

Saskatchewan Land Surveyors Association

Practical Surveying

April, 2021

Time Allowed: 3 hours

Instructions

- You may use any self contained calculator or computer.
- Partial marks may be awarded for incorrect answers if the solution process can be followed and is correct.
- Intermediate calculations are not necessary, but sketches and/or a brief description of geometric construction will show that you understand the problem and solution process.
- For traverses, a sketch showing the angular and linear input is all that is required. Showing coordinates is not required unless they form part of the answer.
- If the information appears vague, incomplete or incorrect and you make an assumption, state that assumption in your work.

Question 1

Your firm has been engaged to subdivide a parcel on the legal subdivision boundary of LSD 3 of the SW 17-48-22-W3Mer. You are at a stage in the subdivision process where you must complete the field survey and post the subdivision.

Using information provided in Appendix A (listed below, i to iii), answer the following questions.

i. Field Note Sketch

ii. Coordinate list derived from RTK GPS (UTM Zone 12 coordinates). Assume check measurements have been made

iii. Township Plat (Twp 48, Rge.22 W.3 Mer.)

- | | |
|----------|--|
| 6 marks | I) Sketch the evidence required to be found in the field and the positions requiring monuments for the subdivision. |
| 12 marks | II) Establish and dimension (angles and distances) the section and subdivision boundaries. |
| 7 marks | III) Suppose we were to subdivide LSD 3 of Section 16-48-22-W3Mer which has an implied exception for the Natural Boundary. What are the Legal Plan Requirements for the implied exception? What does the Plan Preparation and Procedure Manual say regarding "Square Water"? |

Question 2

During your field work for question 1, you find a monument at the N. $\frac{1}{4}$ of Section 17-48-22-W.3 Mer. Upon field measurement, it is found to be 0.314 metres from the position you have calculated. For each scenario, provide:

- Your opinion, is the monument a governing monument? Provide a detailed argument as to your opinion
- Explain how this scenario relates to the Controller of Surveys Policy and Procedure **GO-09/001 Quarter monuments on blind lines** including the Standard of Accuracy.
- Describe what research you would do in order to substantiate your opinion

12 marks

- I) The monument is an unmarked 'brass-cap'. ISC corner and plan search yields no plan records of this monument being erected. It is in bush with no fence lines .
- II) The monument was established by the original township survey and is shown on the 2nd Edition of the Township Plat.
- III) The monument was planted by a secondary survey and is shown on registered plan 69B01489. No subsequent surveys have tied to the said monument, no improvements are erected to said monument.
- IV) The monument was planted by a secondary survey and is shown on registered plan 69B01489. Yet subsequent surveys have tied to the said monument, and the landowner has built a new fence line to the monument.

Question 3

The oil and gas company, Discovery, has asked your firm to survey a new horizontal well location and to provide them with a plan of survey. The client has provided you with the requested UTM coordinates for the surface location, Intermediate Casing Point (ICP), and the Bottom Hole (BH)

Using information provided in Appendix A (listed below, i to iii) answer the following questions.

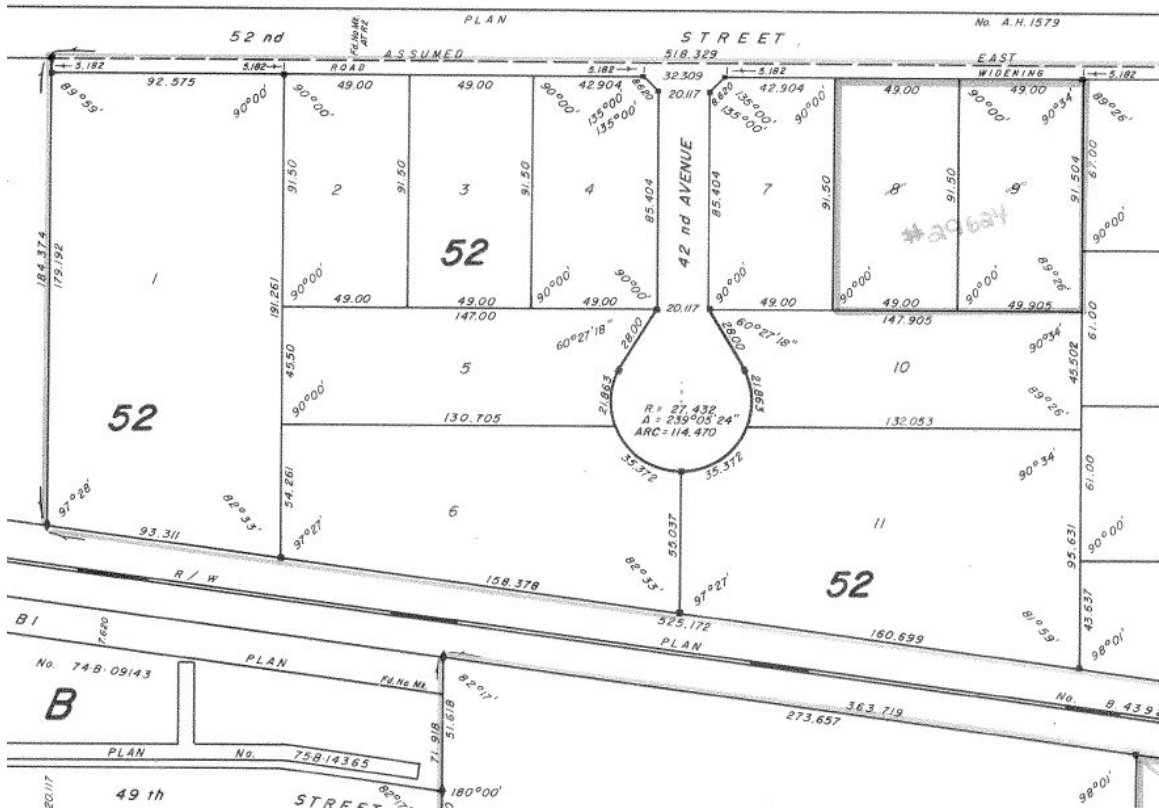
- i. Field Note Sketch*
 - ii. Coordinate list derived from RTK GPS (UTM Zone 12 coordinates). Assume check measurements have been made*
 - iii. Township Plat (Twp 48, Rge.22 W.3 Mer.)*
- 6 marks I) Calculate the section offsets required to be shown on the plan of survey for the well location, ICP, and BH?
- 6 marks II) Calculate the rectangular coordinates required to be shown on the plan of survey for the well location, ICP, and BH?
- 2 marks III) Unless defined by a Pool Order or Spacing Area Order, what is the minimum inter-well setback of a productive interval of a horizontal well?
- 2 marks IV) The Horizontal Pool order has determined the inter-well set-back is 180m. What drainage radius will be shown on the plan of survey when calculating the ultimate drainage area of the productive interval of the well?
- 10 marks V) The Horizontal Pool order has determined the inter-well set-back is 180m. Calculate the ultimate drainage area of the productive interval of the well given the size of the drainage unit is 1 legal subdivision (LSD) and Section 17-48-22-W3Mer is 100% Freehold mineral rights and Section 18-48-22-W3Mer is 100% Crown-owned mineral rights.

Question 4

You have been approached by the landowner of Lot 5 and Lot 6, Block 52, Plan 79B07571 to perform a lot line adjustment. The landowner would like the 2 new lots to have equal frontage and be equal in area. The portion of the plan is also included in Appendix B.

- 6 marks 1) Assume all of the lot corners have been found in their original undisturbed locations, on your sketch show what type of monument you would expect to find at each location, and where you would expect to have to plant a monument.
- 20 marks 3. On your sketch, show the new lot dimensions and interior angles for the two new lots based on the two lots having equal frontage and equal areas as requested by the client. Include the curve data required to be shown on the final registered plan.

Portion of Plan 79B07571



Question 5

You have just completed a survey of several corner pins and one pin does not agree with the position shown on the registered plan. The pin has been in the ground long enough that you can't determine if it has been disturbed or planted in error.

4 marks Describe what checks you could make in the field to try and resolve the discrepancy.

7 marks Based on your thorough investigation; you conclude that the corner pin was placed in error. Please explain how you would proceed to have the situation corrected.

APPENDIX A

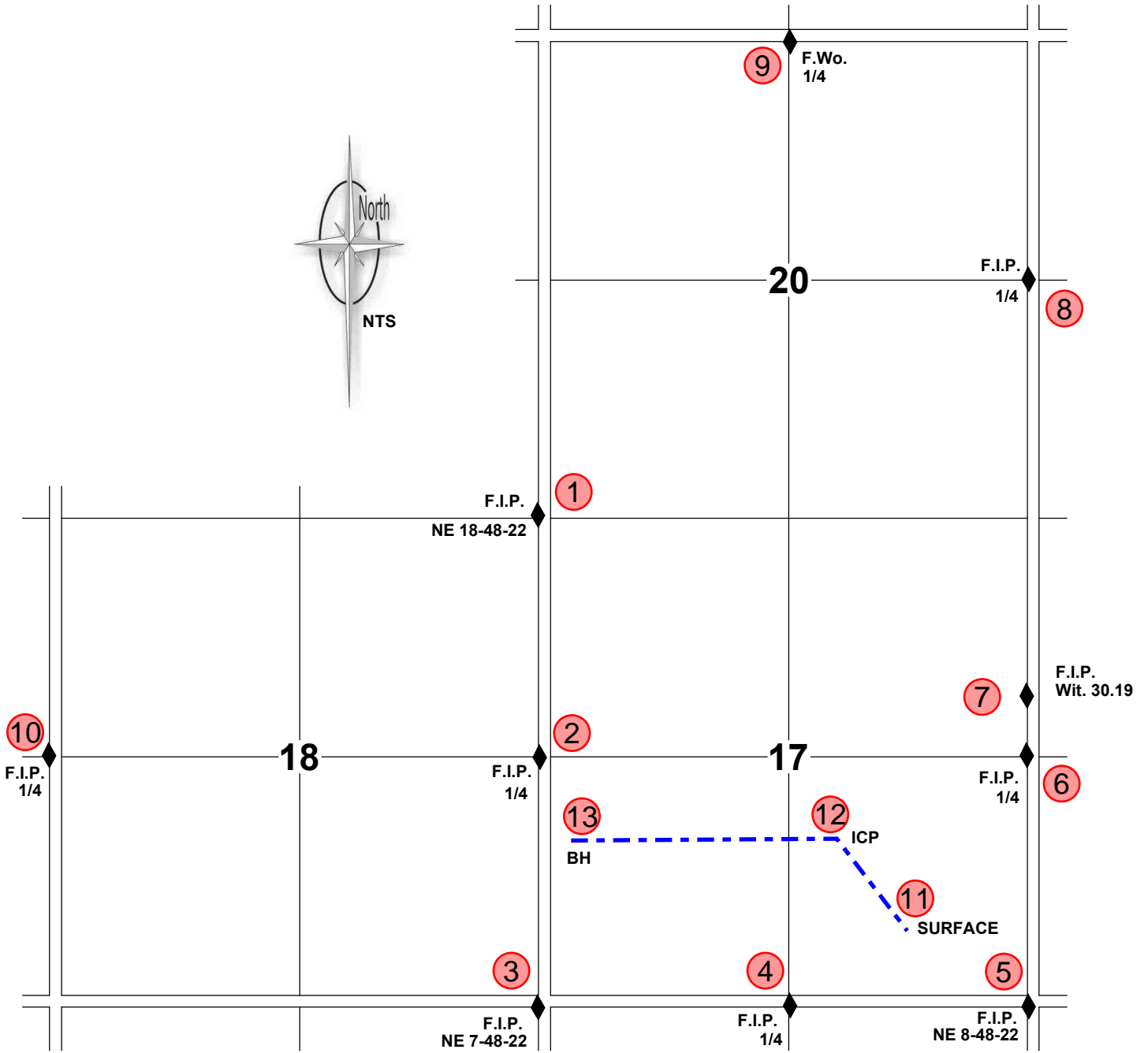
RTK GNSS (UTM Zone 12 coordinates)

Point	Northing	Easting	Elevation	Feature Code
1	5890148.352	620434.060	565.470	F.I.P. MR. NE 18-48-22
2	5889335.368	620453.955	568.810	F.I.P. 1/4
3	5888501.648	620475.210	571.840	F.I.P. NE 7-48-22
4	5888521.086	621298.449	564.980	F.I.P. 1/4
5	5888558.418	622100.891	564.330	F.I.P. NE 8-48-22
6	5889383.052	622080.400	565.000	F.I.P. MR. 1/4
7	5889581.050	622074.598	563.800	F.I.P. MR. WIT.30.19
8	5890992.843	622040.043	562.150	F.I.P. 1/4
9	5891776.134	621215.259	561.460	F. Wo. 1/4
10	5889343.515	620452.465	562.458	F.I.P. 1/4
11	5888948.630	621748.716	565.589	Well Location (Surface)
12	5889213.136	621403.279	568.255	Intermediate Casing Point
13	5889187.232	620519.741	562.356	Bottom Hole

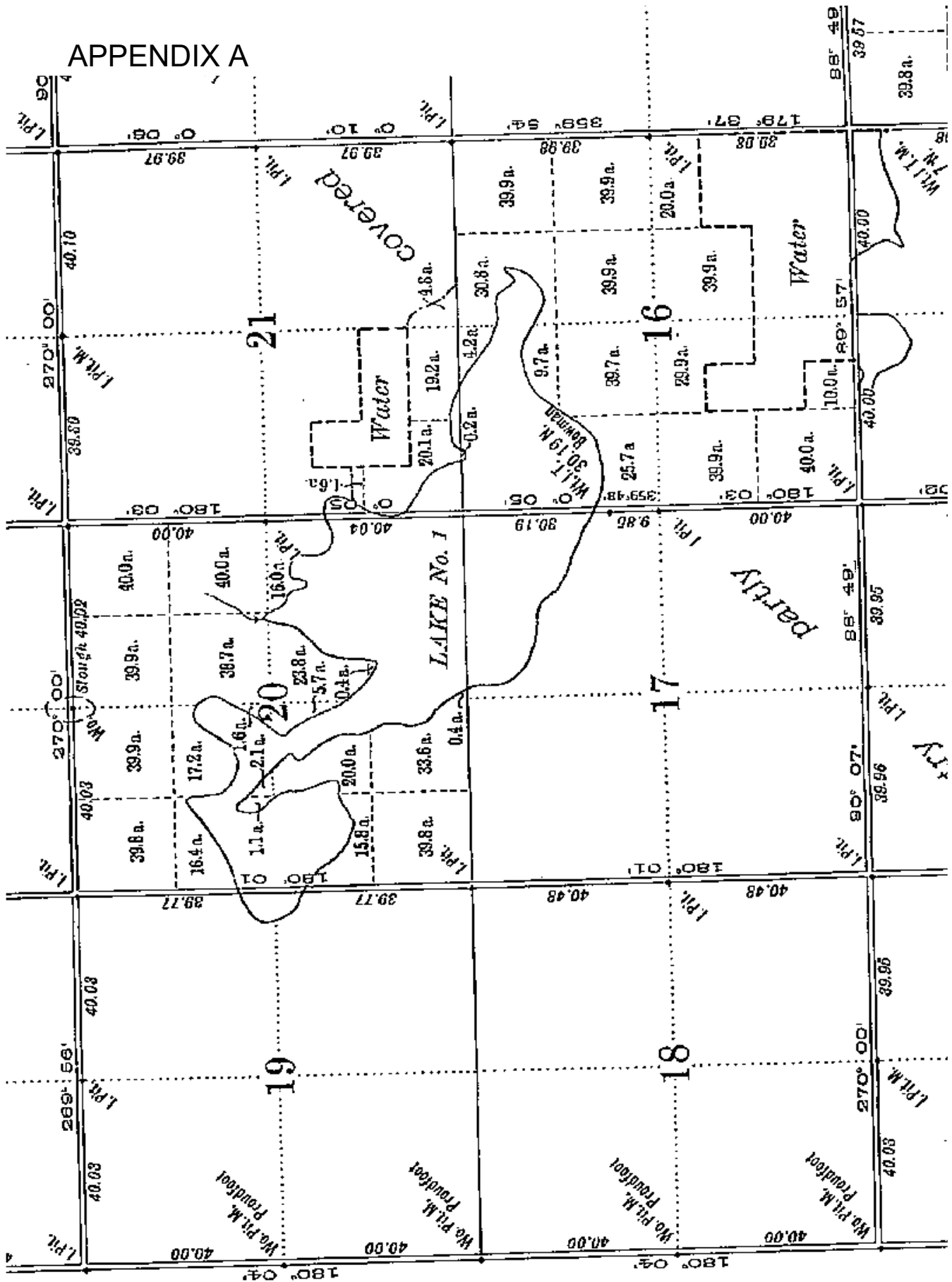
Combined Scale Factor: 0.999693

Meridian Convergence Angle: 1°26'27"

APPENDIX A



APPENDIX A



APPENDIX B

This instrument has not been examined but purports to be a duplicate of an instrument registered in the Land Titles Office for the Battleford Land Registration District at Battleford, in the Province of Saskatchewan on the 22 day of May A.D. 1979 as Number 79-B-09571

Tom Scotty Registrar B.L.R.D.

PLAN OF SURVEY

SHOWING SUBDIVISION OF

BLOCK 61, REG'D. PLAN NO. BZ.2775

IN AND PART OF

S.E. 1/4, SEC. 2 · TP. 50 · RG. 28 · W.3M.

LLOYDMINSTER - SASKATCHEWAN

SCALE: 1 : 2000

1978

H.M. KNITTER, S.L.S.

NOTE:

PORTION TO BE REGISTERED IS OUTLINED IN ORANGE. LINEAR MEASUREMENTS ARE IN METRES AND DECIMALS THEREOF. STANDARD IRON POSTS FOUND SHOWN THUS STANDARD IRON POSTS PLANTED SHOWN THUS ALL LOT CORNERS ARE MARKED WITH 0.016m x 0.381m IRON BARS, UNLESS OTHERWISE SHOWN

NPXØ1711

I, HENRY MAX KNITTER, SASKATCHEWAN LAND SURVEYOR, DO HEREBY CERTIFY THAT THE SURVEY REPRESENTED BY THIS PLAN HAS BEEN MADE BY ME IN ACCORDANCE WITH THE PROVISIONS OF THE LAND SURVEYS ACT, THAT THIS SURVEY WAS PERFORMED BETWEEN THE 18th & 22nd DAYS OF DECEMBER, 1978, AND THAT THIS PLAN IS CORRECT AND TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

DATED AT LLOYDMINSTER, IN THE PROVINCE OF SASKATCHEWAN, THIS 29th DAY OF DECEMBER, 1978.

H.M. Knitter SASKATCHEWAN LAND SURVEYOR

