



Parkland Geo-Environmental Ltd.
189 Pembina Road
Sherwood Park, AB, T8H 2W8
www.parklandgeo.com
T: 780 416 1755
F: 780 416 1752

December 12, 2012
Project No. ED1285

Via E-mail
Original to remain on file

Focus Corporation
300, 9925-109 Street
Edmonton, Alberta
T5K 2J8

ATTN: Ms. Lisa Sharun, BA, MEdes, RPP, MCIP
Planner, Land Development

RE: Proposed Woodbend Estates Area Structure plan
W1/2 25-51-26 W4M, Parkland County, Alberta
Desktop Aquifer Study Addendum Letter

Dear Ms. Sharun:

This letter provides background information and elaborates on the desktop aquifer study performed for the proposed Woodbend Estates which was initially presented in the ParklandGEO report dated November 2, 2011 (File ED1285). This is intended to provide additional data and support for the conclusions originally presented.

Hydrogeological information used in this desktop study was obtained from the Alberta Environment (AENV) water well record database, published geological and hydrogeological reports, and several other sources.

1.0 SITE DESCRIPTION

The proposed project will consist of the development of two quarter sections into a rural residential subdivision within Parkland County, Alberta. Access to the property was from Range Road 261 to the west of the site, and Township Road 514 to the south of the site.

The quarter sections consisted mostly of relatively flat agricultural land with an oil well lease site towards the north, a residence to the west, and an undeveloped low-lying area in the southwest corner of the site (Photographs 1 to 4). At the time of investigation, NW¼-25-51-26-W4M had been harvested and SW¼-25-51-26-W4M was an unharvested wheat field. The low-lying area in the southwest encompassed about 10 percent of the developable area. The vegetation in this area consisted primarily of native grasses, thistles, and stands of deciduous trees.

The surrounding quarter sections generally consisted of agricultural land and undeveloped treed areas, with existing rural residential subdivisions located to the west and northwest of the property. The nearest major water body is the North Saskatchewan River located approximately 2.75 km to the east of the site.

It is understood that the proposed development will make use of private sewage disposal systems such as septic tanks and disposal fields, as applicable. If feasible, it is proposed to use the local groundwater aquifer for potable water supply.

2.0 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Property is located in the Edmonton Plain region which lies north of the North Saskatchewan River (Bedrock Topography Map of the Edmonton-Calgary Corridor, Government of Alberta). Surficial soils consisting of unconsolidated quaternary deposits extend from surface to approximately 20 to 30 m. These surficial soils consist of fine sands, silts and clay deposits.

The Property is underlain largely by Lake Edmonton silts and clays, which is not expected to be a viable producing aquifer. Areas to the north and west of the Property are expected to be underlain by North Saskatchewan River alluvium consisting of some sands and gravels, which is expected to be the dominant aquifer in the area (Bedrock Topography and Surficial Aquifers of the Edmonton District, Alberta by V.A. Carlson for the Research Council of Alberta, 1967). The early North Saskatchewan River alluvium is located in a pre-glacial buried valley with water bearing sand and gravels located from approximately 40 to 70 m below surface. Although this deposit is estimated to have a capacity of between 25 and 100 igpm, the Subject Property is located on the fringes of this valley and is only estimated to have a capacity of between 5 and 25 igpm (Hydrogeology of the Southwest Segment, Edmonton Area, Alberta by W. Ceroici for the Alberta Research Council, 1979). This converts to yields between 0.19 and 0.38 m³/min for the Property and surrounding areas.

The bedrock in the area is located at an approximate elevation of 670 to 700 mASL, and the Cretaceous era Wapiti Formation, which is described as alternating sandstone and mudstone with bentonitic layers and occasional coal beds (Hydrogeology of the Southwest Segment, Edmonton Area, Alberta by W. Ceroici for the Alberta Research Council, 1979).

A review of the local groundwater use was completed using Alberta Environment's groundwater well database. A total of 347 water wells are listed for the Subject Property and within two quarter section of the Property. Of these wells, approximately 66 water well records provided pump test information. Based on these records, safe well yield was calculated for nine wells, with the results showing an average Q_{20} safe yield of 0.492 m³/min. The selected well records and the yield analysis sheets are included as an attachment.

3.0 CURRENT AND PROPOSED GROUNDWATER USE

3.1 Current Use

The Province of Alberta Water Act states that each household requires a diversion of 1,250 m³/year, and that this shall not interfere with other users in the area. This equates to a water usage of 3.42 m³/day for each household, or approximately 0.024 m³/min.

From aerial photographs, it was determined that approximately 195 residences and one golf course were located within two quarter sections of the Property. Based on the average water use per household required by The Water Act, current use in the area is estimated to be approximately 0.464 m³/min, or approximately 670 m³/day.

3.2 Proposed Use

The proposed development is to include 103 new lots with an average water use of 3.42 m³/lot/day. Based on the proposed lots, it is estimated that 352 m³/day of additional water demand is proposed through the development of the subdivision. Based on this, the increase in water demand would be approximately 0.245 m³/min.

4.0 DISCUSSION AND RECOMMENDATIONS

If the proposed 103 new residential users were added to the existing water usage in the area, the total water required from the aquifer would be approximately 0.71 m³/min, which is greater than the estimated local aquifer yield of between 0.19 and 0.38 m³/min based on historical hydrogeological reports and the local groundwater well database.

Based on the number of existing wells and users in the area relying on the groundwater aquifer, it is recommended that individual cisterns water supplies or other water supply not relying on the local aquifer be utilized for the proposed development. If individual lots wish to use the existing aquifer, it is recommended that they engage a hydrogeologist to perform a full scale pump test and groundwater availability assessment on each proposed well development in order to determine the ability of the aquifer to sustain water supply to the proposed new residences.

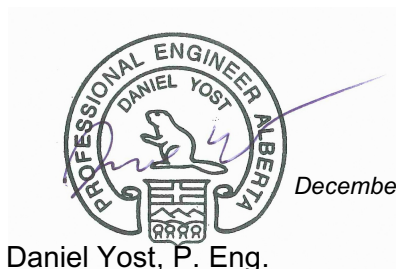
5.0 LIMITATIONS AND CLOSURE

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We trust that this report meets with your current requirements. If there are any questions or comments regarding this information, please contact the undersigned at 780 / 416 - 1755.

Respectfully submitted,

PARKLAND GEO-ENVIRONMENTAL LTD.
APEGA Permit to Practice No. P - 8867



December 12, 2012

Daniel Yost, P. Eng.
Geo-Environmental Engineer

Reviewed by:

Michael McCormick, M.Eng., P.Eng.
Principal Geo-Environmental Engineer

Attached: Groundwater Wells with Pump Test Information
Analysis Sheets

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.

GIC Well ID 1715072
GoA Well Tag No.
Date Report Received

1. Well Identification and Location										Measurement in Imperial
Owner Name SOUMAKO, ROB & CHERYL		Address # 5 25507 TWP RD 512A		Town SPRUCE GROVE		Province AB		Postal Code T7Y 1A8		
Location	1/4 or LSD 16	SEC 25	TWP 051	RGE 26	W of MER 4	Lot 1	Block 1	Plan 8522152	Additional Description	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.437710</u> Longitude <u>-113.693190</u> How Location Obtained Map				Elevation _____ ft How Elevation Obtained Not Obtained		

2. Drilling Information		
Method of Drilling Bored	Type of Work New Well	Proposed Well Use Domestic

3. Formation Log			Measurement in Imperial
Depth from ground level (ft)	Water Bearing	Lithology Description	
12.00		Silty Sand	
36.00		Blue Silt	
42.00		Blue Clay	
50.00		Silty Sand	
70.00		Clay	

4. Well Completion				Measurement in Imperial
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
70.00 ft		2002/06/12	2002/06/12	
Borehole				
Diameter (in)	From (ft)	To (ft)		
30.00	0.00	70.00		
Surface Casing (if applicable) Galvanized Steel		Well Casing/Liner Unknown		
Size OD : <u>24.00</u> in		Size OD : _____ in		
Wall Thickness : <u>0.063</u> in		Wall Thickness : _____ in		
Bottom at : <u>70.00</u> ft		Top at : _____ ft		
		Bottom at : _____ ft		
Perforations				
From (ft)	To (ft)	Diameter (in)	Interval (in)	
Perforated by Unknown				
Annular Seal Bentonite Chips/Tablets				
Placed from <u>0.00</u> ft to <u>30.00</u> ft				
Amount _____				
Other Seals				
Type		At (ft)		
Screen Type Steel				
Size OD : <u>24.00</u> in				
From (ft)	To (ft)	Slot Size (in)		
42.00	44.00	0.010		
Attachment <u>Attached To Casing</u>				
Top Fittings <u>Coupler</u>		Bottom Fittings <u>Other</u>		
Pack				
Type <u>Artificial</u>		Grain Size <u>COARSE</u>		
Amount <u>9.00</u> Yards				

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well DAVE SUMMERS	Certification No 5286Q
Company Name SUMMERS DRILLING LTD.	Copy of Well report provided to owner Date approval holder signed

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GIC Well ID 1715072
GoA Well Tag No.
Date Report Received

1. Well Identification and Location										Measurement in Imperial
Owner Name SOUMAKO, ROB & CHERYL		Address # 5 25507 TWP RD 512A			Town SPRUCE GROVE		Province AB		Postal Code T7Y 1A8	
Location	1/4 or LSD 16	SEC 25	TWP 051	RGE 26	W of MER 4	Lot 1	Block 1	Plan 8522152	Additional Description	
Measured from Boundary of ft from ft from				GPS Coordinates in Decimal Degrees (NAD 83) Latitude 53.437710 Longitude -113.693190 How Location Obtained Map				Elevation ft How Elevation Obtained Not Obtained		

Additional Information										Measurement in Imperial
Distance From Top of Casing to Ground Level 12.00 in Is Artesian Flow Rate igpm										Is Flow Control Installed Describe
Recommended Pump Rate 3.00 igpm Recommended Pump Intake Depth (From TOC) 60.00 ft										Pump Installed Yes Depth ft Type SUB @ 55 FT Model H.P.
Did you Encounter Saline Water (>4000 ppm TDS) Depth ft Gas Depth ft										Well Disinfected Upon Completion Geophysical Log Taken Submitted to GIC Sample Collected for Potability Result Attached
Additional Comments on Well SCREEN TYPE : LOW CARBON STEEL, FITTING BOTTOM : COUPLER										

5. Yield Test			Measurement in Imperial	Taken From Ground Level
Test Date 2002/06/12	Start Time 12:00 AM	Static Water Level 12.00 ft	Depth to water level	
Method of Water Removal Type Bailer Removal Rate 60.00 igpm Depth Withdrawn From 60.00 ft			Drawdown (ft)	Elapsed Time Minutes:Sec Recovery (ft)
If water removal period was < 2 hours, explain why				0:00 60.00
				1:00 59.50
				2:00 59.00
				3:00 58.50
				4:00 58.00
				5:00 57.50
				6:00 57.00
				7:00 56.50
				8:00 56.00
				9:00 55.75
				10:00 55.25
				12:00 54.08
	14:00 54.42			
	16:00 53.50			
	20:00 53.00			
	25:00 52.33			
	30:00 51.67			
	35:00 51.00			
	40:00 50.67			
	50:00 50.00			
	60:00 48.67			
	75:00 48.00			
	90:00 49.00			
	105:00 48.25			
	120:00 48.00			

6. Water Diverted for Drilling		
Water Source	Amount Taken ig	Diversion Date & Time

7. Contractor Certification		
Name of Journeyman responsible for drilling/construction of well DAVE SUMMERS	Certification No 5286Q	
Company Name SUMMERS DRILLING LTD.	Copy of Well report provided to owner	Date approval holder signed

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The information on this report will be retained in a public database.

GIC Well ID 1495278
GoA Well Tag No.
Date Report Received

1. Well Identification and Location										Measurement in Imperial
Owner Name FORNARA, BERNARD		Address #36, 51514 RANGE RD. 261			Town SPRUCE GROVE		Province AB		Postal Code T7Y 1B3	
Location	1/4 or LSD SE	SEC 35	TWP 051	RGE 26	W of MER 4	Lot	Block	Plan	Additional Description #36 FLEMING PARK	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.443100</u> Longitude <u>-113.720000</u> How Location Obtained Not Verified				Elevation _____ ft How Elevation Obtained Not Obtained		

2. Drilling Information		
Method of Drilling Rotary	Type of Work New Well	Proposed Well Use Domestic

3. Formation Log			Measurement in Imperial
Depth from ground level (ft)	Water Bearing	Lithology Description	
17.00		Brown Clay	
112.00		Gray Clay	
160.00		Gray Medium Grained Sand	
161.00		Gray Sandstone	

4. Well Completion				Measurement in Imperial
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
161.00 ft		2006/10/06	2006/10/06	
Borehole				
Diameter (in)	From (ft)	To (ft)		
7.88	0.00	161.00		
Surface Casing (if applicable) Plastic		Well Casing/Liner Unknown		
Size OD :	6.00 in	Size OD : _____ in		
Wall Thickness :	0.500 in	Wall Thickness : _____ in		
Bottom at :	155.00 ft	Top at : _____ ft		
		Bottom at : _____ ft		
Perforations				
From (ft)	To (ft)	Diameter (in)	Interval (in)	
Perforated by Unknown				
Annular Seal Bentonite Chips/Tablets				
Placed from	0.00 ft	to	112.00 ft	
Amount	_____			
Other Seals				
Type	At (ft)			
Screen Type Stainless Steel				
Size OD :	5.00 in			
From (ft)	To (ft)	Slot Size (in)		
155.00	160.00	0.100		
Attachment Attached To Casing				
Top Fittings	Coupler	Bottom Fittings Plug		
Pack				
Type	Washed Sand	Grain Size GRIT 3		
Amount	650.00 Pounds			

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well TERRY BERGSTREISER	Certification No 41955A
Company Name MAR-WAYNE WATER WELL DRILLING SERVICES LTD.	Copy of Well report provided to owner Date approval holder signed

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1. Well Identification and Location										Measurement in Imperial
<i>Owner Name</i> FORNARA, BERNARD		<i>Address</i> #36, 51514 RANGE RD. 261				<i>Town</i> SPRUCE GROVE		<i>Province</i> AB	<i>Postal Code</i> T7Y 1B3	
<i>Location</i>	<i>1/4 or LSD</i> SE	<i>SEC</i> 35	<i>TWP</i> 051	<i>RGE</i> 26	<i>W of MER</i> 4	<i>Lot</i>	<i>Block</i>	<i>Plan</i>	<i>Additional Description</i> #36 FLEMING PARK	
<i>Measured from Boundary of</i>					<i>GPS Coordinates in Decimal Degrees (NAD 83)</i>					
ft from					Latitude <u>53.443100</u> Longitude <u>-113.720000</u>					Elevation _____ ft
ft from					How Location Obtained					How Elevation Obtained
					Not Verified					Not Obtained

Additional Information				Measurement in Imperial	
Distance From Top of Casing to Ground Level		17.72 in			
Is Artesian Flow				Is Flow Control Installed	
Rate		igpm		Describe	
Recommended Pump Rate		19.00 igpm		Pump Installed	
Recommended Pump Intake Depth (From TOC)		144.36 ft		Depth	
				ft	
				Type	
				Model	
				H.P.	
Did you Encounter Saline Water (>4000 ppm TDS)		Depth		ft	
Gas		Depth		ft	
				Well Disinfected Upon Completion	
				Geophysical Log Taken	
				Submitted to GIC	
Additional Comments on Well				Sample Collected for Potability	
				Result Attached	

5. Yield Test			Measurement in Imperial		Taken From Ground Level	
<i>Test Date</i> 2006/10/06	<i>Start Time</i> 12:00 AM	<i>Static Water Level</i> 66.80 ft	<i>Depth to water level</i>			
<i>Method of Water Removal</i>			Drawdown (ft)	Elapsed Time Minutes:Sec	Recovery (ft)	
<i>Type</i> Air			66.80	0:00	111.55	
<i>Removal Rate</i> 19.00 igpm				1:00	87.96	
<i>Depth Withdrawn From</i> 157.48 ft				2:00	78.08	
				3:00	73.13	
				4:00	70.80	
				5:00	69.62	
				6:00	68.96	
				7:00	68.60	
				8:00	68.41	
				9:00	68.27	
				10:00	68.18	
				12:00	68.08	
				14:00	68.08	
				16:00	68.08	
				20:00	68.08	
				25:00	68.08	
				30:00	68.08	
				35:00	68.08	
				40:00	68.08	
				50:00	68.08	
				60:00	68.08	
				75:00	68.08	
				90:00	68.08	
				105:00	68.08	
				120:00	68.08	

If water removal period was < 2 hours, explain why

6. Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	ig	

7. Contractor Certification <i>Name of Journeyman responsible for drilling/construction of well</i> TERRY BERGSTREISER <i>Company Name</i> MAR-WAYNE WATER WELL DRILLING SERVICES LTD.		<i>Certification No</i> 41955A <i>Copy of Well report provided to owner</i> <i>Date approval holder signed</i>
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GIC Well ID 1495257
GoA Well Tag No.
Date Report Received

1. Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Postal Code
LEENTVAAR, HUGO	#31-51514 RANGE RD 261	SPRUCE GROVE	AB	T7Y 1B3

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SE	35	051	26	4	31	3	1891TR	

Measured from Boundary of

ft from _____
ft from _____

GPS Coordinates in Decimal Degrees (NAD 83)

Latitude 53.443100 Longitude -113.720000

How Location Obtained

Not Verified

Elevation _____ ft

How Elevation Obtained

Not Obtained

2. Drilling Information

Method of Drilling

Rotary

Type of Work

New Well

Proposed Well Use

Domestic

3. Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
12.00		Brown Clay
90.00		Gray Silty Clay
130.00		Gray Till
143.00		Clay & Sand
157.00		Gray Clay
172.00		Sand
173.00		Shale

4. Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
173.00 ft		2006/05/29	2006/05/29

Borehole

Diameter (in)	From (ft)	To (ft)
7.88	0.00	173.00

Surface Casing (if applicable)

Plastic

Size OD : 6.00 in

Wall Thickness : 0.500 in

Bottom at : 165.00 ft

Well Casing/Liner

Unknown

Size OD : _____ in

Wall Thickness : _____ in

Top at : _____ ft

Bottom at : _____ ft

Perforations

From (ft)	To (ft)	Diameter (in)	Interval (in)

Perforated by Unknown

Annular Seal Bentonite Chips/Tablets

Placed from 0.00 ft to 140.00 ft

Amount _____

Other Seals

Type	At (ft)

Screen Type Stainless Steel

Size OD : 5.00 in

From (ft)	To (ft)	Slot Size (in)
165.00	170.00	0.010

Attachment Attached To Casing

Top Fittings Coupler

Bottom Fittings Plug

Pack

Type Artificial

Grain Size 0.275

Amount 400.00 Pounds

7. Contractor Certification

Name of Journeyman responsible for drilling/construction of well

TERRY BERGSTREISER

Company Name

MAR-WAYNE WATER WELL DRILLING SERVICES LTD.

Certification No

41955A

Copy of Well report provided to owner

Date approval holder signed

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GIC Well ID 1495257
GoA Well Tag No.
Date Report Received

1. Well Identification and Location										Measurement in Imperial
Owner Name LEENTVAAR, HUGO		Address #31-51514 RANGE RD 261			Town SPRUCE GROVE		Province AB		Postal Code T7Y 1B3	
Location	1/4 or LSD SE	SEC 35	TWP 051	RGE 26	W of MER 4	Lot 31	Block 3	Plan 1891TR	Additional Description	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.443100</u> Longitude <u>-113.720000</u> How Location Obtained Not Verified				Elevation _____ ft How Elevation Obtained Not Obtained		

Additional Information										Measurement in Imperial
Distance From Top of Casing to Ground Level <u>15.75 in</u> Is Artesian Flow _____ Rate _____ igpm										Is Flow Control Installed _____ Describe _____
Recommended Pump Rate <u>20.00 igpm</u> Recommended Pump Intake Depth (From TOC) <u>137.79 ft</u>										Pump Installed _____ Depth _____ ft Type _____ Model _____ H.P. _____
Did you Encounter Saline Water (>4000 ppm TDS) _____ Depth _____ ft Gas _____ Depth _____ ft										Well Disinfected Upon Completion _____ Geophysical Log Taken _____ Submitted to GIC _____ Sample Collected for Potability _____ Result Attached _____
Additional Comments on Well FILTER PACK WASHED, WELL LOCATION FLEMING PARK										

5. Yield Test			Measurement in Imperial	Taken From Ground Level																																							
Test Date 2006/05/29	Start Time 12:00 AM	Static Water Level 72.18 ft	Depth to water level																																								
Method of Water Removal Type <u>Air</u> Removal Rate <u>20.00 igpm</u> Depth Withdrawn From <u>167.32 ft</u> If water removal period was < 2 hours, explain why			<table border="1"> <thead> <tr> <th>Drawdown (ft)</th> <th>Elapsed Time Minutes:Sec</th> <th>Recovery (ft)</th> </tr> </thead> <tbody> <tr><td></td><td>0:00</td><td>111.55</td></tr> <tr><td></td><td>1:00</td><td>91.57</td></tr> <tr><td></td><td>2:00</td><td>78.77</td></tr> <tr><td></td><td>3:00</td><td>77.46</td></tr> <tr><td></td><td>4:00</td><td>76.05</td></tr> <tr><td></td><td>5:00</td><td>75.53</td></tr> <tr><td></td><td>6:00</td><td>75.43</td></tr> <tr><td></td><td>7:00</td><td>75.36</td></tr> <tr><td></td><td>8:00</td><td>75.36</td></tr> <tr><td></td><td>9:00</td><td>75.33</td></tr> <tr><td></td><td>10:00</td><td>75.33</td></tr> <tr><td></td><td>12:00</td><td>75.30</td></tr> </tbody> </table>	Drawdown (ft)	Elapsed Time Minutes:Sec	Recovery (ft)		0:00	111.55		1:00	91.57		2:00	78.77		3:00	77.46		4:00	76.05		5:00	75.53		6:00	75.43		7:00	75.36		8:00	75.36		9:00	75.33		10:00	75.33		12:00	75.30	
Drawdown (ft)	Elapsed Time Minutes:Sec	Recovery (ft)																																									
	0:00	111.55																																									
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	6:00	75.43																																									
	7:00	75.36																																									
	8:00	75.36																																									
	9:00	75.33																																									
	10:00	75.33																																									
	12:00	75.30																																									

6. Water Diverted for Drilling		
Water Source	Amount Taken ig	Diversion Date & Time

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well TERRY BERGSTREISER Company Name MAR-WAYNE WATER WELL DRILLING SERVICES LTD.	Certification No 41955A Copy of Well report provided to owner Date approval holder signed

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The information on this report will be retained in a public database.

GIC Well ID 296997
GoA Well Tag No.
Date Report Received 2001/08/14

1. Well Identification and Location

Measurement in Imperial

Owner Name	Address	Town	Province	Postal Code
OSWALD, SHAWN	2308 8 ST, NISKU			T9E 7Z2

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	SE	35	051	26	4	32			

Measured from Boundary of

ft from _____
ft from _____

GPS Coordinates in Decimal Degrees (NAD 83)

Latitude 53.443092 Longitude -113.719670

How Location Obtained

Not Verified

Elevation _____ ft

How Elevation Obtained

Not Obtained

2. Drilling Information

Method of Drilling

Rotary

Type of Work

New Well

Proposed Well Use

Domestic

3. Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
19.00		Brown Clay
69.00		Gray Silty Clay
122.00		Gray Sandy Clay
154.00		Clay & Sand
190.00		Gray Coarse Grained Sand
195.00		Sand
196.00		Gravel

4. Well Completion

Measurement in Imperial

Total Depth Drilled	Finished Well Depth	Start Date	End Date
196.00 ft		2001/06/21	2001/06/21

Borehole

Diameter (in)	From (ft)	To (ft)
0.00	0.00	196.00

Surface Casing (if applicable)

Plastic

Size OD : 6.00 in

Wall Thickness : 0.500 in

Bottom at : 190.00 ft

Well Casing/Liner

Size OD : 0.00 in

Wall Thickness : 0.000 in

Top at : 0.00 ft

Bottom at : 0.00 ft

Perforations

From (ft)	To (ft)	Diameter (in)	Interval (in)

Perforated by

Annular Seal Bentonite Chips/Tablets

Placed from 0.00 ft to 122.00 ft

Amount _____

Other Seals

Type	At (ft)

Screen Type Stainless Steel

Size OD : 4.00 in

From (ft)	To (ft)	Slot Size (in)
190.00	195.00	0.010

Attachment Attached To Casing

Top Fittings Coupler

Bottom Fittings Plug

Pack

Type Washed Sand

Grain Size .275

Amount 900.00 Pounds

7. Contractor Certification

Name of Journeyman responsible for drilling/construction of well

UNKNOWN NA DRILLER

Company Name

MAR-WAYNE WATER WELL DRILLING SERVICES LTD.

Certification No

1

Copy of Well report provided to owner Date approval holder signed

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.

GIC Well ID 296997
GoA Well Tag No.
Date Report Received 2001/08/14

1. Well Identification and Location										Measurement in Imperial
Owner Name		Address		Town		Province		Postal Code		
OSWALD, SHAWN		2308 8 ST, NISKU						T9E 7Z2		
Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description	
	SE	35	051	26	4	32				
Measured from Boundary of				GPS Coordinates in Decimal Degrees (NAD 83)				Elevation _____ ft		
_____ ft from _____				Latitude <u>53.443092</u> Longitude <u>-113.719670</u>				How Elevation Obtained _____		
_____ ft from _____				Not Verified				Not Obtained		

Additional Information										Measurement in Imperial
Distance From Top of Casing to Ground Level _____ in										
Is Artesian Flow _____										
Rate _____ igpm										
Is Flow Control Installed _____										
Describe _____										
Recommended Pump Rate _____ 20.00 igpm										
Pump Installed <u>Yes</u> _____ Depth _____ ft										
Recommended Pump Intake Depth (From TOC) _____ 115.00 ft										
Type <u>SUB</u> _____ Model _____ H.P. <u>.75</u>										
Did you Encounter Saline Water (>4000 ppm TDS) _____ Depth _____ ft										
Well Disinfected Upon Completion _____										
Gas _____ Depth _____ ft										
Geophysical Log Taken _____										
Submitted to GIC _____										
Additional Comments on Well _____										
Sample Collected for Potability _____ Result Attached _____										
DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 35 CMS. FLEMING PARK EST.										

5. Yield Test			Measurement in Imperial	Taken From Ground Level
Test Date	Start Time	Static Water Level	Depth to water level	
2001/06/21	12:00 AM	67.00 ft		
Method of Water Removal				
Type <u>Air</u>				
Removal Rate _____ 21.00 igpm				
Depth Withdrawn From _____ 0.00 ft				
If water removal period was < 2 hours, explain why _____				
			Drawdown (ft)	Elapsed Time Minutes:Sec
				Recovery (ft)
				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

6. Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	ig	

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well	Certification No
UNKNOWN NA DRILLER	1
Company Name	Copy of Well report provided to owner
MAR-WAYNE WATER WELL DRILLING SERVICES LTD.	Date approval holder signed

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.

GIC Well ID 289029
GoA Well Tag No.
Date Report Received 1998/05/28

1. Well Identification and Location										Measurement in Imperial
Owner Name HAARSMA, GARY		Address 8711 199 ST, EDMONTON			Town		Province		Postal Code T5T 6E8	
Location	1/4 or LSD NE	SEC 25	TWP 051	RGE 26	W of MER 4	Lot	Block	Plan	Additional Description	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.435847</u> Longitude <u>-113.695224</u> How Location Obtained Not Verified				Elevation _____ ft How Elevation Obtained Not Obtained		

2. Drilling Information		
Method of Drilling Rotary	Type of Work New Well	Proposed Well Use Domestic

3. Formation Log			Measurement in Imperial
Depth from ground level (ft)	Water Bearing	Lithology Description	
18.00		Yellow Sandy Clay	
104.00		Blue Sandy Clay	
162.00		Sand	
170.00		Gray Shale	

4. Well Completion				Measurement in Imperial
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
170.00 ft		1998/04/21	1998/04/21	
Borehole				
Diameter (in)	From (ft)	To (ft)		
0.00	0.00	170.00		
Surface Casing (if applicable)		Well Casing/Liner		
Plastic				
Size OD :	6.00 in	Size OD :	0.00 in	
Wall Thickness :	0.390 in	Wall Thickness :	0.000 in	
Bottom at :	158.00 ft	Top at :	0.00 ft	
		Bottom at :	0.00 ft	
Perforations				
From (ft)	To (ft)	Diameter (in)	Interval (in)	
Perforated by				
Annular Seal Bentonite Chips/Tablets				
Placed from	0.00 ft	to	102.00 ft	
Amount				
Other Seals				
Type	At (ft)			
Screen Type Stainless Steel				
Size OD :	5.00 in			
From (ft)	To (ft)	Slot Size (in)		
158.00	163.00	0.010		
Attachment <u>Attached To Casing</u>				
Top Fittings <u>Coupler</u>		Bottom Fittings <u>Plug</u>		
Pack				
Type	<u>Washed Sand</u>		Grain Size _____	
Amount	<u>2500.00 Pounds</u>			

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name D&D WATER WELL DRILLING & SERVICING LTD.	Copy of Well report provided to owner Date approval holder signed

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.

GIC Well ID 289029
GoA Well Tag No.
Date Report Received 1998/05/28

1. Well Identification and Location										Measurement in Imperial
Owner Name HAARMSMA, GARY		Address 8711 199 ST, EDMONTON			Town		Province		Postal Code T5T 6E8	
Location	1/4 or LSD NE	SEC 25	TWP 051	RGE 26	W of MER 4	Lot	Block	Plan	Additional Description	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.435847</u> Longitude <u>-113.695224</u> How Location Obtained Not Verified				Elevation _____ ft How Elevation Obtained Not Obtained		

Additional Information										Measurement in Imperial
Distance From Top of Casing to Ground Level _____ in										
Is Artesian Flow _____										
Rate _____ igpm										
Is Flow Control Installed _____										
Describe _____										
Recommended Pump Rate _____ 5.00 igpm										
Pump Installed _____ Depth _____ ft										
Recommended Pump Intake Depth (From TOC) _____ 140.00 ft										
Type _____ Model _____ H.P. _____										
Did you Encounter Saline Water (>4000 ppm TDS) _____ Depth _____ ft										
Well Disinfected Upon Completion _____										
Gas _____ Depth _____ ft										
Geophysical Log Taken _____										
Submitted to GIC _____										
Additional Comments on Well _____										
Sample Collected for Potability _____ Result Attached _____										
DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 30 CM.										

5. Yield Test			Measurement in Imperial	Taken From Ground Level																											
Test Date 1998/04/21	Start Time 12:00 AM	Static Water Level 89.00 ft	Depth to water level																												
Method of Water Removal																															
Type Air																															
Removal Rate _____ igpm																															
Depth Withdrawn From _____ 163.00 ft																															
If water removal period was < 2 hours, explain why																															
			<table border="1"> <thead> <tr> <th>Drawdown (ft)</th> <th>Elapsed Time Minutes:Sec</th> <th>Recovery (ft)</th> </tr> </thead> <tbody> <tr><td></td><td>0:00</td><td>116.57</td></tr> <tr><td></td><td>1:00</td><td>98.00</td></tr> <tr><td></td><td>2:00</td><td>92.52</td></tr> <tr><td></td><td>3:00</td><td>90.68</td></tr> <tr><td></td><td>4:00</td><td>89.99</td></tr> <tr><td></td><td>6:00</td><td>89.57</td></tr> <tr><td></td><td>8:00</td><td>89.44</td></tr> <tr><td></td><td>10:00</td><td>89.40</td></tr> </tbody> </table>		Drawdown (ft)	Elapsed Time Minutes:Sec	Recovery (ft)		0:00	116.57		1:00	98.00		2:00	92.52		3:00	90.68		4:00	89.99		6:00	89.57		8:00	89.44		10:00	89.40
Drawdown (ft)	Elapsed Time Minutes:Sec	Recovery (ft)																													
	0:00	116.57																													
	1:00	98.00																													
	2:00	92.52																													
	3:00	90.68																													
	4:00	89.99																													
	6:00	89.57																													
	8:00	89.44																													
	10:00	89.40																													

6. Water Diverted for Drilling		
Water Source	Amount Taken ig	Diversion Date & Time

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name D&D WATER WELL DRILLING & SERVICING LTD.	Copy of Well report provided to owner Date approval holder signed

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.

GIC Well ID 286934
GoA Well Tag No.
Date Report Received 1997/03/20

1. Well Identification and Location										Measurement in Imperial
Owner Name FINDLAY, ED		Address 3 51514 RNG 261, SPRUCE GROVE			Town		Province		Postal Code T7Y 1B3	
Location	1/4 or LSD SE	SEC 35	TWP 051	RGE 26	W of MER 4	Lot 2	Block	Plan	Additional Description	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.443092</u> Longitude <u>-113.719670</u> How Location Obtained Not Verified				Elevation _____ ft How Elevation Obtained Not Obtained		

2. Drilling Information		
Method of Drilling Rotary	Type of Work New Well	Proposed Well Use Domestic

3. Formation Log			Measurement in Imperial
Depth from ground level (ft)	Water Bearing	Lithology Description	
11.00		Yellow Clay	
79.00		Blue Sandy Clay	
89.00		Sand	
111.00		Blue Sandy Clay	
124.00		Fine Grained Sand	
127.00		Blue Sandy Clay	
142.00		Coarse Grained Sand	
146.00		Blue Clay	
150.00		Gray Shale	

4. Well Completion				Measurement in Imperial
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
150.00 ft		1997/02/13	1997/02/13	
Borehole				
Diameter (in)	From (ft)	To (ft)		
0.00	0.00	150.00		
Surface Casing (if applicable)		Well Casing/Liner		
Plastic				
Size OD :	6.00 in	Size OD :	0.00 in	
Wall Thickness :	0.395 in	Wall Thickness :	0.000 in	
Bottom at :	137.00 ft	Top at :	0.00 ft	
		Bottom at :	0.00 ft	
Perforations				
From (ft)	To (ft)	Diameter (in)	Interval (in)	
Perforated by				
Annular Seal Bentonite Chips/Tablets				
Placed from	0.00 ft	to	127.00 ft	
Amount				
Other Seals				
Type	At (ft)			
Screen Type Stainless Steel				
Size OD :	5.00 in			
From (ft)	To (ft)	Slot Size (in)		
137.00	142.00	0.012		
Attachment <u>Attached To Casing</u>				
Top Fittings <u>Coupler</u>		Bottom Fittings <u>Plug</u>		
Pack				
Type	<u>Washed Sand</u>		Grain Size _____	
Amount	<u>1400.00 Pounds</u>			

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name D&D WATER WELL DRILLING & SERVICING LTD.	Copy of Well report provided to owner Date approval holder signed

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.

GIC Well ID 286934
GoA Well Tag No.
Date Report Received 1997/03/20

1. Well Identification and Location										Measurement in Imperial
Owner Name FINDLAY, ED		Address 3 51514 RNG 261, SPRUCE GROVE			Town		Province		Postal Code T7Y 1B3	
Location	1/4 or LSD SE	SEC 35	TWP 051	RGE 26	W of MER 4	Lot 2	Block	Plan	Additional Description	
Measured from Boundary of _____ ft from _____ _____ ft from _____				GPS Coordinates in Decimal Degrees (NAD 83) Latitude <u>53.443092</u> Longitude <u>-113.719670</u> How Location Obtained Not Verified				Elevation _____ ft How Elevation Obtained Not Obtained		

Additional Information										Measurement in Imperial
Distance From Top of Casing to Ground Level _____ in Is Artesian Flow _____ Rate _____ igpm										Is Flow Control Installed _____ Describe _____
Recommended Pump Rate _____ 5.00 igpm										Pump Installed _____ Depth _____ ft
Recommended Pump Intake Depth (From TOC) _____ 90.00 ft										Type _____ Model _____ H.P. _____
Did you Encounter Saline Water (>4000 ppm TDS) _____ Depth _____ ft										Well Disinfected Upon Completion _____
Gas _____ Depth _____ ft										Geophysical Log Taken _____
Submitted to GIC _____										
Additional Comments on Well DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 30 CM.										Sample Collected for Potability _____ Result Attached _____

5. Yield Test			Measurement in Imperial	Taken From Ground Level
Test Date 1997/02/13	Start Time 12:00 AM	Static Water Level 63.00 ft	Depth to water level	
Method of Water Removal Type Air Removal Rate _____ igpm Depth Withdrawn From _____ 142.00 ft If water removal period was < 2 hours, explain why			Drawdown (ft)	Elapsed Time Minutes:Sec
				Recovery (ft)
				105.15
				90.65
				81.30
				74.64
				70.01
				67.19
				65.49
				64.47
				63.91
				63.58
				63.42
				62.99

6. Water Diverted for Drilling		
Water Source	Amount Taken ig	Diversion Date & Time

7. Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name D&D WATER WELL DRILLING & SERVICING LTD.	Copy of Well report provided to owner Date approval holder signed

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The information on this report will be retained in a public database.

GIC Well ID 1715074
GoA Well Tag No.
Date Report Received

1. Well Identification and Location

Measurement in Imperial

Owner Name WOLOSHYN, PETE **Address** 51413 - RGE RD 262 **Town** SPRUCE GROVE **Province** AB **Postal Code** T7Y 1B4

Location 1/4 or LSD SE 26 TWP 051 RGE 26 W of MER 4 Lot 2 Block 5661RS **Additional Description**

Measured from Boundary of

ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)

Latitude 53.428600 Longitude -113.720000

How Location Obtained

Not Verified

Elevation ft

How Elevation Obtained

Not Obtained

2. Drilling Information

Method of Drilling

Rotary

Type of Work

New Well

Proposed Well Use

Domestic

3. Formation Log

Measurement in Imperial

Depth from ground level (ft)	Water Bearing	Lithology Description
12.00		Silt
86.00		Clay & Silt
140.00		Sand
167.00		Coarse Grained Sand

4. Well Completion

Measurement in Imperial

Total Depth Drilled 167.00 ft **Finished Well Depth** 167.00 ft **Start Date** 2002/03/22 **End Date** 2002/03/23

Borehole

Diameter (in)	From (ft)	To (ft)
7.88	0.00	167.00

Surface Casing (if applicable)

Plastic

Size OD : 6.00 in

Wall Thickness : 0.390 in

Bottom at : 162.00 ft

Well Casing/Liner

Unknown

Size OD : in

Wall Thickness : in

Top at : ft

Bottom at : ft

Perforations

From (ft)	To (ft)	Diameter (in)	Interval (in)

Perforated by Unknown

Annular Seal Bentonite Chips/Tablets

Placed from 0.00 ft to 150.00 ft

Amount

Other Seals

Type	At (ft)

Screen Type Stainless Steel

Size OD : 4.00 in

From (ft)	To (ft)	Slot Size (in)
162.00	167.00	0.012

Attachment Attached To Casing

Top Fittings Coupler

Bottom Fittings Plug

Pack

Type Artificial

Grain Size COARSE

Amount 3000.00 Pounds

7. Contractor Certification

Name of Journeyman responsible for drilling/construction of well

DAVE SUMMERS

Company Name

SUMMERS DRILLING LTD.

Certification No

5286Q

Copy of Well report provided to owner

Date approval holder signed

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.

GIC Well ID 1715074
GoA Well Tag No.
Date Report Received

1. Well Identification and Location

Measurement in Imperial

Owner Name WOLOSHYN, PETE Address 51413 - RGE RD 262 Town SPRUCE GROVE Province AB Postal Code T7Y 1B4

Location 1/4 or LSD SEC TWP RGE W of MER Lot Block Plan Additional Description
SE 26 051 26 4 2 5661RS

Measured from Boundary of

ft from
ft from

GPS Coordinates in Decimal Degrees (NAD 83)

Latitude 53.428600 Longitude -113.720000

How Location Obtained

Not Verified

Elevation ft

How Elevation Obtained

Not Obtained

Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level 12.00 in

Is Artesian Flow

Is Flow Control Installed

Rate igpm

Describe

Recommended Pump Rate 10.00 igpm

Pump Installed Yes Depth ft

Recommended Pump Intake Depth (From TOC) 120.00 ft

Type SUB @ 120' Model H.P.

Did you Encounter Saline Water (>4000 ppm TDS)

Depth ft

Well Disinfected Upon Completion

Gas

Depth ft

Geophysical Log Taken

Submitted to GIC

Additional Comments on Well

Sample Collected for Potability Result Attached

TESTED @ +50 GPM

5. Yield Test

Measurement in Imperial

Taken From Ground Level

Test Date 2002/03/23 Start Time 12:00 AM Static Water Level 26.00 ft

Method of Water Removal

Type Air

Removal Rate 50.00 igpm

Depth Withdrawn From 120.00 ft

If water removal period was < 2 hours, explain why

Drawdown (ft)	Elapsed Time Minutes:Sec	Recovery (ft)
	0:00	120.00
	1:00	76.00
	2:00	56.00
	3:00	47.00
	4:00	36.00
	5:00	32.00
	6:00	27.00
	7:00	26.00

6. Water Diverted for Drilling

Water Source

Amount Taken

ig

Diversion Date & Time

7. Contractor Certification

Name of Journeyman responsible for drilling/construction of well

DAVE SUMMERS

Company Name

SUMMERS DRILLING LTD.

Certification No

5286Q

Copy of Well report provided to owner Date approval holder signed



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project: Focus ASP

Number: ED1285

Client: 1285827 Alberta Ltd.

Location: Near Devon, AB

Slug Test: Well 1495257

Test Well: Well 3

Test Conducted by:

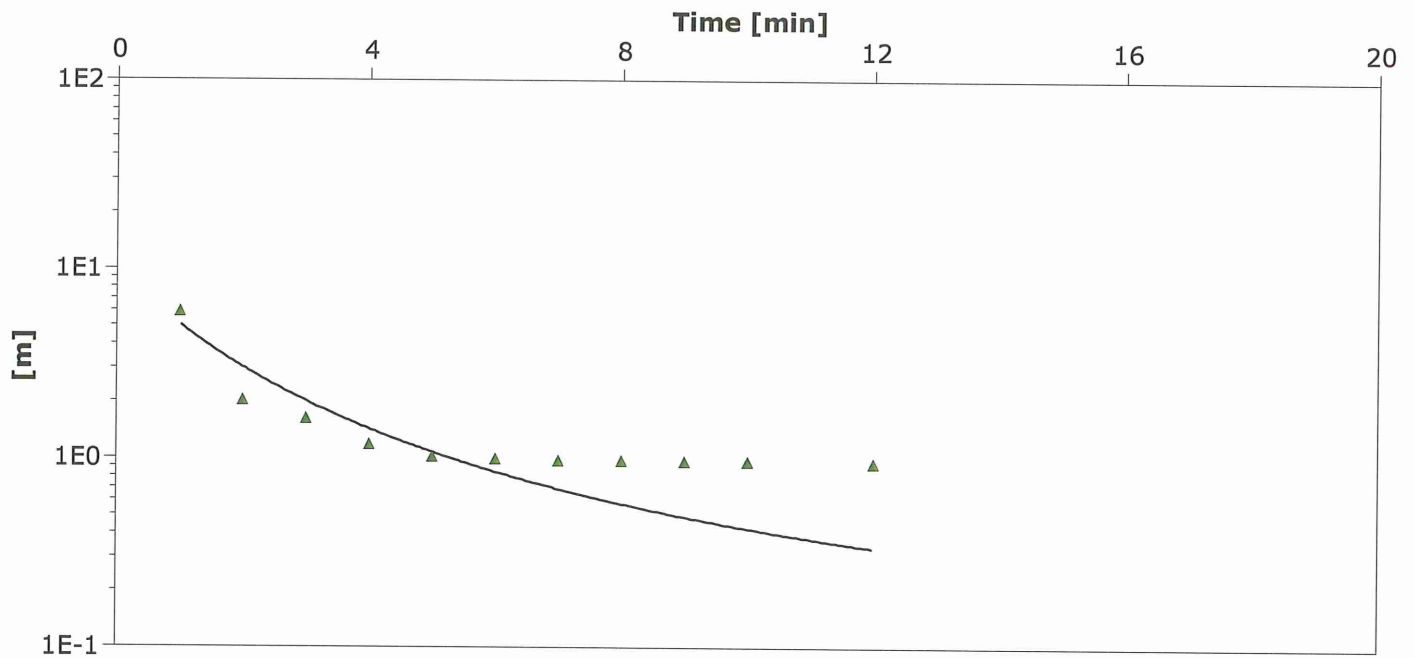
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 4.58 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient
Well 3	8.36×10^0	1.83×10^0	2.64×10^{-2}



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project: Focus ASP

Number: ED1285

Client: 1285827 Alberta Ltd.

Location: Near Devon, AB

Slug Test: Well 1495278

Test Well: Well 4

Test Conducted by:

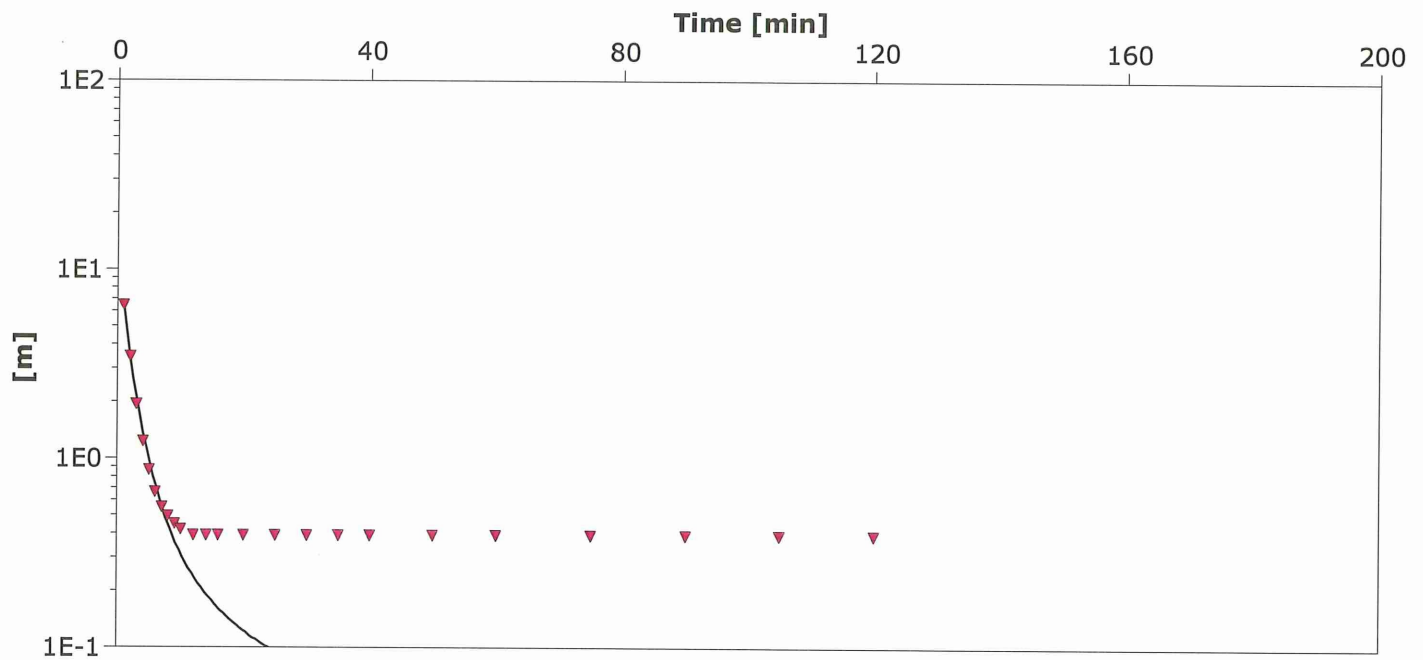
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 14.63 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient
Well 4	9.53 × 10 ⁰	6.51 × 10 ⁻¹	5.64 × 10 ⁻⁴



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project: Focus ASP

Number: ED1285

Client: 1285827 Alberta Ltd.

Location: Near Devon, AB

Slug Test: Well 1715072

Test Well: Well 5

Test Conducted by:

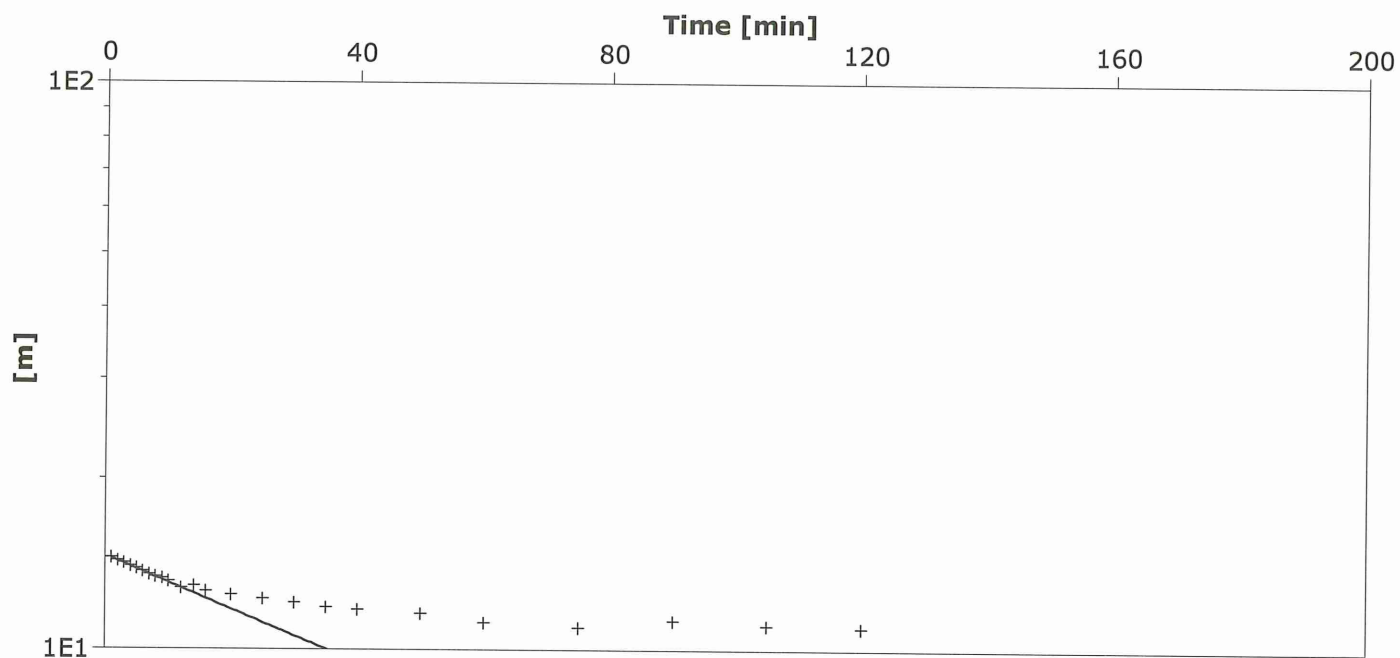
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 2.44 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient	
Well 5	2.44×10^1	9.98×10^0	3.43×10^{-29}	



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project: Focus ASP

Number: ED1285

Client: 1285827 Alberta Ltd.

Location: Near Devon, AB

Slug Test: Well 1715074

Test Well: Well 6

Test Conducted by:

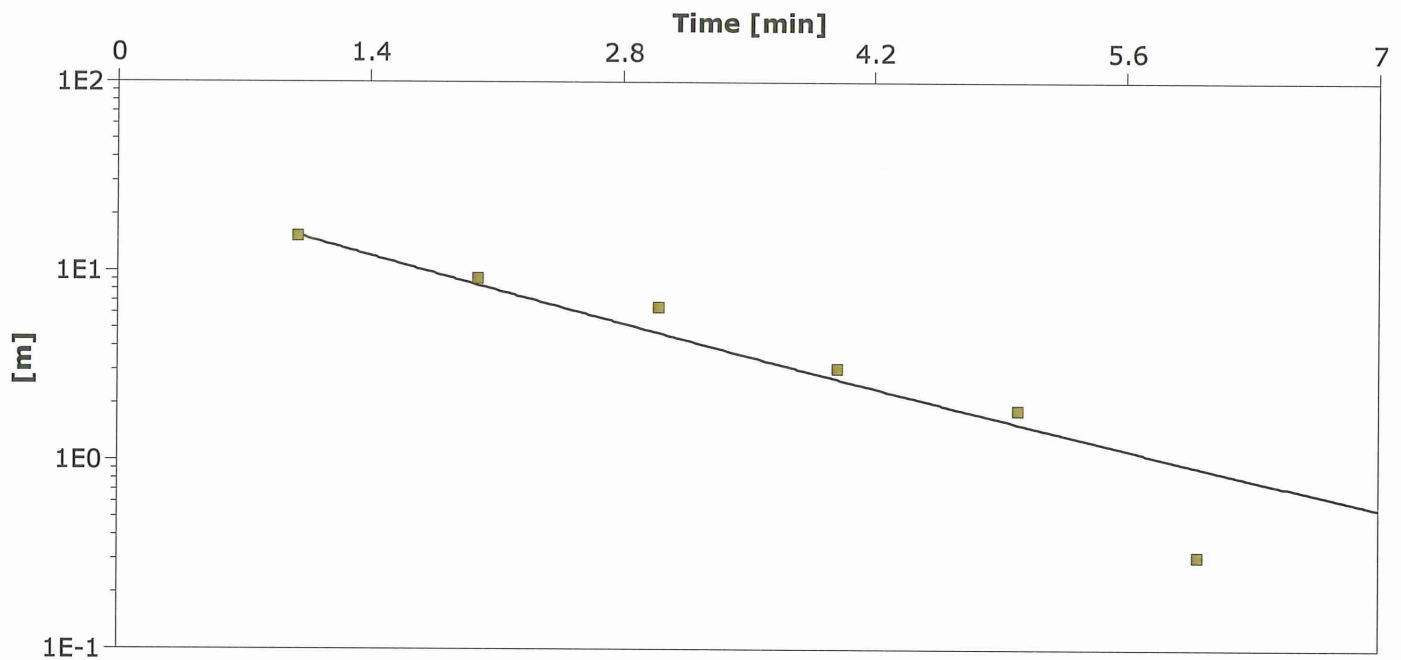
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 24.69 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient	
Well 6	1.09×10^2	4.41×10^0	1.00×10^{-35}	



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project: Focus ASP

Number: ED1285

Client: 1285827 Alberta Ltd.

Location: Near Devon, AB

Slug Test: well 289029

Test Well: Well 1

Test Conducted by:

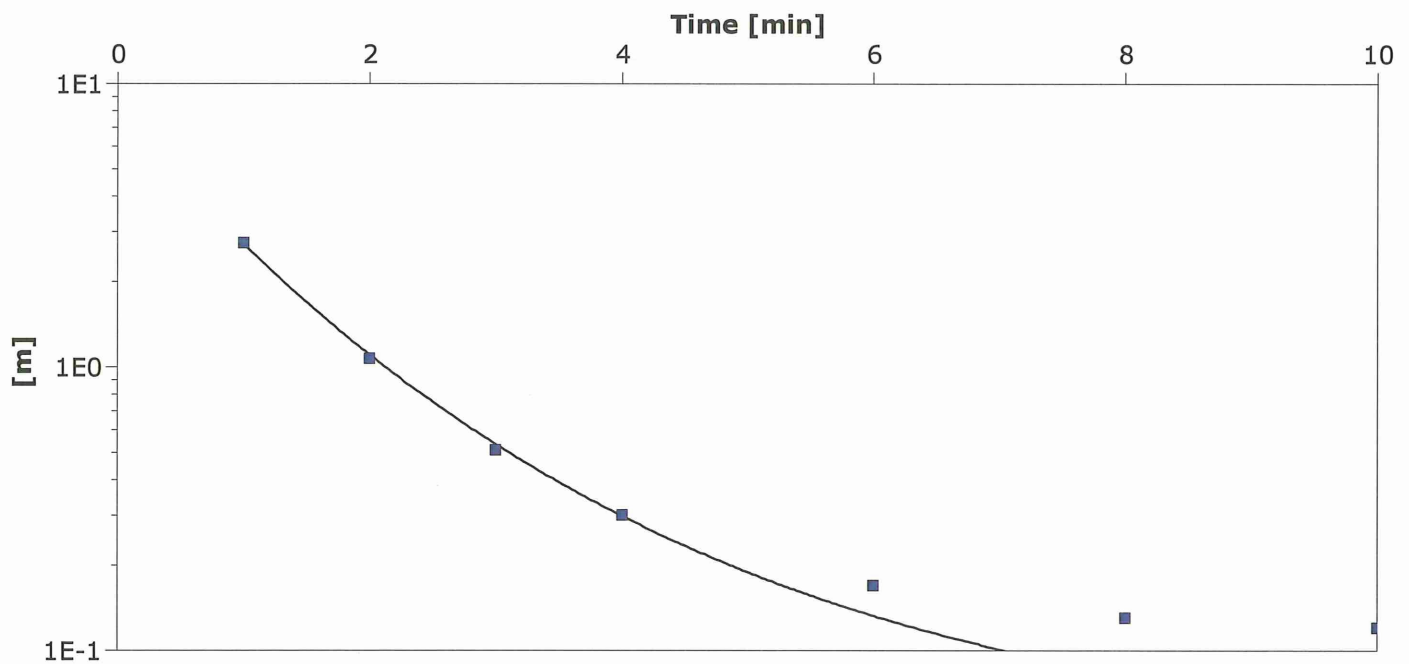
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 17.68 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient	
Well 1	3.53×10^1	1.99×10^0	3.67×10^{-6}	



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project: Focus ASP

Number: ED1285

Client: 1285827 Alberta Ltd.

Location: Near Devon, AB

Slug Test: Well 296997

Test Well: Well 2

Test Conducted by:

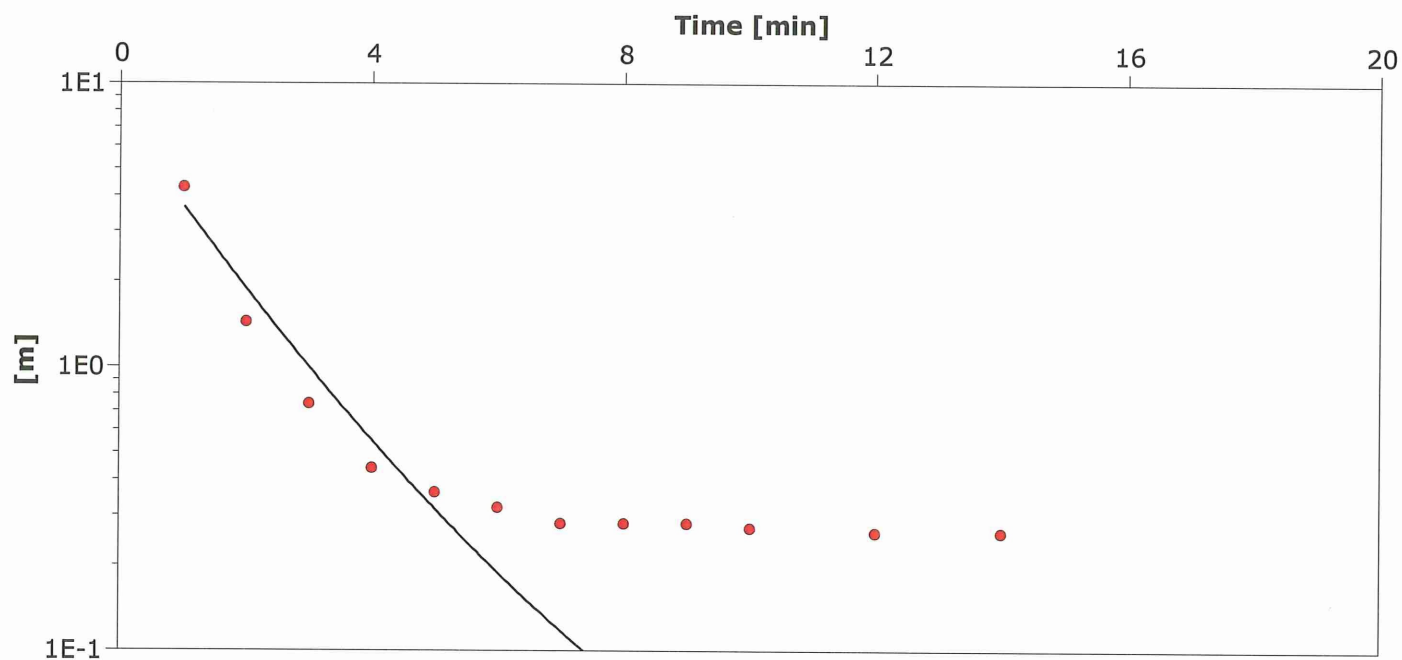
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 12.80 m



Calculation after Cooper-Bredehoeft-Papadopulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient
Well 2	6.35×10^1	4.96×10^0	7.07×10^{-18}



ParklandGEO
189 Pembina Road
Sherwood Park, AB
T8H 2W8

Slug Test Analysis Report

Project:

Number:

Client:

Location:

Slug Test: Well 286934

Test Well: Well 1

Test Conducted by:

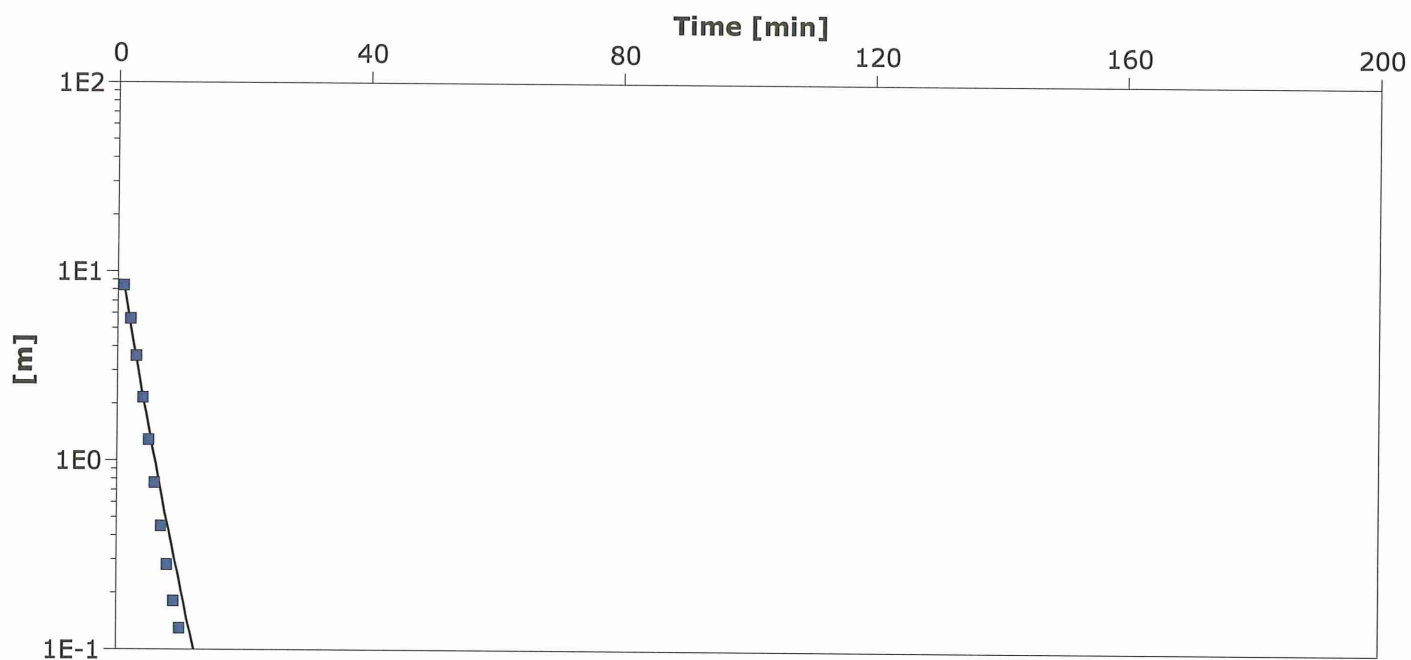
Test Date: 8/11/2011

Analysis Performed by:

New analysis 1

Analysis Date: 8/11/2011

Aquifer Thickness: 5.48 m



Calculation after Cooper-Bredehoeft-Papadopoulos

Observation Well	Transmissivity [m ² /d]	Hydraulic Conductivity [m/d]	Well-bore storage coefficient
Well 1	7.76×10^1	1.42×10^1	1.00×10^{-35}

The use of this attached report is subject to acceptance of the following general terms and conditions.

1. **STANDARD OF CARE** - In the performance of professional services, ParklandGEO will use that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession practicing in the same or similar localities. No other warranty expressed or implied is made or intended by this agreement or by furnishing oral or written reports of the findings made. ParklandGEO is to be liable only for damage directly caused by the negligence of ParklandGEO.
2. **INTERPRETATION OF THE REPORT** - The CLIENT recognizes that subsurface conditions will vary from those encountered at the location where borings, surveys, or explorations are made and that the data, interpretations and recommendation of ParklandGEO are based solely on the information available to him. Classification and identification of soils, rocks, geological units, contaminated materials and contaminant quantities will be based on commonly accepted practices in geotechnical or environmental consulting practice in this area. ParklandGEO will not be responsible for the interpretation by others of the information developed.
3. **SITE INFORMATION** - The CLIENT agrees to fully cooperate with ParklandGEO and provide all information with respect to the past, present and proposed conditions and use of the Site whether specifically requested or not. The CLIENT acknowledges that in order for ParklandGEO to properly advise and assist the CLIENT in respect of the investigation of the Site, ParklandGEO is relying upon full disclosure by the CLIENT of all matters pertinent to an investigation of the Site.

Where specifically stated in the scope of work, ParklandGEO will perform a review of the historical information obtained or provided by the Client to assist in the investigation of the Site unless and except to the extent that such a review is limited or excluded from the scope of work.

4. **COMPLETE REPORT** - The Report is of a summary nature and is not intended to stand alone without reference to the instructions given to ParklandGEO by the CLIENT, communications between ParklandGEO and the CLIENT, and to any other reports, writings or documents prepared by ParklandGEO for the CLIENT relative to the specific Site, all of which constitute the Report. The word "Report" shall refer to any and all of the documents referred to herein. In order to properly understand the suggestions, recommendations and opinions expressed by ParklandGEO, reference must be made to the whole of the Report. ParklandGEO cannot be responsible for use of any part or portions of the report without reference to the whole report. The CLIENT agrees to the following statement:

"This report has been prepared for the exclusive use of the named CLIENT. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ParklandGEO accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report."

The CLIENT agrees that in the event that any such report is released to a third party, such disclaimer shall not be obliterated or altered in any manner. The CLIENT further agrees that all such reports shall be used solely for the purposes of the CLIENT and shall not be released or used by others without the prior written permission of ParklandGEO.

5. **LIMITATIONS ON SCOPE OF INVESTIGATION AND WARRANTY DISCLAIMER**
There is no warranty, expressed or implied, by ParklandGEO that:
 - a) the investigation shall uncover all potential geo-hazards, contaminants or environmental liabilities on the Site; or
 - b) the Site will be entirely free of all geo-hazards or contaminants as a result of any investigation or cleanup work undertaken on the Site, since it is not possible, even with exhaustive sampling, testing and analysis, to document all potential geo-hazards or contaminants on the Site.

The CLIENT acknowledges that:

- a) the investigation findings are based solely on the information generated as a result of the specific scope of the investigation authorized by the CLIENT;

- b) unless specifically stated in the agreed Scope of Work, the investigation will not, nor is it intended to assess or detect potential contaminants or environmental liabilities on the Site;
 - c) any assessment regarding geological conditions on the Site is based on the interpretation of conditions determined at specific sampling locations and depths and that conditions may vary between sampling locations, hence there can be no assurance that undetected geological conditions, including soils or groundwater are not located on the Site;
 - d) any assessment is also dependent on and limited by the accuracy of the analytical data generated by the sample analyses;
 - e) any assessment is also limited by the scientific possibility of determining the presence of unsuitable geological conditions for which scientific analyses have been conducted; and
 - f) the laboratory testing program and analytical parameters selected are limited to those outlined in the CLIENT's authorized scope of investigation; and
 - g) there are risks associated with the discovery of hazardous materials in and upon the lands and premises which may inadvertently discovered as part of the investigation. The CLIENT acknowledges that it may have a responsibility in law to inform the owner of any affected property of the existence or suspected existence of hazardous materials and in some cases the discovery of hazardous conditions and materials will require that certain regulatory bodies be informed. The CLIENT further acknowledges that any such discovery may result in the fair market value of the lands and premises and of any other lands and premises adjacent thereto to be adversely affected in a material respect.
6. **CONTROL OF WORK SITE AND JOBSITE SAFETY** - ParklandGEO is only responsible for the activities of its employees on the jobsite. The presence of ParklandGEO personnel on the Site shall not be construed in any way to relieve the CLIENT or any contractors on Site from their responsibilities for Site safety. The CLIENT undertakes to inform ParklandGEO of all hazardous conditions, or possible hazardous conditions which are known to him.
7. **COST ESTIMATES** - Estimates of remediation or construction costs can only be based on the specific information generated and the technical limitations of the investigation authorized by the CLIENT. Accordingly, estimated costs for construction or remediation are based on the known site conditions, which can vary as new information is discovered during construction. As some construction activities are an iterative exercise, ParklandGEO shall therefore not be liable for the accuracy of any estimates of remediation or construction costs provided.
8. **LIMITATION OF LIABILITY** - The CLIENT hereby agrees that to the fullest extent permitted by the law ParklandGEO's total liability to CLIENT for any and all injuries, claims, losses, expenses or damages whatsoever arising out of or in anyway relating to the Project, the Site, or this agreement from any cause or causes including but not limited to ParklandGEO 's negligence, errors, omissions, strict liability, breach of contract, or breach of warranty shall not exceed the total amount paid by the CLIENT for the services to ParklandGEO under this contract or \$50,000, whichever is lessor, or as otherwise agreed to in writing.
9. **NO SPECIAL OR CONSEQUENTIAL DAMAGES** - The CLIENT and ParklandGEO agree that to the fullest extent permitted by law ParklandGEO shall not be liable to the CLIENT for any special, indirect or consequential damages whatsoever, whether caused by ParklandGEO's negligence, errors, omissions, strict liability, breach of contract, breach of warranty or other cause of causes whatsoever.
10. **INDEMNIFICATION** - To the fullest extent permitted by law, the CLIENT agrees to defend, indemnify and hold ParklandGEO, its directors, officers, employees, agents and subcontractors, harmless from and against any and all claims, defence costs, including legal fees on a full indemnity basis, damages, and other liabilities arising out of or in any way related to ParklandGEO 's reports or recommendations concerning this Agreement, ParklandGEO's work and presence on the project property, or the presence, release, or threatened release of hazardous substances or pollutants on or from the Site; provided that the CLIENT shall not indemnify ParklandGEO against liability for damages to the extent caused by the negligence or intentional misconduct of ParklandGEO, its agents or subcontractors.