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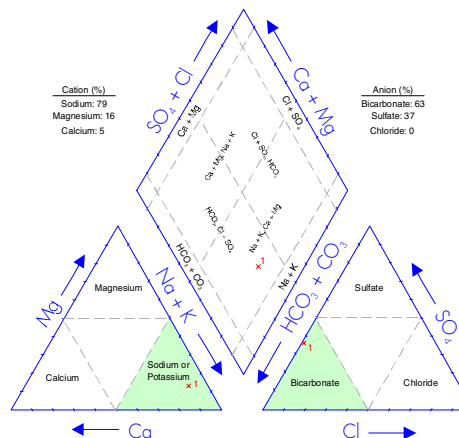
## 10. Conversions

Multiply	by	To Obtain
<b>Length/Area</b>		
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 <sup>2</sup> )	0.092 903	square metres (m <sup>2</sup> )
square metres (m <sup>2</sup> )	10.763 910	square feet (ft <sup>2</sup> )
square metres (m <sup>2</sup> )	0.000 001	square kilometres (km <sup>2</sup> )
<b>Concentration</b>		
grains/gallon (UK)	14.270 050	parts per million (ppm)
ppm	0.998 859	mg/L
mg/L	1.001 142	ppm
<b>Volume (capacity)</b>		
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
<b>Rate</b>		
litres per minute (lpm)	0.219 974	UK gallons per minute (igpm)
litres per minute	1.440 000	cubic metres/day (m <sup>3</sup> /day)
igpm	6.546 300	cubic metres/day (m <sup>3</sup> /day)
cubic metres/day	0.152 759	igpm

## 11. Glossary

Aquifer	a formation, group of formations, or part of a formation that contains saturated permeable rocks capable of transmitting groundwater to water wells or springs in economical quantities
Available Drawdown	in a confined aquifer, the distance between the non-pumping water level and the top of the aquifer  in an unconfined aquifer (water table aquifer), two thirds of the saturated thickness of the aquifer
Borehole	includes all “work types” except springs
Dewatering	the removal of groundwater from an aquifer for purposes other than use
Deltaic	a depositional environment in standing water near the mouth of a river
Dfb	climate classification that relates to long, cool summers and severe winters (Thornthwaite and Mather, 1957)
Evapotranspiration	a combination of evaporation from open bodies of water, evaporation from soil surfaces, and transpiration from the soil by plants (Freeze and Cherry, 1979)
Facies	the aspect or character of the sediment within beds of one and the same age (Pettijohn, 1957)
Fluvial	produced by the action of a stream or river
Friable	poorly cemented
Hydraulic Conductivity	the rate of flow of water through a unit cross-section under a unit hydraulic gradient; units are length/time
km	kilometre
Kriging	a geo-statistical method for gridding irregularly-spaced data (Cressie, 1990)
Lacustrine	fine-grained sedimentary deposits associated with a lake environment and not including shore-line deposits
Lithology	description of rock material
Lsd	Legal Subdivision
m	metres
mm	millimetres
m <sup>2</sup> /day	metres squared per day
m <sup>3</sup>	cubic metres
m <sup>3</sup> /day	cubic metres per day
mg/L	milligrams per litre
Obs WW	Observation Water Well

**Piper tri-linear diagram** a method that permits the major cation and anion compositions of single or multiple samples to be represented on a single graph. This presentation allows groupings or trends in the data to be identified. From the Piper tri-linear diagram, it can be seen that the groundwater from this sample water well is a sodium-bicarbonate-type. The chemical type has been determined by graphically calculating the dominant cation and anion. For a more detailed explanation, please refer to Freeze and Cherry, 1979



**Piper Tri-Linear Diagram**

- Rock** earth material below the root zone
- Surficial Deposits** includes all sediments above the bedrock
- Thalweg** the line connecting the lowest points along a stream bed or valley; *longitudinal profile*
- Till** a sediment deposited directly by a glacier that is unsorted and consisting of any grain size ranging from clay to boulders
- Transmissivity** the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient: a measure of the ease with which groundwater can move through the aquifer
  - Apparent Transmissivity:** the value determined from a summary of aquifer test data, usually involving only two water-level readings
  - Effective Transmissivity:** the value determined from late pumping and/or late recovery water-level data from an aquifer test
  - Aquifer Transmissivity:** the value determined by multiplying the hydraulic conductivity of an aquifer by the thickness of the aquifer
- Water Well** a hole in the ground for the purpose of obtaining groundwater; “work type” as defined by AENV includes test hole, chemistry, deepened, well inventory, federal well survey, reconditioned, reconstructed, new, old well-test
- Yield** a regional analysis term referring to the rate a properly completed water well could be pumped, if fully penetrating the aquifer
  - Apparent Yield:** based mainly on apparent transmissivity
  - Long-Term Yield:** based on effective transmissivity
- AENV** Alberta Environment
- AMSL** above mean sea level
- BGP** Base of Groundwater Protection
- DEM** Digital Elevation Model
- DST** drill stem test
- EUB** Alberta Energy and Utilities Board

GCDWQ	Guidelines for Canadian Drinking Water Quality
NPWL	non-pumping water level
PFRA	Prairie Farm Rehabilitation Administration
TDS	Total Dissolved Solids
WSW	Water Source Well or Water Supply Well

**STURGEON 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 and Springs
- Depth of Existing Water Wells
- Depth to Base of Groundwater Protection
- Generalized Cross-Section (for terminology only)
- Geologic Column
- Hydrogeological Map
- Cross-Section A - A'
- Cross-Section B - B'
- Cross-Section C - C'
- Cross-Section D - D'
- Bedrock Topography
- Bedrock Geology
- E-Log Showing Base of Foremost Formation
- Risk of Groundwater Contamination
- 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)

### b) First Sand and Gravel

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

### c) 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

### d) 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 Lower Sand and Gravel Aquifer

### 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 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 in Upper Bedrock Aquifer(s)

#### b) Upper Horseshoe Canyon Formation

- Depth to Top of Upper Horseshoe Canyon Formation
- Structure-Contour Map - Upper Horseshoe Canyon Formation

#### c) Middle Horseshoe Canyon Formation

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

#### d) Lower Horseshoe Canyon Formation

- Depth to Top of Lower Horseshoe Canyon Formation
- Structure-Contour Map - Lower 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
- Fluoride in Groundwater from Lower Horseshoe Canyon Aquifer
- Piper Diagram - Lower Horseshoe Canyon Aquifer
- Recharge/Discharge Areas between Surficial Deposits and Lower Horseshoe Canyon Aquifer

#### e) 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
- Fluoride in Groundwater from Bearpaw Aquifer
- Piper Diagram - Bearpaw Aquifer
- Recharge/Discharge Areas between Surficial Deposits and Bearpaw Aquifer