

SASKATCHEWAN INSTITUTE OF PEDOLOGY

GEOLOGY OF THE BORDEN SOIL SALINITY
PROJECT

Report 0083-014 December 6, 1986

E. A. Christiansen Consulting Ltd.

CONSULTING GEOLOGIST

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SASKATOON, SASKATCHEWAN, CANADA
S7K 3S9

PHONE 374-6700

December 6, 1986

Saskatchewan Institute of Pedology
University of Saskatchewan
Saskatoon, Saskatchewan
S7N 0W0

Attention: Dr. J.L. Henry

Dear Dr. Henry:

Enclosed are six copies of Report 0083-014 on the "Geology of the Borden soil salinity project". The report includes a map provided by Tri-City Surveys Ltd. through your office which shows the location of three cross sections, six testholes, one well, and one piezometer (Drawing 0083-014-001). In addition to the map, three cross sections (Drawings 0083-014-02 to 04) and copies of the logs are enclosed.

The Sutherland Group was the base of exploration for this study. Above the base of exploration, the Saskatoon Group in ascending order is composed of: (1) sandy till, (2) discontinuous silt, (3) sand, (4) silt and clay, and (5) a discontinuous sand. The sandy till ranges in thickness from about 10 to 50 feet. Overlying the sandy till is a discontinuous silt unit, up to 4 feet thick (Drawing 0083-014-02, log 86-203).

The sand overlying the discontinuous silt is the unit under investigation. The sand, which is up to 50 feet thick, forms a 20-foot ridge about two miles long

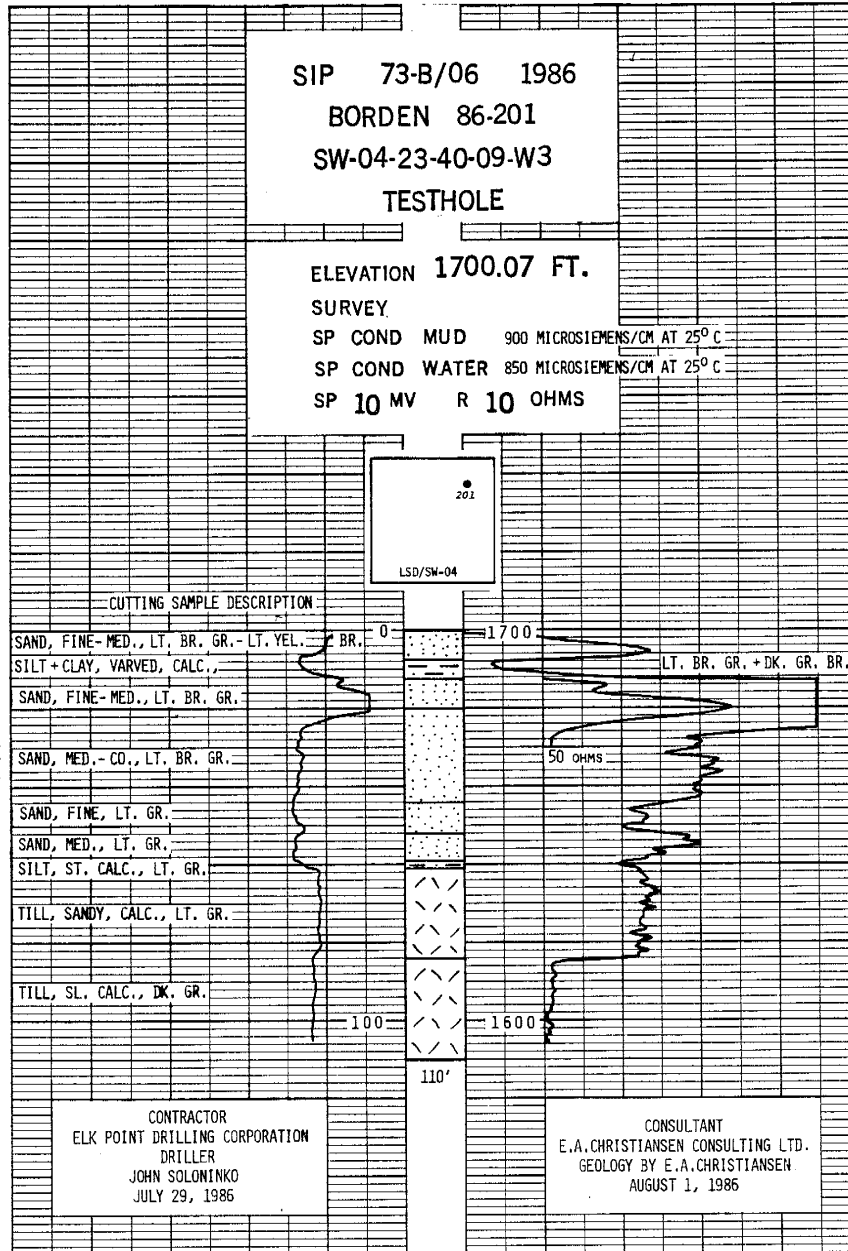
and is inferred to be about 800 feet wide. The sand unit thickens at the expense of the underlying sandy till suggesting the till was eroded prior to deposition of the sand. The fact that the sand forms a ridge required glacial ice to be present on both sides during deposition. The downward fining of this unit indicates that the mode of deposition was regressive offlap. It is concluded, therefore, that the sand unit was deposited as a delta restricted in an ice-walled channel which emptied into glacial Lake Saskatchewan. The overlying silts and clays were deposited in this lake and were subsequently covered locally by eolian sands.

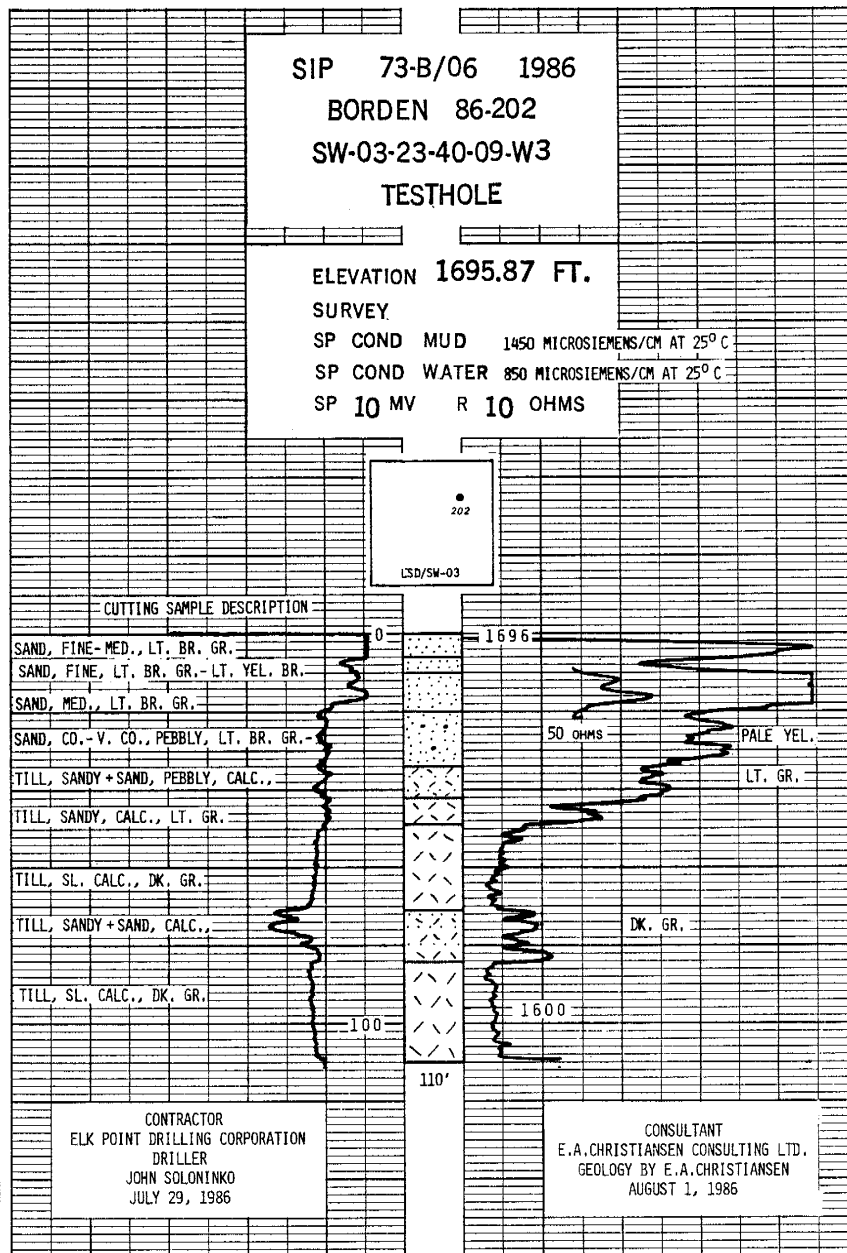
Although the southerly extent of the sand ridge is documented in Drawing 0083-014-03, its extent to the north is unknown. It is recommended, therefore, that a testhole be drilled into the Lea Park Formation 400 to 500 feet north of testhole 86-205. Such a testhole would presumably define the north boundary of the sand ridge and would verify the presence of Judith River Formation thought to occur in log 85-305.

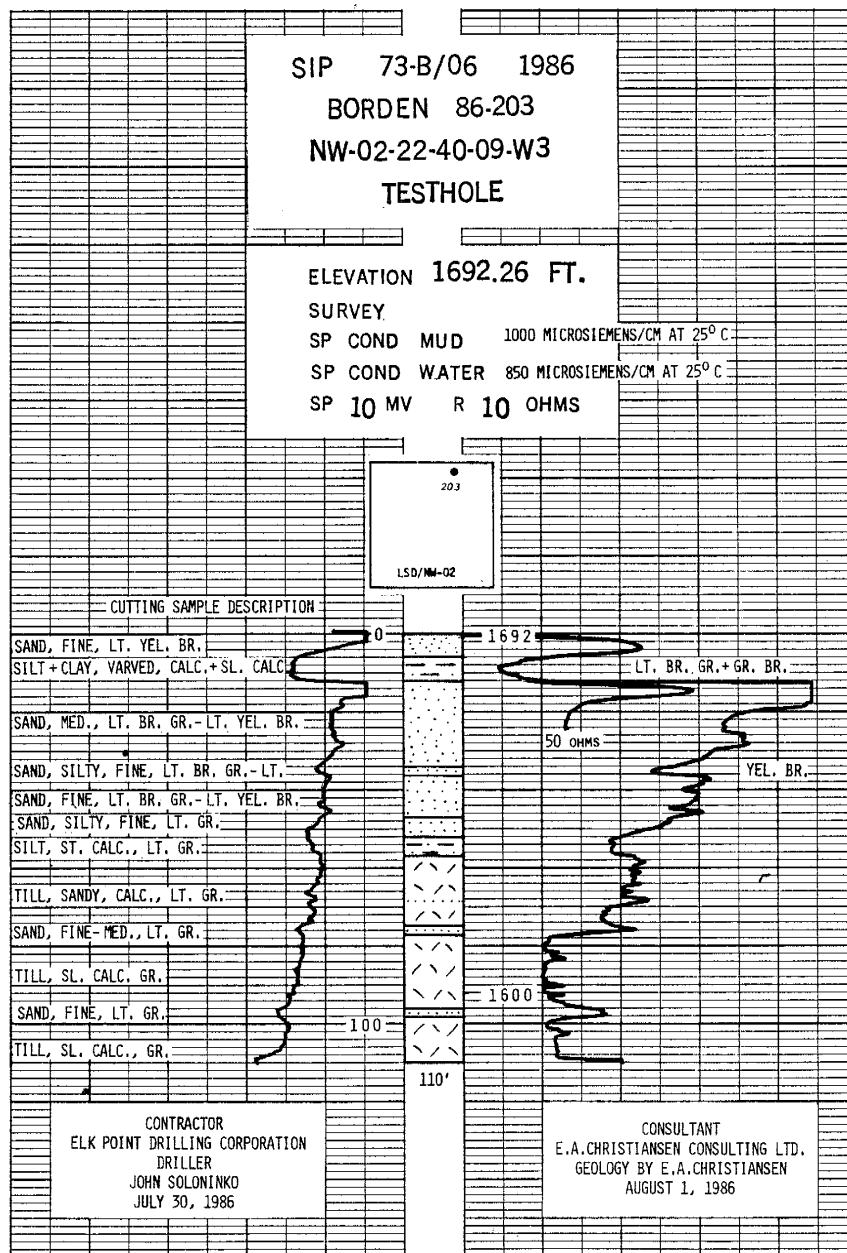
Sincerely yours,

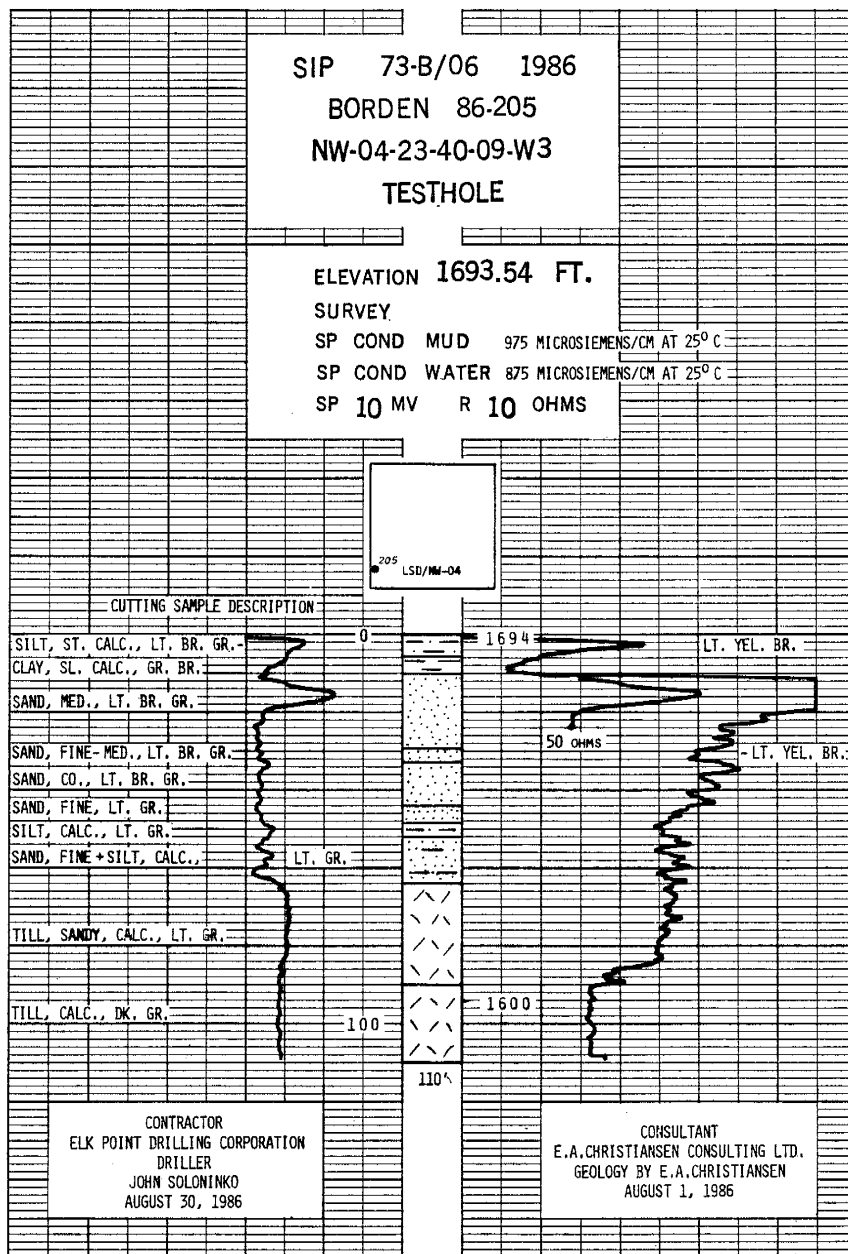
A handwritten signature in cursive script, appearing to read "E.A. Christiansen".

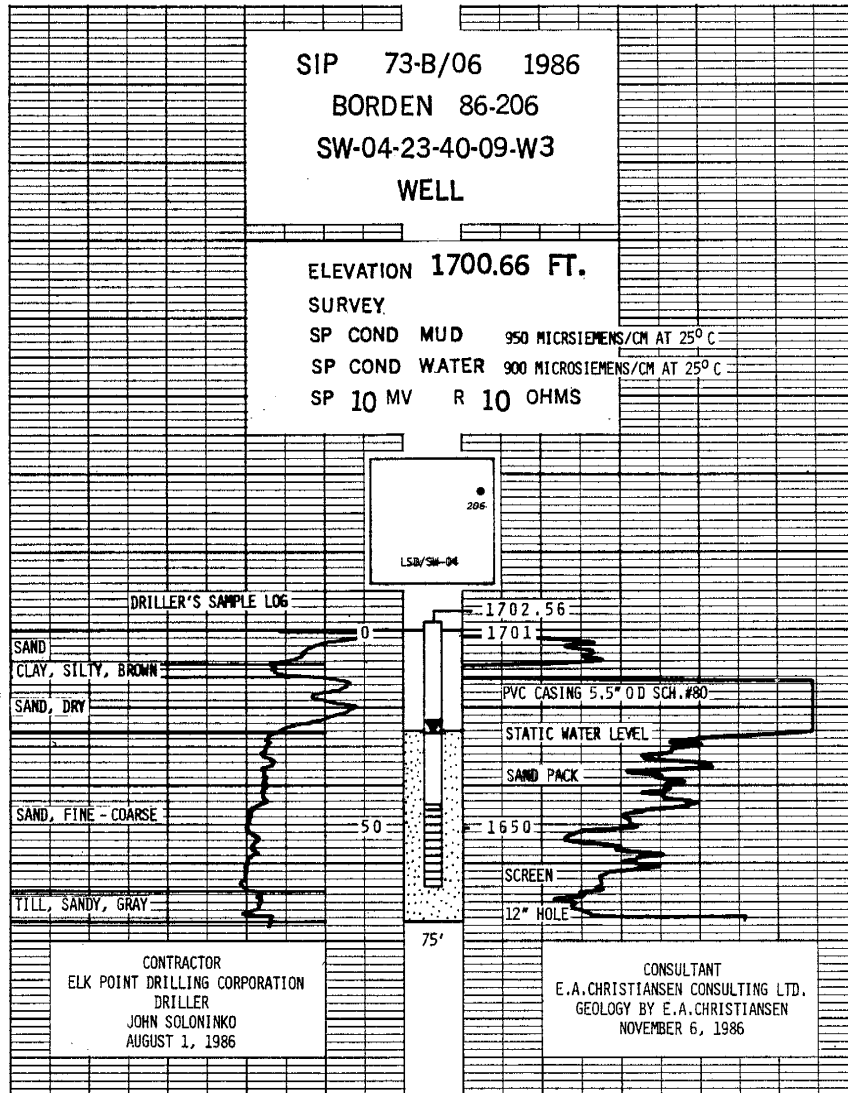
E.A. Christiansen

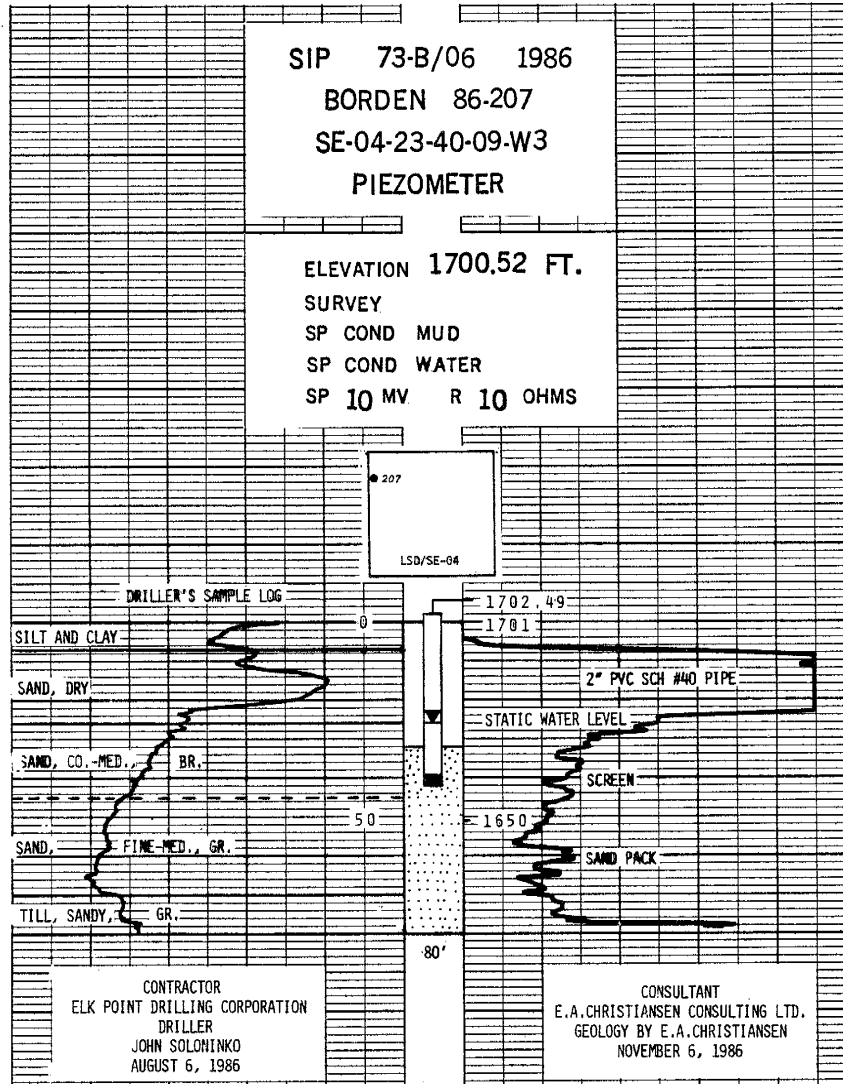












SIP 73B/06 1985
RADISSON 85-305
SW-04-23-40-09-W3
13:350300E/5813100N
TESTHOLE

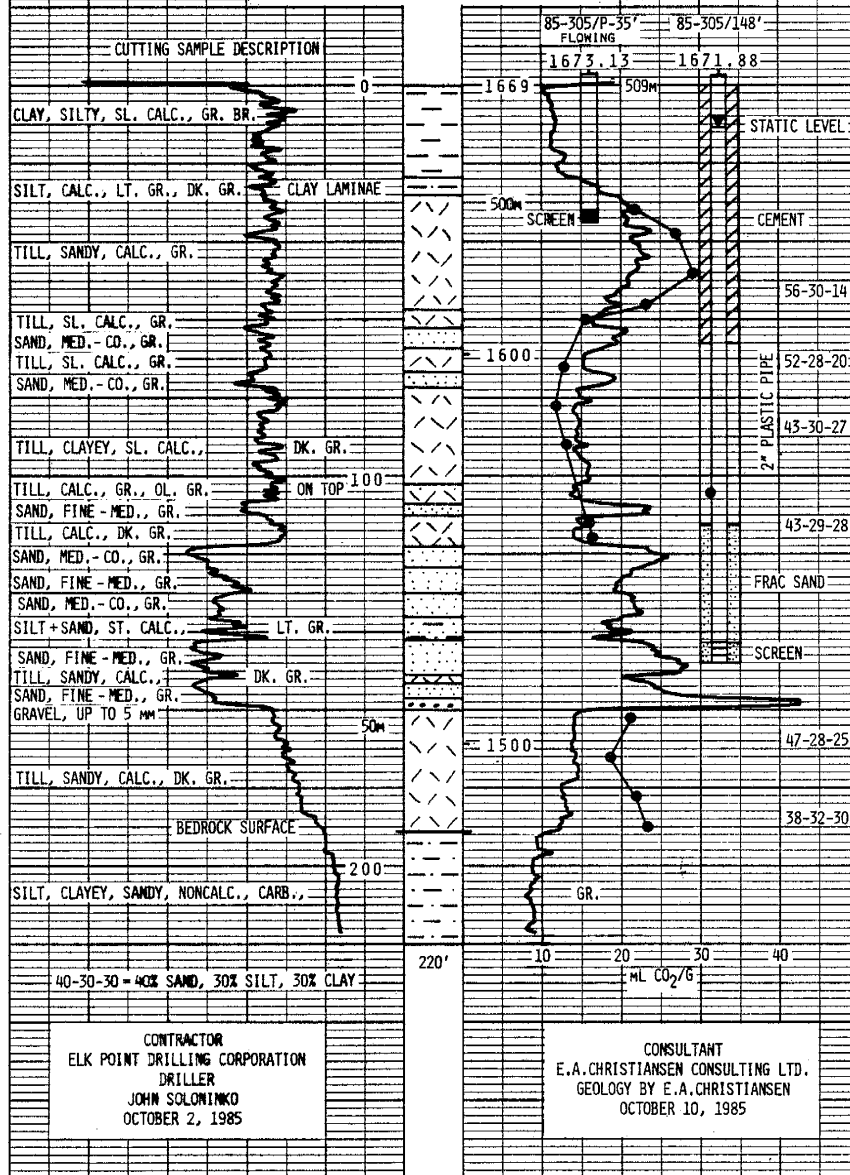
ELEVATION 1669.42 FT.

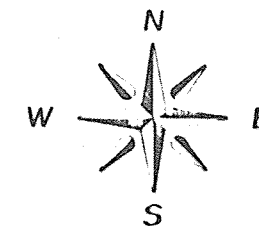
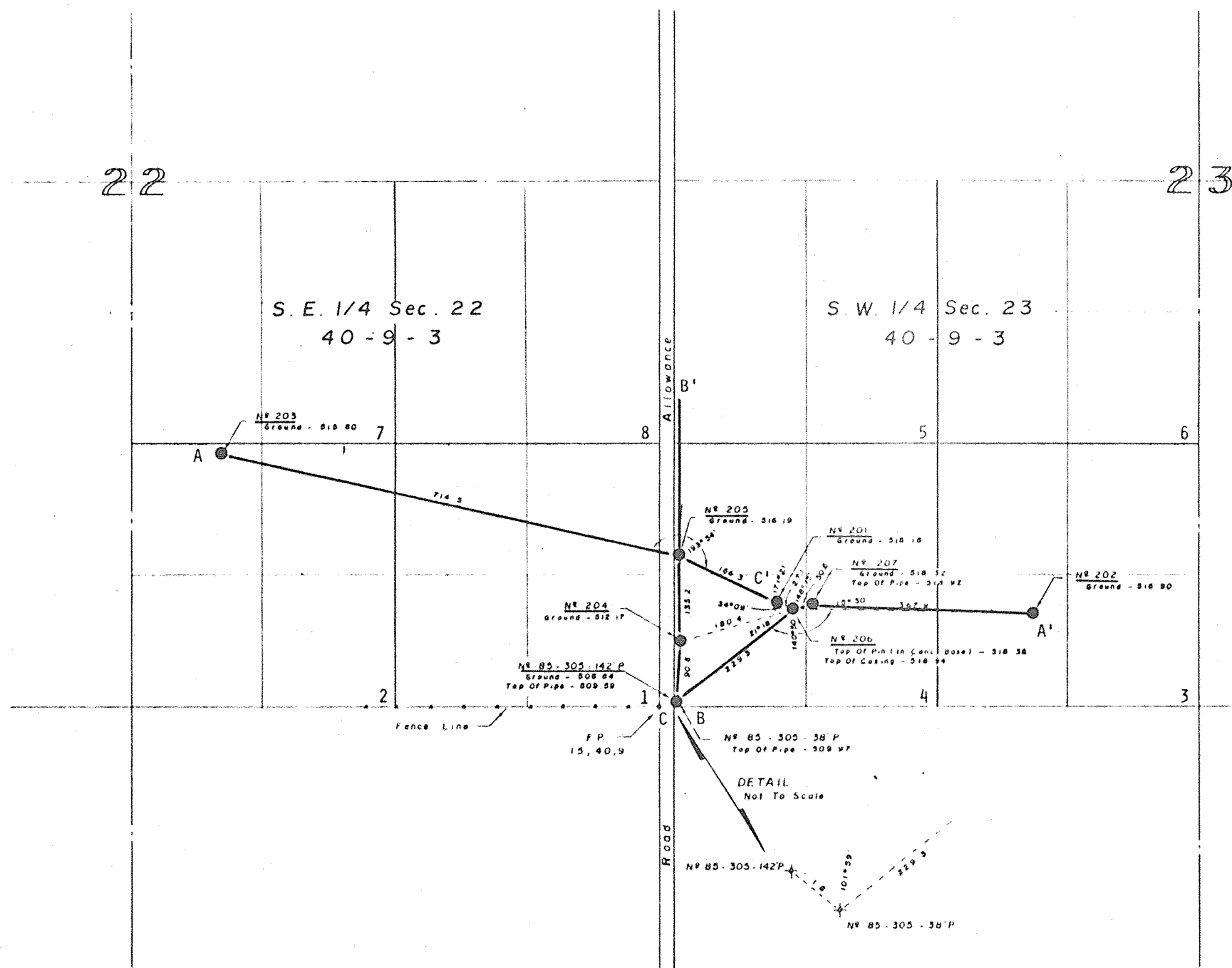
SURVEY

SP COND MUD 480 MICROSIEMENS/CM AT 25°C

SP COND WATER 180 MICROSIEMENS/CM AT 25°C

SP 20 MV R 25 OHMS





SKETCH PLAN
showing
Test Wells & Elevations
located in
S.E. 1/4 Sec. 22 & S.W. 1/4 Sec. 23
Twp. 40 - Rge. 9 - W 3rd M
R.M. of GREAT BEND N° 405
Scale: 1:5000

Note:
Measurements are in metres and decimals thereof.
Elevations are related to Geodetic Bench
Mark N° 785033. Description: Iron Post with
Brass Cap, along Highway N° 16, in N.E. 1/4 Sec. 26 -
Twp. 39 - Rge. 9 - W 3rd M, 22.2 m South West of
centreline of Highway, 70 cm East of North-South
fence line between 1/4 Sections

Survey completed October 10th, A.D. 1986

By: G. A. Anderson
Saskatchewan Land Surveyor

DRAWING 0083-014-01. MAP SHOWING LOCATION OF TESTHOLES AND CROSS SECTIONS.

Prepared by
TRI-CITY SURVEYS LTD.
1 - 3111 MILLAR AVENUE
SASKATOON, SASK
S7K 6N3
Phone: 934-1818 Our File: 86134

SP 774/05 1986
BORDEN 86-203
NW-03-23-40-09 M3
TESTHOLE

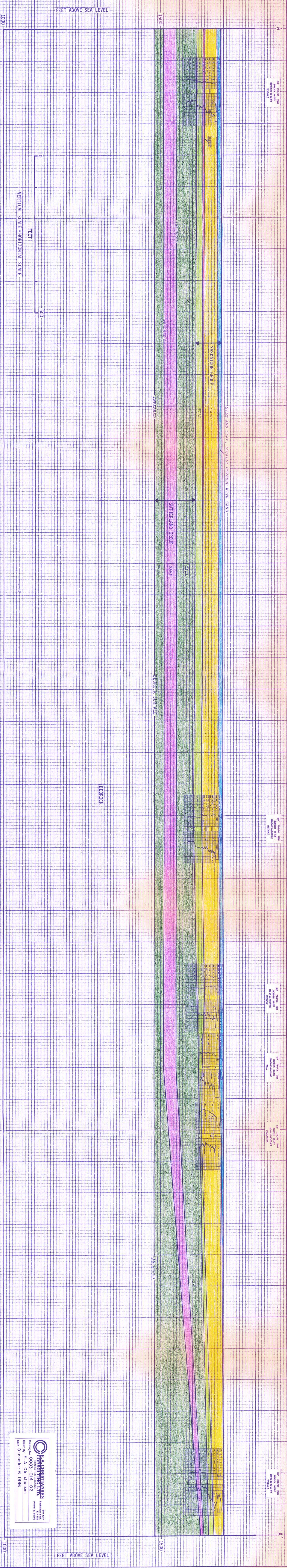
SP 774/05 1986
BORDEN 86-203
NW-03-23-40-09 M3
TESTHOLE

SP 774/05 1986
BORDEN 86-203
NW-03-23-40-09 M3
TESTHOLE

SP 774/05 1986
BORDEN 86-203
NW-03-23-40-09 M3
WELL

SP 774/05 1986
BORDEN 86-203
NW-03-23-40-09 M3
PREDOMINANT

SP 774/05 1986
BORDEN 86-203
NW-03-23-40-09 M3
TESTHOLE



DRAWING 0083-014-02, CROSS SECTION A-A', BORDEN SALINITY PROJECT.

SIP 738/06 1985
RADISSON 85-306
SW-04-23-40-09-W3
TESTHOLE

SIP 738/06 1985
BORDEN 86-204
SW-04-23-40-09-W3
TESTHOLE

SIP 738/06 1985
BORDEN 86-205
NW-04-23-40-09-W3
TESTHOLE

FEET ABOVE SEA LEVEL

FEET ABOVE SEA LEVEL

1500

1500

1000

1000

BEDROCK SURFACE

BEDROCK

0

500

FEET

VERTICAL SCALE = HORIZONTAL SCALE

INFERRED

SASKATOON GROUP

SAND

SILT AND CLAY

TILL

TILL

SUTHERLAND GROUP

SAND

TILL



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Drawing No. **0083-014-03**

Drawn By **E. A. Christiansen**

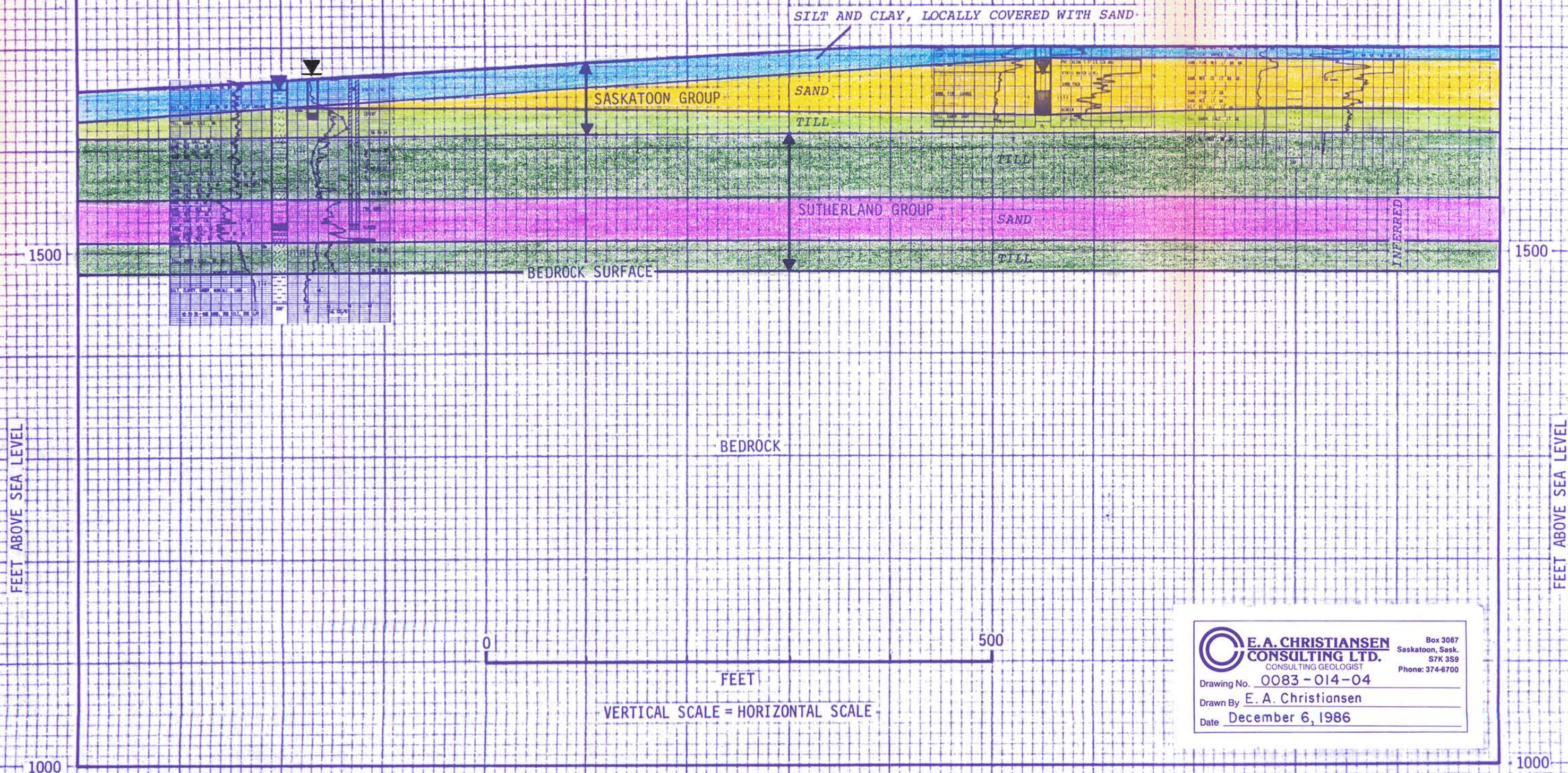
Date **December 6, 1986**

DRAWING 0083-014-03. CROSS SECTION B-B', BORDEN SALINITY PROJECT.


SIP 738/06 1985
RADISSON 85-305
SW-04-23-40-09-W3
13-350300E/5813100N
TESTHOLE

SIP 738/06 1986
BORDEN 86-206
SW-04-23-40-09-W3
WELL

SIP 738/06 1986
BORDEN 86-201
SW-04-23-40-09-W3
TESTHOLE



DRAWING 0083-014-04, CROSS SECTION C-C', BORDEN SALINITY PROJECT.

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Drawing No. 0083-014-04
Drawn By E. A. Christiansen
Date December 6, 1986