1) Risk of Groundwater Contamination Map

The information from the reclassification of the soil map is the basis for preparing the initial risk map. The depth to the first sand and gravel is then used to modify the initial map and to prepare the final map. The criteria used for preparing the final Risk of Groundwater Contamination map are outlined in the adjacent table.

Surface Permeability	Sand or Gravel Present - Top Within One Metre Of Ground Surface	Groundwater Contamination Risk
Low	No	Low
Moderate	No	Moderate
High	No	High
Low	Yes	High
Moderate	Yes	High
High	Yes	Very High

Table 8. Risk of Groundwater Contamination Criteria

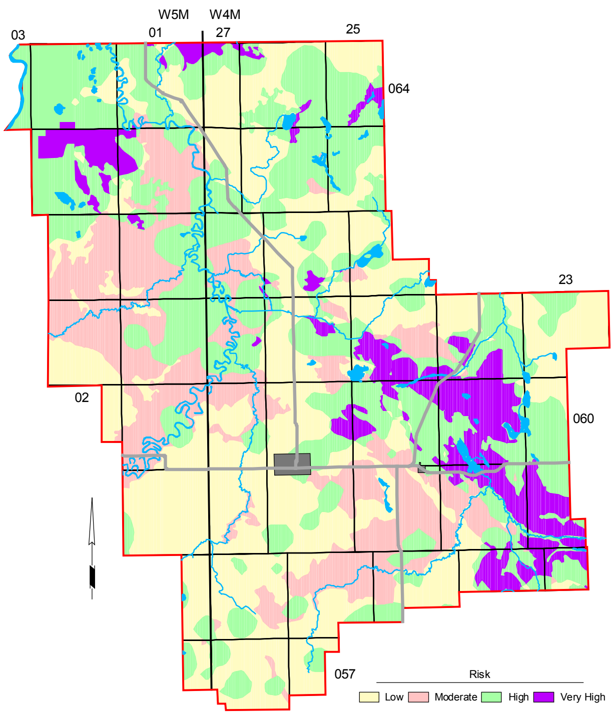

Figure 25. Risk of Groundwater Contamination

The Risk of Groundwater Contamination map shows that, in 45% of the County, there is a high or very high risk for the groundwater to be contaminated. These areas would be considered the least desirable ones for a development that has a product or by-product that could cause groundwater contamination. However, because the map has been prepared as part of a regional study, the designations are a guide only. Detailed hydrogeological studies must be completed at any proposed development site to ensure the groundwater is protected from possible contamination. At all locations, good environmental practices should be exercised in order to ensure that contaminants will not affect groundwater quality.

VIII. RECOMMENDATIONS

The present study has been based on information available from the groundwater database. The database has three problems:

1) the quality of the data
2) the coordinate system used for the horizontal control
3) the distribution of the data.

The quality of the data in the groundwater database is affected by two factors: a) the technical training of the persons collecting the data, and b) the quality control of the data. The possible options to upgrade the database include the creation of a “super” database, which includes only verified data. The first step would be to field-verify the 125 existing water wells listed in Appendix E. These water well records indicate that a complete water well drilling report is available along with at least a partial chemical analysis. The level of verification would have to include identifying the water well in the field, obtaining meaningful horizontal coordinates for the water well and the verification of certain parameters such as water level and completed depth. Even though the water wells for which the County has responsibility do not satisfy the above criteria, it is recommended that they be field-verified, water levels be measured, a water sample be collected for analysis, and a short aquifer test be conducted. There is one County-operated water well that is also included in Appendix E. An attempt to update the quality of the entire database is not recommended.

While there are a few areas where water-level data are available, on the overall, there are an insufficient number of water levels to set up a groundwater budget. One method to obtain additional water-level data is to solicit the assistance of the water well owners who are stakeholders in the groundwater resource. In the M.D. of Rocky View and in Flagstaff County, water well owners are being provided with a tax credit if they accurately measure the water level in their water well once per week for a year. A pilot project indicated that approximately five years of records are required to obtain a reasonable data set. The cost of a five-year project involving 50 water wells would be less than the cost of one drilling program that may provide two or three observation water wells.

A second approach to obtain water-level data would be to conduct a field survey to identify water wells not in use that could be used as part of an observation water well network. County personnel and/or local residents could measure the water levels in the water wells regularly.

In general, for the next level of study, the database needs updating. It requires more information from existing water wells, and additional information from new ones.

Before an attempt is made to provide a major upgrade to the level of interpretation provided in this report and the accompanying maps and groundwater query, it is recommended that all water wells for which water well drilling reports are available be subjected to the following actions (see pages C-2 to C-3):

1) The horizontal location of the water well should be determined within ten metres. The coordinates must be in 10TM NAD 27 or some other system that will allow conversion to 10TM NAD 27 coordinates.
2) A four-hour aquifer test (two hours of pumping and two hours of recovery) should be performed with the water well to obtain a realistic estimate for the transmissivity of the aquifer in which the water well is completed.
3) Water samples should be collected for chemical analysis after five and 115 minutes of pumping, and analyzed for major and minor ions.

A list of 125 water wells that could be considered for the above program is given in Appendix E.

In addition to the data collection associated with the existing water wells, all available geophysical logs should be interpreted to establish a more accurate spatial definition of individual aquifers.

There is also a need to provide the water well drillers with feedback on the reports they are submitting to the regulatory agencies. The feedback is necessary to allow for a greater degree of uniformity in the reporting process. This is particularly true when trying to identify the bedrock surface. One method of obtaining uniformity would be to have the water well drilling reports submitted to the AE Resource Data Division in an electronic form. The money presently being spent by AE and PFRA to transpose the paper form to the electronic form should be used to allow for a technical review of the data and follow-up discussions with the drillers.

An effort should be made to form a partnership with the petroleum industry. The industry spends millions of dollars each year collecting information relative to water wells. Proper coordination of this effort could provide significantly better information from which future regional interpretations could be made. This could be accomplished by the County taking an active role in the activities associated with the construction of lease sites for the drilling of hydrocarbon wells and conducting of seismic programs.

Groundwater is a renewable resource and it must be managed.

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X. Conversions

Multiply	by	To Obtain
Length/Area		
feet	0.304 785	metres
metres	3.281 000	feet
hectares	2.471 054	acres
centimetre	0.032 808	feet
centimetre	0.393 701	inches
acres	0.404 686	hectares
inchs	25.400 000	millimetres
miles	1.609 344	kilometres
kilometer	0.621 370	miles (statute)
square feet (ft^2)	0.092 903	square metres (m^2)
square metres (m^2)	10.763 910	square feet (ft^2)
square metres (m^2)	0.000 001	square kilometres (km^2)
Concentration		
grains/gallon (UK)	14.270 050	parts per million (ppm)
ppm	0.998 859	mg/L
mg/L	1.001 142	ppm
Volume (capacity)		
acre feet	1233.481 838	cubic metres
cubic feet	0.028 317	cubic metres
cubic metres	35.314 667	cubic feet
cubic metres	219.969 248	gallons (UK)
cubic metres	264.172 050	gallons (US liquid)
cubic metres	1000.000 000	litres
gallons (UK)	0.004 546	cubic metres
imperial gallons	4.546 000	litres
Rate		
litres per minute (lpm)	0.219 974	UK gallons per minute (igpm)
litres per minute	1.440 000	cubic metres/day (m^3/day)
igpm	6.546 300	cubic metres/day (m^3/day)
cubic metres/day	0.152 759	igpm

WESTLOCK COUNTY

Appendix B

Maps and Figures on CD-ROM

1) General

Index Map
Surface Casing Types used in Drilled Water Wells
Location of Water Wells
Depth of Existing Water Wells
Depth to Base of Groundwater Protection
Generalized Cross-Section (For terminology only)
Geologic Column
Cross-Section A - A'
Cross-Section B - B'
Bedrock Topography
Bedrock Geology
E-Log showing Base of Foremost Formation
Risk of Groundwater Contamination
Relative Permeability
Water Wells Recommended for Field Verification

2) Surficial Aquifers

a) Surficial Deposits

Thickness of Surficial Deposits
Non-Pumping Water-Level Surface in Surficial Deposits Based on Water Wells Less than 20 Metres Deep
Modelled Non-Pumping Water-Level Surface in Surficial Deposits
Total Dissolved Solids in Groundwater from Surficial Deposits
Sulfate in Groundwater from Surficial Deposits
Fluoride in Groundwater from Surficial Deposits
Nitrate + Nitrite (as N) in Groundwater from Surficial Deposits
Chloride in Groundwater from Surficial Deposits
Total Hardness in Groundwater from Surficial Deposits
Piper Diagram - Surficial Deposits
Thickness of Sand and Gravel Deposits
Amount of Sand and Gravel in Surficial Deposits
Thickness of Sand and Gravel Aquifer(s)
Water Wells Completed in Surficial Deposits
Apparent Yield for Water Wells Completed through Upper Sand and Gravel Aquifer(s)

b) First Sand and Gravel

Thickness of First Sand and Gravel
First Sand and Gravel - Saturation Thickness

3) Bedrock Aquifers

a) General

Apparent Yield for Water Wells Completed in Upper Bedrock Aquifer(s)
Total Dissolved Solids in Groundwater from Upper Bedrock Aquifer(s)
Sulfate in Groundwater from Upper Bedrock Aquifer(s)
Chloride in Groundwater from Upper Bedrock Aquifer(s)
Fluoride in Groundwater from Upper Bedrock Aquifer(s)
Total Hardness of Groundwater from Upper Bedrock Aquifer(s)
Piper Diagram - Bedrock Aquifer(s)
Recharge/Discharge Areas between Surficial Deposits and Upper Bedrock Aquifer(s)
Non-Pumping Water-Level Surface in Upper Bedrock Aquifer(s)

c) Lower Horseshoe Canyon Formation

Depth to Top of Lower Horseshoe Canyon Formation
Structure-Contour Map - Horseshoe Canyon Formation
Non-Pumping Water-Level Surface - Lower Horseshoe Canyon Aquifer
Apparent Yield for Water Wells Completed through Lower Horseshoe Canyon Aquifer
Total Dissolved Solids in Groundwater from Lower Horseshoe Canyon Aquifer
Sulfate in Groundwater from Lower Horseshoe Canyon Aquifer
Chloride in Groundwater from Lower Horseshoe Canyon Aquifer
Piper Diagram - Lower Horseshoe Canyon Aquifer
Recharge/Discharge Areas between Surficial Deposits and Lower Horseshoe Canyon Aquifer

d) Bearpaw Formation

Depth to Top of Bearpaw Formation
Structure-Contour Map - Bearpaw Formation
Non-Pumping Water-Level Surface - Bearpaw Aquifer
Apparent Yield for Water Wells Completed through Bearpaw Aquifer
Total Dissolved Solids in Groundwater from Bearpaw Aquifer
Sulfate in Groundwater from Bearpaw Aquifer
Chloride in Groundwater from Bearpaw Aquifer
Piper Diagram - Bearpaw Aquifer
Recharge/Discharge Areas between Surficial Deposits and Bearpaw Aquifer

d) Oldman Formation

Depth to Top of Oldman Formation
Structure-Contour Map - Oldman Formation
Non-Pumping Water-Level Surface - Oldman Aquifer
Apparent Yield for Water Wells Completed through Oldman Aquifer
Total Dissolved Solids in Groundwater from Oldman Aquifer
Sulfate in Groundwater from Oldman Aquifer
Chloride in Groundwater from Oldman Aquifer
Piper Diagram - Oldman Aquifer
Recharge/Discharge Areas between Surficial Deposits and Oldman Aquifer

e) Birch Lake Member

Depth to Top of Birch Lake Member
Structure-Contour Map - Birch Lake Member
Non-Pumping Water-Level Surface - Birch Lake Aquifer
Apparent Yield for Water Wells Completed through Birch Lake Aquifer
Total Dissolved Solids in Groundwater from Birch Lake Aquifer
Sulfate in Groundwater from Birch Lake Aquifer
Chloride in Groundwater from Birch Lake Aquifer
Piper Diagram - Birch Lake Aquifer
Recharge/Discharge Areas between Surficial Deposits and Birch Lake Aquifer

f) Ribstone Member

Depth to Top of Ribstone Creek Member
Structure-Contour Map - Ribstone Creek Member

f) Victoria Member

Depth to Top of Victoria Member
Structure-Contour Map - Victoria Member

f) Brosseau Member

Depth to Top of Brosseau Member
Structure-Contour Map - Brosseau Member

g) Lea Park Formation

Depth to Top of Lea Park Formation
Structure-Contour Map - Lea Park Formation

WESTLOCK COUNTY
Appendix C

General Water Well Information

Domestic Water Well Testing

Purpose and Requirements

The purpose of the testing of domestic water wells is to obtain background data related to:

1) the non-pumping water level for the aquifer - Has there been any lowering of the level since the last measurement?
2) the specific capacity of the water well, which indicates the type of contact the water well has with the aquifer;
3) the transmissivity of the aquifer and hence an estimate of the projected long-term yield for the water well;
4) the chemical, bacteriological and physical quality of the groundwater from the water well.

The testing procedure involves conducting an aquifer test and collecting of groundwater samples for analysis by an accredited laboratory. The date and time of the testing are to be recorded on all data collection sheets. A sketch showing the location of the water well relative to surrounding features is required. The sketch should answer the question, "If this water well is tested in the future, how will the person doing the testing know this is the water well I tested?"

The water well should be taken out of service as long as possible before the start of the aquifer test, preferably not less than 30 minutes before the start of pumping. The non-pumping water level is to be measured 30, 10, and 5 minutes before the start of pumping and immediately before the start of pumping which is to be designated as time 0 for the test. All water levels must be from the same designated reference, usually the top of the casing. Water levels are to be measured during the pumping interval and during the recovery interval after the pump has been turned off; all water measurements are to be with an accuracy of ± 0.01 metres.

During the pumping and recovery intervals, the water level is to be measured at the appropriate times. An example of the time schedule for a four-hour test is as follows, measured in minutes after the pump is turned on and again after the pump is turned off:

1,2,3,4,6,8,10,13,16,20,25,32,40,50,64,80,100,120.

For a four-hour test, the reading after 120 minutes of pumping will be the same as the 0 minutes of recovery. Under no circumstance will the recovery interval be less than the pumping interval.

Flow rate during the aquifer test should be measured and recorded with the maximum accuracy possible. Ideally, a water meter with an accuracy of better than ±1% displaying instantaneous and total flow should be used. If a water meter is not available, then the time required to completely fill a container of known volume should be recorded, noting the time to the nearest 0.5 seconds or better. Flow rate should be determined and recorded often to ensure a constant pumping rate.

Groundwater samples should be collected as soon as possible after the start of pumping and within 10 minutes of the end of pumping. Initially only the groundwater samples collected near the end of the pumping interval need to be submitted to the accredited laboratory for analysis. All samples must be properly stored for transportation to the laboratory and, in the case of the bacteriological analysis, there is a maximum time allowed between the time the sample is collected and the time the sample is delivered to the laboratory. The first samples collected are only analyzed if there is a problem or a concern with the first samples submitted to the laboratory.

Procedure

Site Diagrams

These diagrams are a map showing the distance to nearby significant features. This would include things like a corner of a building (house, barn, garage etc.) or the distance to the half-mile or mile fence. The description should allow anyone not familiar with the site to be able to unequivocally identify the water well that was tested. In lieu of a map, UTM coordinates accurate to within five metres would be acceptable. If a hand-held GPS is used, the post-processing correction details must be provided.

Surface Details

The type of surface completion must be noted. This will include such things as a pitless adapter, well pit, pump house, in basement, etc. Also, the reference point used for measuring water levels needs to be noted. This would include top of casing (TOC) XX metres above ground level; well pit lid, XX metres above TOC; TOC in well pit XX metres below ground level.

Groundwater Discharge Point

Where was the flow of groundwater discharge regulated? For example was the discharge through a hydrant downstream from the pressure tank; discharged directly to ground either by connecting directly above the well seal or by pulling the pump up out of the pitless adapter; from a tap on the house downstream from the pressure tank? Also note must be made if any action was taken to ensure the pump would operate continuously during the pumping interval and whether the groundwater was passing through any water-treatment equipment before the discharge point.

Water-Level Measurements

How were the water-level measurements obtained? If obtained using a contact gauge, what type of cable was on the tape, graduated tape or a tape with tags? If a tape with tags, when was the last time the tags were calibrated? If a graduated tape, what is the serial number of the tape and is the tape shorter than its original length (i.e. is any tape missing)?

If water levels are obtained using a transducer and data logger, the serial numbers of both transducer and data logger are needed and a copy of the calibration sheet. The additional information required is the depth the transducer was set and the length of time between when the transducer was installed and when the calibration water level was measured, plus the length of time between the installation of the transducer and the start of the aquifer test. All water levels must be measured at least to the nearest 0.01 metres.

Discharge Measurements

Type of water meter used. This could include such things as a turbine or positive displacement meter. How were the readings obtained from the meter? Were the readings visually noted and recorded or were they recorded using a data logger?

Water Samples

A water sample must be collected between the 4- and 6-minute water-level measurements, whenever there is an observed physical change in the groundwater being pumped, and 10 minutes before the end of the planned pumping interval. Additional water samples must be collected if it is expected that pumping will be terminated before the planned pumping interval.

Water Act - Water (Ministerial) Regulation

PROVINCE OF ALBERTA

WATER ACT

WATER (MINISTERIAL) REGULATION

Alberta Regulation 205/98

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ALBERTA REGULATION 205/98

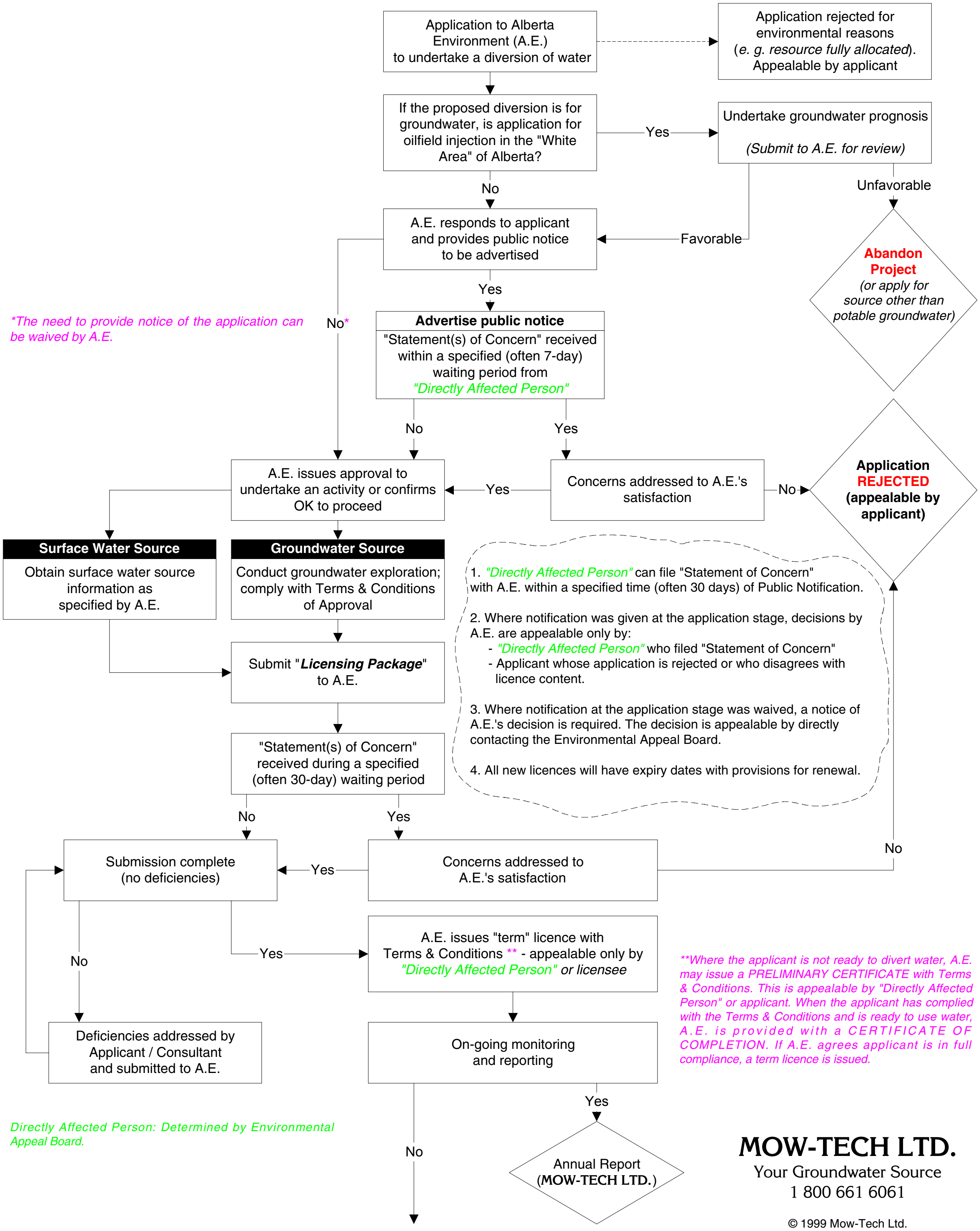
Water Act

WATER (MINISTERIAL) REGULATION

Table of Contents

1

Water Act - Flowchart



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*This flow chart was developed by Mow-Tech Ltd. and is provided as a guide **only** to Alberta's new **Water Act.** Mow-Tech Ltd. accepts no responsibility for the information provided.*

Additional Information

VIDEOS

Will the Well Go Dry Tomorrow? (Mow-Tech Ltd.: 1-800 GEO WELL)
Water Wells that Last (PFRA – Edmonton Office: 780-495-3307)
Ground Water and the Rural Community (Ontario Ground Water Association)

BOOKLET

Water Wells that Last (PFRA – Edmonton Office: 780-495-3307)

ALBERTA ENVIRONMENTAL PROTECTION

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Edmonton: 780-427-3932

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UNIVERSITY OF CALGARY – Department of Geology and Geophysics - Hydrogeology

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PRAIRIE FARM REHABILITATION ADMINISTRATION

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LOCAL HEALTH DEPARTMENTS

WESTLOCK COUNTY

Appendix E

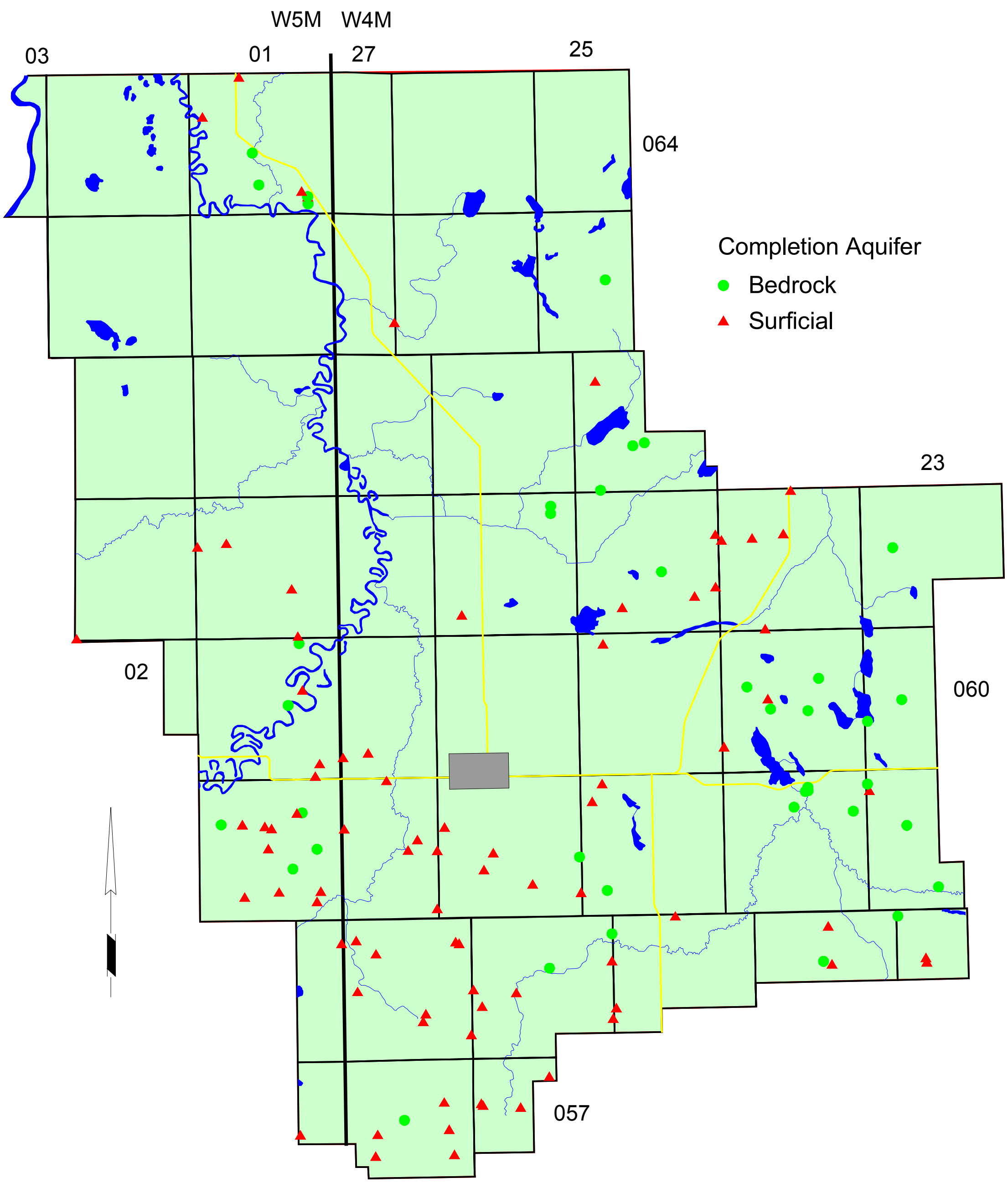
Water Wells Recommended for Field Verification

and

County – Operated Water Wells

Water Wells Recommended for Field Verification

(details on following pages)



WATER WELLS RECOMMENDED FOR FIELD VERIFICATION

Owner	Location	Aquifer Name	Date Water Well Drilled	Completed Depth Metres	Completed Depth Feet	NPWL Metres	NPWL Feet
Advanchura Holdings	13-22-059-01 W5M	Bearpaw	Nov-83	22.9	75.0	6.1	20.0
Allers, Gordon	SE-17-059-26 W4M	Bearpaw	Jan-78	30.5	100.0	15.2	50.0
Anderson, O.	01-16-062-25 W4M	Upper Surficial	Jun-85	62.5	205.0	10.7	35.0
Baker, David	SE-23-059-01 W5M	Upper Surficial	May-83	18.9	62.0	7.3	24.0
Balascak, Steve	SE-28-061-24 W4M	Oldman	Oct-78	25.9	85.0	35.7	117.0
Berry, Ken	SW-34-059-24 W4M	Upper Surficial	Sep-86	10.4	34.0	1.2	4.0
Breault, R.	NW-16-059-26 W4M	Bearpaw	May-76	43.3	142.0	9.5	31.0
Brown, Earl	SW-18-058-25 W4M	Bearpaw	Sep-86	61.0	200.0	24.4	80.0
Brown, Gordon	NE-34-059-27 W4M	Oldman	Sep-84	67.1	220.0	11.6	38.0
Burns, B.	NE-17-058-26 W4M	Bearpaw	Jun-82	28.0	92.0	14.6	48.0
Byvank, Ken	SE-28-059-01 W5M	Bearpaw	Jan-78	21.3	70.0	12.2	40.0
Callaghan, Geo	SE-30-064-01 W5M	Birch Lake	Oct-79	36.6	120.0	12.2	40.0
Cameron, Dorothy	NW-21-059-27 W4M	Bearpaw	Jan-83	30.5	100.0	10.7	35.0
Chiovelli, A.	NE-15-060-24 W4M	Upper Surficial	Aug-81	8.5	28.0	20.7	68.0
Clark, Zane	SW-24-059-27 W4M	Oldman	Jan-75	77.7	255.0	16.8	55.0
Clausen, Eric	SE-02-060-01 W5M	Oldman	Nov-86	85.3	280.0	30.5	100.0
County of Westlock	15-33-058-25 W4M	Oldman	Jun-84	79.2	260.0	22.9	75.0
County of Westlock	13-05-061-26 W4M	Oldman	Nov-80	68.3	224.0	8.8	28.9
Dobson, Brian	NW-31-058-23 W4M	Upper Surficial	Aug-73	9.8	32.0	4.9	16.0
Dul, Ted	08-02-064-01 W5M	Upper Surficial	Apr-83	35.7	117.0	9.5	31.2
Dundas, Wayne	12-14-057-01 W5M	Lower Horseshoe Canyon	Jun-85	41.2	135.0	16.8	55.0
Dusseault, George	SE-36-058-26 W4M	Upper Surficial	Mar-84	30.5	100.0	4.6	15.0
Dzivinski, Dave	16-12-061-25 W4M	Oldman	Feb-84	47.2	155.0	4.9	16.0
Empson, Robert	13-04-060-27 W4M	Oldman	Apr-81	77.7	255.0	22.9	75.0
Erdmann, Ron	16-04-059-23 W4M	Upper Surficial	Aug-85	19.5	64.0	9.5	31.0
Famco Holdings Ltd.	NW-20-058-23 W4M	Oldman	Mar-79	38.4	126.0	7.9	26.0
Fauque, Jim	SE-09-064-01 W5M	Upper Surficial	Nov-80	19.2	63.0	14.3	47.0
Fedorvich, George	SW-22-057-27 W4M	Upper Surficial	Nov-79	7.3	24.0	1.5	5.0
Fesyk, John	NE-17-057-27 W4M	Lower Horseshoe Canyon	Aug-73	36.6	120.0	4.6	15.0
Fesyk, John	NE-08-057-27 W4M	Lower Horseshoe Canyon	Jun-82	39.0	128.0	2.4	8.0
French, J./Louis/Davis, Darrel	04-32-058-27 W4M	Bearpaw	Aug-58	24.4	80.0	3.1	10.0
Gerun, Nick	01-25-061-25 W4M	Oldman	Apr-81	27.4	90.0	9.1	30.0
Goydar, Dave	NW-01-060-01 W5M	Oldman	Nov-81	54.9	180.0	12.8	42.0
Guest, George	SE-02-060-01 W5M	Oldman	Jul-55	95.1	312.0	13.7	45.0
Hadley, Allan	SE-08-059-01 W5M	Lower Horseshoe Canyon	Sep-78	13.7	45.0	3.7	12.0
Hansen, Jim	14-20-061-24 W4M	Oldman	Oct-69	45.7	150.0	15.2	50.0
Hess, Bill	04-31-059-23 W4M	Oldman	Jun-83	39.6	130.0	15.2	50.0
Hess, Joseph	SE-28-059-24 W4M	Upper Surficial	Aug-77	9.1	30.0	3.1	10.0
Hill, Roland	12-32-060-25 W4M	Oldman	Aug-81	22.9	75.0	3.1	10.0
Hillgardner, Stanley	SE-08-061-25 W4M	Oldman	Sep-80	57.9	190.0	3.7	12.0
Holmes, Ron	SE-34-059-24 W4M	Upper Surficial	Nov-81	19.8	65.0	6.1	20.0
Hunt, Ernie	NE-02-059-01 W5M	Bearpaw	Oct-77	24.4	80.0	1.8	6.0
James, Don	01-30-059-01 W5M	Upper Surficial	Jul-80	11.3	37.0	4.0	13.0
Jensen, Ham	SW-34-057-26 W4M	Lower Horseshoe Canyon	Sep-73	16.5	54.0	6.7	22.0

WATER WELLS RECOMMENDED FOR FIELD VERIFICATION

Owner	Location	Aquifer Name	Date Water Well Drilled	Completed Depth Metres	Completed Depth Feet	NPWL Metres	NPWL Feet
Kallal, Dave	10-20-059-23 W4M	Upper Surficial	Jun-78	6.7	22.0	4.3	14.0
Kallal, Terry	09-30-062-25 W4M	Oldman	Jun-81	59.4	195.0	21.3	70.0
Keyser, Ron	04-14-061-01 W5M	Oldman	Apr-82	32.0	105.0	6.1	20.0
Kinsella, Lyle	SE-29-059-01 W5M	Bearpaw	Aug-83	14.0	46.0	3.4	11.0
Kinsella, Lyle	SE-29-059-01 W5M	Bearpaw	Aug-83	18.0	59.0	3.4	11.0
Klimosko, Barry/Holland, Elain	NE-10-058-27 W4M	Lower Horseshoe Canyon	Aug-79	20.7	68.0	0.6	2.0
Kohlruss, Wm	12-16-060-24 W4M	Upper Surficial	Jun-78	62.5	205.0	9.1	30.0
Kosky, Martin	05-34-058-24 W4M	Oldman	Jun-79	94.5	310.0	13.4	44.0
Kushnieryk, Bill	04-05-062-25 W4M	Upper Surficial	Aug-69	34.8	114.0	5.5	18.0
Lambert, Emile	NE-13-059-26 W4M	Upper Surficial	May-75	30.5	100.0	12.2	40.0
Lanctot, R.	09-12-058-26 W4M	Bearpaw	Jun-82	31.1	102.0	5.5	18.0
Larsen, John	11-26-059-01 W5M	Upper Surficial	Aug-82	12.2	40.0	5.5	18.0
Laughy, James	09-02-064-01 W5M	Upper Surficial	Apr-83	33.2	109.0	11.5	37.7
Laughy, Jim	NE-02-064-01 W5M	Upper Surficial	Sep-78	7.3	24.0	3.7	12.0
Laughy, Jim	NE-02-064-01 W5M	Ribstone Creek	Feb-84	79.2	260.0	3.1	10.0
Lewicki, Morris	SE-21-063-25 W4M	Upper Surficial	Sep-86	18.3	60.0	8.7	28.5
Linaria Ag Society	13-19-061-01 W5M	Oldman	Nov-79	48.8	160.0	12.8	42.0
Logan, Tom	NE-20-057-26 W4M	Lower Horseshoe Canyon	Aug-67	35.1	115.0	2.4	8.0
Look, Gorden	01-06-061-02 W5M	Bearpaw	Aug-83	32.0	105.0	5.8	19.0
Luchka, Victor	SE-25-058-26 W4M	Bearpaw	Jun-86	58.8	193.0	6.1	20.0
Lynes, Daryl	09-11-061-25 W4M	Oldman	Aug-82	59.4	195.0	4.0	13.0
Lyons, Albert	04-10-060-27 W4M	Oldman	Sep-75	61.0	200.0	24.4	80.0
M.D. Westlock	10-16-064-01 W5M	Upper Surficial	Oct-86	64.9	213.0	12.5	41.0
Macintyre, David	15-14-059-27 W4M	Oldman	Aug-78	64.0	210.0	14.6	48.0
Macleod, Brian	01-35-061-26 W4M	Upper Surficial	Jul-81	16.8	55.0	0.6	2.0
Majeau, Paul	SE-21-059-01 W5M	Lower Horseshoe Canyon	Aug-75	25.9	85.0	19.8	65.0
Mandryk, William	NE-15-061-25 W4M	Upper Surficial	Jan-83	36.6	120.0	3.7	12.0
Marko, Mike	NE-31-059-25 W4M	Oldman	Oct-75	64.0	210.0	27.4	90.0
Mccoy, Alfred	13-23-060-24 W4M	Upper Surficial	Jul-81	5.8	19.0	4.0	13.0
Mcdonald, W.	NW-18-058-26 W4M	Lower Horseshoe Canyon	Aug-70	22.9	75.0	10.7	35.0
Mcnelly, Stewart	SW-25-059-24 W4M	Upper Surficial	May-83	51.5	169.0	36.6	120.0
Message, Alymer	SW-12-059-01 W5M	Bearpaw		28.0	92.0	3.1	10.0
Mirus, Carl	SE-23-057-27 W4M	Lower Horseshoe Canyon	May-80	19.2	63.0	1.8	6.0
Mowbray, Ralph	14-30-059-25 W4M	Oldman	Jul-86	85.3	280.0	27.4	90.0
Mt. Sinai Hermitage	01-05-061-24 W4M	Oldman	Aug-79	45.7	150.0	12.2	40.0
Myziuk, Michael	SE-10-059-26 W4M	Bearpaw	Feb-83	51.8	170.0	11.6	38.0
Nixon, William R.	16-13-059-27 W4M	Oldman	Feb-82	67.1	220.0	12.2	40.0
Norell, Glen/Verheul, Michael	01-12-058-27 W4M	Lower Horseshoe Canyon	Oct-81	24.4	80.0	7.9	26.0
Page, Raymond	NW-22-058-26 W4M	Upper Surficial	May-76	36.0	118.0	10.7	35.0
Paquette, Bob	SE-15-059-01 W5M	Upper Surficial	Oct-83	13.7	45.0	2.1	7.0
Passey, Irene/Groundwater Cons	NW-22-058-24 W4M	Oldman	May-80	61.0	200.0	24.4	80.0
Pax Natura Ranch For The Deaf	NE-17-060-23 W4M	Upper Surficial	Jun-76	9.8	32.0	25.4	83.3
Pinchuk, L.	SW-07-060-24 W4M	Oldman	Aug-82	80.8	265.0	26.4	86.6
Pointer Realty Ltd	NW-20-058-23 W4M	Oldman	Oct-82	36.6	120.0	27.4	89.8
Pointer Realty Ltd	NW-20-058-23 W4M	Oldman	May-83	77.7	255.0	28.4	93.1

WATER WELLS RECOMMENDED FOR FIELD VERIFICATION

Owner	Location	Aquifer Name	Date Water Well Drilled	Completed Depth Metres	Completed Depth Feet	NPWL Metres	NPWL Feet
Primrose, Mel	01-22-060-01 W5M	Upper Surficial	Jun-70	37.8	124.0	2.7	9.0
Pudlowski, Wm.	NW-23-060-01 W5M	Oldman	May-60	54.3	178.0	1.8	6.0
Riopel, Rene	SE-26-057-27 W4M	Lower Horseshoe Canyon	May-85	48.8	160.0	24.1	79.0
Rosendale, G.	03-18-058-26 W4M	Bearpaw	Jul-85	42.7	140.0	4.6	15.0
Rude, Allan	01-36-058-01 W5M	Bearpaw	Jul-76	39.6	130.0	3.1	10.0
Sabourin, Richard	SW-08-059-25 W4M	Upper Surficial	Apr-73	13.4	44.0	3.7	12.0
Schnirer	SW-30-057-26 W4M	Lower Horseshoe Canyon	Sep-57	29.0	95.0	13.7	45.0
Schnirer, Arvin	SW-30-057-26 W4M	Lower Horseshoe Canyon	Aug-82	26.5	87.0	13.7	45.0
Schuster, Ken	08-01-059-27 W4M	Bearpaw	Jun-78	21.3	70.0	9.1	30.0
Semeniuk, Delmer	13-19-061-24 W4M	Oldman	Apr-82	46.6	153.0	5.2	17.0
Sheehan, Leo	NW-35-060-01 W5M	Upper Surficial	Aug-62	27.4	90.0	0.6	2.0
Sheehan, Terry	SW-02-061-01 W5M	Oldman	Aug-85	50.0	164.0	0.3	1.0
Shelton, John	14-09-062-25 W4M	Upper Surficial	Sep-80	13.7	45.0	3.7	12.0
Shewchuck, Pete	NW-11-058-27 W4M	Lower Horseshoe Canyon	Jul-74	19.8	65.0	2.4	8.0
Sjostrom, Berner	NW-17-058-27 W4M	Bearpaw	May-85	24.4	80.0	3.7	12.0
Smith, A.	SW-18-060-23 W4M	Upper Surficial	Jun-83	10.4	34.0	0.9	3.0
Smith, Kevin	08-35-061-26 W4M	Upper Surficial	Mar-84	27.4	90.0	6.4	21.0
Spence, Brian	13-34-061-24 W4M	Oldman	Mar-76	42.7	140.0	9.1	30.0
Sportsmans Service	13-33-064-01 W5M	Birch Lake	Sep-80	64.0	210.0	27.4	90.0
St. Louis, Edward	NE-29-058-27 W4M	Bearpaw	May-67	21.3	70.0	15.9	52.0
Sterling, Brent & Jean	01-12-059-26 W4M	Bearpaw	Nov-82	39.0	128.0	3.7	12.0
Sterling, Church	NW-20-060-24 W4M	Upper Surficial	Sep-80	7.3	24.0	2.4	8.0
Sterling, Jim	NW-26-059-01 W5M	Bearpaw	Oct-81	26.2	86.0	18.3	60.0
Stowe, D.	SW-10-059-01 W5M	Bearpaw	Jun-75	57.9	190.0	24.4	80.0
Terhorst, Hardy	08-12-063-27 W4M	Birch Lake	Aug-84	73.8	242.0	22.9	75.0
Vachon, G. & C.	NE-02-064-01 W5M	Ribstone Creek	Aug-84	70.1	230.0	9.1	30.0
Village of Pickardville	NW-25-058-27 W4M	Lower Horseshoe Canyon	Mar-81	18.9	62.0	7.3	24.0
Village of Pickardville	NW-25-058-27 W4M	Lower Horseshoe Canyon	Jun-77	18.3	60.0	8.0	26.1
Wajtowich, Frank	05-31-059-23 W4M	Upper Surficial	Mar-84	28.0	92.0	10.7	35.0
Walker, Dick	SW-29-061-01 W5M	Oldman	Jun-79	42.7	140.0	13.7	45.0
Welsh, James	NW-19-059-26 W4M	Oldman	Jul-75	57.9	190.0	12.2	40.0
Whitson/Andersen, Allan	NW-12-057-27 W4M	Lower Horseshoe Canyon	Jul-66	36.6	120.0	4.6	15.0
Yaremko, Mike	01-20-060-24 W4M	Oldman	Jul-83	76.2	250.0	11.0	36.0
Young, Henry	SE-34-059-24 W4M	Upper Surficial	May-85	9.1	30.0	3.1	10.0
Zabelski, Zane/Staffen, Don	16-21-058-24 W4M	Upper Surficial	Jul-78	36.6	120.0	18.3	60.0

WESTLOCK COUNTY-OPERATED WATER WELLS

Owner	Location	Date Water Well Drilled	Aquifer Name	Completed Depth Metres	Completed Depth Feet	NPWL Metres	NPWL Feet
County of Westlock	13-05-061-26 W4M	Nov-80	Oldman	68.3	224.0	8.8	28.9
County of Westlock	15-33-058-25 W4M	Jun-84	Oldman	79.2	260.0	22.9	75.0