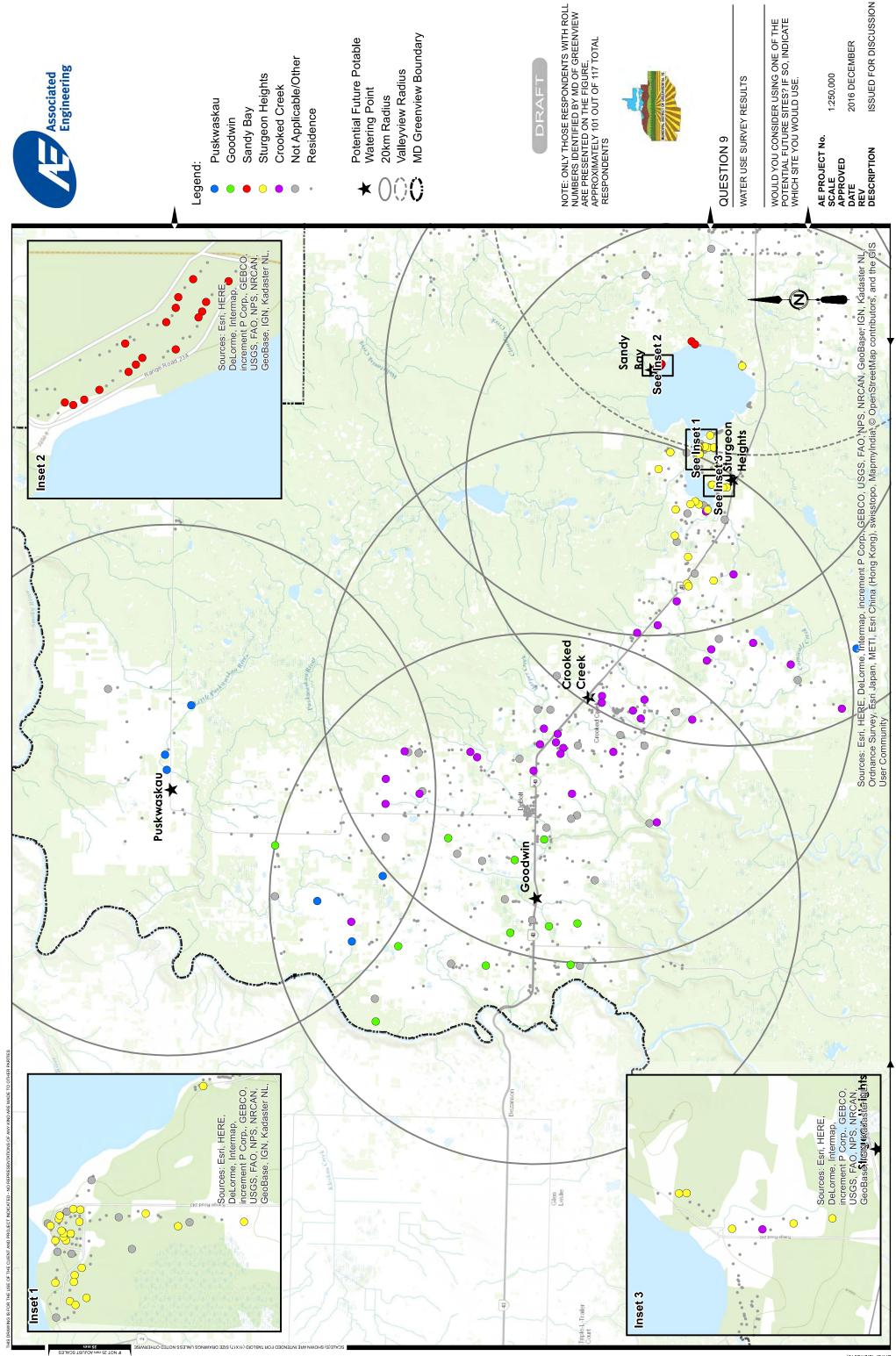




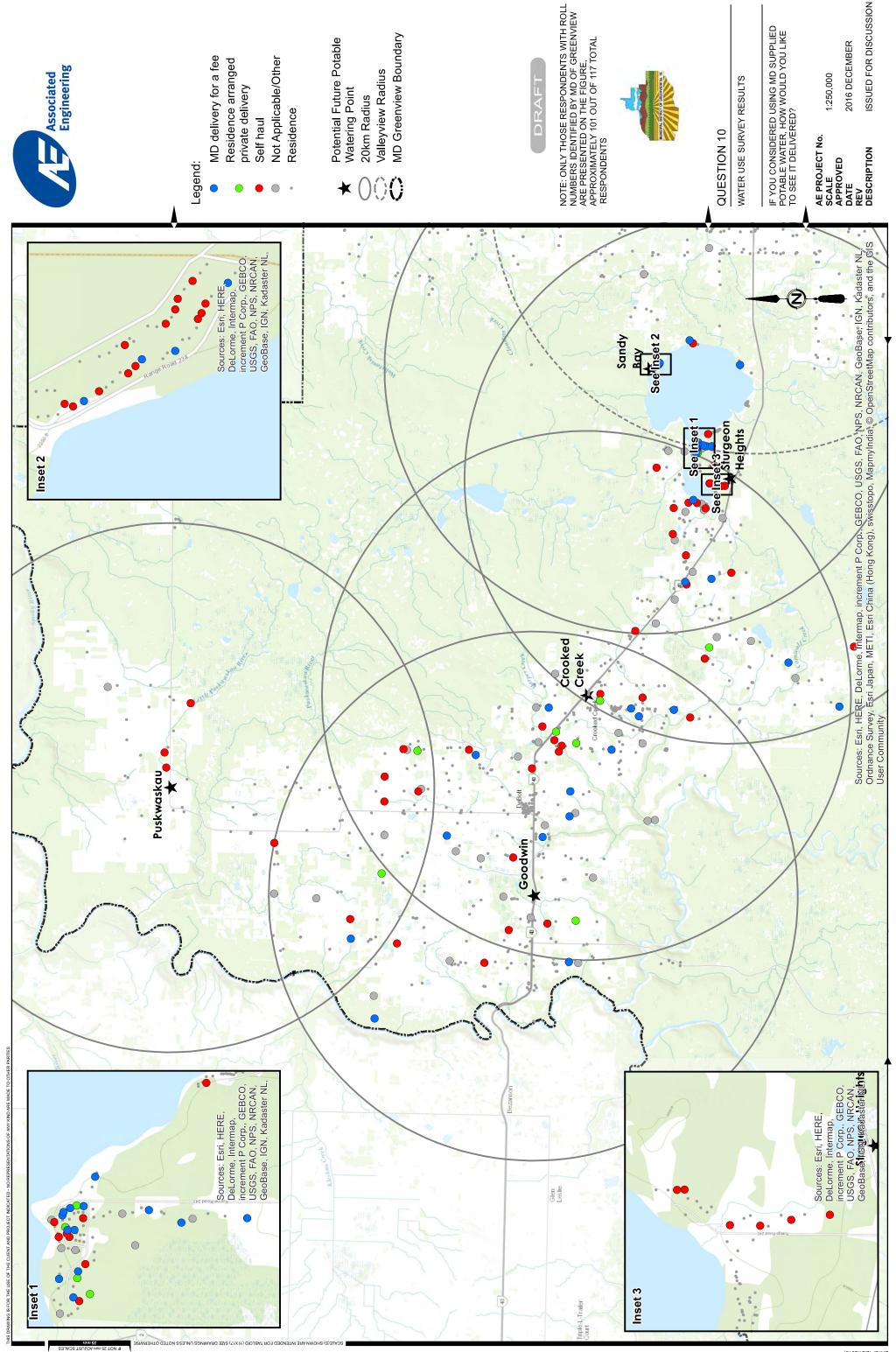
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Manager's Report

Function: Infrastructure & Planning

Submitted by: Grant Gyurkovits, General Manager Infrastructure & Planning

Date: 4/11/2017

General Manager, Infrastructure & Planning, Grant Gyurkovits

Manager Construction & Maintenance, Kevin Sklapsky

- MCL Group Ltd. is expected to start work on the Economy Creek Slide Realignment project at km 20 of the FTR on July 3, 2017.
- Day labour is continuing work on the Simonette River hill at km 9 of the FTR, with work expecting to be completed by the end of July. They will then proceed onto the roadside turnouts at KM 13 & KM 14 to finish them off tentatively by the end first week in August.
- Day labour started the stabilization work at KM 52 on June 26 working north.
- Day labour finished the road construction on Twp. 721A and the access road for the DeBolt PSB.
- Day labour replaced some emergency culvert replacements where roads were collapsing.
- Work on Twp. 672 on the East end continues with additional equipment to start working from West end. Rain every couple of days are causing delays in the progress and having to rework wet material to dry it out and recondition to be able to meet moisture density tests.
- RR 230 project has been going very well with the sub grade preparation and base course gravel to be all in place tentatively by July 7th. The paving crew is expected to start approximately July 7th with project completion anticipated by end of third week in July.
- Work continues with annual inspections on Greenview's bridge files with some repair works completed on some and will be doing more as we get updated lists from the consultants.
- The drainage ditch inventory was completed, now working with consultants to approve a scope of work to do inspections on them all. Expecting to be completed by the end of the year.

- Tender closed on June 30th for the Old High Prairie Road subgrade preparation project with three contractors submitting bids. Once they are reviewed we will confirm who the low bidder was and see if it is within our budget.
- Asking our consultant for a scope of work package to be approved to begin preliminary and design work on the FTR phase 4 project.
- Working with consultant on the BF78286 (Huckleberry Tower Road). All approvals are in place to be able to find a contractor who will be able to complete the work and schedule it within the time parameters provided having it complete by August 31st.
- Working with Sanderson Construction (approach contractor) to start building all approaches as per new approved policy. The sites will be inspected, the contractor will provide estimates and then begin to schedule the construction of the approaches.

Supervisor, Facility Maintenance, Alfred Lindl

- Due to vandalizing the South Wapiti Transfer Station; we are in progress of installing 2 high efficient security cameras, Camera's will be protected with a steel box and mounted on an 18ft. 3" steel post.
- Admin; requested a second work station to install to be installed in Office 127 for.
- PSB-DeBolt and Grovedale: we are still working on warranty deficiencies with Southwest and Fields Engineering.
- The furniture request for the spare office at PSB-DeBolt are assembled and in place.
- Grande Cache: on request, we are installing new blinds on every window because some windows have no blinds and some are not working.
- Water Points; the project to install security cameras, security system and card readers on following water points are still in progress, NFC-SSH-SWH-Goodwin-Crooked Creek-Little Smoky-DeBolt-Grovedale-South Wapiti

Manager Operation, Gord Meaney

The following tenders were posted on the APC and were approved through the 2017 Operations Budget. The results are listed below.

Company	Total	Comments
Okanagan Quality Control	\$907,160.00	Awarded
Hopkins	\$940,690.00	-
Wapiti Gravel	\$1,783,997.28	-

Westview Pit SML 030053 Crushing Contract (93,024 tonnes 2-25 - 62,016 tonnes 2:40)

Company	Total	Comments
Hopkins	\$671,620.00	Awarded
Westridge Rock	\$730,000.00	-
Wapiti Gravel	\$730,142.17	:-

Athabasca Pit SML 060086 Crushing Contract (60,384 tonnes 2:25 -39,168 tonnes 2:40)

The estimated amount for these tenders was \$1,800.000.00

West Sector

- Spot gravelling in DeBolt for calcium application is now complete. Areas covered were RR 11 south of Hwy. 43 to transfer site and RR 15 north of Hwy. 43.
- Spot gravelling on the FTR for calcium application is on-going and has been completed to Km. 96 heading south.
- Spot gravelling on the D Road between Km. 70 on the FTR and the Railrock Pit has been completed in preparation for the stockpile transfer.
- RR 264 south of Twp. 724 was washed out. Kevin Sklapsky day labour crews replaced the culvert and got the road opened up.
- Sellors' property has been monitored for activity until Robert was approached by Mr. Sellor and was accused of harassing him and invading upon his privacy.
- On the FTR calcium has been applied from KM. 5 75 and a second crew has been set up to start at the south end.
- Calcium flake was applied to Twp. 690 as an experiment and has worked well to date.
- No Dust Solutions was tried on the FTR between Km. 93 -103 as a stabilizer and dust suppressant but does not seem to be working that well as a stabilizer.
- Carried out interviews for a gravel checker.
- Two 400 barrel water tank have been set up at KM 120 on the FTR to assist with the calcium application. A retaining wall and bladder have been installed as well.

East Sector

- Two brushing crews have started and are working are working in the Little Smoky area and around the Old High Prairie Road north of Fish Creek. Brushing was also completed on RR 11 heading towards the DeBolt landfill site.
- The mowing crew has started and is working north of Valleyview and Sunset House. They also mowed around the DeBolt rodeo grounds.
- The calcium program was started and completed this month.
- Spot gravelling was completed prior to the calcium chloride application.
- Started gravel haul from Athabasca SML 060085 to Valleyview and the Little Smoky stockpile sites.
- Replace culverts at the following locations Twp. 700 / RR 221, Sweathouse Tower Road, Twp. 692 / RR 225, Twp. 691 / RR 225 and Twp. 681 / RR 231.
- Beaver dams that have been removed Twp. 722 / RR 212, Twp. 692 / RR 234 and Twp. 700 / RR 200.

- Light trucks are being delivered. Twelve out of fourteen have arrived.
- Contact has been made with Jeremy Walker (Devco) regarding the possible sale of the Railrock Pit. One of the owners (Al Side) was attending a funeral at that time so will be contacted early next week to discuss the options.

Shop

- Four trips were made to Grovedale for servicing and repairs.
- The new service truck will be completed and delivered on July 13, 2017.

Manager Environmental Services, Gary Couch

Water and Distribution

- Co-ordinating a presentation for the water line alignment and required infrastructure for the new Grovedale water treatment system to be presented to the next Committee of the Whole meeting being held in Grande Cache.
- Rural water line water leak was repaired at the end of June. Environmental Services will be reviewing the entire rural water line mechanical connections to try to eliminate future failures.
- A new second well was successfully completed at the new Ridgevalley water treatment plant. The two new RO units have arrived and are being installed.
- Finalizing SCADA assessment on Environmental Services water and waste water systems.
- DeBolt water treatment plant reservoir was cleaned July 7th, 2017 as part of the upgrade with no interruptions as we will be using an underwater diver to complete the process.

Wastewater

- Industrial Lagoon construction started July 5th, 2017.
- Repairing low pressure sewer CC's in Grovedale.

Solid Waste

- "Take It or Leave It" buildings are built and ready for delivery.
- Greenview Regional Landfill was broken into again, tools, diesel and oil were stolen from the location. Damages to the gate and door jams occurred. A remote camera is being installed.

Manager Planning & Development, Sally Rosson

- Update on the Grovedale Area Structure Plan Open House held on June 20th in which we received good turnout with the radio advertising and hosting in conjunction with the Grovedale Ratepayers Barbeque. Some of the public comments included:
 - Some attendees from Landry Heights preferred being considered as the River Valley versus Estate Living Policy which limits further subdivision;
 - Concerns over height of front yard fencing;
 - Walking trails to be labeled as Walking or Pedestrian Trail on mapping;
 - Design Do not like the trail that dead ends; and
 - Needs a designated area for Horse Trail system.

A number of these items specifically detailing the trail design would be addressed in the Recreation Master Plan rather than the Area Structure Plan.

- Notices were mailed to a number of landowners (10 total) in the Swan Lake, Young's Point, Eagle Bay and Narrows Subdivision outlying non-compliance of campsite use with the Land Use Bylaw, regarding the use of land for recreational vehicle campsites. The parcels varied from smaller Agriculture parcels to CR-1 or CR-2 parcels, none of which are allowed to have recreational type development. Some have recreational vehicles with roof structure build over, as well as decks, sheds, and/or gazebos on the site.
- Following is a breakdown of the new Applications received in the various Planning & Development categories for the month of June 2017 including the total numbers showing the activity:

Type of Development:	Amount
Business Licenses:	Four
Development Permit Applications:	Thirty-nine
Lease Referrals:	One
Land Use Amendments (re-designation):	None
Subdivision Applications:	Two



Manager's Report

Function: Corporate Services

Submitted by: Rosemary Offrey, General Manager Corporate Services

Date: 7/11/2017

General Manager Corporate Services, Rosemary Offrey

I thoroughly enjoyed helping to serve the food at the Valleyview Ratepayer's BBQ. Although it was a challenge keeping up with the flow of people who wanted to help themselves. I also attended the Ratepayer's BBQ in Grovedale and enjoyed that event as well.

Administration is preparing for eSend. This is a program that is used to email invoices to stakeholders. Initially the program will be used to send out the accounts receivable and utility invoicing with the hope that we will also add the tax invoicing in the future. To ensure that we are able to email the invoices to our stakeholders, first we need recipients to provide us with their email addresses and permission for us to use the email address to send their invoices to them. Communications will assist with the messaging for this service and the message will be included in the monthly billings until such time as we have collected the email addresses. The plan is to implement this program for the October billings.

The Corporate Services team is also gearing up for the annual team building event. The event is planned for September 14th and 15th with hopes of touring a Weyerhaeuser facility, participating in a game called trapped. With the trapped game, we will need to work as a team to find our way out of a room that we are trapped in! Along with other activities as the team builds our agenda. To facilitate our team building we will travel via bus from Valleyview to Grande Prairie and surrounding area.

I attended the Municipal Affairs MGA Workshop in Grande Prairie for two days. I wanted to ensure that I had firsthand information regarding the MGA changes that will affect Greenview. The changes that will affect Greenview are the mandatory Inter-municipal Collaboration Frameworks, the central assessment for designated industrial properties to name a few. The new MGA also requires municipalities to provide Elected Officials training opportunities.

I attended the pre and post safety audit meetings last week. I met with the owners of the Meadowview Apartments and viewed the 2 apartments that Greenview is leasing from them for temporary housing. The owners are providing a local person to assist with any concerns tenants may have. They are also building a house for rent and considering a second apartment building in Valleyview. At the request of Reeve Gervais, I connected with Dr. Piercy, to advise her regarding potential landlords that she may contact regarding renting a unit for the doctor's needs.

The Electronic Records Management System Project, continues to be on time with the last shipment scheduled for the second week in July.

I have been reviewing HR policies with our HR team. When we are ready we will provide the revised policies to the senior leadership team and the policy review committee for input and approval to move to a future Council agenda for final approval.

Donna and I met Cory Boddy, with ATB Investments, Greenview's investment portfolio manager. Since 2009, Greenview has earned just over \$14M on the Fixed Income Account. Along with just over \$5M in the Cash Management Account. The Cash Management Account is the area ATB maximizes the short term investments to ensure that Administration has sufficient funds in the chequing account to pay the monthly bills.

Greenview's HR Officer - Generalist will be going on maternity leave in October. At that time the Greenview's HR Officer – Recruitment will assume the Generalist duties for the duration of the leave. At the end of the maternity leave the Recruitment Officer will revert back to her permanent recruitment position. Administration will be posting for a temporary HR Officer – Recruitment some time next week.

Finance & Administration Manager, Donna Ducharme

The Finance & Administration Manager, has been busy adding new vehicles and equipment to Greenview's insured list at Jubilee Insurance. Along with registering these items at the registry office. She has prepared and submitted the 2017 Statistical Return.

Due to June 30th being the deadline for the non-residential tax payments, it has been a busy month dealing with tax payments and deposits. All in all a good month.

Human Resources - Recruitment, Jocelyn Moe

Positions filled since last report: 1) Utility Operator Trainee – Environmental Services 2) Gravel Checker, Valleyview – Operations Department. There are no positions at offer stage, at this time.

Open Competitions are as follows; 1) Seasonal Gravel Checker, Grovedale (references in progress). 2) Road Coordinator (Central – FTR and area) – I and P - Operations, 3) Equipment Operator – I and P - Environmental Services (this positon is a temporary position to cover a short term disability situation), 4) Administrative Support - Corporate Services. 5) Equipment / Grader Operator (Little Smoky area) – I and P – Operations.

There has been one termination since the last report.

Information Systems, Shane Goalder

Shane continues to purchase new computer equipment as per the 2017 budget. He attended the Grovedale, Committee of the Whole meeting and the Ratepayers BBQ on June 20th.

The installation of the acoustic panels in Council Chambers is about 90% complete. The printed image panels were not ready at time of install and will be mounted later. Reverberation in Council Chamber has been noticeably reduced. Shane assists with all other IT support task as requested of him. He was on vacation from June 1st to the 20th.



CAO's Report

Function:	CAO
Date:	July 11 th , 2017
Submitted by:	Mike Haugen

MGA Changes

As more information comes out regarding the meaning and impact of changes as a result of the Modernized Municipal Government Act, Administration is started the process of developing some policies and gathering data for projects such as the Intermunicipal Collaboration Frameworks.

Regional Community Development Initiative

Staff will be forwarding this topic to Council in the near future for a preliminary discussion about the grant funding provided to the Towns. The current agreement expire at the end of 2017. Council has number of options available the Administration will be seeking Council's feedback prior to engaging the Towns on this topic.

Upcoming Dates:

Ratepayer BBQ - DeBolt Ratepayer BBQ - Grande Cache July 11th September 19th



Manager's Report

Function: Community Services

Submitted by: Dennis Mueller, General Manager Community Services

Date: 7/1/2017

General Manager Community Services, Dennis Mueller

A letter of support was sent to the Sheldon Coates Elementary School Parent Council for their application for grant funding to acquire new playground equipment.

A letter of support was also sent to Nitehawk, Grande Prairie Ski Club, in support of their application for funding to upgrade the inefficient lighting fixtures at the facility through the Energy Efficiency Alberta grant.

It is with great sadness to report the passing of Multiplex construction manager Jocelyn Kew, she was a very dedicated individual and was a huge asset in the project's success and process. She will be sadly missed.

Two separate Multiplex tours were conducted with interested sponsors, the overall interest was exceptional with only a few high end sponsorships still available. A meeting will be held with non-profit organizations as to arrange for the soliciting of donations for the Friends of the Multiplex wall at the facility. The entire community seems to be very interested and supportive of the facility.

Agricultural Services Manager, Quentin Bochar

Agricultural Equipment

The following equipment budgeted for 2017 has been purchased:

 Bale hauler: Four requests for quote were submitted to various companies and three quotes were received. Tender awarded to Agriterra of Stony Plain for \$35,700 plus tax.

Supplier	Notes	Rank	Complian t	Bid
Agriterra Equipment Ltd	Frame 8x8 Tubing, cross bar for moving bales. Delivery 1 week	1	Yes	\$35,700.00
Stony Plain	,			
Keddies Grand Prairie	Frame 8X4 tubing Crossframe 6x4 tubing, no cross bar for moving bales. Delivery 2-3 weeks	2	Yes	\$35,950.00
Martin Deerline Equipment	Frame 8x3 tubing, no cross bar for moving bales.	3	No	\$33,282.85
Mayerthorpe	Delivery 60 days			

 Bin crane: Three requests for quote were submitted to various companies and one quote was received. Tender was awarded to Keddie's Tack and Western Wear of Grande Prairie for \$29,850 plus tax.

Supplier	Notes	Rank	Compliant	Bid
Keddies	Only manufacturer to respond to RFQ.	1	Yes	\$29 <i>,</i> 850.00
Grand Prairie	Delivery 6-8 weeks			

 Gran vacuum: Three requests for quote were submitted to various companies and four quotes were received (one company submitted for two models). Tender was awarded to Keddie's Tack and Western Wear of Grande Prairie for \$24,250 plus tax.

Supplier	Notes	Rank	Compliant	Bid
Keddies	2017 REM VRX model	1	Yes	\$24,250.00
Grande Prairie	6600 Bu./hr.			
Prairie Coast	2017 Brandt 5200EX model	2	Yes	\$24,100.00
Equipment	5200 bu./hr.			
Grand Prairie				
Martin Deerline	2016 Brandt 5200EX	3	Yes	\$25,375.00
Equipment	5200 Bu./hr.			
Edmonton				
Prairie Coast	2016 Brandt 5200EX	4	Yes	\$25,475.00
Equipment	5200 Bu./hr.			
Grand Prairie				

 Manure spreader: Three requests for quote were submitted to various companies and three quotes were received. Tender was awarded to Nobel Equipment Ltd. for \$51,585 plus \$1,032 bolt on extensions.

Supplier	Notes	Rank	Compliant	Bid
Noble Equipment	2015 Bunning 80	1	Yes	\$51,585.00 +
Olds				\$2100.00 for bolt
				on extensions
Big City Equipment	2017 Nitro 450	2	no	\$50,900.00
Beaverlodge				
K&M Equipment	2014 Bunning 75 Selected for award	N/A	yes	\$45,950.00 +
Barrhead	but company had already sold the			\$3959.00 for bolt
	unit			on extensions

• *No-till drill*: Three requests for quote were submitted to various companies and two quotes were received. Tender awarded to Martin Deerline Sales Edmonton for \$68,224.44 plus tax.

Supplier	Notes	Rank	Compliant	Bid
Martin Deerline	2017 JD 1590	1	Yes	\$63,084.54 =
Equipment	10 inch row spacing, and			\$5139.00 for row
Edmonton	Electronic population rate control			maker arms
Prairie Coast	2017 JD 1590	2	Yes	\$62,450.00
Equipment	10 inch row spacing, and			
Grande Prairie	Electronic population rate			
	control.			
	Issues with dealer service.			
Douglas Lake	2017 Haybuster 147C	3	No	\$49 <i>,</i> 900.00
Equipment	7 inch row spacing, and manual			
Grand Prairie	population rate control			

• *Three-point hitch rototiller*: Three requests for quotes were submitted to various companies and two quotes were received. Tender awarded to Martin Deerline Edmonton Ltd. for \$11,207.06 plus tax.

Supplier	Notes	Rank	Compliant	Bid
Martin Deerline	2017 Frontier RT2293	1	yes	\$11,207.06
Equipment				
Edmonton				
Prairie Coast	2017 Frontier RT2293	2	yes	\$11,500.00
Equipment	Dealer service issues			
Grande Prairie				

Vegetation Management Program

The Vegetation Management crew have completed vegetation control work on 237 kilometers of ditches, 75 hectares of spot spraying, and 17 kilometers of brush suppression. Weed inspection staff have conducted 1458 inspections and 47 re-inspections.

Economic Development Officer, Kevin Keller

New Website Launch and Affiliated Media Release

Economic Development and Tourism launched the new Greenview's Expand Your Vision website (<u>http://www.expandyourvision.ca/</u>) on June 14th. During the summer season, the website focus will be on tourism and local community events throughout Greenview. The remainder of the year will be focused on updating the website with additional tools and information to assist with business attraction and retention within Greenview.

Valleyview Economic Advisory Committee

The Economic Development Officer participated in two workshops to develop an economic development strategy for the Town of Valleyview and Region. The workshops have identified issues and potential opportunities for economic stimulation and business attraction and retention that will be further reviewed at the next meetings.

Though the focus was on the Town of Valleyview; a good portion of the discussion was centered on potential collaboration strategies to promote Agritourism in the region. This approach is aligned with Greenview Economic Development vision and strategies.

Community Readiness Project

Funding partners of the Grande Prairie Regional Hospital Gap Analysis Report met to review previously identified issues and opportunities. The partners agreed on meeting every three months to ensure that critical gaps are addressed and common goals are met.

Meetings with Corporate Taxpayers

During June 2017; the Economic Development Officer met with members of the Fox Creek Operators Group to discuss their development plans for 2018 and collaborative community opportunities for the period 2017-2018. The group also reviewed Tri-Municipal Industrial Partnership updates, the 2018 Greenview Golf Tournament and potential networking and sponsorship opportunities.

Green View Family and Community Support Services (FCSS) Manager, Lisa Hannaford

Summer Day Camp dates and locations have been set. These camps are offered to children aged between 6 and 12 years old.

- July 4-6 Grovedale Hall
- July 11-13 Valleyview (Swanson Room)
- July 18-20 DeBolt Centre
- July 25-27 FCSS Building (Art Camp)
- August 1-3 Grovedale Hall (Art Camp)
- August 15-17 New Fish Creek Community Hall
- August 22-24 Little Smoky Community Hall

The Celebration of Cultures, in partnership with the Valleyview and Districts Agricultural Society, will take place at the Agricultural Society Hall on Saturday August 12 from 1:00 to 3:00 p.m. This event highlights the diverse cultural footprint in our area, showcasing food, music and costume.

The Green View FCSS Board has approved funding in the amount \$10,000.00 to Northlands School Division to offset costs for a School Liaison Worker in Susa Creek School for the 2017/2018 school year.

Protective Services Manager, Jeff Francis

Fire Department

Protective Services will be taking delivery on our new mobile live fire training unit the week of July 3rd. The mobile Draeger System 64 training unit will be set up at the DeBolt Public Service Building and will be available to travel to any of the five fire stations within Greenview. The system includes six props, a pick-up truck and horizontal propane tank. Draeger will be completing onsite training on the new equipment on July 8th and 9th at the DeBolt Public Service Building. Trainers from each of the fire stations will be in attendance to ensure we have an adequate number of qualified instructors for the equipment.

Protective Services helped to organize and facilitate a joint Hazardous Materials Training with the DeBolt and Valleyview Fire Departments. The Office of the Fire Commissioner certified training was completed on July 6th with the testing of the students. The knowledge gained during the course will help to ensure that local fire crews operate safely during hazardous materials events or when supporting outside agencies like the County of Grande Prairie when our Technical Services Agreement is activated. Another certified Hazardous Materials Course is planned for early November at our Grovedale station.

With guidance from the Fire Services Coordinator; the Grovedale and DeBolt Fire Departments are working on a Levels of Service document. The new modernized levels of service will outline the fire and rescue services Greenview provides to taxpayers and visitors while taking into account Workman's Compensation and Occupational Health and Safety legislation. A meeting will be held between the fire department and administration on July 4th to discuss and come to an agreement on the type of services local fire and administration that can be reasonably provided. The anticipated timeline for completion of this important project is mid-September this year.

Health & Safety

Seasonal summer work is in high gear and orientation training is complete. Field tours will be a priority for the remainder of the summer months to continue with monitoring safety systems, field hazard assessments, inspections, and Marshal training.

The external safety audit has been submitted and results should be available in 6 weeks. All staff was supportive and cooperated with the external auditor, Compass Safety. The results will be used to develop the safety action plan for the 2017-18 period and support Greenview's commitment to continuous improvement.

The Marshal Program will be receiving some upgrades to address efficiencies in document management and to improve user access and usage. Upgrades will include applications for inspections, Safety Data Sheets, WHMIS (workplace hazardous material information systems), forms and reports.

Recreation Services Manager, Stacey Wabick

DeBolt & District Museum Playground & Bathroom

In 2016 the DeBolt & District Museum identified the need for a bathroom on their location and for replacing the old playground. After the Museum Board successfully complete the Greenview grant process; Administration had the old playground removed and the community held a work bee to prepare the site for its new amenities. The new bathroom and playground have been successfully installed and will serve the community well for many years to come.

Johnson Park

Greenview's plan to build an outdoor recreation area southeast of Valleyview along the Goose River continues to move forward. All application development requirements have been submitted to the Province of Alberta and we are waiting for the lease title. In the meantime, a Temporary Field Authorization Permit has been successfully obtained that allows us to begin construction on the site.

Administration has submitted requests for quote for this project and will prepare a construction timeline.

Grande Cache Lake Day Use Area



Greenview continues to strive to provide a positive experience for all visitors at Greenview recreation sites. In an effort to ensure this, upgrades at the Grande Cache Lake Day Use Area have been implemented. A new dock has been installed that features room for multiple boats with tie downs and bumpers to protect docked boats. A tender has been awarded for the installation of a new bathroom in August 2017.

Smoke Lake and Iosegun Lake Campgrounds

Administration received a request from Council to assess the possibility of undertaking the Smoke Lake and losegun Lake campgrounds leases, currently own by the Town of Fox Creek. Administration has requested information from the Town that will assist in the decision process and has begun field recognisance and data collection for preparing a feasibility report that will be presented to Council.

Kakwa Wildland Park Access

The budget approved for 2017 includes a project to improve access to the Kakwa Wildland Park and area. The work is to be completed through a partnership with the Swan City Snowmobile Club and discussions are ongoing between the club and Administration. Details and locations of the work required are currently being identified and will be implemented in the coming months. The goal of the project is to improve year-round access to key staging areas for recreation enthusiasts and enhance users' experience with the installation of new bathrooms and clear way finding signage.