BY-LAW NUMBER 2014/42

BY-LAW NO. 2014/42 is a by-law of the County of Wetaskiwin No. 10 in the Province of Alberta, to authorize the adoption of an Area Structure Plan for the purpose of providing a framework for subsequent subdivision and development of 4 lots within SE 10-47-24-W4M in accordance with Section 633 of the Municipal Government Act, Chapter M-26.1, Revised Statutes of Alberta 2000, and amendments thereto.

WHEREAS: the proposed Area Structure Plan has been widely circulated and discussed within the County pursuant to Section 230, 606(1), and 633(1) of the Municipal Government Act, 2000, Chapter M-26.1, and amendments thereto.

NOW THEREFORE: the County of Wetaskiwin No. 10, duly assembled, hereby enacts as follows:

- (a) The document attached to this By-law as "Appendix A", together with accompanying maps, is hereby adopted as the "Bishop (4 lots) within SE 10-47-24-W4M)".
- 2. This by-law comes into effect on the date of third reading.

READ: A First time this 9 day of October, A.D., 2014.

READ: A Second time this 9 day of October, A.D., 2014.

READ: A Third time and finally passed this 9 day of October, A.D., 2014.

SECRETARY-TREASURE

Area Structure Plan

Proposed subdivision

SE 10-47-24 W4M Wetaskiwin

Josh and Kimberly Bishop 780.387.8483

County of Wetaskiwin

Prepared May 15, 2014

According to Municipal Policy & Procedures Manual

Contents

Item 1: Groundwater and Percolation

Item 2: Sewage Treatment

Item 3: Stormwater Management

Item 4: Water Supply

Item 5: Traffic and Roads

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Item 7: Plan of Subdivision

Item 8: Sabatini Earth Technologies Report for item 1

Item 9: Geowater Consulting report for item 4

Item 10: Maps of subdivision and utilities

Introduction and background,

The intent of this area structure plan is to outline the proposal of subdividing the current parcel, (SE 10-47-24 W4), into 5 pieces. 4 new residential lots roughly 2.5 acres each. Remaining parcel of roughly 18 acres to remain agricultural land. This quarter section has been previously developed on a few occasions, each time adding a few new lots. This land has been included in "the Millet /Wetaskiwin acreage study", as suitable for development. Surrounding land uses include many country residential acreages, hobby farms, and some farm land. There are no intensive or confined feeding operations in this area. We do not foresee any conflicts with existing land uses. Adjacent landowners have been notified of this plan and were invited to meet at our house or submit any comments through email. We have not received any feedback. Should the proposal be accepted by council and the County of Wetaskiwin we will proceed with an application for subdivision.

Item 1: Geotechnical & Groundwater Percolation Reports

Surface topography is nearly level with low areas lying away from build sites. Groundwater was encountered in ranges from 1.5 to 2.7 meters below ground level. The water table bore hole results show areas of high water table in some areas on the property. We have found that there is no issue with water in basements as a result of high water tables. There has been 3 new basements put in over the past 6 years as development progressed on the previous sub-division on this parcel. Our house has a full basement and sits 2' above water table. Our neighbours to the South have a full basement as well with no issues.

Report attached

Item 2: Sewage treatment

As recommended by item 1 report the proposed methods are for field system where requirements are met and raised mounds where they are not met by local soil conditions.

Item 3: Stormwater Management

As this quarter sits at the top of a hill all runoff makes its way into one of 2 creeks on either the North (Pipestone Creek) or South (Bigstone Creek) Surface soils are primarily sand, and most existing approaches do not even have culverts as there has been no need for them. There is very rarely surface water even after heavy rains. The ditches surrounding the proposed new acreage development very rarely have standing water, even in the spring runoff that we have seen over the past 11 years we have lived on this parcel. The sandy soil helps to soak up any stormwater accumulation. No additional flows should be expected by placement of approaches and culverts on any of the proposed locations. There is only one culvert on any bordering roads, that being at RR 242 and township 472 where there is a 24" culvert going North and South across twp 472 towards Pipestone Creek. As a result of the topography being steeply dropping towards the creek on adjacent parcel there should be no upstream flows to consider.

Item 4: Water Supply

A groundwater availability report was prepared by Geowater Consulting in accordance with section 23 of the water act. The report finds that there is more than the required 6000 cu M available to each lot

"For the proposed subdivision, the aquifer below the site must be able to provide an additional 6000 cubic meters per year. This quantity of water for the four new residential lots will be available beneath the site." (page 7 of report) Report attached.

The report recommends the use of individual wells as a source for water supply.

Item 5: Traffic and Roads

In consultation with Dave Dextraze the Director of Public Works, suitable locations for an approach were found for each lot. Closest new Lot to a provincial highway, (2A) is 2.1km The final approach locations will be determined through County inspections. With rr 242A already dividing the quarter in half there is no internal public road design required and all lots will be accessed from the County Public road system. As per Road Contribution Fee Policy 6615, we understand a fee of \$2000 per lot for future improvements will be levied.

Item 6: Land Uses and Maps

Four new lots approximately between 2 and 4 acres each are proposed see maps attached. No foreseeable conflicts with the proposed development and existing land uses.

Lot 1: determined by existing fence will have an area of 2 acres

Lot 2: determined by existing fence will have an area of 2 acres

Lot 3: determined by existing fence lines will have an area of approximately 3 to 4 acres

Lot 4: determined by existing fence lines will have an area of approximately 3 to 4 acres

Item 7: Zoning

An application will be made to re-zone the parcel from agricultural to country residential. Spot re-zoning only the areas where the new lots will be and leaving the remainder as agricultural.

Item 8: Plan of Subdivision

Upon approval of ASP subdivision will proceed as follows:

Phase 1

Immediate action to subdivide the 2 lots with access off of RR 242.

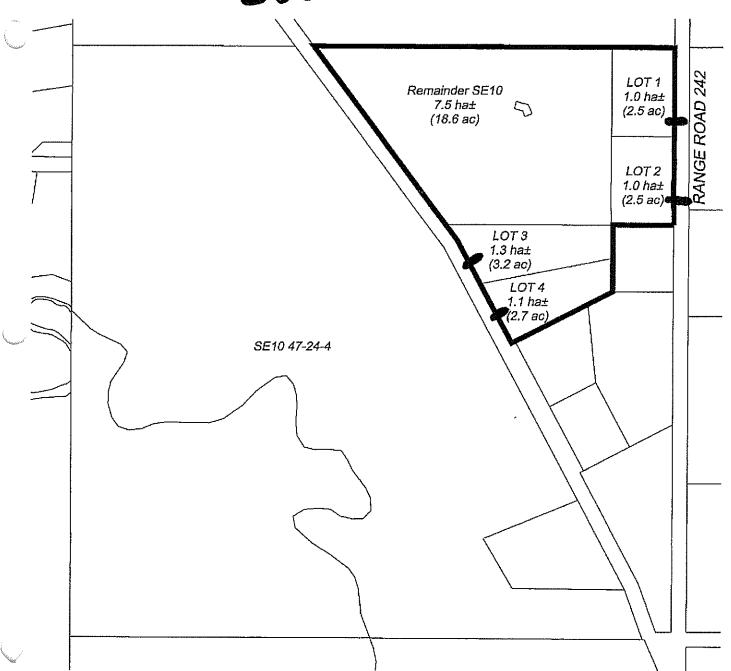
Phase 2

Subdivision of the other 2 lots accessing from 242A to proceed within the three year guideline of approval.





New Approach Locations



Groundwater availability for proposed subdivision SE 10-47-24 W4M Wetaskiwin

Prepared for:

JOSH BISHOP

Wetaskiwin

Prepared by:



GEOWATER CONSULTING

19-53 Erin Ridge Dr. St. Albert, Alberta, T8N 6A3 Tel (780) 419-6331 Fax (780) 419-6331

May, 2014

Certification

This report was prepared by Geowater Consulting under the direction of a professional geologist registered in the Province of Alberta. It is intended solely for the use of the individual, company, government or other entity for which it was prepared, and for the purpose and within the limitations stated in the report.

APEGGA Member Number M 72261

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Appendix C — Table 1 Water wells survey
Appendix D — Water well drilling reports
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Table 2 Summary of hydrogeological parameters
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1. INTRODUCTION

Geowater Consulting was retained by Josh Bishop (the client) to complete a Groundwater Availability Study for the property located at SE 10-47-24 W4M (the Site). The property is located about 10 km northwest from Wetaskiwin. Figure 1 shows the Site location. The property plan is shown in Appendix A.

The client intends to add four new residential lots to the existing eight residential lots in SE 10-47-24W4M.



Figure 1 - Site location map

Geowater Consulting has prepared this technical report presenting the findings of the Study. Hydrogeological information for the Site and the surrounding area was assembled and reviewed to complete this Study. Information sources include the information obtained from the published geological and hydrogeological maps and reports relevant to the area of interest and Alberta Environment and Sustainable Resources Development (AESRD) - Alberta Water Well Information Database.

2. OBJECTIVE AND INVESTIGATION GUIDELINES

The purpose of the Study was to evaluate the suitability of the Site for subdivision with respect to groundwater availability.

The Study was conducted in general accordance with the 1998 AENV publication: *Environmental Guideline for the Review of Subdivisions in Alberta*, and in particular with Chapter 2 – Guidelines for the Evaluation of Groundwater Supply for Unserviced Residential Subdivisions. These guidelines are recommended for use in cases where the water supply will be provided by privately owned domestic wells.

The Province of Alberta's Water Act (2014), addresses household diversion directly under Section 23 (3) which states that a person residing within a subdivision on a parcel of land has the right to commence and continue the diversion of water only if

"a report certified by a professional engineer, professional geologist and professional geophysicist, as defined in the Engineering, Geological and Geophysical Professional Act, was submitted to the subdivision authority as part of the application for subdivision under the Municipal Government Act, and the report states that the diversion of 1,250 cubic metres of water per year for household purposes under Section 21 for each of the households within the subdivision will not interfere with any household users, licensees or traditional agriculture users who exist when the subdivision is approved."

Relevant to the proposed development at SE 1-47-24 W4M, the Water Act states that the diversion of 1 250 m³/year per household (household use as defined in the Water Act) should not interfere with any household users, licensees, or traditional agriculture users who exist when the subdivision is approved.

In accordance with above, the objective of the Study is to provide a professional opinion, based on information obtained from readily available data, as to whether the aquifer underlying the Site should be able to yield an additional 6 000 m³/year (0.16 L/s or 2.01 imperial gallons per minute [igpm]) to provide water for four new residential lots.

3. GEOLOGICAL CHARACTERISTICS

J. Park

1

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There are two main distinguishing geological units present at the Site and the surrounding area (area of interest). The area of interest comprises section 10 and a quarter of each section adjacent to this section).

The first geological unit is surficial deposits and the second is bedrock deposits. These two units are presented in cross section A-B, Figure 2, shown below. The detailed cross section A-B and the location of the cross-section line map are presented in Appendix B.

The geological and hydrogeological characteristics presented in Figure 2 were defined by water well data available from the AESRD Alberta Water Well Information Database, published geological and hydrogeological maps, and reports relevant to the area of interest. The water well data used for geological and hydrogeological interpretation is summarised in Table I – Water well survey, Appendix C. Additionally, in Appendix D, there are water well drilling reports for all wells drilled in section SE 10-47-24W4M and a well log for well ID 1030113 at the property.

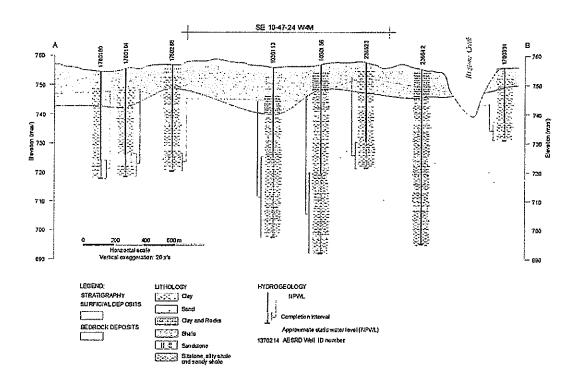


Figure 2 - Cross section A - B

The Drift Thickness of the Edmonton Map Area (Andriashek, 1987) indicates that the average thickness of surficial deposits in the area of interest is between 10 and 30 m.

Surficial deposits are Quaternary unconsolidated deposits that are about 10 to 20 m thick in the area of interest and consist of glacial sediments—mostly till-clay, clay mixed with rocks and

boulders, and sand. They are not able to store a significant amount of groundwater. There is no water wells completed in the surficial deposits in the area of interest.

The upper bedrock is presented by the Horseshoe Canyon Formation. In the Hydrogeological Map (1978) this formation consists of sandstone, shale, bentonitic mudstone, coal, and ironstone beds. In the area of interest water well drilling reports show that upper bedrock consists of light grey and green shale, shale, sandy shale, siltstone, and sandstone. Grain sizes range from fine to coarse.

The depth to the top of the bedrock at the Site is equal to the thickness of the surficial deposits, which is about 10 and 20 m.

4. HYDROGEOLOGICAL CHARACTERISTICS

The Hydrogeology Map of the Edmonton Area (1978) indicates that water wells in the area of interest completed in bedrock deposits have an apparent yield (Q_{20}) between 25 and 100 imperial gallons per minute (igpm) (172 and 690 m³/day).

Based on information obtained from the AESRD Alberta Water Well Information Database, in the area of interest, all water supply wells are drilled into the bedrock. They are between 16 and 65 m deep. The depth of completion interval in the wells varies from 18 to 65 m from the ground surface. Based on short pumping test performed by the driller the recommended yields vary from 20 to 54 L/s.

Geowater Consulting has calculated the long term apparent yields (Q₂₀) for the water wells drilled into the bedrock at the Site and in its vicinity. The Q₂₀ values are shown in Figure 3 below and Table 2 (Appendix E). These yields were calculated based on aquifer transmissivity and available drawdown obtained from short pumping tests that were available from the AESRD Alberta Water Well Information Database. The pumping tests were conducted on wells when they were drilled. Based on this estimation, water wells in the area can yield between 1 600 and 9 000 m³/year.

The theoretical 20 year yields (Q20) of the wells were determined by using the Farvolden Method:

 $Q_{20} = (0.68)*(T)*(H_A)*(0.7)$

Q₂₀ - sustainable yield for a 20 year period (m³/day)

 $T = transmissivity (m^2/day)$

H_A - available drawdown (m)

0.7 - 70% safety factor

The available drawdown (HA) is measured from the static water level to the depth of the pump.

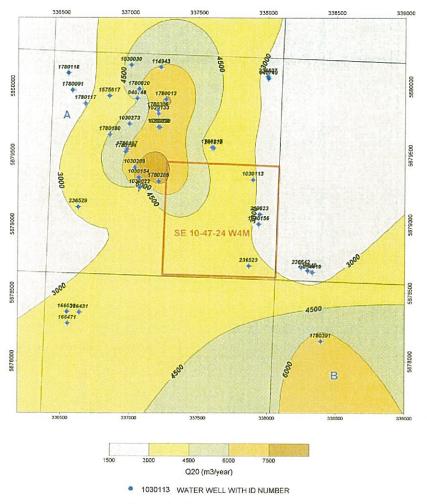


Figure 3 - Apparent yield map

Often it is necessary to capture two or more water bearing sequences at different depths in order to get a suitable amount of groundwater because the aquifer is not continuous.

The depths to the aquifer located in the bedrock vary considerable and range between 18 to 64 m.

The non-pumping static water levels in the aquifer are influenced by the ground surface and strongly vary as well. However, depth to the static water level is mainly between 7 and 12 m from the ground surface.

The aquifer below the Site is made up of weathered sandy shale, shale, and sandstone. The water bearing sequences are at a depth between 30 and 58 m deep from the ground surface. A well

drilled in this aquifer can yield about 3 000 m³/year. The non-pumping static water level is about 10 m below ground surface.

The aquifer is confined and well protected against potential contamination from the ground surface by surficial deposits, about 10 to 20 m thick, that are made up of till and clay.

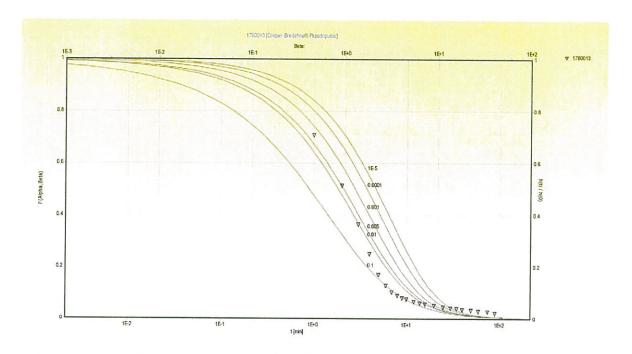


Figure 4 - Cooper-Bredhoeft-Papadopulos analysis graph

The slug test graph in Figure 4 shows an example of how hydrogeological parameters—transmissivity and conductivity—were calculated for the water wells in the area of interest.

5. GROUNDWATER QUALITY

The summary of groundwater chemistry for the water wells in the area of interest is shown in Table 3, Appendix F. These historical data were available from the AESRD Alberta Water Well Information Database.

According to the *Guideline for Canadian Drinking Water Quality* (GCDWQ; Heath Canada 2006) criteria shown in Table 2, the pH, total dissolved solids (TDS), and sodium (Na) exceed the aesthetic objective (AO) outlined in the *Guideline*. The pH slightly exceeds the recommended AO. The maximum pH in some groundwater in the area was reported to be 8.8 and recommended



AO pH is between 6.5 and 8.5. The maximum TDS was 1100 mg/L compare to recommended 500 mg/L. The recommended AO content of sodium is 200 mg/L. All samples of groundwater except one contain between 263 and 418 mg/L of sodium.

However, all these AO exceedances do not represent a major obstacle to the potential use of local groundwater for the water supply since they do not affect human health.

Generally, the groundwater below the Site has a satisfactory quality and can be used for human consumption. Some level of water treatment may be desirable, depending on the actual groundwater quality. The water in this aquifer is soft.

6. CONCLUSIONS AND RECOMMENDATIONS

This Study was conducted in accordance with the *Environmental Guidelines for the Review of Subdivisions in Alberta (1998)*.

A supply of 1 250 m³/day (or 0.04 L/s) of groundwater per household is needed for each lot to satisfy Section 23 (3) of the *Water Act*. Water usage from the wells on the site will not interfere with any other household users, licensees, or traditional agricultural users who existed when the subdivision was approved.

At the area proposed for subdivision there is a perspective aquifer located in bedrock deposits. The aquifer is located in weathered sandy shale and sandstone. A water well drilled in the aquifer below the Site can yield about 3 000 m³/year (0.1 L/s) on a long-term basis (Q₂₀).

For the proposed subdivision, the aquifer below the Site must be able to provide an additional amount of 6 000 m³/year (0.16 L/s or 2.01 igpm). This quantity of water for the new four residential lots will be available beneath the Site.

The approximate static water level (NPWL) in the aquifer is between 10 and 15 m below the ground surface. The aquifer is confined and well protected against potential contamination from the ground surface by layers of low permeable glacial sediments about 10 to 20 m thick.

The aquifer can provide the required quantity of water without creating adverse effects on groundwater users in the vicinity that already rely on the local aquifers for their water supply.

The water quality is satisfactory according to the GCDWQ. The aesthetic exceedances (AO) of some constituents do not represent a major obstacle in the potential use of local groundwater for the water supply; however, some level of water treatment may be desirable, depending on the actual groundwater quality in any given well.

Chemical and bacteriological analyses of water should be conducted for every new well. It is recommended that local health authorities be contacted regarding groundwater quality.

7. REFERENCES

- Hydrogeology Map Edmonton Area, Alberta, NTS 83H-SW segment, Alberta, W.J. Ceroici, Research Council of Alberta, 1978.
- Lexicon of Canadian Stratigraphy, Volume 4 Western Canada, Canadian Society of Petroleum Geologists, Calgary, Alberta, 1997.
- 3. Drift Thickness of the Edmonton Map Area, Alberta, L. D. Andiashek, Alberta Energy, 1987.
- 4. Quaternary Geology Central Alberta, Scale 1: 500 000, Alberta Research Council, 1990.
- Summary of Guidelines for Canadian Drinking Water Quality, prepared by the Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, 2004.
- Environmental Guidelines for the Review of Subdivisions in Alberta, Alberta Environment Protection, 1998.

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Respectfully submitted;

GEOWATER CONSULTING

Prepared by:

Senija Butorac P. Geol.

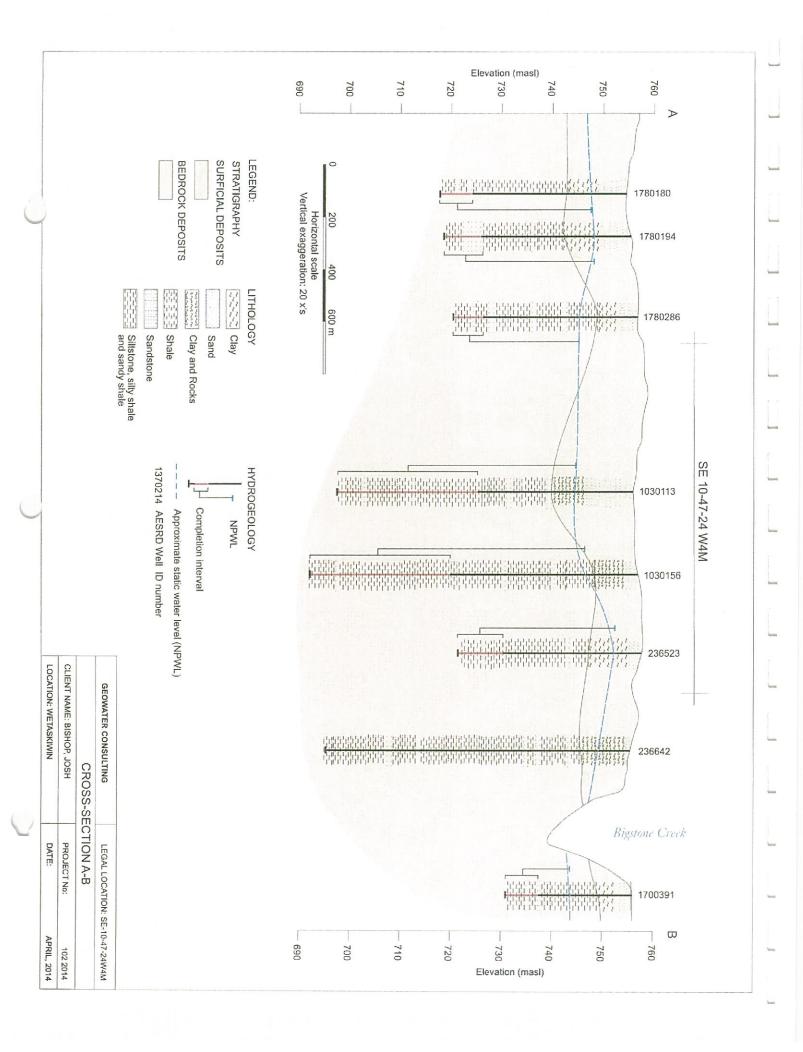
APPENDIX A

PROPERTY PLAN



APPENDIX B

CROSS-SECTION A - B





A ----B CROSS-SECTION LINE

1030113 WATER WELL WITH AENV ID NUMBER

NAD83 UTM12

GEOWATER CONSULTING	LEGAL LOCATION	I: SE-10-47-24W4M
LOCATION OF CE	ROSS-SECTION A-	-В
CLIENT NAME: BISHOP, JOSH	PROJECT No:	102 2014
LOCATION: WETASKIWIN	DATE:	APRIL, 2014

APPENDIX C

TABLE 1 - WATER WELL SURVEY

ivel	legal .	type of	proposed	well	casing	perfer.	Deliot.	perfor.	perfor.	perfor.	perfec.		yield	dale	ye)
10	location W4M	work	veluse	depth	bottom at			from 1	101	from 2		NPWL	(L/m)	completed	owner
				1			(meter						L		
1040747	NNY-10-047-24	New Well	Domestic	35.58	25.91	24.35	36.66	24,38	20,68			7.62	53.05	2002-05-16	REIMCHEN, TEO
2 040748	NNY-10-047-24	New Well	Domestic	47.24	31,39	28.96	47.24	28,95	47.24			10,67			CULFORD, RAY
3 040749	NE-10-047-24	New Well	Domestis	42.67	26.82	25.91	42.67	30,48	42.67			12.60	31,82	2002-06-26	THOMPSON, JAMESITARA
4 114943	NW-10-047-24	New Well	Domestic	33.53	11,69	7						4,27			STIENE, JOE
5 166036	NW-03-047-24	New Welf	Stock	30.48	21,95				******			6.71	45,46	1960-04-30	FINNMAN, GERALD
G [[] 165471	1W-03-047-24	New Well	Domestic	33,53	22.56	21.34	33.53	21.34	33,53			6.71	45,45	1992-03-13	FINMAN, GERALD
7:236334	NW-02-047-24	Federal Well Survey	Unknown	16.45								12.19		1905-01-01	LUCAS, S.
8 236337	NW-02-047-24	Reconditioned	Unknown	60.05								10.06	9.09	1974-10-01	CDGK, ROY
9 235345	NW-02-047-24	Chemistry	Domestic	33.53											LUCAS, SAM
10 235431	1477-03-047-24	New Well	Domestic	30.48	20.42							5.79	36.37	1970-05-28	FINMAN, HELMAR
11235434	NW-03-047-24	Chemistry	Domestic	60.96											FINEMAN, H.
12 236519	SE-10-047-24	Chemistry	Domestic	42,67								15.24			CAMPBELL MARY
13 236520	SE-10-047-24	Chemistry	Domestic	39.62											CRICHTON, DAVE
14 236523	SE-10-047-24	NewWell	Domestic	30.68	27.74							9.75	54.55	1882-04-03	JACOBE, DON H.
15 236527	SE-10-047-24	Chemistry	Domestic	0.00	0.00										GRAPENTINE, ED
	SW-10-047-24	New Well	Domestic & Stock	27.43	15.24							6.10	45.46	1665-05-13	STENGEL, ART
	NW-10-047-24	Chemistry	Domestic	53.34											KOSTER, LEO (TARCEE NURSERIES)
18 235532	10-10-047-24	Federal Well Burvey	Unknown	33.53										1935-01-01	THOMPSON. V.
19 236535	10-10-047-24	Federal Well Survey	Unknown	55.76				1						1935-01-01	THOMPSON, V.
20 235627	16-10-047-24	Test Hafe	Unknown	37,49				i						1057-01-01	ARC #TH1
	SW-11-047-24	Test Hale	Unknown	19,81								8,78		1960-12-28	
,—,	SW-11-047-24	Chemistry	Comestic	0,00									1		SMITH, MARTY
·	04-11-047-24	New Well	Demestic & Slock	42,67	21,64							10,08	27.28	1975-10-15	WAITT, DON
24 236642		Test Hote	Unknown	60,96								,		1657-11-18	
25 235644	SW-11-047-24	New Wall	Industrial	60.96	8.23	22.86	35.05					9.14	68.19		SUNGIL CO
25 24 1570	NE-10-047-24	New Well	Domestic	35.56	22,85	21,34	36,59	21,34	27,43	33.53	36.50		45,46		WILLIAMS, KEN
27/254418		New Well	Demestic	36.58	24.05	23.77	36.58	30.48	35.50			7.01	45,46		GRAPANTINE, ED
		New Well	Domanic	41.15	27.43	25.91	41.15	35.05	41.16			11.69	22.73		HAWKINS, ORVAL/RUTH
		New Well	Domesus	48.77	38.40	35.58	48,77					9,14			JENSEN, JACK & CONNE
		New Well	Damestic	48,77	37,19	36.58	49.77					9.75			Brown, Ian & Ann
		Unknown	1	57,91	32,02	30.48	57.91					11,43			BISHOP, JACK & KIMBERLY
		New Well	Domesto	48,77	32.92	30.48	48.77					8,23			DEMUND, JAKOB
		New Well	Domestic	51.21	34.14	17.07	51.21					7.92			WILLIS, ANDY
	1-10-47-24	New Well	Comestic	54.62	28.71	37,10	64.62					10.67			STEFFENSEN, MATT & MELISSA
		New Well	Domestic	64.86	34.75	33.53	54.66					9.14			MOISAN, DANNY & JARENE
	13-10-47-24	New Well	Comestic	54.66	34.14	33.53	54.86					7.62			AMBROSE STEVE
37 1620133	13-10-47-24	New Well	Domestic	28.26	29,26	20,12	25.91					14,02	36.37	2001-05-16	BITTNER, ORIAN
38 1575517	1-10-47-24	New Well	Domestic	33.53	18.29	24.38	30.48		-		-	10.74	63.65	2007-10-07	VANDECK, COLIN
	NW-10-047-24	New Well	Domastic	36.58	24.99							7.60			VENOASEN, HENRY
	NW-10-047-24	New Well	Domestic	38,10	26.52	32.00	38,10					8,90			VENOASEN, HENRY (B & H HOXIES)
	NW-10-047-24	New Well	Domestic	38,10	25,91	25.91	38.10					9.00			VENOASEN, HENRY ID & A HOMES
42 1780001		Now Well	Domestio	36.59	25.91	30.48	35,58					9.00			SETCHEL ANGIE AND DAVE
43 1780117		New Well	Domestio	36.59	22.80	27.43	36.56					9,00			BRYNEAU, DONNA & GEORGE
	NW-10-047-24	New Well	Domestic	39.01	27.43	27.43	39,01					9.76	20.45		KLEIN, SUE & BART
45 1780167		New Well	Domestic	35,58	24,33	24.38	25,58					9.00			LETOURNEAU, JOE
	12-10-47-24	Naw Wall	Domestic	35,58	24,69	30.40	35.56			_		7.00	45,45		FALLON, KELLY & CARRIE
		NawWell	Domestic	35.50	25.30	30.48	28.58			-		7.80	35.37		REIMCHEM, TEO
48 1750194		New Well	Domestic	36,50	25.91		35,58	-				7.80	36.37		FLEWELLING, JOHN & ANNAMARIE
49 1780217		NewWell	Domests:	33.53	22.85	27.43	33.53					10.04	44.55		MCKINNEY, CLARENCE
		New Well	Domestic	30.10	20.42		33.33 38.10					9.66	45.46		REIMCHEN, TED
51 1780285		New Well	Domest:c	30.50	26.52	_	35.58					5,41			HENDRICKS, OTIS
		New Well	Domestic	38.50	26.52	24.38	38.58			· · · · · ·		11.43			HIGGINS, GERRY
53 1780391		New Well			12.80		24.38				 	12.01			LUCAS, DAMNI
2314460391	12-2-41-24	INCM WEII	Domestic	24,38	12.60	18.29	29.30					1201	41.45	T017-00-50	LUCAS, DATAN

walls located in section SE 10-47-24W4M (drilling logs available in Appendix x)

APPENDIX D

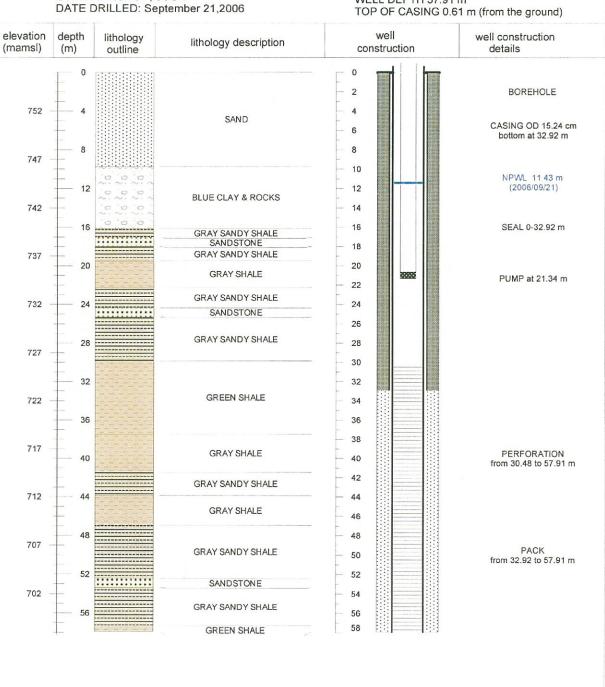
WELL ID 1030113 DRILLING LOG

WATER WELL DRILLING REPORTS

GEOWATER CONSULTING

WATER WELL DRILLING LOG ID 1030113 LOCATION: WETSKIWIN OWNER: BISHOP, JOSH

LEGAL LOCATION SE 10- 47-24 W4M COORDINATES NAD83 UTM12 X: 337893.6 Y: 5879324.04 Z: 756 m WELL DEPTH 57.91 m TOP OF CASING 0.61 m (from the ground)



Well Identification and Location

Water Well Drilling Report

View in Imperial Export to Excel
GIC Well ID 1030113

GoA Well Tag No.

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Drilling Company Well ID
Date Report Received Measurement in Metric

		m from		How Location Not Verified	.036100 Obtained	Longitude -113	3.421000	How Elevation Obtain Not Obtained	mned
rilling Info ethod of L nknown roposed V	rilling			Type of Work Unknown	2				
ormation	Log		Me	easurement in M	etric	Yield Test Summ	ary		Measurement in Me
epth from ound leve	Water (m) Bearing	Lithology Description	on			Recommended Put Test Date	np Rate Vater Removal	normalist control of the first terms of the first t	atic Water Level (m)
9.75		Sand				2006/09/21	54.5	5	11.43
16.15		Blue Clay & Rocks			I	Well Completion			Measurement in Me
17.07		Gray Sandy Shale				Total Depth Drilled	Finished Well	Depth Start Date	End Date
17.98		Sandstone						2006/09/20	2006/09/21
19.51		Gray Sandy Shale				Borehole			
22.25		Gray Shale				Diameter (cm)	From (m)	To (m)
24.38		Gray Sandy Shale				Surface Casing (if	applicable)	Well Casing/Lin	ner
25.30		Sandstone				Plastic	45.04	Plastic	
29.87		Gray Sandy Shale				Size OD : _ Wall Thickness :		_	
37.49		Green Shale			_	Bottom at :	1.118 cm 32.92 m		
41.45		Gray Shale				Dottom St .	02.32 III	Boltom a	
43.89		Gray Sandy Shale				Perforations			
45.94		Gray Shale					Diamete		
52.43		Gray Sandy Shale				From (m) To (Slot m) Width(d		Hole or Slot Interval(cm)
53.34		Sandstone			- 11	30.48 57.			15.24
57.30		Gray Sandy Shale				Perforated by	Saw		
57.91		Green Shale				Annular Seal Driv	ven & Bentonite		
						Placed from			
						Amount			
					- 11	Other Seals			
						<u>_</u>	pe		At (m)
					- 11	Screen Type			
						Size OD:	cn	<u>1</u>	
						From (m)		To (m)	Slot Size (cm)
						Attachment			
						Top Fittings		Bottom Fitting	s
						Pack			S-1
					- 11	Type Unknown		Grain Size	
						Amount	Unknown		
					"				

Water Well Drilling Report

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GIC Well ID GoA Well Tag No. Drilling Company Well ID

	ification and L	ocation				-					Country	Measuremen	tal Code
Wher Nan SISHOP, JA	ne ACK & KIMBER	LY	Address P.O. BOX	20 RR3		Town WETA	SKIWIN		AB		CA CA		1X1
ocation	1/4 or LSD SE	SEC 10	7WP 047	RGE 24	W of MER 4		Block	0.0.000000	Additio	nal Descrip	tion		
Measured f	from Boundary o	of			GPS Coordin		Commence of the Commence of th		Contraction (III)	El-veties.		_	
		m from			Latitude 5		_ Longii	-113.4.	21000			<u>m</u>	
		m from		- 1	How Location	n Obtained					ration Obta	ained	
					Not Verified				I I	Not Obtai	ined		
dditional	Information											Measuremer	t in Me
	rom Top of Cas				60.96 cm								
Is Artesia	n Flow		28.5			15		trol installed					
	n Flow Rate		L/min					Describe					
	nded Pump Rat				54.55 L/min	Pump	Installed			Depth		m	
Recomme	nded Pump Inta	ke Depth (From TOC)		27.43 m	Туре			Make			H.P.	
												iting)	
Did you	Encounter Salin	e Water (>	4000 ppm 1	DS)	Depth		m	Well Disin	fected Upon	Completion	7		
							m	Geo	physical Lo	g Taken			
				Gas	Depth								
NOTE: BL	nal Comments o	COMPRES	SOR @ 70'	FOR 2 HR	Depth				Submitted to Potability		Subm	uitted to ESRD _	
NOTE: BL DRILLING	EW WITH AIR (WATER FROM	COMPRES	SOR @ 70'	FOR 2 HR				allected for F	Potability			nitted to ESRD	
NOTE: BL DRILLING 'ield Test	EW WITH AIR (WATER FROM t	COMPRES I WETASK	SOR @ 70'	FOR 2 HF GAL	88			allected for F	Potability		vel		
NOTE: BL DRILLING Test Date	EW WITH AIR (WATER FROM t	COMPRES	SSOR @ 70'	FOR 2 HF GAL			Sample Co	allected for F	Potability	Ground Le	vel level		nt in Me
NOTE: BL DRILLING Test Date	EW WITH AIR (WATER FROM t	COMPRES WETASK	SSOR @ 70'	FOR 2 HF GAL	RS Lic Water Level		Sample Co	nilected for F	Potability	Ground Le	vel level	Measuremer	nt in Me
NOTE: BL DRILLING Tield Test Test Date 2006/09/2	EW WITH AIR (WATER FROM t	Stort Tim 12:00 AM	SSOR @ 70'	FOR 2 HF GAL	RS Lic Water Level		Sample Co	nilected for F	Potability	Ground Le th to water I Elapsed Tim Minutes:Se	vel level	Measuremer Recovery (r	nt in Me
NOTE: BL DRILLING field Test Test Date 2006/09/2	EW WITH AIR OF WATER FROM t t f Water Remov	Stort Tim 12:00 AM	SSOR @ 70'	FOR 2 HF GAL	RS Lic Water Level		Sample Co	nilected for F	Potability	Ground Le th to water I Elapsed Tim Minutes:Se 1:00	vel level	Measuremer Recovery (I 18.29	nt in Me
NOTE: BL DRILLING field Test Test Date 2006/09/2 Method o	EW WITH AIR (SWATER FROM t If Water Remove Type 1	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500	FOR 2 HF GAL	RS Lic Water Level		Sample Co	nilected for F	en From (Ground Le th to water I Elapsed Tim Minutes:Ser 1:00 2:00 3:00 4:00	vel level	Measuremer Recovery (i 18.29 15.54 13.56 12.95	nt in Me
NOTE: BL DRILLING Tield Test Test Date 2006/09/2 Method o	EW WITH AIR OF WATER FROM t if if Water Remove Type If Removal Rate	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500	FOR 2 HF GAL	RS Lic Water Level		Sample Co	Tal	en From (Ground Le th to water I Elapsed Tim Minutes:Ser 1:00 2:00 3:00 4:00 5:00	vel level	Measuremen Recovery (i 18.29 15.54 13.56 12.95 12.50	nt in Me
NOTE: BL DRILLING Tield Test Test Date 2006/09/2 Method o	EW WITH AIR (SWATER FROM t If Water Remove Type 1	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500	FOR 2 HF GAL	RS Lic Water Level		Sample Co	Tal	en From (Ground Let the to water I Elapsed Tim Minutes: See 1:00 2:00 3:00 4:00 5:00 6:00	vel level	Measuremer Recovery (I 18.29 15.54 13.56 12.95 12.50 11.99	nt in Me
NOTE: BL DRILLING Field Test Test Date 2006/09/2 Method o	EW WITH AIR (6) WATER FROM t If Water Remove Type I Removal Rate I Ithdrawn From	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	en From (Ground Le th to water I Elapsed Tim Minutes:Se: 1:00 2:00 3:00 4:00 5:00 6:00 7:00	vel level	Measuremer Recovery (1 18.29 15.54 13.56 12.95 12.50 11.99 11.81	nt in Me
NOTE: BL DRILLING Field Test Test Date 2006/09/2 Method o	EW WITH AIR OF WATER FROM t if if Water Remove Type If Removal Rate	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	en From (Ground Le th to water I Elapsed Tim Minutes:Ser 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00	vel level	Measuremer Recovery (1 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73	nt in Me
NOTE: BL DRILLING Field Test Test Date 2006/09/2 Method o	EW WITH AIR (6) WATER FROM t If Water Remove Type I Removal Rate I Ithdrawn From	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	en From (Ground Le th to water I Elapsed Tim Minutes:Ser 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00	vel level	Measuremer Recovery (i 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68	nt in Me
NOTE: BL DRILLING field Test Test Date 2006/09/2 Method o	EW WITH AIR (6) WATER FROM t If Water Remove Type I Removal Rate I Ithdrawn From	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	en From (Ground Let the to water I Elapsed Tim Minutes: See 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00	vel level	Measuremen Recovery (i 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68 11.63	nt in Me
NOTE: BL DRILLING field Test Test Date 2006/09/2 Method o	EW WITH AIR (6) WATER FROM t If Water Remove Type I Removal Rate I Ithdrawn From	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	ken From (Ground Le th to water I Elapsed Tim Minutes: See 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00	vel level	Measuremer Recovery (1 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68 11.63 11.58	nt in Me
NOTE: BL DRILLING field Test Test Date 2006/09/2 Method o	EW WITH AIR (6) WATER FROM t If Water Remove Type I Removal Rate I Ithdrawn From	Stort Tim 12:00 AM	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	ken From (Ground Let the to water I Elapsed Tim Minutes: See 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00	vel level	Measuremen Recovery (i 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68 11.63	nt in Me
NOTE: BL DRILLING 'ield Test Test Date 2006/09/2 Method o	EW WITH AIR (6) WATER FROM t If Water Remove Type I Removal Rate I Ithdrawn From	Stort Tim 12:00 Ah 13:00 Ah 14:00 Ah 15:00 Ah 16:00 Ah 16	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL Stat	RS Lic Water Level		Sample Co	Tal	ken From (Ground Le th to water I Elapsed Tim Minutes: See 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00	vel level	Measuremer Recovery (1 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68 11.63 11.58	nt in Me
NOTE: BL DRILLING /ield Test /ield Test //ield Test /	t Mater Remove Type Interpreted for Drilling Warted for Drilling	Stort Tim 12:00 Ah 13:00 Ah 14:00 Ah 15:00 Ah 16:00 Ah 16	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL	tic Water Level 11.43 m		Sample Co	Tal	ken From (Ground Le th to water I Elapsed Tim Minutes: See 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00	vel evel ee c	Measuremer Recovery (1 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68 11.63 11.58	nt in Me
NOTE: BL DRILLING field Test Test Date 2006/09/2 Method o Depth Will If water re	t Mater Remove Type Interpreted for Drilling Warted for Drilling	Stort Tim 12:00 Ah 13:00 Ah 14:00 Ah 15:00 Ah 16:00 Ah 16	SSOR @ 70' IWIN, 1500 64.55 L/min 21.34 m	FOR 2 HF GAL	tic Water Level 11.43 m		Sample Co	Tal	ken From (Ground Le th to water I Elapsed Tim Minutes:See 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00	vel evel ee c	Measuremer Recovery (1 18.29 15.54 13.56 12.95 12.50 11.99 11.81 11.73 11.68 11.63 11.58	nt in Me

Contractor	Certifica	tion

Name of Journeyman responsible for drilling/construction of well

BRIAN MAYGARD

Company Name ACTION WATER WELLS LTD. Certification No.

Copy of Well report provided to owner Date approval holder signed

Water Well Drilling Report

View in Imperial **Export to Excel**

1030156

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GIC Well ID GoA Well Tag No. Drilling Company Well ID Date Report Received

2007/06/28

ocation	1/4 or 1	LSD	SEC 10	TWP 47	RGE 24	W of MER 4	Lot 3	Block 2	Plan 07212		tional Des	scription	
deasured fr		ndary of		47		The second secon	inates in De	cimal Degre	es (NAD 8	13)	T		
			n from				53.036004		tude113	.417332		ation	
		r	n from		- 1		on Obtained					Elevation Obtaine	ed
						Lat/Long ca	lculated to c	entre of lot			Not C	Obtained	
orilling Info	ormation	1											
Method of I						Type of We New Well	ork						
Proposed V	Vell Use							Lefter Lucia				i 13. e	
ormation	Log				M	easurement in	Metric	Yield Te	st Summ	ary		N	Measurement in Me
Depth from pround level		ater earing	Litholog	y Description				Recomme Test D		np Rate Vater Remo			tic Water Level (m)
3.66			Sand					2007/0	5/24	4	5.46		10.67
5.49			Brown	Clay			آ ا	Well Cor	npletion			N	Measurement in Mi
8.53			Blue C	lay & Rocks							Vell Depth	Start Date	End Date
14.02			Green	Shale				64.62 m		64.62 m		2007/05/22	2007/05/24
16.15			Gray Sa	andy Shale				Borehole)				
17.07			Sands	tone				Dia	meter (cm)			To (m)
18.90			Gray Sa	andy Shale				Surface	20.00 Casing (if	applicable	0.0	Well Casing/Lin	64.62
23.16			Gray S	hale				Plastic	ousnig (ii	арричани		Plastic	
25.60			Gray Sa	andy Shale					-	15.24		Size OD	
26.21			Sands	tone					ickness:	1.113		Wall Thickness	
28.04			Gray S	hale				Bo	ottom at :	38.71	m	Top at	
35.36			Green	Shale				Perforati	ons			Bottom at	64.62 m
37.19			Gray Sa	andy Shale				remorati	uns	Diam	eter or		
37.80			Gray S	hale						9	Slot	Slot	Hole or Slot
43.28			Green	Shale				From (n 37.19			th(cm) .051	Length(cm)	Interval(cm) 15.24
44.20			Gray S	hale									
46.94			Gray Sa	andy Shale				Periorale		Saw			
53.64			Green	Shale						en & Bento		29.71 m	
57.00			Gray S	hale						0.00 m	_	38.71 m	
59.13			Gray Sa	andy Shale				Other Se				-	
60.05			Sands							/pe		T	At (m)
63.70			Grav Sa	andy Shale									
64.62			Green					Screen 7	Vpe				
							- 11		Size OD :		cm		
									rom (m)		To	m)	Slot Size (cm)
							- 11	Atto	chment				
							- 11		Fittings			Bottom Fittings	
									. mango			20110/11 / Illings	
								Pack Type I	Unknown			Grain Size	
								Amoun		Unkno	wn	Sidni Gize	
							Ι,			Olikit			
ontractor													

ACTION WATER WELLS LTD.

Date approval holder signed 2007/05/28

Copy of Well report provided to owner

Water Well Drilling Report

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GoA Well Tag No. Drilling Company Well ID Date Report Received

2007/06/28

Vell Identification and	Location									Measurement in
Owner Name		Address			Town			Province		
STEFFENSEN, MATT & I				TE 2	WETA		****	ALBERTA		T9A 1X1
ocation 1/4 or LSD	SEC 10	7WP	RGE 24	W of MER	Lot 3	Block			al Description	
		47	-24			mal Dear	0721277 ees (NAD 83)			
leasured from Boundary				Latitude 5					Flevation	m
	m from						-113.41	7332		
1	m from			How Location					How Elevation	Oblained
				Lat/Long calc	culated to cer	ntre of lot			Not Obtained	
dditional Information										Measurement in
Distance From Top of Ca	sing to Gro	ound Level		60.96 cm						
					Is	Flow Cor	ntrol Installed			
Rate		L/min					Describe			
1.15	1			45.40.11.	-	1 1 11 1			D - 11	
Recommended Pump Ra Recommended Pump Int	110	(F TO 0)		45.46 L/min	Pump	Installed .			Depth	m
lecommended Pump Int	ake Depth	(From TOC)		33.53 m	Type			Make		H.P
								The second second second		t Rating)
Did you Encounter Sali	ne Water (>4000 ppm TE	DS)	Depth		m	Well Disinfo	ected Upon	Completion	
		(Gas	Depth		m	Geor	hysical Log	Taken	
								Submitted to		
Additional Comments of WATER USED TO DRIL		LL FROM CIT	Y OF WET	ASKIWIN H2O			AM 1500 GAI	LONS,	round Level	Measurement in
WATER USED TO DRIL	L THE WE						AM 1500 GAI	LONS, en From G		
WATER USED TO DRIL		ne		** Water Level 10.67 m		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m)	LLONS, en From G Depth	round Level	
WATER USED TO DRIL feld Test Fest Date 2007/05/24	Start Tin	ne		: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m)	LLONS, en From G Depth	round Level to water level apsed Time finutes:Sec 0:00	Measurement in Recovery (m) 27.43
WATER USED TO DRIL eld Test fest Date 1007/05/24 Method of Water Remove	Start Tin 12:00 Al	ne		: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m)	LONS, en From G Depth El	round Level a to water level apsed finetes:Sec 0:00 1:00	Measurement in Recovery (m) 27.43 24.13
water used to dril eld Test fest Date 1007/05/24 Method of Water Remor	Start Tin 12:00 Al	ne M	Static	: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	LONS, en From G Depth El	round Level a to water level apsed Time dinutes:Sec 0:00 1:00 2:00	Measurement in Recovery (m) 27.43 24.13 21.64
WATER USED TO DRIL eld Test fest Date 007/05/24 fethod of Water Remo	Start Tin 12:00 Al	ne M	Static	: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	en From G Depth	round Level to water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76
eld Test est Date 007/05/24 fethod of Water Remo Type Removal Rate	Start Tin 12:00 Al	ne M 45.46 L/min	Static	: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	en From G Depth	round Level a to water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29
eld Test est Date 007/05/24 fethod of Water Remo Type Removal Rate	Start Tin 12:00 Al	ne M 45.46 L/min	Static	: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	en From G Depth	round Level a to water level appsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97
eld Test est Date 007/05/24 fethod of Water Remo Type Removal Rate Depth Withdrawn From	Start Tin 12:00 Al val Air	45.46 L/min 27.43 m	Static	: Water Level		5/22 9:00 Drav	AM 1500 GAI Tak vdown (m) 10.67	LLONS, en From G Depth El	round Level a to water level appsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29
eld Test est Date 007/05/24 fethod of Water Remo Type Removal Rate Depth Withdrawn From water removal period w	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	LLONS, en From G Depth El	round Level a to water level appsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05
eld Test est Date 007/05/24 Method of Water Remo Type Removal Rate Depth Withdrawn From water removal period w. MEASUREMENTS FROM	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak vdown (m) 10.67	LLONS, en From G Depth El	round Level to water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19
eld Test est Date 007/05/24 lethod of Water Remo Type Removal Rate Depth Withdrawn From water removal period w. MEASUREMENTS FROM	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak vdown (m) 10.67	LLONS, en From G Depth El	round Level a to water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53
eld Test est Date 007/05/24 lethod of Water Remo Type Removal Rate Depth Withdrawn From water removal period w.	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak vdown (m) 10.67	LLONS, en From G Depth El	round Level a to water level apsed Time dinutes: Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53 14.02
eld Test est Date 007/05/24 lethod of Water Remo Type Removal Rate Depth Withdrawn From water removal period w.	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak vdown (m) 10.67	LONS, en From G Depth El	round Level Ito water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53 14.02 13.56 13.11 12.70
eld Test est Date 007/05/24 lethod of Water Remo Type Removal Rate Depth Withdrawn From water removal period w.	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak vdown (m) 10.67	LONS, en From G Depth EI	round Level a to water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53 14.02 13.56 13.11 12.70 12.34
eld Test est Date 007/05/24 lethod of Water Remo Type Removal Rate Depth Withdrawn From water removal period w. MEASUREMENTS FROM	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	LONS, en From G Depth EI	round Level a to water level appsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53 14.02 13.56 13.11 12.70 12.34 11.79
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ield Test fest Date 2007/05/24 Method of Water Remo Type Removal Rate Depth Withdrawn From f water removal period w	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	LONS, en From G Depth EI	round Level Ito water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00 25:00 30:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53 14.02 13.56 13.11 12.70 12.34 11.79 11.43 10.97
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ield Test fest Date 2007/05/24 Method of Water Remo Type Removal Rate Depth Withdrawn From f water removal period w	Start Tim 12:00 At val Air	45.46 L/min 27.43 m	Static	: Water Level 10.67 m	STN 2007/09	5/22 9:00 Drav	AM 1500 GAI Tak wdown (m) 10.67	LONS, en From G Depth EI	round Level a to water level apsed Time dinutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00 25:00 30:00 35:00	Measurement in Recovery (m) 27.43 24.13 21.64 19.76 18.29 16.97 16.05 15.19 14.53 14.02 13.56 13.11 12.70 12.34 11.79 11.43 10.97 10.87
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Contractor	Certification	n

Name of Journeyman responsible for drilling/construction of well

BRIAN MAYGARD

Company Name

ACTION WATER WELLS LTD.

Certification No

10167A

Copy of Well report provided to owner

Date approval holder signed 2007/05/28

Yes

Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID

1575617

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GoA Well Tag No.
Drilling Company Well ID
Date Report Received 2009/01/06

Well Identification and Location				Me	easurement in Met
Owner Name Address VANBECK, COLIN P.O. BOX 181	Tov MIL	vn LET	Province ALBERTA	Country CA	Postal Code TOC 1Z0
Location 1/4 or LSD SEC TWP RGE 1 10 47 24	W of MER Lot 4 2	Block Plan 2 0721277		scription	
Measured from Boundary of m from m from	GPS Coordinates in D Latitude 53.035140 How Location Obtaine Lat/Long calculated to	d	16811 Eleve How	ation Elevation Obtained Obtained	
Drilling Information Method of Drilling Rotary Proposed Well Use Domestic	Type of Work New Well				
	Measurement in Metric	Yield Test Summar	У	Me	easurement in Met
Depth from Water Lithology Description ground level (m) Bearing 8.53 Sand		Recommended Pump	-	THE PERSONNEL AND LONG COMM.	Water Level (m)
12.50 Clay		Well Completion		Me	asurement in Me
19.51 Shale		Total Depth Drilled F	and the same of th		End Date
30.18 Sandstone & Shale Ledges		33.53 m 3	3.53 m	2007/10/07	2007/10/07
33.53 Shale		Diameter (cm) 20.00 Surface Casing (if al Plastic Size OD: Wall Thickness: Bottom at: Perforations From (m) To (m) 24.38 30.48 Perforated by Sa Annular Seal Driver Placed from Amount Other Seals Type Size OD: From (m) Attachment Top Fittings Pack Type Unknown Amount	15.24 cm 0.838 cm 18.29 m Diameter or Slot Width(cm) 0.152 w 1 & Shale Trap 15.24 m to	Well Casing/Liner Plastic Size OD: Wall Thickness: Top at: Bottom at: Slot Length(cm) 18.29 m At	11.43 cm 0.584 cm 15.24 m 33.53 m Hole or Slot Interval(cm) 15.24 (m)
Contractor Certification Tame of Journeyman responsible for drilling/construction of the contraction of the	f well	Certification 5896A			
APLEY DRILLING LTD.		Yes	ll report provided to	2008/05/2	roval holder signed 21

Water Well Drilling Report

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

View in Imperial Export to Excel

GIC Well ID 1575617

GoA Well Tag No.

Drilling Company Well ID Date Report Received 2009/01/06

Vell Identification an Owner Name /ANBECK, COLIN		Address P.O. BOX	181		Town MILLET		Province ALBERTA	Country CA	Postal Ci
ocation 1/4 or LSI		TWP 47	RGE 24	W of MER	Lot Block	k Plan 0721277	Additional	l Description	
Measured from Bounda					ates in Decimal De 3.035140 Lo			Elevation	m
	m from			How Location		113.41		How Elevation O	
-	m from				ulated to centre of I	lot		Not Obtained	pramed
Additional Information									Measurement in
Distance From Top of		ound Level		45.72 cm					Weasarement in
le Artonian Flow					Is Flow C	Control Installed	Constitution of the constitution of		
Rate		L/min				Describe			
Recommended Pump				63.65 L/min	Pump Installe	Yes Yes	D	Depth	m
Recommended Pump	Intake Depth	(From TOC)				<u>a</u> 75'	Make		H.P5
								Model (Output	Rating)
Did you Encounter S	aline Water (>4000 ppm Ti	DS)	Depth	m	Well Disinf	ected Upon Co	ompletion	
		(Gas	Depth	m	Geor	physical Log T	aken	
						5	Submitted to E	SRD	
					Sample	Collected for Pe	otability	Suk	omitted to ESRD
Additional Comment									
BOREHOLE DIAMETE	K 1.075 CA	SING & 3. 12.	LINER						
ield Test						Tak	en From Gro		Measurement in I
rield Test Test Date 2007/11/07	Start Tin 12:00 Al		Stati	c Water Level 10.74 m	D	Tak rawdown (m)	Depth to	ound Level o water level osed Time nutes:Sec	Measurement in Recovery (m)
Test Date 2007/11/07	12:00 Af		Stati		D	rawdown (m)	Depth to	o water level osed Time nutes:Sec 0:00	Recovery (m)
Test Date 2007/11/07 Method of Water Rem	12:00 Al		Stati		D	10.74 12.57	Depth to	osed Time nutes:Sec 0:00 1:00	Recovery (m) 16.31 13.36
Fest Date 2007/11/07 Method of Water Rem Typ	12:00 Al	М			D	10.74 12.57 13.26	Depth to	osed Time nutes:Sec 0:00 1:00 2:00	Recovery (m) 16.31 13.36 12.42
est Date 007/11/07 dethod of Water Rem Typ Removal Rat	12:00 Al noval e Pump e	63.65 L/min			D	10.74 12.57 13.26 13.62	Depth to	o water level osed Time outes:Sec 0:00 1:00 2:00 3:00	Recovery (m) 16.31 13.36 12.42 12.14
est Date 007/11/07 dethod of Water Rem Typ Removal Rat	12:00 Al noval e Pump e	63.65 L/min			D	10.74 12.57 13.26 13.62 13.84	Depth to	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02
est Date 007/11/07 dethod of Water Rem Typ Removal Rat	12:00 Al noval e Pump e	63.65 L/min			D	10.74 12.57 13.26 13.62 13.84 14.00	Depth to	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror	12:00 Af	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15	Depth to	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25	Depth to	o water level psed Time putes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84
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est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38	Depth ti Elaş Mir	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45	Depth ti	o water level psed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55	Depth ti	o water level psed Time putes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68
est Date 1007/11/07 Lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 14:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71	Depth ti	o water level osed Time outes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58
est Date 1007/11/07 Lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63	Depth ti	o water level psed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99	Depth ti	o water level osed Time outes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00 25:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.53 11.48
est Date 1007/11/07 Lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99	Depth ti	o water level osed Time outes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00 20:00 30:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.53 11.48 11.43
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 14:00 16:00 20:00 25:00 30:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.53 11.48 11.43
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 14:00 16:00 20:00 25:00 30:00 40:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.53 11.48 11.43 11.43 11.43
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m			D	10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00 25:00 30:00 40:00 50:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.53 11.48 11.43 11.43 11.43 11.43 11.38
est Date 007/11/07 lethod of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m				10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.49	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 20:00 25:00 30:00 35:00 40:00 66:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.53 11.48 11.43 11.43 11.43 11.38 11.38 11.38
est Date 007/11/07 Method of Water Rem Typ Removal Rat Depth Withdrawn Fror water removal period	12:00 Al	63.65 L/min 22.86 m				10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.65 15.85	Depth t	o water level osed Time outes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.53 11.48 11.43 11.43 11.38 11.33 11.28
Test Date 007/11/07 Method of Water Rem Typ Removal Rat Depth Withdrawn Fron Water removal period	12:00 Al	63.65 L/min 22.86 m				10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.49 15.65 15.85 16.03	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 25:00 30:00 35:00 40:00 50:00 60:00 75:00 90:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.53 11.48 11.43 11.43 11.43 11.33 11.28 11.33 11.28 11.23
Test Date 007/11/07 Method of Water Rem Typ Removal Rat Depth Withdrawn Fron	12:00 Al	63.65 L/min 22.86 m				10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.65 15.85	Depth ti	o water level osed Time outes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.53 11.48 11.43 11.43 11.38 11.33 11.28
Fest Date 1007/11/07 Method of Water Rem Typ Removal Rat Depth Withdrawn Fror I water removal period	12:00 Al noval e Pump e m // was < 2 hou	63.65 L/min 22.86 m				10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.49 15.65 15.85 16.03 16.18	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 25:00 30:00 35:00 40:00 50:00 60:00 75:00 90:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.48 11.43 11.43 11.43 11.43 11.38 11.38 11.38 11.38 11.18
Test Date 007/11/07 Method of Water Rem Typ Removal Rat Depth Withdrawn Fror Twater removal period MEASUREMENTS FR	12:00 Al noval e Pump e m // was < 2 hou	63.65 L/min 22.86 m				10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.49 15.65 15.85 16.03 16.18	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 25:00 30:00 35:00 40:00 50:00 60:00 75:00 90:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.48 11.43 11.43 11.43 11.43 11.38 11.38 11.38 11.38 11.18
Test Date 007/11/07 Method of Water Rem Typ Removal Rat Depth Withdrawn Fron	12:00 Al noval e Pump e m // was < 2 hou	63.65 L/min 22.86 m	пу			10.74 12.57 13.26 13.62 13.84 14.00 14.15 14.25 14.33 14.38 14.45 14.55 14.63 14.71 14.86 14.99 15.11 15.22 15.32 15.49 15.65 15.85 16.03 16.18	Depth ti	o water level osed Time nutes:Sec 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 12:00 14:00 16:00 25:00 30:00 35:00 40:00 50:00 60:00 75:00 90:00	Recovery (m) 16.31 13.36 12.42 12.14 12.02 11.94 11.89 11.84 11.79 11.76 11.73 11.68 11.63 11.58 11.48 11.43 11.43 11.43 11.43 11.38 11.38 11.38 11.38 11.18

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

DARREN PAPLEY

PAPLEY DRILLING LTD.

Certification No

5896A

Copy of Well report provided to owner

2008/05/21

Date approval holder signed

Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No. Drilling Company Well ID Date Report Received

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1982/07/19

Location	1/4 or LSD		TWP	RGE	W of MER	Lot	Block	Plan	Addition	al Description		
Inacurad f	SE rom Boundary	10	047	24	GPS Coore	finates in De	ecimal Degre	es (NAD 83)				
исазатец п	on boundary	m from				53.036143		tude113.42		Elevation	758.95 m	
		m from			How Locati	on Obtained	1			How Elevation	Obtained	
					Not Verified	i				Estimated		
Orilling Info	ormation											
Method of				- 1	Type of W	ork						
Rotary					New Well							
Proposed N Domestic	Vell Use											
ormation	Log			Me	asurement ir	Metric	Yield Tes	st Summary	1		Measur	ement in Me
Depth from ground leve	Water I (m) Bearing	Litholog	y Description	1			Recomme Test D			45.46 L/min ate (L/min)	Static Wate	er Level (m)
3.05		Sand					1982/04	1/03	54.55		9.	75
10.67		Blue Cla					Well Con					ement in Me
13.72		Blue Sh						th Drilled Fi	inished Well I	Depth Start Da		nd Date
15.24		Sandst					36.58 m Borehole			1982/04	19 TUN	982/04/03
27.43		Green S						neter (cm)		From (m)		- (-)
29.57		Gray Sh					Diali	0.00		From (m) 0.00		o (m) 36.58
32.00		Sand 8						Casing (if ap	plicable)	Well Casi	ng/Liner	
35.05		Green S				- 1	Steel	ize OD ·	14.12 cm	5	ize OD :	0.00 cm
36.58	36.58 Sand & Shale					ckness:	0.000 cm	•		0.000 cm		
						tlom at :			Top at :	0.00 m		
											ttom at :	0.00 m
							Perforation	ons				
									Diameter Slot	or Slot	Hole	or Slot
							From (m) To (m)				val(cm)
							Perforated	by				
								Seal Driven				
									0.00 m to	27.74 r	<u>n</u>	
							Other Sea	ount				
							Ollier Sea	Type			At (m)	
											7.6 (111)	
							Screen Ty	/pe				
								ze OD :	0.00 cm			
							Fr	om (m)		To (m)	Slot S	Size (cm)
							4.1-					
											Eittings	
								nungs		BOHOM I	Fittings	
							Pack			0	70	
							Type Amount			Grain Si.	ze	_
						'						
			- X									
	Certification											
amount law	rneyman respo	multila for a	trilling/namate	cotion of a	in II			Certification	1.1.			

Water Well Drilling Report

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View in Imperial

Export to Excel

GIC Well ID GoA Well Tag No. Drilling Company Well ID

1982/07/19

236523

Date Report Received Well Identification and Location Measurement in Metric Postal Code Owner Name Address Town Province Country 4117-53A ST, WETASKIWIN JACOBE, DON H. T9A 1S2 1/4 or LSD TWP RGE W of MER Additional Description Location SE 047 24 10 GPS Coordinates in Decimal Degrees (NAD 83) Measured from Boundary of Elevation Latitude 53.036143 Longitude -113.421203 758.95 m m from How Location Obtained How Elevation Obtained m from Not Verified Estimated Additional Information Distance From Top of Casing to Ground Level Is Artesian Flow Is Flow Control Installed Describe Recommended Pump Rate 45.46 L/min Pump Installed Yes H.P. .5 Recommended Pump Intake Depth (From TOC) 21.34 m Type SUB Model (Output Rating) Did you Encounter Saline Water (>4000 ppm TDS) Depth m Well Disinfected Upon Completion Geophysical Log Taken Depth m Submitted to ESRD Sample Collected for Polability Submitted to ESRD Yes Additional Comments on Well WATER IS SOFT. Taken From Ground Level Measurement in Metric Yield Test Depth to water level Test Date Start Time Static Water Level Drawdown (m) Elapsed Time Recovery (m) 1982/04/03 12:00 AM 9.75 m Minutes:Sec Method of Water Removal Type Pump Removal Rate 54.55 L/min Depth Withdrawn From 14.94 m If water removal period was < 2 hours, explain why Water Diverted for Drilling Water Source Amount Taken Diversion Date & Time

Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name WARNKE DRILLING LTD.

Certification No

Copy of Well report provided to owner Date approval holder signed

Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No. Drilling Company Well ID Date Report Received

236527

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1985/09/06

Well Identification and Location Owner Name Address Tow GRAPENTINE, ED P.O. BOX 6544 WETASKIWIN	Measurement in Me vn Province Country Postal Code T9A 2G2
m from Latitude 53.036143	Block Plan Additional Description Becimal Degrees (NAD 83) Longitude -113.421203 Elevation m How Elevation Obtained
Not Verified	Not Obtained
Drilling Information Method of Drilling Unknown Chemistry	
Proposed Weli Use Domestic Tomastics Log Massussess tis Matrix	Visit Test Comment
Formation Log Measurement in Metric Depth from Water Lithology Description ground level (m) Bearing	Yield Test Summary Recommended Pump Rate Test Date Water Removal Rate (L/min) Static Water Level (m)
	Well Completion Total Depth Drilled Finished Well Depth Start Date 0.00 m Borehole Diameter (cm) From (m) To (m) 0.00 0.00 0.00 0.00
	Surface Casing (if applicable) Well Casing/Liner
	Perforations Diameter or Slot Hole or Slot From (m) To (m) Width(cm) Length(cm) Interval(cm)
	Perforated by Annular Seal Placed from 0.00 m to 0.00 m Amount Other Seals
	Screen Type
	Atlachment Top Fittings Bottom Fittings
	Pack Type Grain Size Amount
Contractor Certification	
lame of Journeyman responsible for drilling/construction of well INKNOWN NA DRILLER	Certification No.
ompany Name NKNOWN DRILLER	Copy of Well report provided to owner Date approval holder signed

Water Well Drilling Report

View in Imperial Export to Excel

GIC Well ID GoA Well Tag No. Drilling Company Well ID Date Report Received

236520

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1975/12/18

Owner Nam CRICHTON	, DAVE		Address P.O. BOX	6544 WETA	SKIWIN				Province	Country	y Postal C
ocation	1/4 or LSD SE	SEC 10	TWP 047	RGE 24	W of MER	Lot	Block	Plan	Additio	nal Description	
Measured fi	rom Boundary o	of		T			ecimal Degrees				
		m from			Latitude			de <u>-113.42</u>	21203	Elevation	****
		m from			How Locati		d			How Elevation O	blained
					Not Verified				1	Estimated	
rilling Info	ormation										
Method of I	Drilling			1	Type of Wo	ork					
Drilled					Chemistry						
roposed Vomestic	Vell Use			1							
ormation	Log			Mea	asurement in	Metric	Yield Test	Summary	,		Measurement in I
epth from	Water	Litholog	y Description				Recommend			L/min	
	(m) Bearing	Littiolog	iy bescription				Test Date			Rate (L/min)	Static Water Level (m)
							Well Comp				Measurement in I
								Drilled Fi	nished Well	Depth Start Date	e End Date
							39.62 m				
							Borehole	han family		F7-3	
								ter (cm)		From (m) 0.00	To (m) 39.62
							Surface Ca:	sing (if ap			
							0:	- 00 -	0.00		00
							Wall Thick		0.00 cm		e OD: 0.00 cm
							1	om at :			op at : 0.000 m
									0.00 111		om at: 0.00 m
							Perforation	s			0.00 111
									Diamete		
							From (m)	To (m)	Slot Width(Hole or Slot Interval(cm)
							Perforated b	v			
							Annular Sea	-			
							Placed fro		0.00 m	0.00 m	
						1	Amou				_
							Other Seals				
								Type			At (m)
							-				
							Screen Typ				
								OD:	0.00 cm	-	
							Fron	n (m)		To (m)	Slot Size (cm)
							Attachr	ment			
							Top Fitt	tings		Bottom Fit	ttings
							Pack				
							Туре			Grain Sizo	
							Amount				
ntractor	Certification										
	rneyman respo	nsible for a	drilling/const	ruction of w	9//		C	ertification :	No		
	NA DRILLER						1	J. LIII CONTON			
	ime										

Water Well Drilling Report

View in Imperial Export to Excel 236519

GIC Well ID GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1974/08/09

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CAMPBELL				ST, EDMC		Tow		Province	Country	Postal Code
Location	1/4 or LSD SE	SEC 10	7WP 047	RGE 24	W of ME 4	R Lot	Block Plan	Addition	nal Description	
Measured Ir		n from n from			Latitude		cimal Degrees (NAD 8. Longitude <u>-113.</u>		Elevation How Elevation Old Estimated	
Drilling Info Method of E Drilled Proposed W Domestic	Drilling				Type of Chemistr					
Formation I	Log			Mea	surement	in Metric	Yield Test Summa	ary		Measurement in Metr
Depth from ground level	Water (m) Bearing	Lithology	y Description	1			Recommended Pum Test Date W 1974/07/30	ap Rate		Static Water Level (m) 15.24
							Well Completion Total Depth Drilled 42.67 m Borehole	Finished Well	Depth Start Date	Measurement in Metro End Date
							Diameter (cm) 0.00 Surface Casing (if a		From (m) 0.00 Well Casing	To (m) 42.67 //Liner
							Wall Thickness : Bottom at :		Wall Thickr	0.00 cm 0.00 cm 0.00 cm 0.00 m 0.00 m
							Perforations From (m) To (m	Diamete Slot Width(c	Slot	Hole or Slot Interval(cm)
							Perforated by Annular Seal Placed from Amount Other Seals	0.00 m to	0.00 m	<u>.</u>
							Тур	e		At (m)
							Screen Type Size OD : From (m)	0.00 cm	To (m)	Slot Size (cm)
							Attachment Top Fittings Pack		Bottom Fitt	ings
							Type		Grain Size	
ame of Jour	Dertification neyman respons IA DRILLER	sible for d	rilling/constr	uction of we	ell		Certification	n No		

Water Well Drilling Report

View in Imperial **Export to Excel**

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GIC Well ID GoA Well Tag No. Drilling Company Well ID Date Report Received

1974/08/09

Well Identi	ification and L	_ocation										Measu	rement in Me
Owner Nam CAMPBELL			A <i>ddress</i> 5511-113A	ST, EDMC	NOTAC	Town	7		Provin	ce	Country		Postal Code
Location	1/4 or LSD SE	SEC 10	TWP 047	RGE 24	W of MEI		Block	Plan		itional Des	cription		
Measured fi	rom Boundary o	of				rdinates in De							
		m from				53.036143		itude <u>-113.</u>	421203			746.76 n	1
		m from				ation Obtained				10,100,000,00	Elevation O	btained	
					Мар					Estim	ated	-	
Additional	Information											Measu	rement in Me
Distance F	rom Top of Cas	sing to Ground	d Level		cm								
Is Artesiar	n Flow					_	Is Flow Co.	ntrol installe	d		_		
	Rate		L/min					Describ	е				-
Recommer	nded Pump Rali	е			0.00 L/	min Pum	p Installed			Depth		m	
Recommer	nded Pump Inta	ike Depth (Fr	om TOC)		0.00 m							H.P.	
Did you E	Encounter Salin	e Water (>40	100 ppm TL	DS)	De De		m m	Well Disi		on Comple .og Taken			
	Encounter Salin		00 ppm TL	DS)	De			Well Disi Ge ollected for	Submitted	on Comple .og Taken I to ESRD	etion		
Additions	al Comments or		00 ppm Tl	DS) Gas	De			ollected for	Submitted	on Comple .og Taken i to ESRD	etion Sub	mitted to ES	(Excel)
Additions Yield Test	al Comments or		00 ppm TL		De De	pth_ pth	Sample C	ollected for Ta	Submitted Potability	on Comple .og Taken i to ESRD	Sub.	mitted to ES	RD <u>Yes</u> (Excel)
Additions /ield Test Test Date	al Comments or	n Well	000 ppm TE			pthpth	Sample C	ollected for	Submitted Potability	on Comple og Taken i to ESRD i Ground opth to wat Elapsed	Sub. Level er level Time	mitted to ES	(Excel)
Additions Yield Test Test Date 1974/07/30	al Comments or	n Well Start Time 12:00 AM			: Water Level	pthpth	Sample C	ollected for Ta	Submitted Potability	on Comple og Taken i to ESRD in Ground opth to wat	Sub. Level er level Time	mitted to ES	RD <u>Yes</u> (Excel)
Additions /ield Test Test Date 1974/07/30 Method of	al Comments or Water Remove Type Jemoval Rate	n Well Start Time 12:00 AM	L/min		: Water Level	pthpth	Sample C	ollected for Ta	Submitted Potability	on Comple og Taken i to ESRD i Ground opth to wat Elapsed	Sub. Level er level Time	mitted to ES	RD <u>Yes</u> (Excel)
Additions /ield Test Test Date 1974/07/30 Method of	al Comments or Water Remove Type	n Well Start Time 12:00 AM	L/min		: Water Level	pthpth	Sample C	ollected for Ta	Submitted Potability	on Comple og Taken i to ESRD i Ground opth to wat Elapsed	Sub. Level er level Time	mitted to ES	RD <u>Yes</u> (Excel)
Additions Yield Test Test Date 1974/07/30 Method of R Depth With	al Comments or Water Remove Type Jemoval Rate	start Time 12:00 AM	<u>L/min</u> 00 m	Static	: Water Level	pthpth	Sample C	ollected for Ta	Submitted Potability	on Comple og Taken i to ESRD i Ground opth to wat Elapsed	Sub. Level er level Time	mitted to ES	RD <u>Yes</u> (Excel)
Additions Yield Test Test Date 1974/07/30 Method of R. Depth With	Water Remove Type lemoval Rate	Start Time 12:00 AM al 0.0 s < 2 hours, 6	<u>L/min</u> 00 m	Static	: Water Level	pthpth	Sample C	ollected for Ta	Submitted Potability	on Comple og Taken i to ESRD i Ground opth to wat Elapsed	Sub. Level er level Time	mitted to ES	RD <u>Yes</u> (Excel)

Contractor	Certificat	tion

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

UNKNOWN DRILLER

Certification No

Copy of Well report provided to owner Date approval holder signed

APPENDIX E

SUSTAINABLE YIELD

(TABLE 2 AND MAP Q₂₀)

Table 2 - Summary of hydrogeological parameters

			well	completion	interval					depth to	available	app. yield	
	water well ID	legal location	depth	from	to	NPWL	yield	Т	С	pump	drawdown (H _A)	Q_{20}	
3		W4M		(mete	r)		(L/min)	(m ² /s)	(m/s)		(meter)	(m³/year)	
1	040747	NW-10-047-24	36.58	24.38	36.58	7.62	53.05	1.94E-05	1.59E-06	21.34	13.72	4.00E+03	
2	040748	NW-10-047-24	47.24	28.96	47.24	10.67	54.55	2.67E-05	1.27E-06	21.34	10.67	4.28E+03	
3	040749	NE-10-047-24	42.67	30.48	42.67	12.8	31.82	1.11E-05	7.29E-07	28.96	16.16	2.69E+03	
4	254419	SW-11-047-24	36.58	30.48	36.58	7.01	45.46	7.35E-06	8.03E-07	27.43	20.42	2.25E+03	
5	289823	NE-10-047-24	41.15	35.05	41.15	11.89	45.46	1.23E-05	1.01E-06	27.43	15.54	2.87E+03	
6	1030113	SE-10-047-24	57.91	30.48	57.91	10.51	54.55	1.28E-05	4.67E-07	27.43	16.92	3.25E+03	
7	1030154	SW-10-047-24	51.21	30.48	48.77	7.92	45.46	3.65E-05	1.05E-06	25.91	17.99	9.86E+03	
8	1030156	1-10-47-24	64.62	37.19	64.62	10.67	45.46	1.49E-05	5.43E-07	27.43	16.76	3.75E+03	
9	1030209	11-10-047-24	54.86	33.53	54.86	9.14	45.46	2.20E-05	9.76E-07	30.48	21.34	7.05E+03	
10	1030273	13-10-47-24	54.86	33.53	54.86	7.62	54.55	2.20E-05	9.76E-07	22.86	15.24	5.03E+03	
11	1575617	1-10-47-24	33.53	24.38	30.48	10.74	63.65	1.51E-05	1.08E-06	22.86	12.12	2.75E+03	
12	1780013	NW-10-047-24	36.58	24.99	36.58	7.6	45.46	3.80E-05	1.92E-06	21.34	13.74	7.84E+03	
13	1780020	NW-10-047-24	38.10	25.91	38.10	9	31.82	2.16E-05	1.29E-06	27.43	18.43	5.98E+03	
14	1780118	NW-10-047-24	39.01	27.43	39.01	9.76	20.46	5.33E-06	4.17E-07	29.87	20.11	1.61E+03	
15	1780286	SW-10-47-24	36.58	30.48	36.58	8.41	40.10	2.85E-05	4.68E-06	27.44	19.03	8.14E+03	
16	1780391	12-2-47-24	24.38	18.29	24.38	12.01	27.28	4.69E-05	5.13E-06	21.34	9.33	6.57E+03	

T - transmissivity (m²/s)

C - conductivity (m/s)

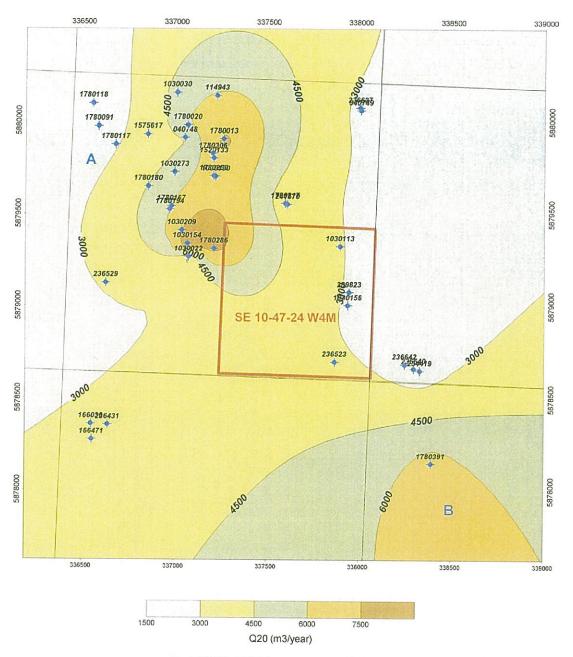
Q₂₀ - sustainable yield for 20 years period (m³/year)

 H_A - available drawdown {depth to pump — static water level (NPWL)} (m)

0.7 - 70% safty factor

 $Q_{20} = 0.6^* T * H_A * 0.7$

well at the property



1030113 WATER WELL WITH ID NUMBER

NAD83 UTM12

GEOWATER CONSULTING	LEGAL LOCATION: SE-10-47-24W4M					
APPAREN	IT YIELD Q20					
CLIENT NAME: BISHOP, JOSH	PROJECT No:	102 2014				
LOCATION: WETASKIWIN	DATE: APRIL,					

APPENDIX F

TABLE 3 - WATER CHEMISTRY

Table 3 - Groundwater chemistry

well ID	legal location	well depth	рН	TDS	Ca	Mg	K	Na	NO ₂ N	NO ₃ _N	CI	SO ₄	CO ₃	HCO ₃	F	NO ₂ NO ₃ N	Fe	TH	analysis date
	W4M	(m)	100	1000							(mg/L)								
1 236334	NW-02-047-24	16.5		814						0.2	59,1	98.9					1.2	4.2	24-Jun-58
2 236345	NW-02-047-24	33.5	8.7	1120	246.5	-1.0	0.9	367	-0.1		40.1	72.0	39.0	707.8		-0.03	0.2	12.4	02-Jul-75
3 236345	NW-02-047-24	33.5	8.5	833	3.0	-1.0	0.7	333	-0.1		34.0	15.0	18.0	834.7	1.6	-0.03	-0.1	0.2	12-Sep-75
4 236434	NW-03-047-24	61.0		662	-1.0	-1.0	0.6	275	-0.1		29.0	16.0	16.0	656.8	2.2	-0.01	0.1	-0.1	01-Mar-85
5 236531	NW-10-047-24	53.3	8.6	1047	6.0	-1.0	0.8	418	-0.1		-1.0	149.9	19.0	916.7	1.1	-0.01	0.1	0.4	22-Jun-85
6 236519	SE-10-047-24	42.7	7.7	684	2.0	-1.0	0.4	283	-0.1	-0.1	123.2	-10.0		532.8	1.6		-0.1	0.1	16-Aug-74
7 236519	SE-10-047-24	42.7	8.5	744	3.0	-1.0	0.5	298	-0.1		134.2	-10.0	9.0	586.8	1.9	-0.01	0.1	0.2	18-Sep-78
8 236520	SE-10-047-24	39.6	-	-	-1.0	-1.0	0.4	197	-0.1		6.0	38.0	21.0	487.8	1.5	-0.03	-0.1	0.0	07-Jan-76
9 236523	SE-10-047-24	36.6		697	2.1	0.3		301			121.9	1.0			2.2		0.2	0.1	24-Apr-87
10 236529	SW-10-047-24	27.4		826							5.0	41.0							13-Sep-65
11 236529	SW-10-047-24	27.4	8.7		-2.0	-1.0	0.5	279	-0.1		15.0	55.0	21.0	667.8	1.9	-0.01	0.7	0.2	18-Sep-78

- Indicates concentration less than

	Hd	TDS	unipos	Vitrite N	Chloride	Sulphate	Fluoride	NO ₂ + NO ₃	Iron
MAC (mg/L)				1		0,	1.5*	10.00	
AO (ma/L)	3.5-8.5	2500	5200		5250	2500			≤0.3

^{*} It is recommended that concentration of fluoride be adjusted to 0.8- 1.0 mg/L, which is optimum range for the control of caries.

MAC - Maximum Acceptable Concentration (affects health)

AO - Aesthetic Objective (does not affect health but affects odour, taste, etc.)