# LACOMBE COUNTY

Appendix B

Maps and Figures on CD-ROM

### 1) General

Index Map/Surface Topography 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 Hydrogeology Map Cross-Section A - A' Cross-Section B - B' Cross-Section C - C' Cross-Section D - D' Cross-Section E - E' Bedrock Topography Bedrock Geology **Relative Permeability** Licensed Water Wells Estimated Water Well Use Per Section

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 Total Dissolved Solids in Groundwater from Surficial Deposits

Sulfate 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 in Sand and Gravel Aquifer(s)

Changes in Water Levels in Sand and Gravel Aquifer(s)

### b) Upper Sand and Gravel

Thickness of Upper Surficial Deposits

Thickness of Upper Sand and Gravel (not all drill holes fully penetrate surficial deposits)

Apparent Yield for Water Wells Completed through Upper Sand and Gravel Aquifer

## c) Lower Sand and Gravel

Structure-Contour Map - Top of Lower Surficial Deposits

Depth to Top of Lower Surficial Deposits

Thickness of Lower Surficial Deposits

Thickness of Lower Sand and Gravel (not all drill holes fully penetrate surficial deposits) Apparent Yield for Water Wells Completed through Lower Sand and Gravel Aquifer Non-Pumping Water-Level Surface in Surficial Deposits in Lower Sand and Gravel Aquifer

### 3) Bedrock Aquifers

### a) General

Apparent Yield for Water Wells Completed in Upper Bedrock Aguifer(s) Total Dissolved Solids in Groundwater from Upper Bedrock Aquifer(s) Sulfate in Groundwater from Upper Bedrock Aquifer(s) Distance from Top of Lacombe Member vs 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 Aquifers Recharge/Discharge Areas between Surficial Deposits and Upper Bedrock Aquifer(s) Non-Pumping Water-Level Surface in Upper Bedrock Aquifer(s) Changes in Water Levels - Upper Bedrock Aquifer(s)

### b) Dalehurst Member

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

### c) Upper Lacombe Member

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

#### d) Lower Lacombe Member

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

### e) Haynes Member

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

#### f) Upper Scollard Formation

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

### g) Lower Scollard Formation

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

### h) Upper Horseshoe Canyon Formation

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

### i) Middle Horseshoe Canyon Formation

Depth to Top of Middle Horseshoe Canyon Formation

Structure-Contour Map - Middle Horseshoe Canyon Formation

### 4) Hydrographs and Observation Water Wells

Hydrographs - AENV & MOW-TECH LTD. Observation Water Wells

# LACOMBE COUNTY Appendix C

# **General Water Well Information**

Domestic Water Well Testing
Purpose and Requirements
Procedure
Site Diagrams
Surface Details
Groundwater Discharge Point
Water-Level Measurements
Discharge Measurements
Water Samples
Water Act - Water (Ministerial) Regulation4
Water Act – Flowchart
Interpretation of Chemical Analysis of Drinking Water
Additional 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  $\pm$  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  $\pm$ 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.

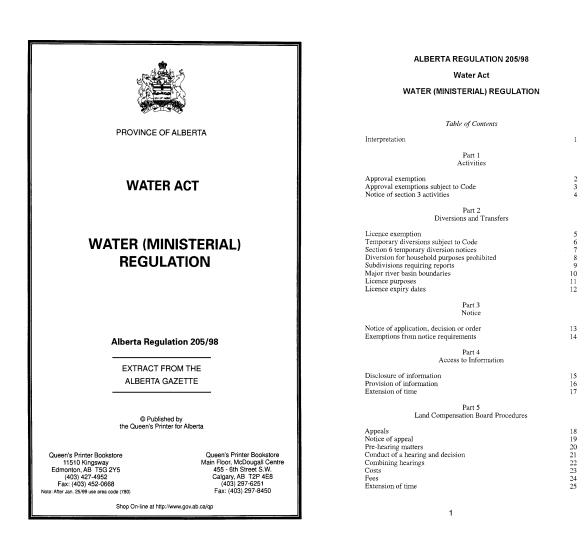
## **Discharge Measurements**

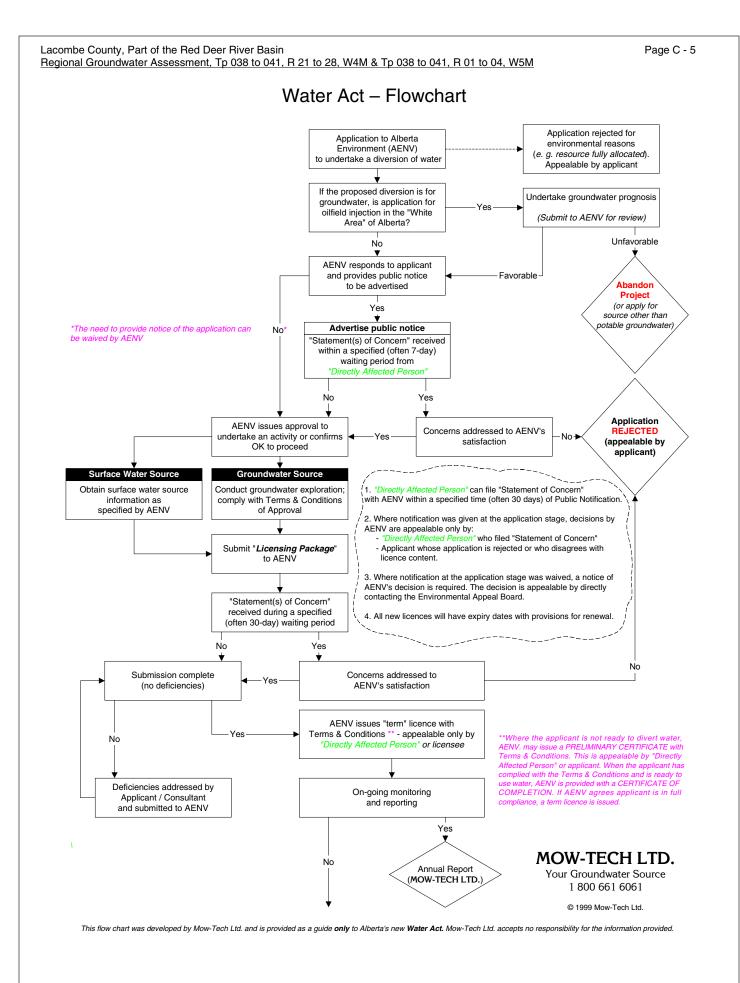
Type of water meter used. This could include such things as a turbine or positive displacement meter. How were the readings obtained from the meter? Were the readings visually noted and recorded or were they recorded using a data logger?

## 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





# Interpretation of Chemical Analysis of Drinking Water



Stony Plain · Lac Ste. Anne Health Unit HEAD OFFICE P.O. Box 210 Stony Plain, Alberta Canada TOE 200 Telephone: 963-2206

Fax: 963-7612

SUB-OFFICES Box 4323 Spruce Grove, Alberta T7X 385 Telephone: 962-4072

163 Provincial Bldg. Box 430 Whitecourt, Alberta Fox Creek, Alberta TOH 1PO Telephone: 778-5555 Telephone: 622-3730 Fax: 778-3852

HOME CARE: Box 210 Stony Plain, Alberta TOE 200 Telephone: 963-3366

#### INTERPRETATION OF CHEMICAL ANALYSIS OF DRINKING WATER

TOE 21.0

- 1. TOTAL DISSOLVED SOLIDS (TDS) The recommended limit is 1000 mg/L for untreated and 500 mg/L for treated waters. TDS indicates the approximate organic and inorganic substances in the water. It will be high if other components of the analysis are high.
- 2. IRON Amounts over 0.3 mg/L, usually stain laundry and plumbing fixtures and cause undesirable tastes. Iron filtration can be utilized. Iron bacteria may also be the cause of increased iron content.
- 3. CALCIUM This is a constituent of hardness. Excessive calcium in drinking water may be a factor in disorders of the kidneys, bladder and urinary system.
- 4. MAGNESIUM This is a constituent of hardness.
- 5. HARDNESS A maximum acceptable concentration has not been established. Hardness is caused mainly by calcium and magnesium. Levels between 80 and 100 mg/L are satisfactory: 100 to 200 mg/L are less acceptable: more than 200 mg/L are considered to be poor and in excess of 500 mg/L are unacceptable for most domestic purposes. Softening can be helpful in given circumstances.
- 6. SODIUM Ideally, there should be no more than 200mg/L. The average intake of sodium from water is only a small fraction of that consumed in a normal diet. Persons suffering from hypertension or congestive heart failure may require a sodium-restricted diet, in which case the intake of sodium from drinking water could become significant. Your physician should be informed of the sodium content.
- 7. <u>NITRITE-NITROGEN & NITRATE-NITROGEN (NO2 + NO3)</u> The maximum acceptable concentration is 10 mg/L. Any amount over that may be harmful to children up to 12 months of age, causing a condition known as methaemoglobinaemia. Presence may indicate a contaminating source although other instances, e.g. fertilizer and decomposing vegetation can cause an elevated figure.
- 8. <u>NITRITE-NITROGEN</u> The maximum acceptable concentration is 1.0 Mg/L. Nitrite is unstable in water and converts to nitrate. An elevated figure may indicate a pollution problem.
- 9. FLUORIDE Approximately 1 mg/L of fluoride is recommended in drinking water in order to give developing teeth some protection against decay. If the fluoride is higher than 1.5 mg/L you should talk to the dental staff of the Health Unit about the possibility of mottled enamel; if the fluoride is lower than 0.7 mg/L please ask about fluoride supplements for your children.
- 10. SULPHATE The maximum acceptable concentration is 500 mg/L. Taste becomes noticeable between 250 and 600 mg/L and a laxative effect may be noticed by new users when sulphate combines with sodium or magnesium.

-2-

- 11. <u>CHLORIDE</u> The recommended limit is 250 mg/L. Chloride content is usually low and an increase may indicate a nearby source of pollution (particularly if NO2 and NO3 and nitrite are high). Some wells contain naturally occurring chlorides. A salty taste may be evident.
- 12. <u>ALKALINITY T (Total)</u> Alkalinity below 500 mg/L is generally accepted. Excessive alkalinity may result in incrustations on utensils, service pipes and water heaters.
- 13. <u>BICARBONATE</u> Upper limit not established. Relates to alkalinity as bicarbonate of sodium, calcium and magnesium.

NOTE: mg/L = milligrams per litre.

The preceding notes and standards are for your guidance only based on an intake of 2 litres of water per day. The figures may be interpreted in a variety of ways and the public health inspector for your area can be contacted for further advice. Telephone: Stony Plain - 963-2206; Spruce Grove - 962-4072; Whitecourt - 778-5555.

For stock water and other agricultural uses the requirements are not necessarily the same as for domestic use. Please consult your District Agriculturalist for that kind of advice.

# 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

WATER WELL INSPECTORS Jennifer McPherson (Edmonton: 780-427-6429)

GEOPHYSICAL INSPECTION SERVICE Edmonton: 780-427-3932

COMPLAINT INVESTIGATIONS Blair Stone (Red Deer: 403-340-5310)

UNIVERSITY OF ALBERTA – Department of Earth and Atmospheric Sciences - Hydrogeology Carl Mendoza (Edmonton: 780-492-2664)

UNIVERSITY OF CALGARY – Department of Geology and Geophysics - Hydrogeology Larry Bentley (Calgary: 403-220-4512)

FARMERS ADVOCATE Paul Vasseur (Edmonton: 780-427-2433)

PRAIRIE FARM REHABILITATION ADMINISTRATION Bill Franz (Red Deer: 403-340-4290) Terry Dash (Calgary: 403-292-5719)

LOCAL HEALTH DEPARTMENTS

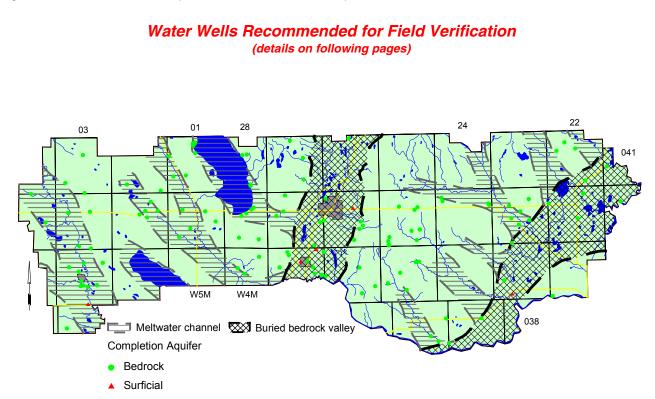
# LACOMBE COUNTY

# Appendix E

Water Wells Recommended for Field Verification

and

**County-Operated Water Wells** 



#### WATER WELLS RECOMMENDED FOR FIELD VERIFICATION

		Aquifer Date Water Comple		Complete	mpleted Depth NPWL				
Owner	Location	Name	Well Drilled	Metres	Feet	Metres	Feet	UID	
Alberta Government Services	13-18-040-26 W4M	Lower Lacombe	26-Sep-88	24.4	80.1	9.4	30.8	M36076.566626	
Anderson, Sven R.	NW 10-039-03 W5M	Dalehurst	22-Jun-81	27.4	90.0	10.7	35.0	M35379.037104	
Beamish, L.	12-15-040-22 W4M	Upper Horseshoe Canyon	21-Mar-80	56.1	184.0	9.5	31.0	M35377.074151	
Bentley Farm Supplies Ltd.	NE 22-040-01 W5M	Upper Lacombe	18-Jul-80	25.9	85.0	7.6	25.0	M35379.031790	
Berge, D.A.	NW 26-039-27 W4M	Lower Lacombe	01-Aug-73	57.9	190.0	42.7	140.0	M35377.066073	
Botting, Gary	SW 17-039-23 W4M	Lower Scollard	21-Oct-77	36.6	120.0	14.3	47.0	M35377.080440	
Brannen, Bill	08-23-039-27 W4M	Lower Lacombe	30-Jun-83	54.9	180.0	26.2	86.0	M35377.066314	
Brown, William	SW 04-040-23 W4M	Upper Scollard	08-Jul-78	64.0	210.0	36.6	120.0	M35377.068906	
Buelow, Walter	NW 20-041-22 W4M	Upper Horseshoe Canyon	07-Mar-78	68.6	225.0	49.4	162.0	M35377.066694	
Butcher, Garry	SE 26-040-02 W5M	Upper Lacombe	10-Jun-77	36.6	120.0	30.5	100.0	M35379.037908	
Cameron, R.C.	SE 09-039-25 W4M	Lower Lacombe	12-Jul-75	36.6	120.0	10.4	34.0	M35377.079020	
Carlyle, Don	SE 34-040-22 W4M	Upper Horseshoe Canyon	26-Jul-69	27.4	90.0	7.3	24.0	M35377.074289	
Carlyle, Don	SE 34-040-22 W4M	Upper Horseshoe Canyon	20-Aug-70	21.3	70.0	1.2	4.0	M35377.074290	
Carlyle, Don	SE 34-040-22 W4M	Upper Horseshoe Canyon	30-Apr-74	24.4	80.0	2.7	9.0	M35377.081428	
Carroll, Bill	08-28-041-01 W5M	Upper Lacombe	20-Jun-77	27.4	90.0	6.7	22.0	M35379.030586	
Central Alberta Florists Ltd.	NW 36-039-27 W4M	Surficial	29-Aug-69	39.6	130.0	30.8	101.0	M35377.066462	
Chessor, D.	SW 21-039-25 W4M	Upper Lacombe	07-Jul-76	22.9	75.0	7.0	23.0	M35377.080470	
Chitwood, Doug	SW 27-041-22 W4M	Lower Scollard	19-Jun-85	27.4	90.0	10.7	35.0	M35377.066732	
Copland, H.	NW 02-041-22 W4M	Upper Horseshoe Canyon	22-Mar-79	45.7	150.0	14.3	47.0	M35377.066632	
Deer Valley Meadows Camp	SW 06-039-22 W4M	Lower Scollard	22-May-85	15.2	50.0	3.7	12.0	M35377.069200	
Dell, Elmer	03-03-039-03 W5M	Surficial		2.7	9.0	0.6	2.0	M35379.037021	
Duckworth, T.	SW 33-039-27 W4M	Upper Lacombe	02-May-67	18.3	60.0	3.1	10.0	M35377.080856	
Eclipse Pork Ltd.	SW 26-039-25 W4M	Lower Lacombe	25-Feb-98	18.3	60.0	11.9	38.9	M36480.615337	
Ellsworth, H.O.	13-13-040-01 W5M	Upper Lacombe	15-May-74	36.6	120.0	24.4	80.0	M35379.031362	
Engel, Egon	SE 16-039-03 W5M	Dalehurst	21-Aug-80	18.6	61.0	2.4	8.0	M35379.037178	
Evans, R.	NE 36-039-27 W4M	Lower Lacombe		54.9	180.0	24.7	81.0	M35377.066468	
Evans, R.	NE 36-039-27 W4M	Lower Lacombe	10-Aug-79	54.9	180.0	31.4	103.0	M35377.066470	
F.E.M. Farms Ltd.	NW 12-039-26 W4M	Upper Lacombe	27-Aug-74	30.5	100.0	16.8	55.0	M35377.080729	
Fjallman, E.	NW 20-039-27 W4M	Upper Lacombe	26-May-81	59.4	195.0	12.8	42.0	M35377.087338	
Fluit, H.	SE 27-039-25 W4M	Lower Lacombe	23-Oct-80	33.5	110.0	6.1	20.0	M35377.194027	
Freeman, Don	13-19-041-01 W5M	Upper Lacombe	06-Aug-83	10.7	35.0	6.4	21.0	M35379.030565	
Freeman, T. Dev	SW 31-040-26 W4M	Upper Scollard	06-Sep-78	112.8	370.0	30.5	100.0	M35377.068543	
Fretwell, Ralph	NW 11-040-25 W4M	Lower Lacombe	17-Oct-73	36.6	120.0	20.7	68.0	M35377.067966	
Fretwell, Ralph	NW 11-040-25 W4M	Lower Lacombe	11-Jun-85	15.9	52.0	15.9	52.0	M35377.067968	
Friesen, I.	11-10-040-25 W4M	Lower Lacombe	31-Mar-73	36.6	120.0	21.9	72.0	M35377.067959	
Gabert, Ray	SE 18-039-25 W4M	Upper Lacombe	05-Nov-77	30.5	100.0	4.3	14.0	M35377.080521	
Geddert, Dave	NE 07-041-01 W5M	Upper Lacombe	23-Sep-80	17.7	58.0	9.8	32.0	M35379.030278	
Geertsma, H.	NW 16-040-23 W4M	Lower Scollard	09-Jul-82	39.6	130.0	0.6	2.0	M35377.069186	
Gilliard, Tim	NE 27-040-23 W4M	Upper Scollard	02-Aug-78	48.8	160.0	34.6	113.4	M35377.069515	
Graupner, Jim	SE 33-041-01 W5M	Upper Lacombe	04-Aug-78	27.4	90.0	5.8	19.0	M35379.031079	
Gull Lake Baptist Camp	NW 02-041-28 W4M	Upper Lacombe	20-Jul-84	36.6	120.0	7.6	25.0	M35377.068944	
Gustavson, G.	03-29-039-03 W5M	Dalehurst	30-Jun-67	31.1	102.0	13.4	44.0	M35379.037332	
Gyori, Tom	NE 05-041-02 W5M	Dalehurst	26-Jul-77	36.6	120.0	10.7	35.0	M35379.031674	
Hahn, Art	01-09-040-28 W4M	Upper Lacombe	09-Apr-78	33.5	110.0	17.4	57.0	M35377.067713	
				2 5.0					

### Lacombe County, Part of the Red Deer River Basin Regional Groundwater Assessment, Tp 038 to 041, R 21 to 28, W4M & Tp 038 to 041, R 01 to 04, W5M

#### WATER WELLS RECOMMENDED FOR FIELD VERIFICATION

		Aquifer	Aquifer Date Water Completed Depth		ed Depth	NPWL		
 Owner	Location	Name	Well Drilled	Metres	Feet	Metres	Feet	UID
Halberg, Leonard	SW 27-041-28 W4M	Upper Lacombe	25-Sep-78	17.4	57.0	3.1	10.0	M35377.069305
Halberg, Victor	SE 27-041-28 W4M	Upper Lacombe	26-Sep-78	36.6	120.0	26.2	86.0	M35377.069300
Harink, Henry	SE 10-039-26 W4M	Haynes	28-May-86	134.1	440.0	94.3	309.4	M35377.053799
Hausen, Allan	04-18-041-21 W4M	Upper Horseshoe Canyon	15-Apr-79	36.6	120.0	7.7	25.4	M35377.163151
Henderson Cattle Co	SW 27-040-26 W4M	Surficial	2-Mar-79	61.0	200.0	52.4	172.0	M35377.068322
Henderson, Ron	NE 22-039-26 W4M	Upper Lacombe	20-Sep-77	39.6	130.0	19.2	63.0	M35377.080732
Hill, Glen	SE 33-041-01 W5M	Upper Lacombe	1-Aug-81	15.2	50.0	7.6	25.0	M35379.031160
Hodenfield, J.	NE 29-041-22 W4M	Upper Scollard	25-Apr-79	36.6	120.0	19.8	65.0	M35377.066740
Hoffman, R.	SE 25-040-24 W4M	Upper Scollard	1-Nov-73	30.5	100.0	0.0	0.1	M35377.067407
Hornet, Ed	SE 16-040-23 W4M	Lower Scollard	26-Aug-75	54.9	180.0	20.7	68.0	M35377.069159
Hughes, Don	NW 01-040-28 W4M	Upper Lacombe	17-Oct-79	32.0	105.0	7.6	25.0	M35377.067475
Huss, Ernest R.	SE 06-040-25 W4M	Upper Lacombe	17-Nov-74	30.5	100.0	18.3	60.0	M35377.067409
Huss, Keith	NE 10-040-26 W4M	Upper Lacombe	20-Sep-78	30.5	100.0	6.4	21.0	M35377.067940
Huss, W.F.	01-06-040-25 W4M	Upper Lacombe	25-Mar-70	36.6	120.0	24.7	81.0	M35377.067406
Ilchuk, Ken	SW 28-040-25 W4M	Upper Lacombe	2-Dec-79	30.5	100.0	15.5	51.0	M35377.081681
James, Bert	NE 15-040-26 W4M	Upper Lacombe	15-Jun-77	32.0	105.0	3.1	10.0	M35377.068125
Johnson, A.L.	NE 22-041-27 W4M	Upper Lacombe	11-Mar-77	30.5	100.0	14.0	46.0	M35377.069044
Kerr, Doug	NW 02-041-28 W4M	Upper Lacombe	28-Oct-80	39.0	128.0	11.3	37.0	M35377.068936
Kieboom, Albert	NW 27-039-27 W4M	Surficial	6-May-80	16.8	55.0	12.5	41.0	M35377.066081
Kilpatrick, Ronald B.	SW 26-040-28 W4M	Upper Lacombe	21-Oct-81	34.1	112.0	3.7	12.0	M35377.081710
Kinna, Robert	SW 04-040-03 W5M	Dalehurst	19-Jul-73	27.1	89.0	7.3	24.0	M35379.031421
Knutson, Cliff	SW 35-040-02 W5M	Upper Lacombe	25-Nov-82	55.5	182.0	22.9	75.0	M35379.038879
Kriese, A.E.	NE 13-040-27 W4M	Lower Lacombe	25-Aug-83	64.0	210.0	14.6	48.0	M35377.081699
Kuipers, Hank	NE 20-040-27 W4M	Upper Lacombe	23-Oct-79	46.9	154.0	24.1	79.0	M35377.081705
Land, Herbert	SE 28-041-03 W5M	Dalehurst	18-Mar-66	21.6	71.0	11.3	37.0	M35379.039633
Larkin Bros	NE 05-039-23 W4M	Surficial	17-Oct-67	27.1	89.0	9.1	30.0	M35377.078674
Lawton Bros.	SW 03-041-04 W5M	Dalehurst	4-Aug-78	18.3	60.0	6.1	20.0	M35379.039414
Lenz Farms	SW 16-040-01 W5M	Upper Lacombe	13-Sep-73	30.5	100.0	9.8	32.0	M35379.031398
Livam, August	NE 14-040-04 W5M	Dalehurst	15-Sep-83	34.1	112.0	21.3	70.0	M35379.032505
Low, Don	12-33-039-27 W4M	Upper Lacombe	13-May-81	38.1	125.0	9.1	30.0	M35377.066425
Maddox, Bill	SW 08-041-03 W5M	Dalehurst	9-Apr-66	16.8	55.0	7.9	26.0	M35379.039124
Martin, Jim	SW 14-038-25 W4M	Haynes	11-Oct-84	32.0	105.0	19.8	65.0	M35377.079593
Mcauley, Terrence	SW 07-038-24 W4M	Haynes	15-May-74	42.7	140.0	33.2	109.0	M35377.053152
Mccullough, Ray	NE 32-040-27 W4M	Upper Lacombe	5-Nov-81	24.4	80.0	7.6	25.0	M35377.069073
McDonald, Adaire	SW 14-039-03 W5M	Dalehurst	16-Oct-79	24.4	80.0	2.4	8.0	M35379.037154
McNary, D.	SE 19-040-27 W4M	Upper Lacombe	24-Sep-76	53.3	175.0	32.0	105.0	M35377.081703
McTavish, D.A.	SE 26-040-28 W4M	Upper Lacombe	16-Sep-75	41.5	136.0	11.3	37.0	M35377.081724
Medin, H. & D.	NE 19-038-03 W5M	Dalehurst	20-Jul-76	16.8	55.0	9.1	30.0	M35379.036847
Meston, Calvin	SW 22-040-23 W4M	Lower Scollard	21-Feb-86	18.3	60.0	4.6	15.0	M35377.069256
Meullerm, Armin	02-27-040-02 W5M	Upper Lacombe	9-Oct-81	33.5	110.0	8.2	27.0	M35379.038390
Meyers, L.	09-28-039-03 W5M	Dalehurst	30-May-63	25.0	82.0	12.2	40.0	M35379.037328
Nabess, K	NE 23-039-27 W4M	Lower Lacombe	28-Jul-79	67.1	220.0	22.9	75.0	M35377.069333
NEWALTA Corporation	11-21-039-03 W5M	Dalehurst	26-Oct-85	36.0	118.1	19.2	63.0	M36076.564466
Oppermann, Al.	02-33-041-01 W5M	Upper Lacombe	11-Aug-81	32.0	105.0	10.1	33.0	M35379.031151
Orange, J.	NE 30-040-24 W4M	Haynes	2-Nov-74	29.0	95.0	10.7	35.0	M35377.067552
Pacific Petroleum Ltd.	02-27-040-03 W5M	Dalehurst	15-Jun-79	38.7	127.0	25.6	84.0	M35379.037727

#### WATER WELLS RECOMMENDED FOR FIELD VERIFICATION

		Aquifer	Date Water Completed Depth		NPWL			
Owner	Location	Name	Well Drilled	Metres	Feet	Metres	Feet	UID
Parlby, H.	SE 15-040-23 W4M	Lower Scollard	24-Jul-68	22.9	75.0	4.0	13.0	M35377.069156
Pearson, Glen	NE 21-040-02 W5M	Dalehurst	5-Jun-63	79.2	260.0	61.0	200.0	M35379.037757
Perlick, J.	SE 24-039-27 W4M	Lower Lacombe	2-Jan-78	54.9	180.0	30.5	100.0	M35377.066331
Pluister, Hank	SW 36-039-28 W4M	Upper Lacombe	28-Mar-80	45.7	150.0	29.6	97.0	M35377.066624
Polson, Esker	SW 26-040-25 W4M	Lower Lacombe	24-Sep-80	27.4	90.0	6.7	22.0	M35377.068536
Porkka, Roy	NE 22-040-28 W4M	Upper Lacombe	19-Jul-78	29.9	98.0	5.8	19.0	M35377.067946
Proudfoot, J.	NE 33-041-26 W4M	Haynes	15-Oct-76	64.0	210.0	12.2	40.0	M35377.082334
Pulst, S. F.	SW 14-040-26 W4M	Upper Lacombe	1-Jan-58	25.0	82.0	4.3	14.0	M35377.081600
R. Rainforth & Sons Ltd	NE 03-040-25 W4M	Lower Lacombe	12-Nov-76	27.4	90.0	15.2	50.0	M35377.081675
Raymond, Dave	SW 01-041-02 W5M	Upper Lacombe	4-Aug-80	73.2	240.0	61.6	202.0	M35379.031322
Ree, Paul	02-29-040-01 W5M	Upper Lacombe	17-Aug-77	36.6	120.0	11.1	36.5	M35379.039258
Riebel, G	SE 29-040-21 W4M	Upper Horseshoe Canyon	27-Jul-77	32.0	105.0	8.2	27.0	M35377.061010
Robinson, Marvin	SE 25-038-25 W4M	Haynes	22-Oct-75	68.6	225.0	51.8	170.0	M35377.053328
Salomons, John	NW 03-040-26 W4M	Upper Lacombe	30-Nov-78	18.3	60.0	6.1	20.0	M35377.067865
Sanche, J.	SE 33-041-01 W5M	Upper Lacombe	9-May-77	27.4	90.0	4.9	16.0	M35379.030848
Sandquist, Don	08-02-040-27 W4M	Lower Lacombe	1-Oct-84	83.8	275.0	39.6	130.0	M35377.067449
Sather, Alan	NE 06-040-25 W4M	Upper Lacombe	4-Nov-80	13.7	45.0	6.4	21.0	M35377.067427
Schmidt, Alex	SE 33-041-01 W5M	Upper Lacombe	16-May-79	32.0	105.0	5.9	19.5	M35379.031081
Schmidt, Don	SE 25-040-24 W4M	Lower Scollard	5-Nov-77	61.0	200.0	21.9	72.0	M35377.067416
Schmidt, Don	SE 25-040-24 W4M	Upper Scollard	13-Apr-74	30.5	100.0	2.1	7.0	M35377.081503
Scott, Garth	NE 08-041-01 W5M	Upper Lacombe	12-Dec-84	24.4	80.0	5.2	17.0	M35379.030284
Shultz, A.	09-26-039-03 W5M	Dalehurst	1-Jan-63	24.4	80.0	13.1	43.0	M35379.037309
Skjonsberg, Len	14-20-040-03 W5M	Dalehurst	6-Oct-66	24.4	80.0	4.1	13.5	M35379.037594
Smith, Dale	SE 03-040-03 W5M	Dalehurst	18-Jul-86	38.1	125.0	24.4	80.0	M35379.031411
Smith, Ed	SE 33-041-01 W5M	Upper Lacombe	1-May-81	18.3	60.0	3.7	12.0	M35379.031108
Smith, G.	SE 31-040-24 W4M	Haynes	4-Dec-76	27.4	90.0	11.6	38.0	M35377.067591
Smith, John	SE 22-040-02 W5M	Upper Lacombe	12-Sep-78	42.7	140.0	27.3	89.6	M35379.037759
Sorpold, Pete	NE 21-039-28 W4M	Upper Lacombe	30-Sep-74	48.8	160.0	22.9	75.0	M35377.066566
Speer, V.	NW 18-039-26 W4M	Lower Lacombe	28-Sep-79	48.8	160.0	28.4	93.0	M35377.053837
Sturgeon, J.	SW 30-040-22 W4M	Upper Horseshoe Canyon	1-Oct-72	41.2	135.0	15.2	50.0	M35377.074264
Surkan, John	NE 11-038-25 W4M	Upper Scollard	13-Jul-81	53.3	175.0	33.5	110.0	M35377.053269
Talsma, Doug	10-33-041-27 W4M	Upper Lacombe	17-Oct-81	27.4	90.0	2.1	7.0	M35377.069284
Terris, Morley	01-16-039-03 W5M	Upper Lacombe	3-Jul-69	30.5	100.0	22.9	75.0	M35379.037177
Thevenaz, M. A.	04-08-040-01 W5M	Upper Lacombe	26-Nov-68	26.8	88.0	4.0	13.0	M35379.031285
Thomas, Tom	SW 03-041-03 W5M	Dalehurst	11-Jul-73	30.5	100.0	10.7	35.0	M35379.038692
Touchette, Leo	SE 27-038-24 W4M	Upper Scollard	11-Oct-79	73.2	240.0	54.9	180.0	M35377.053194
Tumbull, Ian	SE 10-041-27 W4M	Upper Lacombe	23-Jun-77	27.4	90.0	10.7	35.0	M35377.068664
Turney, G.	SE 29-040-23 W4M	Upper Horseshoe Canyon	31-Jul-78	67.1	220.0	7.6	25.0	M35377.069803
Vallet, Clayton	16-06-040-25 W4M	Upper Lacombe	11-Jul-78	42.7	140.0	30.5	100.0	M35377.067421
Wagner, Terry	NE 22-040-25 W4M	Upper Lacombe	5-Aug-79	24.4	80.0	7.3	24.0	M35377.068455
Wessner, Marcel & Gloria	SE 24-039-27 W4M	Lower Lacombe	3-Aug-84	54.9	180.0	30.4	99.8	M35377.066336
Wigmore, Art	06-22-039-28 W4M	Upper Lacombe	26-Oct-64	69.5	228.0	43.6	143.0	M35377.066570
Williams, Don	WH 22-040-28 W4M	Upper Lacombe	10-May-82	27.7	91.0	1.2	4.0	M35377.067805
Wilson, Ed	10-16-039-03 W5M	Dalehurst	12-Dec-75	32.0	105.0	19.8	65.0	M35379.037200
Yakunin, Marilee	NW 02-041-28 W4M	Upper Lacombe	4-Aug-87	31.7	104.0	6.7	22.0	M35377.081962

#### LACOMBE COUNTY-OPERATED WATER WELLS

		Aquifer	Date Water	Completed Depth		NPWL		
Owner	Location	Name	Well Drilled	Metres	Feet	Metres	Feet	UID
County of Lacombe	NE 09-039-25 W4M	Lower Lacombe	20-Aug-76	27.4	90.0	7.9	26.0	M35377.079042
County of Lacombe	SE 36-040-01 W5M	Upper Lacombe	29-May-80	32.0	105.0	9.5	31.0	M35379.041582
County of Lacombe	NE 29-040-28 W4M	Upper Lacombe	01-Jul-71	32.0	105.0	11.3	37.0	M35377.062607