MAR 20090007: EMPRESS SALT CAVERN

Received date: Mar 26, 2009

Public release date: Dec 30, 2010

PART B

AND

PART C

ASSESSMENT REPORT
Metallic and Industrial Mineral Permit Number 9307010951

EMPRESS SALT CAVERN PROJECT
NTS 72 L/9

For

Landis Energy Corporation

Submitted by
John Hilland, P. Geol.
March 24, 2009

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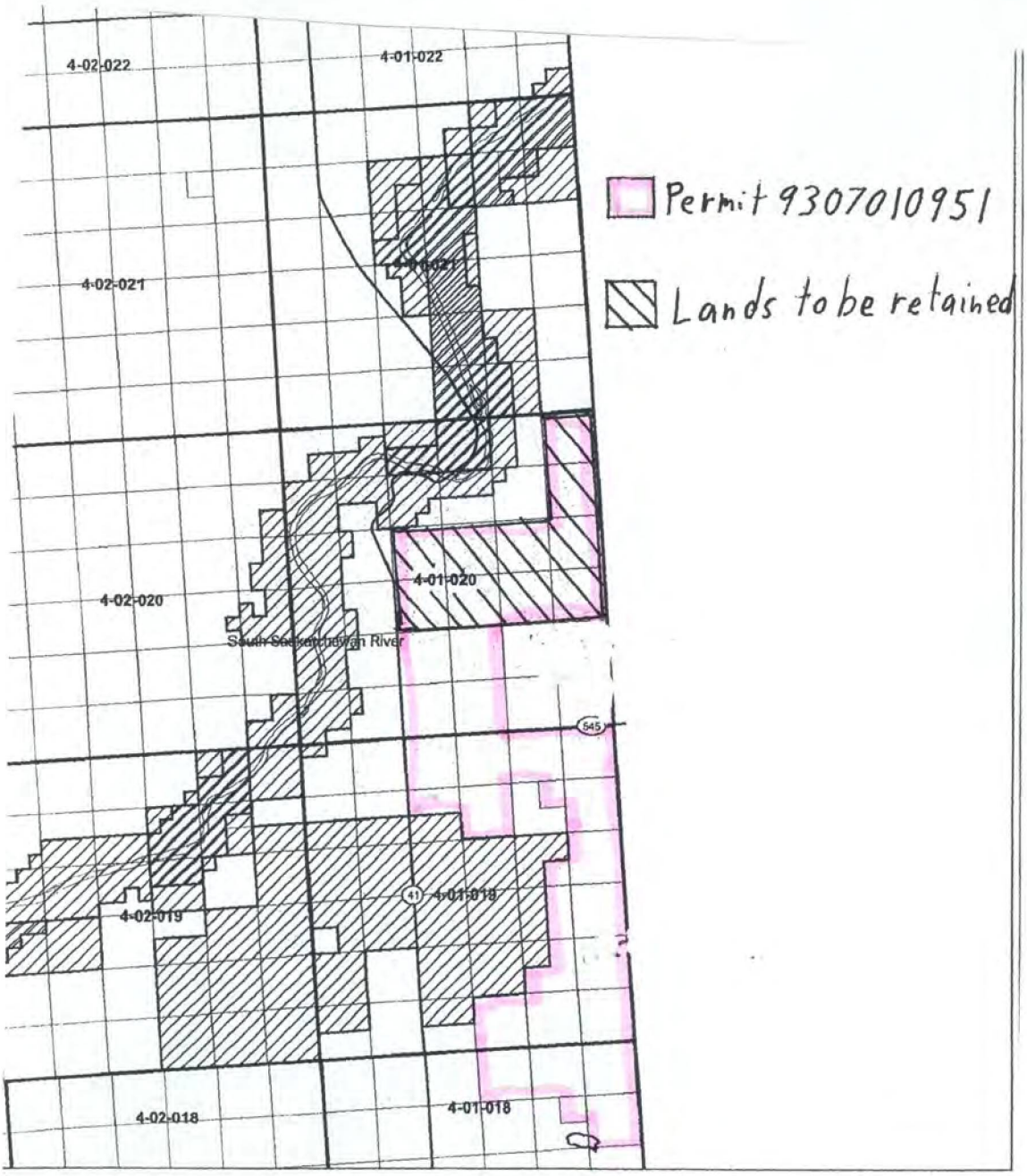
PART B – TECHNICAL REPORT

Map of Current Permit and Boundaries



PART B – TECHNICAL REPORT

Summary

In the area of metallic and industrial permit # 9307010951 the Prarie Evaporite formation occurs at a depth of approximately 1625m, with a thickness of approximately 56m. It consists predominantly of salt, with minor amounts of dolomite, anhydrite, sylvite, and argillaceous material or shale partings. A drill hole located at 14-36-020-01W4 cored the Prairie Evaporite and was examined at the EUB core library in Calgary. A synthetic seismogram was generated from the sonic log of the drill hole. Trade seismic data was purchased and tied to the drill hole. The seismic data indicates that the Prairie Evaporite is relatively flat lying with a fairly uniform thickness, and does not exhibit any salt dissolution features. There is also no apparent biohermal reef buildup in the underlying Winnipegosis formation.

Introduction

Landis Energy Corporation is pursuing the possibility of developing salt caverns in the Empress area for underground hydrocarbon storage. The Prairie Evaporite formation is used for this purpose in the province of Saskatchewan. The close proximity of the Trans Canada Pipeline Limited main line along with the liquids extraction facilities could allow for the storage of natural gas or liquids.

Salt suitable for hydrocarbon storage must be located in a geologically stable area, with an absence of large faults which may lead to dissolution of the salt. The depth must be sufficient to withstand high pressures, and the thickness must be sufficient to develop suitable sized caverns using conventional brining techniques. Saturated brine from cavern development would be injected into deep saline aquifers. Source water could come from a variety of sources, and brackish water is also suitable for cavern development.

Regional Geology

The Western Canada Sedimentary Basin hosts several regionally extensive evaporate deposits, the majority of which occur in the Devonian Elk Point Group. These salt units are (from oldest to youngest) the Lower Lotsburg, the Upper Lotsburg, the Cold Lake, the Prarie Evaporite, and the Hubbard Evaporite salts (Grobe, 2000).

In the Empress area the Prairie Evaporite is deposited on the Winnipegosis carbonate. The Winnipegosis has been explored for hydrocarbons, but has been found to be wet in the area. However, in southeastern Saskatchewan the reef buildups in the Winnipegosis have interfered with cavern development and integrity.

In the Empress area the Prairie Evaporite is overlain by the Second Red Bed unit which is composed of shale with some dolomite. As such, it forms an effective seal above the salt which would prevent fluid migration, and is likely why there no salt dissolution features visible on seismic data.

Work Performed

Landis examined the 14-36-20-1 W4M core of the Prarie Evaporite at the EUB core library in Calgary with people experienced in developing salt caverns. The core report is included in Part C of this report.

To determine the geometry of the salt in the area, trade 2D seismic data was purchased, reprocesses, and interpreted. A synthetic seismogram was generated from the 14-36 sonic log to tie to the seismic data. The seismic report is presented in Part C.

A one day field trip was conducted, to examine the "lay of the land" to see if there were any obvious surface impediments to developing a hydrocarbon storage facility.

Conclusion and Recommendation

It was determined that the core from the 14-36 well represents salt that would be suitable for cavern development and hydrocarbon storage, as the level of insolubles is low and there are no thick anhydrite beds throughout the center portion of the salt. The top of the Prairie Evaporite occurs at 1635.3m MD in the core, with the bottom of the Prairie Evaporite occurring at 1700.1m MD, However, below 1691m dolomite and anhydrite are the dominant rock types, so the usable salt for cavern development would be from 1635.3m to 1691m, or 55.7m. A cavern would leave a few metres of salt at the top and bottom to ensure a seal.

The seismic data indicates that the Prarie Evaporite in the area is relatively flat lying, with the top occurring between 1625m and 1630m depth. The seismic thickness of usable salt (factoring in 9m of dolomite, anhydrite and salt at the bottom of the formation which is not usable) varies from 51m to 56m. There are no apparent biohermal build ups in the underlying Winnipegosis formation. Also, there are no apparent faults or salt dissolution features.

It is apparent that the salt underlying permit 9307010951 is suitable for the development of underground hydrocarbon storage caverns. Prior to cavern development a detailed 3D seismic program is recommended.

EXPENDITURE STATEMENT BY ACTIVITY

	AMOUNT SPENT
1. Prospecting	$
2. Geological mapping & petrography	$
3. Geophysical Surveys	
a. Airborne	$
b. Ground	$
4. Geochemical Surveys	$
5. Trenching and Stripping	$
6. Drilling	$
7. Assaying & whole rock analysis	$
8. Other Work drill core logging, seismic purchase and processing and interpretation, data analysis	$ 12,574.28
SUBTOTAL	$ 12,574.28
9. Administration (10% of subtotal)	$ 1257.43
TOTAL	$ 13,831.71

[redacted]
SIGNATURE

March 24, 2009
DATE

John Hilland
PRINT NAME

Author Qualifications

I, John Hilland, residing at Calgary, Alberta, Canada do hereby certify that:

1. I am a Professional Geologist with Kaminak Resources Ltd., at Suite 496, 222 – 3rd Avenue S.W. Calgary, Alberta, T2B 0B4.
2. I am a graduate of the University of British Columbia, with a Bachelor Degree in Applied Science in Geological Engineering, 1985, and have practiced my profession continuously since 1986.
3. I am registered as a Professional Geologist with APEGGA and with APEGS.
4. I have not received, nor do I expect to receive, any interest directly or indirectly, in the Empress Salt Cavern Project. I do own securities in Landis Energy Corporation, and am an officer and director of the Corporation.
5. I am not aware of any material fact or material change with respect to the subject matter of the Report which is not reflected in the Report, or the omission to disclose which makes the Report misleading.

[redacted]

John Hilland, P. Geol., P. Geo.
Calgary, Alberta, Canada
March 24, 2009

References

Grobe, M., 2000, "Distribution and Thickness of Salt Within the Devonian Elk Point Group, Western Canada Sedimentary Basin", *Alberta Energy and Utilities Board, Alberta Geological Survey, Earth Sciences Report 2000-02.*

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Appendix 2: Figure 3: Synthetic Seismic Model

Appendix 1

LANDIS ENERGY CORPORATION

Empress Gas Storage Project

Core Examination

Prairie Evaporite Formation

CDN LAND MED HAT 14-36-20-1 W4M

Prepared For: John Hilland, Landis Energy Corporation

By: Amjad Riaz, Pro Geo Consultants

March 2008

Pro Geo Consultants

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WELL SUMMARY

WELL NAME:	CDN LAND MED HAT 14-36-20-1
LOCATION:	LSD 14 SEC 36 TWP 20 RGE 01 W 4 M
UWI:	00143602001W400
WELL LICENSE:	# 0162547, licensed in the name of Canadian Landmasters Resources Services Ltd.
ELEVATIONS:	Ground: 723.2m KB: 727.48m
OPERATOR:	Enron Oil Canada Ltd.
DRILL CONTRACTOR:	Precision Drilling Rig # 5
WELLSITE SUPERVISION:	Engineer: Peter Aubrect
	Geologist: Bill Baillie
WELL SPUDDED:	0700 hrs; January 6, 1994
DRILLING COMPLETED:	N/A hrs; January 23, 1994
BOTTOM HOLE FORM:	Winnipegosis
TOTAL DEPTH:	Driller: 1704m Logger: 1703.5m
BIT SIZES:	Surface: 349mm
	Downhole: 222mm
CASING SIZES:	Surface: 244.5mm, landed @ 391.2m
	Final: 177.8mm, landed @ 1402.5m
CORES CUT:	Core #1: Interval: 1158 - 1185, Cut: 27m, Recv'd: 27m
	Core #2: Interval: 1185 – 1203.8m, Cut: 18.8m, Recv'd: 18.8m
	Core #3: Interval: 1613 – 1640m, Cut: 27m, Recv'd: 25.7m
	Core #4: Interval: 1640 – 1667m, Cut: 27m, Recv'd: 27m
	Core #5: Interval: 1667 – 1694m, Cut: 27m, Recv'd: 27m
	Core #6: Interval: 1694 – 1704m, Cut: 10m, Recv'd: 10m
LOGS RUN:	Schlumberger: full suite plus sonic
DRILL STEM TESTS:	DST 1: Fm: Nisku, misrun
	DST 2: Fm: Nisku, Interval: 1180m – 1203m Rec'd 226m water
	DST 3: Fm: Nisku, misrun
	DST 4: Fm: Nisku, Interval: 1158.5m – 1176.5m Rec'd 952m water
RIG RELEASE:	2400 hrs; January 29, 1994
WELL STATUS:	Cased to 1402.5m, plugged back from 1704m TD to 1540m
ADDITIONAL:	Performed frac test 1622m -1624m

Formation Tops

Formation	Depth (m)
2nd White Specks	627.8
Base Fish Scales	683.5
Bow Island	746.8
Mannville	838.8
Pekisko	914
Banff	975.6
Upper Devonian	1095.9
Big Valley	1101.1
Stettler	1116.9
Nisku	1160.2
Peechee	1202.7
Cooking Lake	1402.5
Beaverhill Lake	1455.7
1st Red bed	1615.7
Dawson Bay	1618.3
2nd Red bed	1622
Prairie Evaporite	1635.3
Winnipegosis	1700.7
Total Depth	1704

Core Descriptions for 100/14-36-020-01W4/00

1613m to 1615m (2.00m)

Dolomite
Light brown, very fine to fine crystalline, possible algal matter, stromatoporoids, indistinct fossil.

1615 to 1617.5 (2.50)

Shale
Greenish gray, slightly dolomitic.

1617.5 to 1623 (5.50)

Dolomite
Light brown, very fine to fine crystalline, indistinct fossil, stylolitic vuggy, 6% intercrystalline & vuggy porosity.

1623 to 1626.5 (3.50)

Dolomite
Light brown, microcrystalline to very fine crystalline, thin bituminous shale bands, in part brecciated, trace intercrystalline porosity.

1626.5 to 1630 (3.50)

Shale
grayish green, dolomitic, occasional anhydrite inclusions.

1630 to 1635.3 (5.30)

Shale
Red, occasionally red green mottled, slightly dolomitic.

Formation: Prairie Evaporite TVD: 1635.3m MD: 1635.3m Salt

1635.3 to 1650 (14.70)

Salt
Pink to red, very coarse crystalline, sylvite inclusions, occasionally red shale partings & inclusions (1644.5 to 1647m), 15 to 20% shale inclusions.

1650 to 1653.52 (3.52)

Salt
White, clear, light gray, very coarse crystalline, thin white anhydrite partings, stringers.

1653.52 to 1655.1 (1.58)

Salt
Pink, white mottled, sylvite inclusions, 10% light brown dolomite with trace porosity fill with salt.

1655.1 to 1656 (0.90)

Dolomite
Light brown, microcrystalline to very fine crystalline, salt casts, porosity in part fill with salt.

1656 to 1663.92 (7.92)

Salt
Pink, red, very coarse crystalline, sylvite inclusions, possible 5 to 10% red argillaceous matter.

1663.92 to 1667 (3.08)

Salt
As above, 10 to 20% red argillaceous & shale partings & inclusions, in part green shale inclusions.

1667 to 1669.7 (2.70)

Salt
As above, green shale inclusions to 5%.

1669.7 to 1671.4 (1.70)

Salt
Pink, very coarse crystalline, 10 to 15% leached out & in part fill with green shale, sylvite inclusions.

1671.4 to 1672.5 (1.10)

Salt
Pink to white, very coarse crystalline, in part sylvite inclusions, trace argillaceous matter.

1672.5 to 1675.8 (3.30)

Salt
White, clear, very coarse crystalline, trace green argillaceous matter, trace sylvite inclusions, trace anhydrite & dolomite inclusions.

1675.8 to 1680.2 (4.40)

Salt
Pink, white, occasionally mottled, very coarse crystalline, sylvite inclusions, trace white anhydrite stringers, trace green & red argillaceous matter.

1680.2 to 1691 (10.80)

Salt
White, light gray, clear & occasionally pink, very coarse crystalline, sylvite inclusions, trace argillaceous matter, occasionally light brown to light gray dolomite stringers with salt casts, occasional anhydrite stringers.

1691 to 1694 (3.00)

Dolomite
Light brown to light gray, microcrystalline, in part argillaceous, algal matter ?, trace anhydrite inclusions, abundant salt casts, porosity plugged with salt, brecciated & fill with salt.

1694 to 1694.6 (0.60)

Anhydrite
Light gray, white mottled, microcrystalline, slightly argillaceous, in part dolomitic, salt casts.

1694.6 to 1694.8 (0.20)

Salt
White, clear, very coarse crystalline, anhydrite bands.

1694.8 to 1695.1 (0.30)

Dolomite
Light brown, microcrystalline to very fine crystalline, abundant salt casts, tight.

1695.1 to 1695.6 (0.50)

Anhydrite
Light gray, microcrystalline, argillaceous, brecciated & fill with salt, salt casts.

1695.6 to 1695.8 (0.20)

Salt
Clear, white, very coarse crystalline.

1695.8 to 1696.64 (0.84)

Anhydrite
As above.

1696.64 to 1698.78 (2.14)

Salt
Pink, white, very coarse crystalline, mottled, argillaceous dolomite & anhydrite stringers.

1698.78 to 1700.7 (1.92)

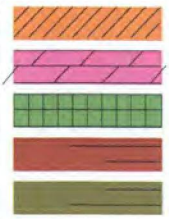
Anhydrite
Light gray, microcrystalline, light brown dolomite stringers, dense.

Formation: Winnipegosis TVD: 1700.7m MD: 1700.7m Dolomite

1700.7 to 1704 (3.30)

Dolomite
Light brown, microcrystalline to very fine crystalline, 10% salt casts, occasional thin shale bands, occasional white anhydrite patches, 0.20m at the end intercrystalline & vuggy porosity to 15%.

Legend



Anhydrite primary (Rock)

Dolomite (Rock)

Salt (Rock)

Shale red (Rock)

Shale green (Rock)

Anhydrite primary (Stringers)

Dolomite (Stringers)

Shale dark gray (Stringers)

Shale red (Stringers)

Shale green (Stringers)

X — Intercrystalline - interfragmental - intergranular (Porosity)

V — Vuggy (Porosity)

Algae non descript (Fossil)

Argillaceous (Accessory)

Dolomitic (Accessory)

F — Fossil (Fossil)

Salt casts (Accessory)

Stromatoporoid - irregularly shaped or encrusting (Fossil)

Stylolitic (Accessory)

* Abundance: Trace Occasional Common Abundant No Indication

Core Log

Well Name: CDN LAND MED HAT 14-36 Location: 14-36-020-01W4

UWI: 100143602001W400

KB: (m)

Hole ID:

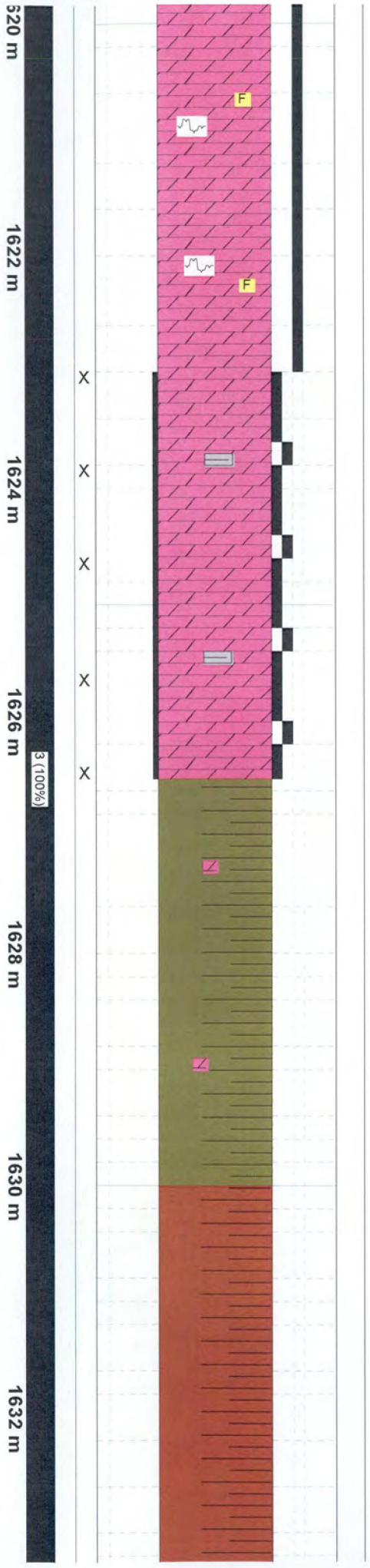
Ground / Collar: (m)

UTM East:

UTM North:

PRO GEO CONSULTANTS
Tel: (403) 262-9229
Fax: (403) 265-0377
Email: Progeo@telus.net

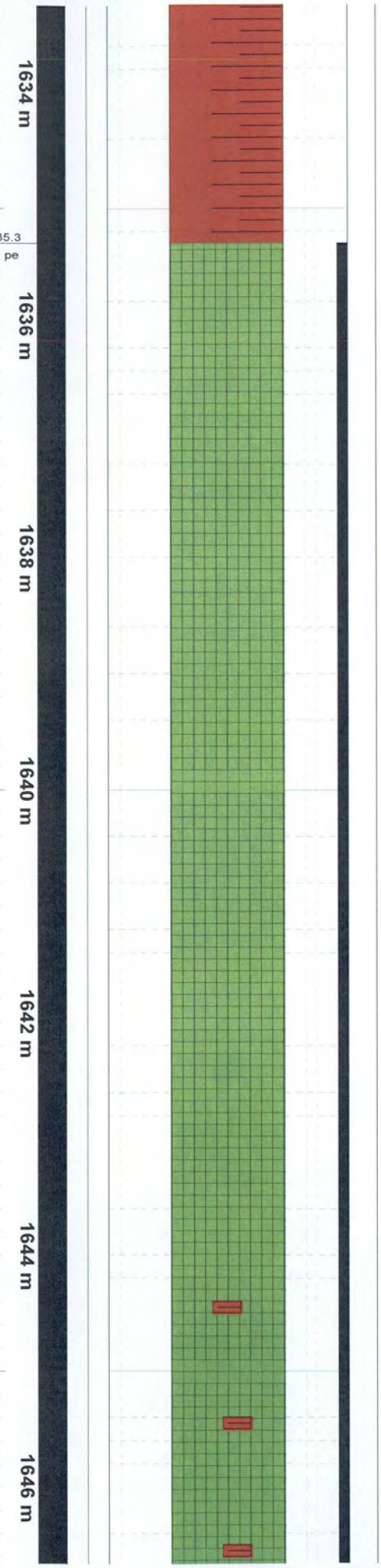
Date	Drilling Progress: Total Gas (units) 0 / 750 / 1500; Drill Rate (min/m) 0 / 7.5 / 15	Depth	Core	Oil Shows	Porosity Type	Porosity (%) 5 / 10 / 15 / 20	Interpreted Lithology	Grain Size (c sltst, vf sndst, f sndst, m sndst, c sndst)	Sorting	Rounding	Lithology Description
		1612 m									CORE DESCRIPTION Core #3: 1613-1640m Core #4: 1640-1667m Core #5: 1667-1694m Core #6: 1694-1704m
	Core study starts @ 1613m in Elk Point	1614 m					F, F				Dol: Lt brn, vf - f xln, pos algl mat, stroms, indst fos.
		1616 m									Sh: Gnsh gy, slly dolic.
		1618 m			X V X V X		F, F, F				Dol: Lt brn, vf - f xln, indst fos, stylic vugy, 6% intxl & vugy por.
		1					F				



Dol: Lt brn, micxl - vf xln, thn bits sh bnds, ip brecd, tr intxl por.

Sh: gysh gn, dolic, occ anhy incls.

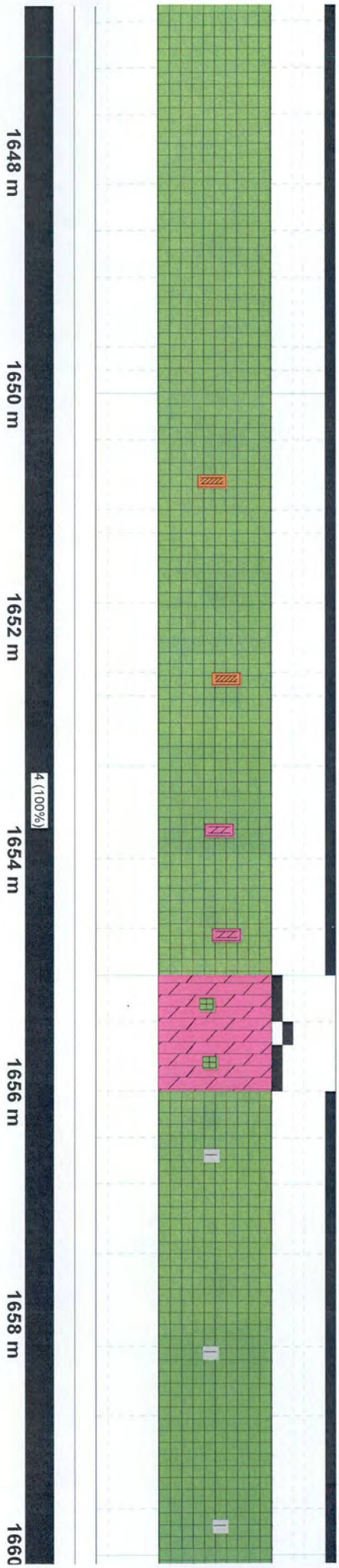
Sh: Red, occly red gn mot, slly dolic.



35.3

Prairie Evaporite pe
(TVD: 1635.3)

Sa: Pk - red, vc xln, syl incls, occly red sh ptgs & incls (1644.5 - 1647m), 15 - 20% sh incls.

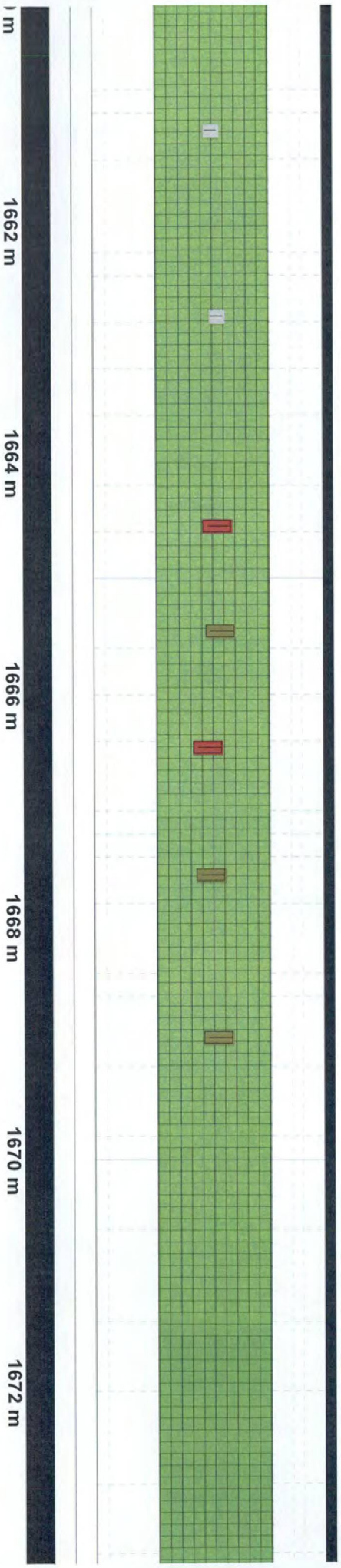


Sa: Wh, clr, lt gy, vc xln, thn wh anhy ptgs, strgs.

Sa: Pk, wh mot, syl incls, 10% lt brn dol / tr por fl / sa.

Dol: Lt brn, micxln - vf xln, sacs, por ip fl / sa.

Sa: Pk, red, vc xln, syl incls, pos 5 - 10% red arg mat.



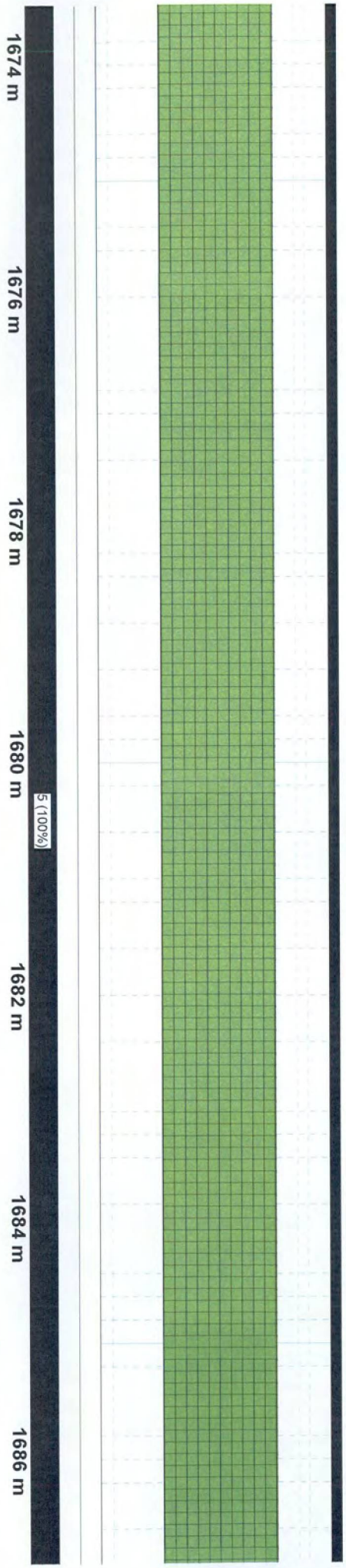
Sa: As abv, 10 - 20% red arg & sh ptgs & incls, ip gn sh incls.

Sa: As abv, gn sh incls to 5%.

Sa: Pk, vc xln, 10 - 15% lchd out & ip fl / gn sh, syl incls.

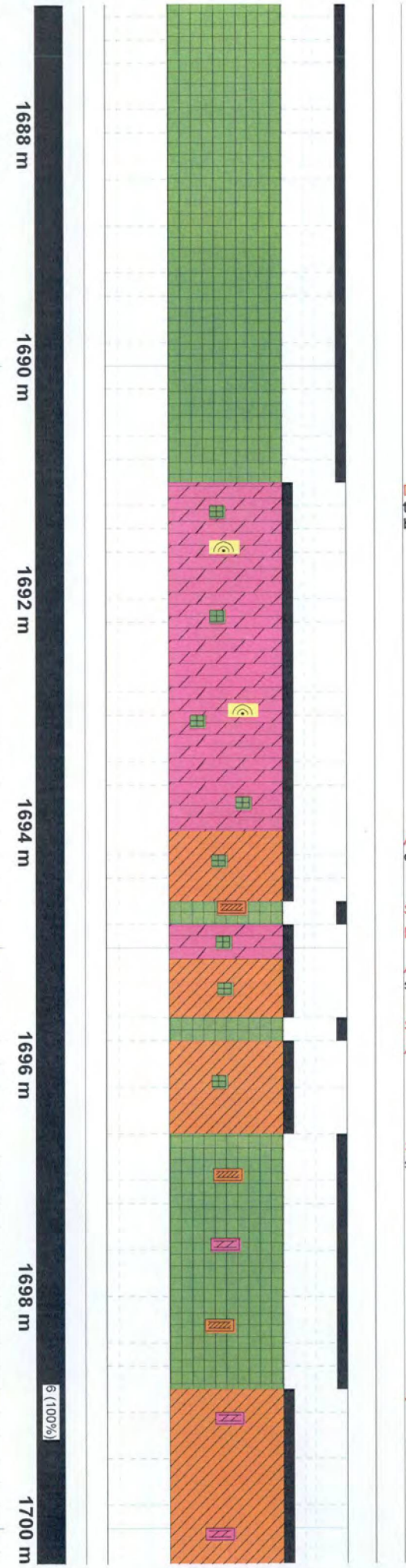
Sa: Pk - wh, vc xln, ip syl incls, tr arg mat.

Sa: Wh, clr, vc xln, tr gn arg mat, tr syl incls, tr anhy & dol incls.



Sa: Pk, wh, occly mot, vc xln, syl incls, tr wh anhy strgs, tr gn & red arg mat.

Sa: Wh, lt gy, clr & occly pk, vc xln, syl incls, tr arg mat, occly lt brn - lt gy dol strgs / sacs, occ anhy strgs.



Dol: Lt brn - lt gy, micxln, ip arg, algl mat ?, tr anhy incls, abnt sacs, por plugged / sa, brecd & fl / sa.

Anhy: Lt gy, wh mot, micxl, slly arg, ip dolic, sacs.

Sa: Wh, clr, vc xln, anhy bnds.

Dol: Lt brn, micxl - vf xln, abnt sacs, tt.

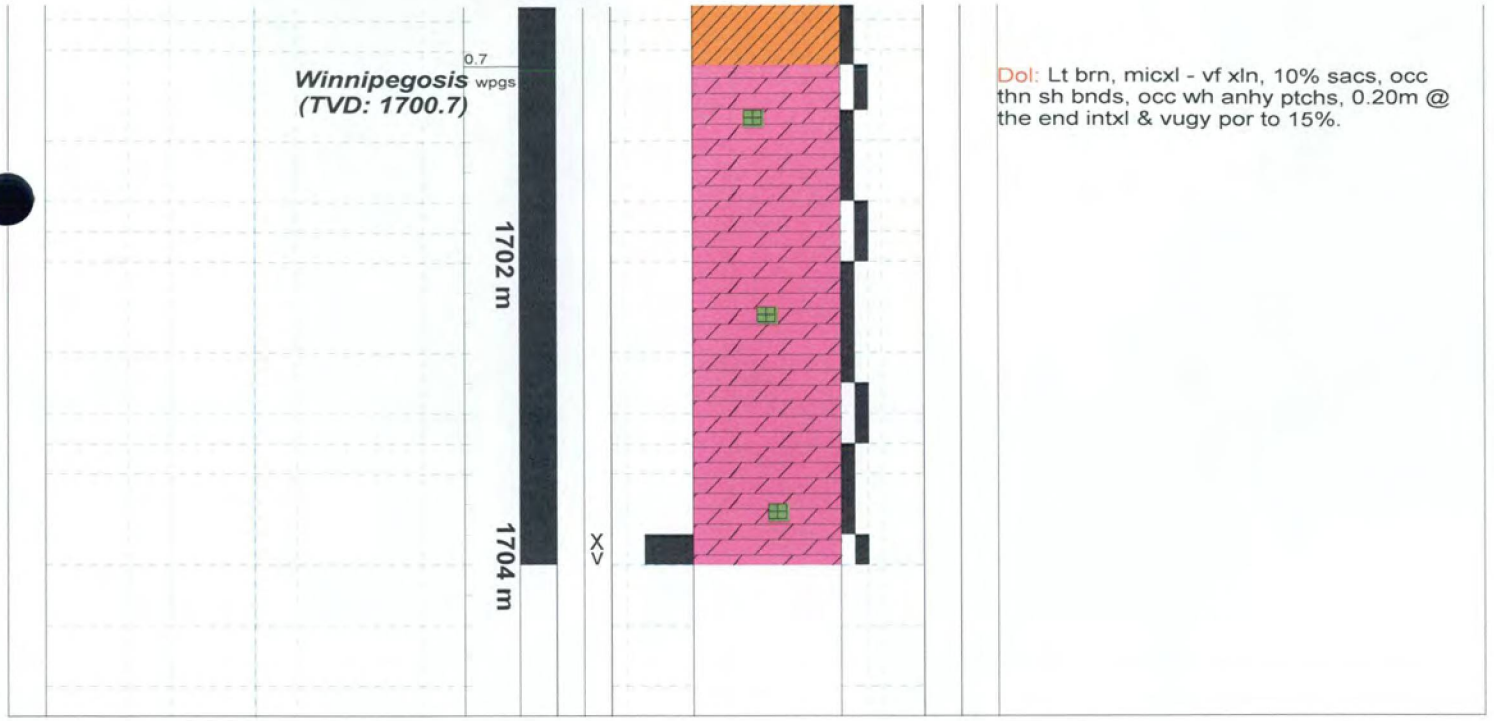
Anhy: Lt gy, micxl, arg, brecd & fl / sa, sacs.

Sa: Clr, wh, vc xln.

Anhy: As abv.

Sa: Pk, wh, vc xln, mot, arg dol & anhy strgs.

Anhy: Lt gy, micxl, lt brn dol strgs, dns.


0.7
Winnipegosis wpgs
(TVD: 1700.7)
1702 m
1704 m
X
V
Dol: Lt brn, micxl - vf xln, 10% sacs, occ thn sh bnds, occ wh anhy ptchs, 0.20m @ the end intxl & vugy por to 15%.

Appendix 2

September 6, 2008.

Landis Energy Corporation.

Area: Empress, Alberta.

P- Wave 2D Seismic Analysis of the Devonian Prairie Evaporite Formation for Cavernous Storage.

Introduction.

Landis Energy Corporation requested a seismic evaluation of the Devonian Elk Point Group Prairie Evaporite Formation salt in the Empress area of Alberta and Saskatchewan. The objective of the evaluation is geologic candidacy for cavernous storage. Four seismic lines (2D) were purchased totalling 34 miles (Figure 1). The seismic data was reprocessed to industry standards. The 2D seismic grid was balanced and calibrated with well synthetic seismic data. The seismic data was interpreted with the objectives of depth conversion of the top of the Prairie Evaporite Formation, generation of a Prairie Evaporite thickness, and determining the presence of any lateral variations of the Prairie Evaporite Formation.

Seismic Data Purchase.

Conventional seismic data in the Empress area available for license was quality inspected (Figure 2). Within the evaluation area, the data is high in quality with a high signal to noise ratio and favourable surface access for placement of geophones and seismic sources. The burial depth of the Prairie Evaporite salt averages 1600 meters. This depth generates acceptable seismic fold and trace-offset statistics at the Prairie Evaporite level for most seismic data available for purchase.

A small 3D seismic program is available for purchase within the project area.

Seismic Data Processing.

The seismic data was reprocessed at Divestco Processing (formerly Geo-X Processing) with quality control by ARCL. (Figures 3 to 6).

ARCL applied a time domain Ormsby filter with bandwidth 10 15 60 80 Hz. to each line. Spectral analysis suggested that the applied filter approximates the bandwidth of the seismic data at the Prairie Evaporite level (Figure 7).

September 6, 2008.

Landis Energy Corporation.

Area: Empress, Alberta.

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Seismic Data Modelling.

The seismic data was grid balanced using a line consistent three parameter (bulk shift, phase, amplitude) least squares solution computed at each seismic line intersection.

A dispersion correction was made to P wave sonic log data from Well 14-36-020-01W400. This well penetrates Precambrian basement and is located 625 meters east of seismic line ES-34.

The grid balanced seismic data received a bulk phase correction to zero phase computed at Well 14-36-020-01W400 using a well sonic correlation to seismic line ES-34 (Figure 8).

The various formations tops depicted on the seismic lines were interpreted based on a synthetic seismic model computed from sonic well data from Well 14-36-020-01W400 (Figure 9).

Seismic Interpretation.

The seismic data showed no lateral variations of the Prairie Evaporite Formation. Variations may be expected from, salt dissolution, Winnipegosis Formation reef developments, salt tectonism (flowage) or faulting of the Prairie Evaporite Formation (see included seismic sections for each line).

The Gamma Ray log Well 14-36-020-01W400 suggests limited clay minerals present within a Prairie Evaporite salt. The seismic data cannot delineate synsedimentary lithologic changes within the Prairie Evaporite Formation. However, the seismic character within the formation is relatively opaque suggesting a laterally consistent salt facies within a cratonic (Elk Point) basin.

Seismic Depth Conversion.

The seismic depth conversion of the top of the Prairie Evaporite Formation was made using a single well apparent velocity (2898 meters/second) computed at Well 14-36-020-01W400. This velocity was used to convert seismic time to depth. The reference datum for the map is 800 meter ASL. This datum is approximately 75 meters above the average surface elevation in the area. A Kriging algorithm was employed for map gridding (see included map).

Salt Isopach Calculation.

The seismic thickness of the Prairie Evaporite Formation was estimated using a single well apparent interval velocity (5404 meters/second) computed at Well 14-36-020-01W400 between the Top of Prairie Evaporite and Top of Deadwood Formations. This velocity was used to convert the associated seismic isochron to an isopach. A correction of 101 meters was made to the isopach values to remove the basal non-evaporite sediments generating an estimate of evaporite thickness. A Kriging algorithm was employed for map gridding (see included map).

Conclusions.

The 2D conventional seismic data does not show variations that limit the Prairie Evaporite Formation salt present in Well 14-36-020-01W400 as a geologic candidate for cavern development in this area.

Seismic spatial coverage is relatively coarse.

Submitted by,

Peter Anderson, P.Geoph.

ARCL

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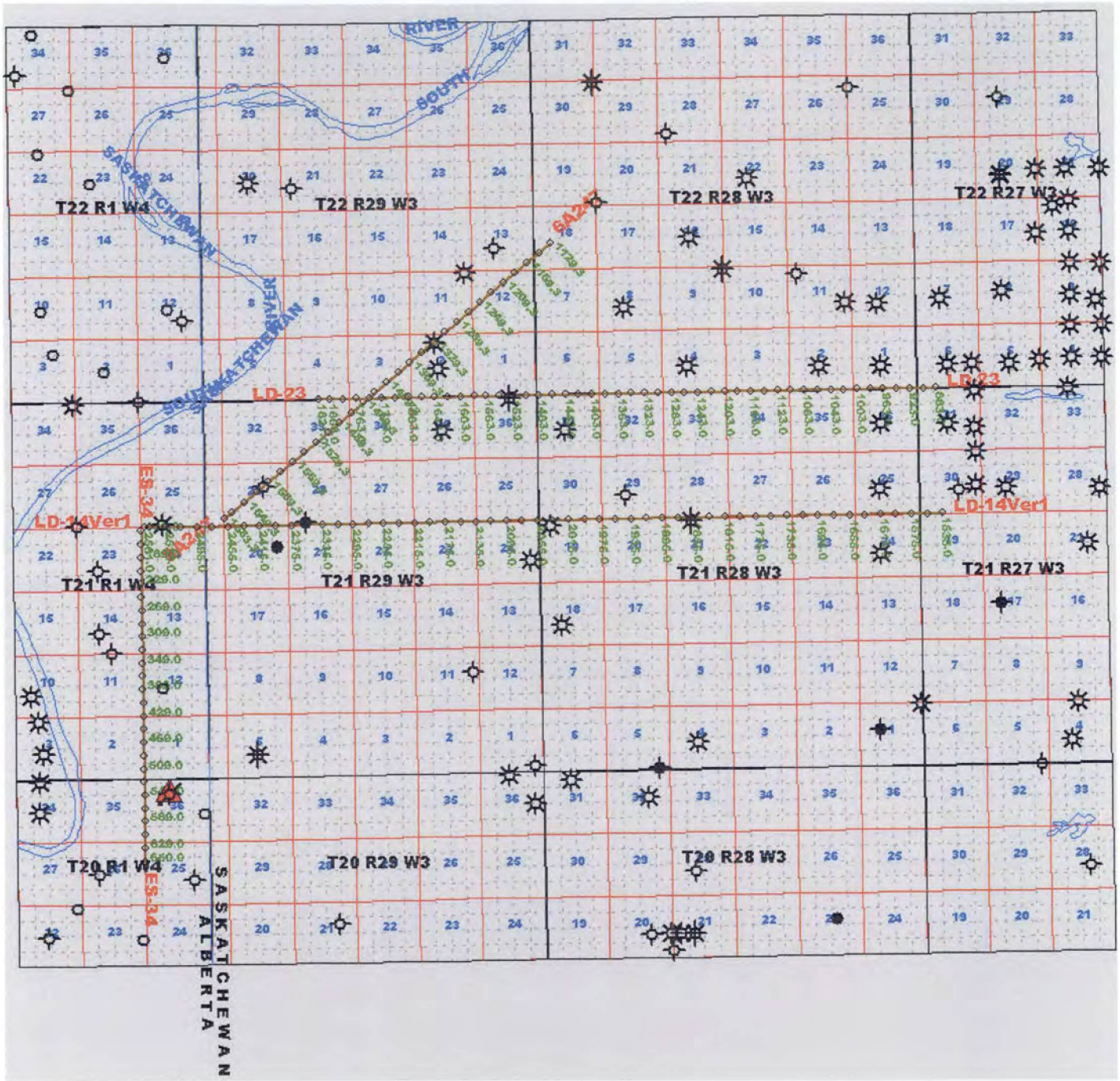
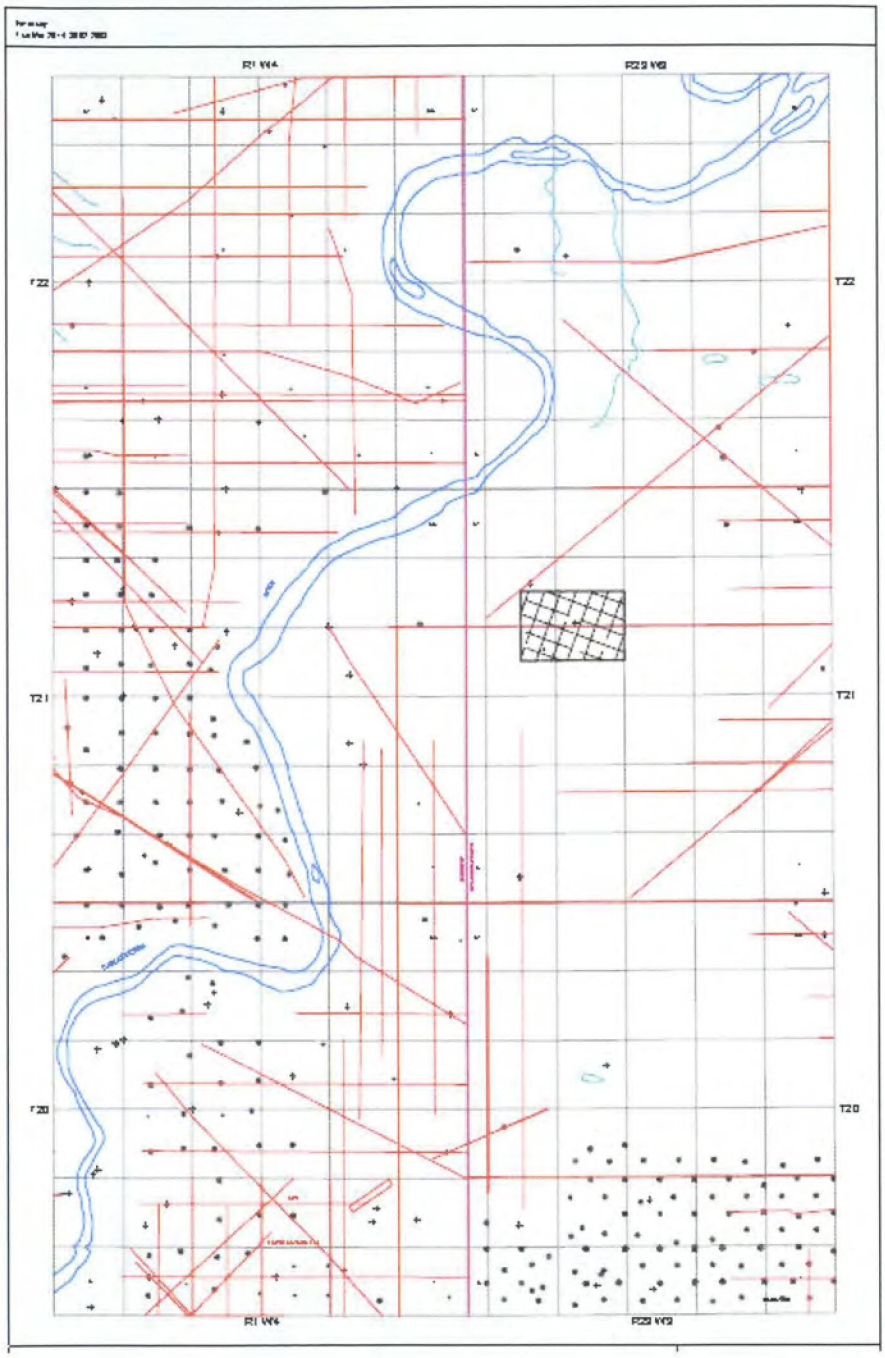


Purchased Seismic Data, Figure 1.



Seismic Data Available for Purchase, Figure 2.

C02 **Line: ES-34** AREA: Empress NAD: 27

C03 Location: Alberta Twp. 20-21 Rge. 1 W4M UTM ZONE: 12

C04 S.P. 620 —> North S.P. 149 CDPS 1 to 1003

C05 DATA TYPE: Filtered FREQ + TX DCON + MIGRATION

C06 Acquisition Pioneer Exploration Inc. PTY: 3

C07 Shot for: Focus September 1989

C08 Spread: Split 1020 - 17 * 17 - 1020 m.

C09 Source Interval: 51 m. Receiver Interval: 17 m. Fold: 20

C10 Source: Dynamite 2 by 0.5 kg. at 9 m. depth 2 Holes Over: 10 m.

C11 Receivers: Geospace 14 Hz. 9 over 16 m.

C12 Instruments: DFS-V 120 Trace SEG-B Gain: I.F.P.

C13 Record Filters: Out - 128 Hz. Notch: Out

C14 PROCESSING: EARTH SIGNAL PROCESSING LTD. Date: May 2008

C15

C16 Expn Scaling: T**p, p=1.8 First Breaks: Generalized Reciprocal Method (2)

C17 Datum: 800 m. Replacement Vel: 2000 m/s Weathering Vel: 610 m/s

C18 Surface Consistent Amplitude Scaling Trace Edits

C19 Dephasing: Designature minimum phase equivalent

C20 Surface Consistent Deconvolution: 5 Component (Frequency Domain)

C21 Zero Phase Frequency Domain Trace Deconvolution

C22 First break equalization. Ground roll equalization: Below 16 Hz.

C23 Laterally variant residual Scaling Time-Offset

C24 Trace gather: Max Fold = 21 Processing Datum: Surface in Time

C25 Velocities: Interactive semblance Surface Consistent Statics

C26 Velocities: Interactive semblance Trim statics: cmp cross correlation

C27 Mute Pairs: (d t) 1 204 200 612 650 1020 900

C28 Stack: Fold = 21 Multichannel Trace Scaling Residual Amplitude

C29 TV FREQ. EQUAL. 400 - 1150 ms. 1050 - 1600 ms. Crossover: 1100 ms.

C30 TX DCON NOISE REDUCTION 15 trace time variant 50 % N.R.

C31 Anti-Alias Kirchhoff Migration 100 % velocity

C32 Time Variant Filter: 8 / 12 - 100 / 120 8 / 12 - 80 / 90 Hz.

C33 Filter crossover midpt.: 1100 ms. Mean Scaling window: 400 1600 ms.

Line ES-34 Acquisition and Processing Parameters, Figure 3.

C02 **Line: LD-14** AREA: Empress NAD: 27

C03 Location: Alberta - Saskatchewan Twp. 21 Rge. 28-29 W3M - Rge. 1 W4M UTM ZO

C04 S.P. 2561 --> East S.P. 1566 CDPS 1 to 2053

C05 DATA TYPE: Filtered FREQ + TX DCON + MIGRATION

C06 Acquisition Sonics Exploration Ltd. PTY: 831

C07 Shot for: Sigma Exploration October 1985

C08 Spread: Split 1240 - 60 * 60 - 1240 m.

C09 Source Interval: 100 m. Receiver Interval: 20 m. Fold: 12

C10 Source: Vibroseis Type: Mertz 18 Sweep: 18-100 Hz. Non-Linear, +3 dB.

C11 Receivers: PC29 Geospace 14 Hz. 9 over 17.6 m.

C12 Instruments: DFS-V 120 Trace SEG-B Gain: I.F.P.

C13 Record Filters: Out - 128 Hz. Notch: Out

C14 PROCESSING: EARTH SIGNAL PROCESSING LTD. Date: May 2008

C15

C16 Expn Scaling: T**p, p=1.4 First Breaks: Generalized Reciprocal Method (2)

C17 Datum: 800 m. Replacement Vel: 2000 m/s Weathering Vel: 610 m/s

C18 Surface Consistent Amplitude Scaling Trace Edits

C19 Vibroseis Dephasing: Vibroseis Designature minimum phase equivalent

C20 Surface Consistent Deconvolution: 5 Component (Frequency Domain)

C21 Zero Phase Frequency Domain Trace Deconvolution

C22 First break equalization. Ground roll equalization: Below 16 Hz.

C23 Laterally variant residual Scaling Time-Offset

C24 Trace gather: Max Fold = 14 Processing Datum: Surface in Time

C25 Velocities: Interactive semblance Surface Consistent Statics

C26 Velocities: Interactive semblance Trim statics: cmp cross correlation

C27 Mute Pairs: (d t) 1 200 200 600 650 1240 1000

C28 Stack: Fold = 14 Multichannel Trace Scaling Residual Amplitude

C29 TV FREQ. EQUAL. 400 - 1150 ms. 1050 - 1600 ms. Crossover: 1100 ms.

C30 TX DCON NOISE REDUCTION 15 trace time variant 50 % N.R.

C31 Anti-Alias Kirchhoff Migration 100 % velocity

C32 Time Variant Filter: 8 / 12 - 100 / 120 8 / 12 - 80 / 90 Hz.

C33 Filter crossover midpt.: 1100 ms. Mean Scaling window: 400 1600 ms.

Line LD-14 Acquisition and Processing Parameters, Figure 4.

C02 **Line: 6A247** AREA: Empress NAD: 27

C03 Location: Saskatchewan Twp. 21-22 Rge. 29 W3M UTM ZONE: 12

C04 S.P. 1683 ---> N.E. S.P. 1159 CDPS 1 to 1109

C05 DATA TYPE: Filtered FREQ + TX DCON + MIGRATION

C06 Acquisition Gale Horizon PTY: 3

C07 Shot for: Esso Resources Canada Ltd. November 1990

C08 Spread: Split 1210 - 30 * 30 - 1210 m.

C09 Source Interval: 40 m. Receiver Interval: 20 m. Fold: 30

C10 Source: Dynamite 1 by 2 kg. at 12 m. depth Single Hole Shooting

C11 Receivers: LRS 1011 14 Hz. 9 over 20 m.

C12 Instruments: DFS-V 120 Trace SEG-B Gain: I.F.P.

C13 Record Filters: 14 - 128 Hz. Notch: Out

C14 PROCESSING: EARTH SIGNAL PROCESSING LTD. Date: May 2008

C15

C16 Expn Scaling: T**p, p=1.8 First Breaks: Generalized Reciprocal Method (2)

C17 Datum: 800 m. Replacement Vel: 2000 m/s Weathering Vel: 610 m/s

C18 Surface Consistent Amplitude Scaling Trace Edits

C19 Dephasing: Designature minimum phase equivalent

C20 Surface Consistent Deconvolution: 5 Component (Frequency Domain)

C21 Zero Phase Frequency Domain Trace Deconvolution

C22 First break equalization. Ground roll equalization: Below 16 Hz.

C23 Laterally variant residual Scaling Time-Offset

C24 Trace gather: Max Fold = 35 Processing Datum: Surface in Time

C25 Velocities: Interactive semblance Surface Consistent Statics

C26 Velocities: Interactive semblance Trim statics: cmp cross correlation

C27 Mute Pairs: (d t) 1 210 200 610 650 1210 1000

C28 Stack: Fold = 35 Multichannel Trace Scaling Residual Amplitude

C29 TV FREQ. EQUAL. 400 - 1150 ms. 1050 - 1600 ms. Crossover: 1100 ms.

C30 TX DCON NOISE REDUCTION 15 trace time variant 50 % N.R.

C31 Anti-Alias Kirchhoff Migration 100 % velocity

C32 Time Variant Filter: 8 / 12 - 90 / 110 8 / 12 - 70 / 80 Hz.

C33 Filter crossover midpt.: 1100 ms. Mean Scaling window: 400 1600 ms.

Line 6A247 Acquisition and Processing Parameters, Figure 5.

C02 **Line: LD-23** AREA: Empress NAD: 27

C03 Location: Saskatchewan Twp. 21-22 Rge. 28-29 W3M UTM ZONE: 12

C04 S.P. 1821 —> East S.P. 913 CDPS 1 to 1877

C05 DATA TYPE: Filtered FREQ + TX DCON + MIGRATION

C06 Acquisition Century Exploration (1988) Ltd. PTY: S-32

C07 Shot for: Sigma Exploration (1978) Ltd. November 1990

C08 Spread: Split 1020 - 17 * 17 - 1020 m.

C09 Source Interval: 68 m. Receiver Interval: 17 m. Fold: 15

C10 Source: Dynamite 1 by 0.5 kg. at 15 m. depth Single Hole Shooting

C11 Receivers: Mark 14 Hz. 9 over 17 m.

C12 Instruments: DFS-V 120 Trace SEG-B Gain: I.F.P.

C13 Record Filters: Out - 128 Hz. Notch: Out

C14 PROCESSING: EARTH SIGNAL PROCESSING LTD. Date: May 2008

C15

C16 Expn Scaling: T**p, p=1.8 First Breaks: Generalized Reciprocal Method (2)

C17 Datum: 800 m. Replacement Vel: 2000 m/s Weathering Vel: 610 m/s

C18 Surface Consistent Amplitude Scaling Trace Edits

C19 Dephasing: Designature minimum phase equivalent

C20 Surface Consistent Deconvolution: 5 Component (Frequency Domain)

C21 Zero Phase Frequency Domain Trace Deconvolution

C22 First break equalization. Ground roll equalization: Below 16 Hz.

C23 Laterally variant residual Scaling Time-Offset

C24 Trace gather: Max Fold = 17 Processing Datum: Surface in Time

C25 Velocities: Interactive semblance Surface Consistent Statics

C26 Velocities: Interactive semblance Trim statics: cmp cross correlation

C27 Mute Pairs: (d t) 1 204 200 612 650 1020 900

C28 Stack: Fold = 17 Multichannel Trace Scaling Residual Amplitude

C29 TV FREQ. EQUAL. 400 - 1150 ms. 1050 - 1600 ms. Crossover: 1100 ms.

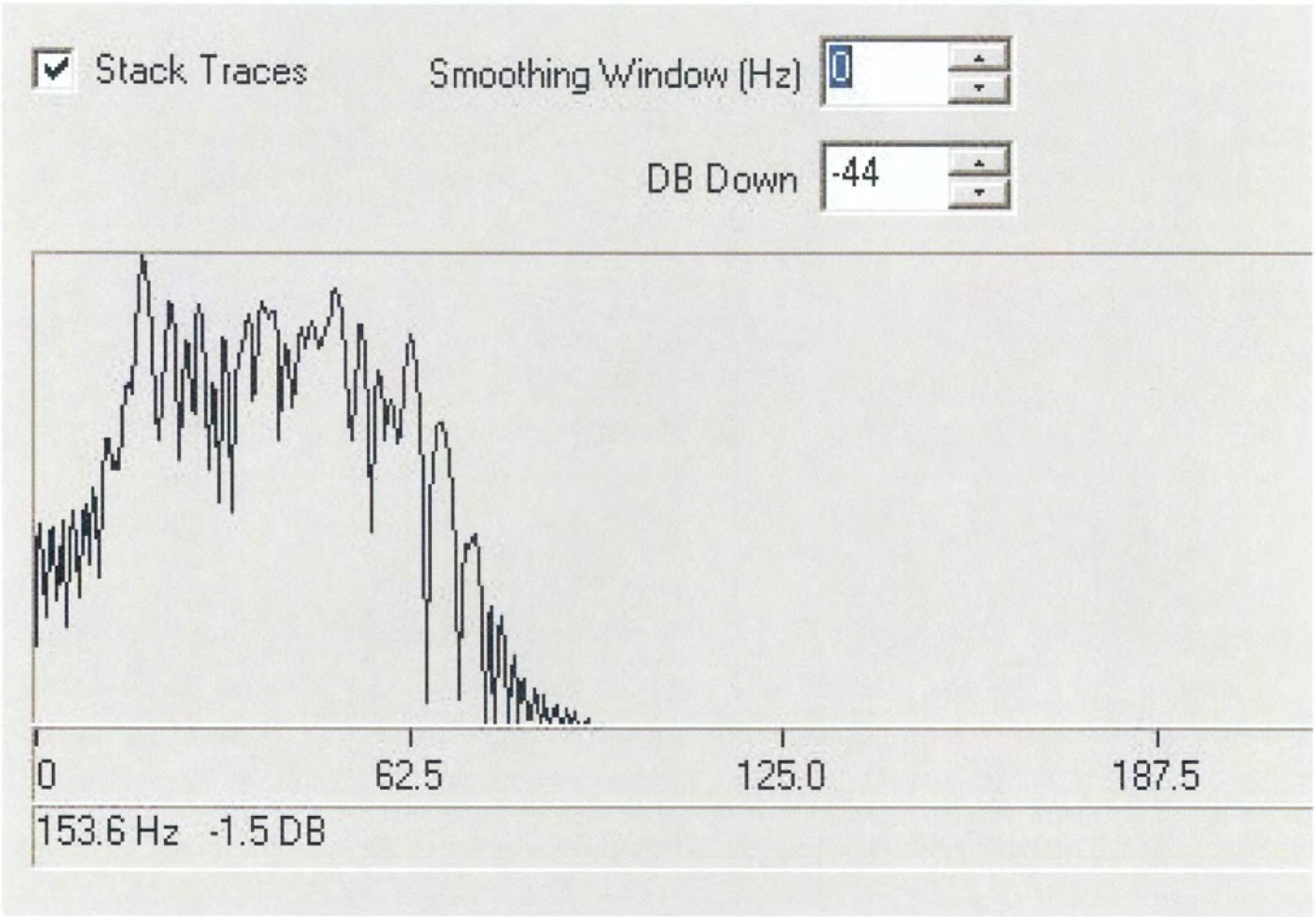
C30 TX DCON NOISE REDUCTION 15 trace time variant 50 % N.R.

C31 Anti-Alias Kirchhoff Migration 100 % velocity

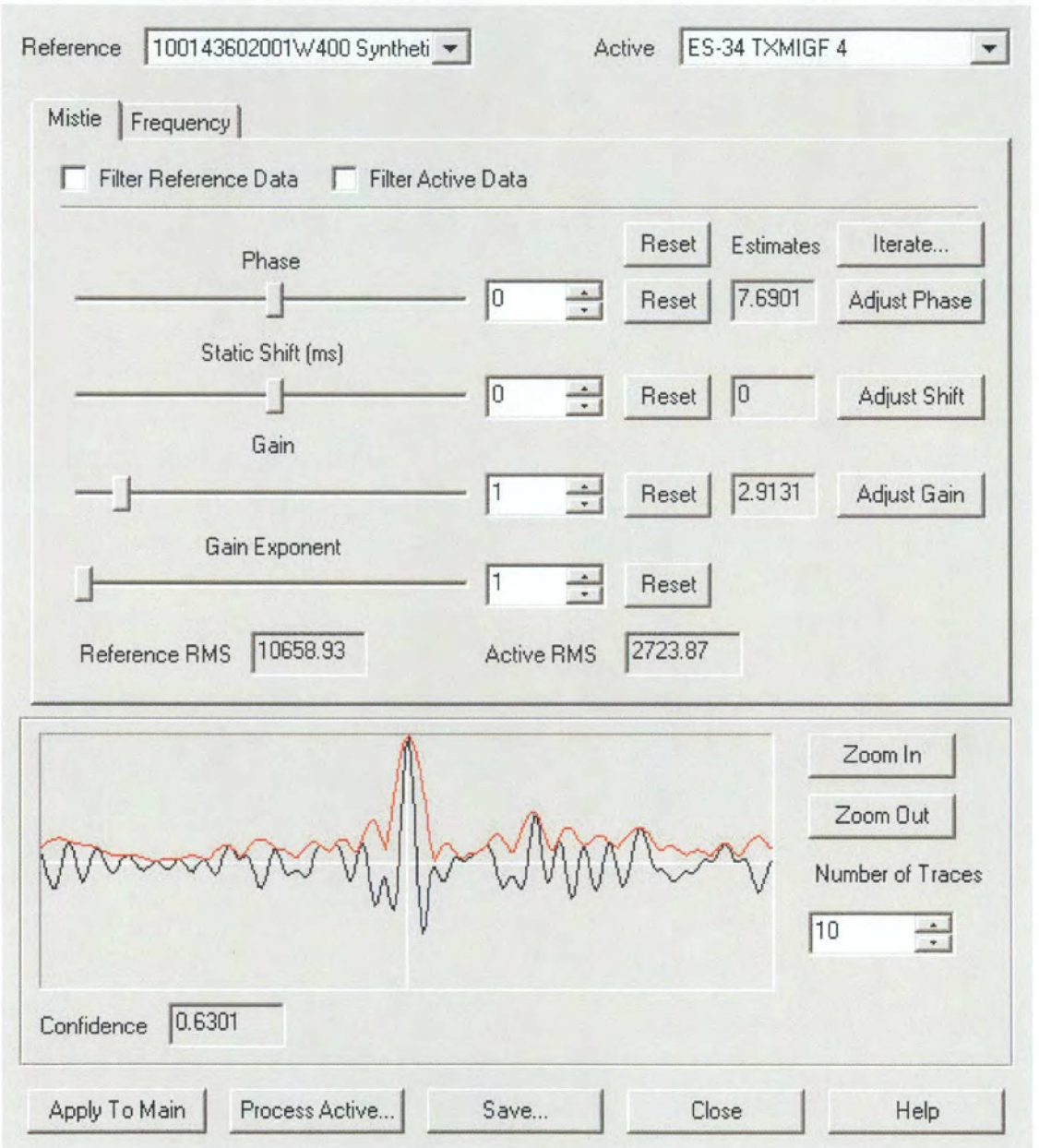
C32 Time Variant Filter: 8 / 12 - 110 / 130 8 / 12 - 90 / 110 Hz.

C33 Filter crossover midpt.: 1100 ms. Mean Scaling window: 400 1600 ms.

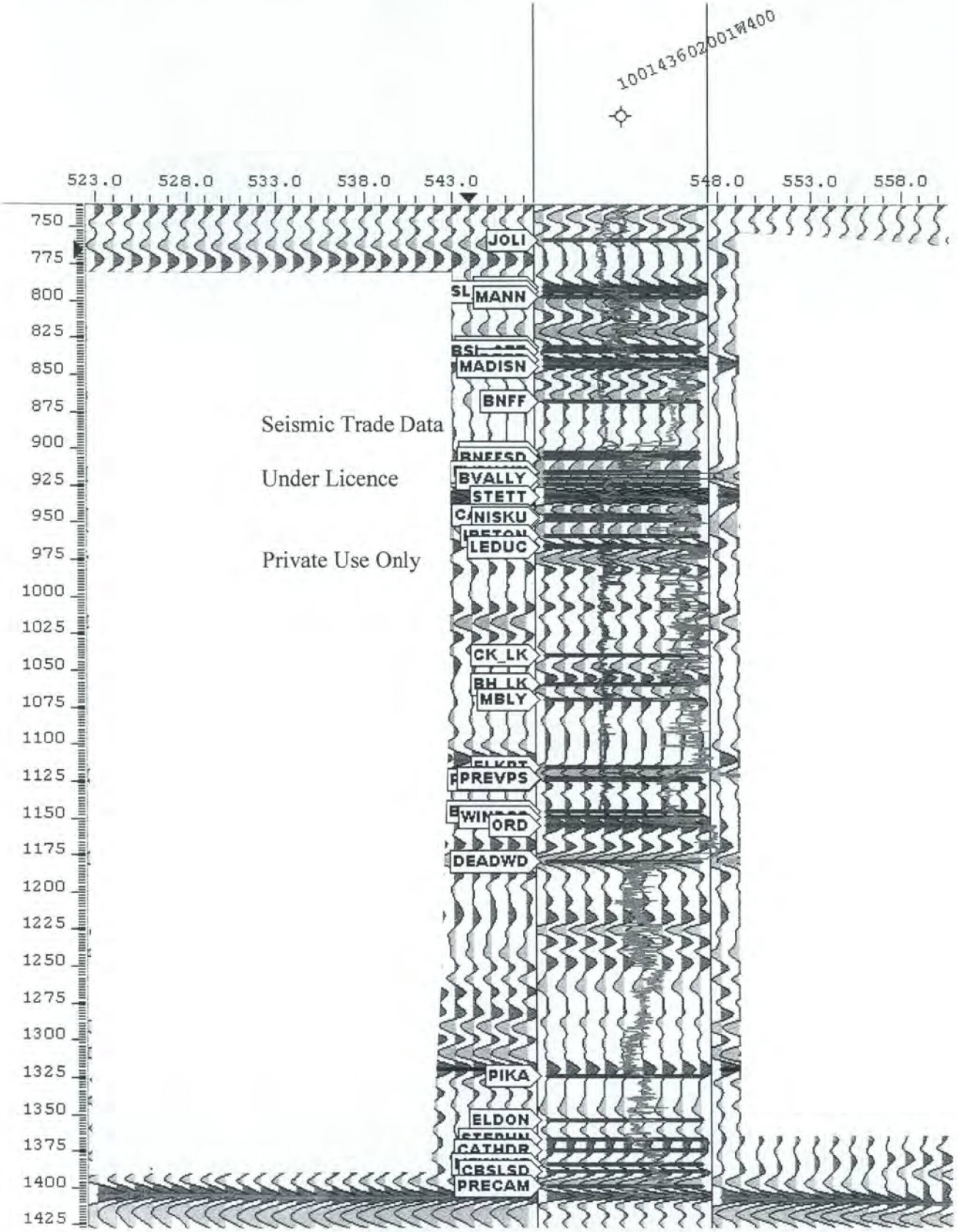
Line LD-23 Acquisition and Processing Parameters, Figure 6.



Seismic Temporal Bandwidth at Prairie Evaporite Formation Level, Figure 7.



Residual Phase (Bulk Phase Shift Applied), Figure 8.



Sonic and Gamma Logs Displayed ; 10 15 80 100 Zero Phase Ormsby Filter

Well Synthetic Tie to Seismic Line ES-34, Figure 9.

References

DISTRIBUTION AND THICKNESS OF SALT WITHIN THE DEVONIAN ELK POINT GROUP, WESTERN CANADA SEDIMENTARY BASIN

M. Grobe

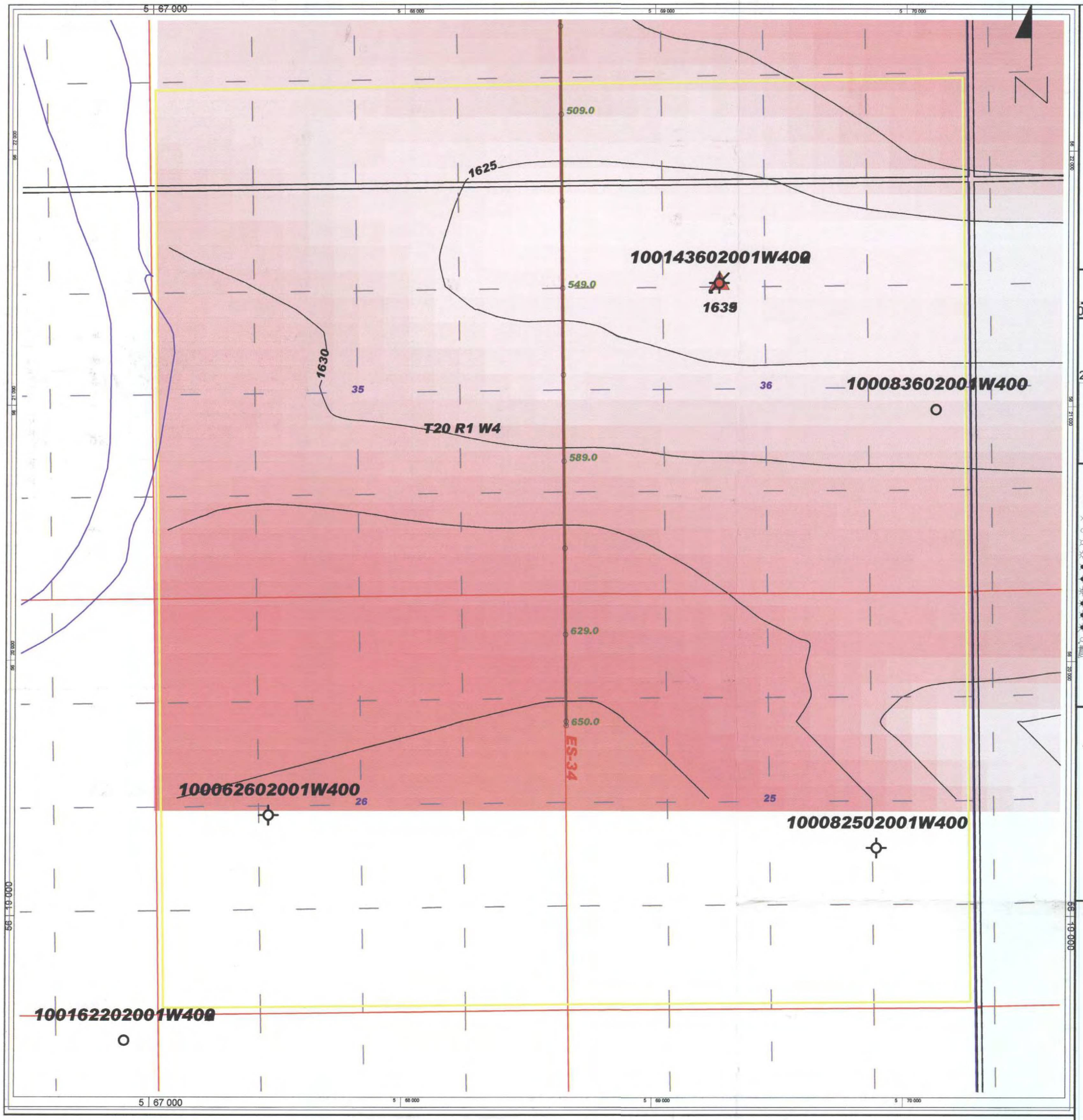
Alberta Energy and Utilities Board
Alberta Geological Survey
Earth Sciences Report 2000-02.

LANDIS ENERGY CORP.

Figure 1

PRAIRIE EVAPORITE FM. SALT WELL/SEISMIC DEPTH

CI : 5 meters.



Scale: 1:15000

0 1 2 3 4 5 6 7 8 9 10x100 m

0 1 2 3 4 5 6 7 8 9x0.1

Grid(s) Displayed: DS_Salt_100 Grid

Automatic (1620 - 1722)
Rainbow Inverted Lite

20 1629 1637 1645 1653 1661 1669 1677 1685 1694 1702 1710 1718

WELL LEGEND

Bottom Hole Locations:

- Unknown
- Drilling
- Service Well
- Gas
- Heavy Oil
- Abandoned Oil
- Abandoned Gas
- Oil & Gas Well
- Abandoned Heavy Oil
- Suspended Oil & Gas
- Injection
- Proposed Well
- Location
- Suspended
- Oil
- Dry Abandoned
- Suspended Oil
- Suspended Gas
- Abandoned Service Well
- Suspended Heavy Oil
- Abandoned Oil & Gas
- Test
- Gas Injector
- Standing

WELL CRITERIA LEGEND

- Has Sonic Curve

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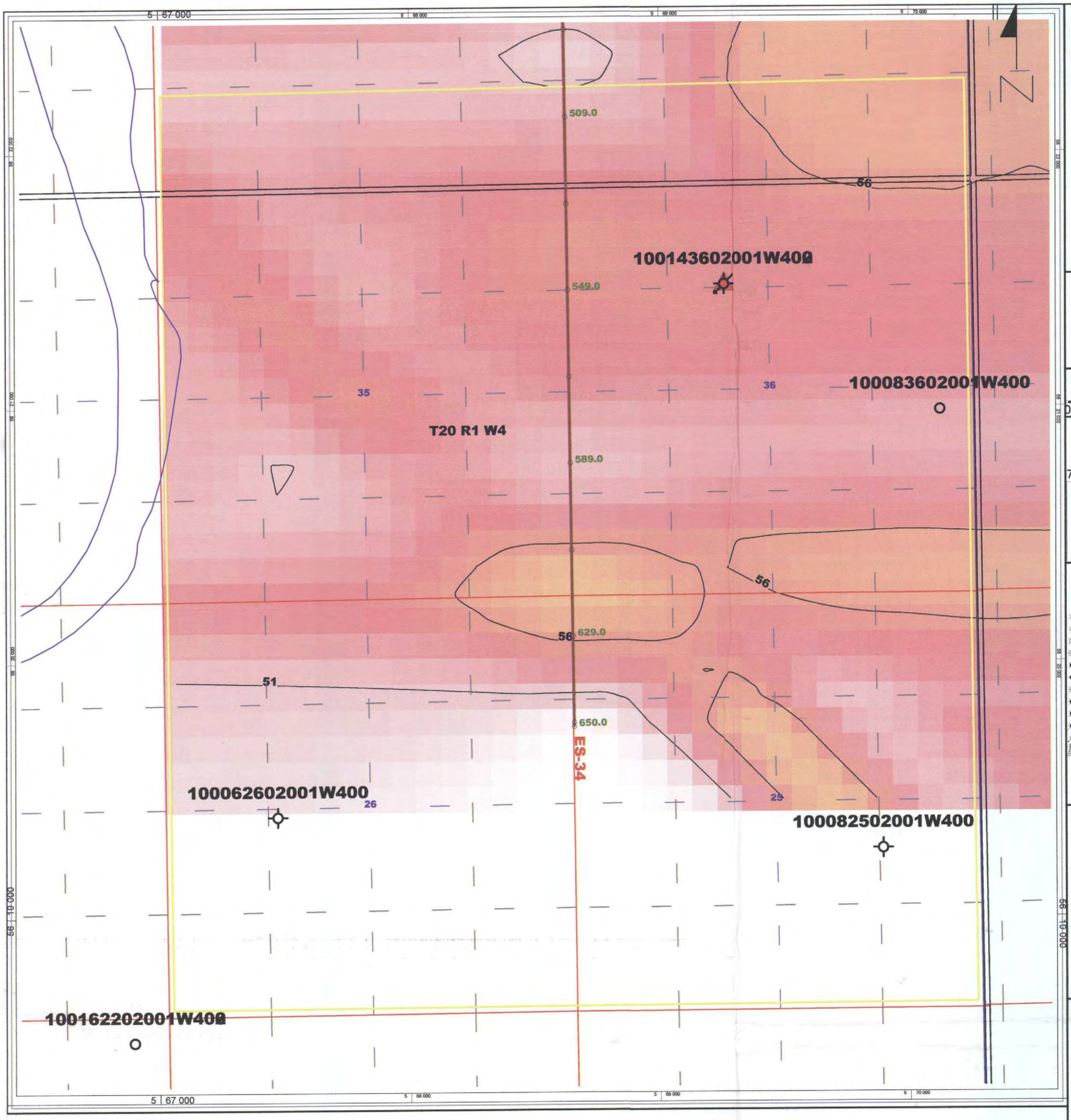
Figure 2

PRAIRIE EVAPORITE FM. SALT WELL/SEISMIC ISOPACH

CI : 5 meters.

Empress
Scale: 1:15000
Date: Tuesday March 10, 2009



Scale: 1:15000
0 1 2 3 4 5 6 7 8 9 10x100 m
0 1 2 3 4 5 6 7 8 9x0.1

Grid(s) Displayed: IP_Salt_100 Grid

Automatic (47 - 86)
Rainbow Inverted Lite
7 49 50 52 53 55 56 58 60 61 63 64 66 67 69 71 72 74 75 77 78 80 82 83 85 8

WELL LEGEND

Bottom Hole Locations:

- Unknown
- Drilling
- Service Well
- Gas
- Heavy Oil
- Abandoned Oil
- Abandoned Gas
- Oil & Gas Well
- Abandoned Heavy Oil
- Suspended Oil & Gas
- Injection
- Proposed Well
- Location
- Suspended
- Oil
- Dry Abandoned
- Suspended Oil
- Suspended Gas
- Abandoned Service Well
- Suspended Heavy Oil
- Abandoned Oil & Gas
- Test
- Gas Injector
- Standing

WELL CRITERIA LEGEND

- Has Sonic Curve

Printed on Tuesday March 10, 2009 at 04:53 PM

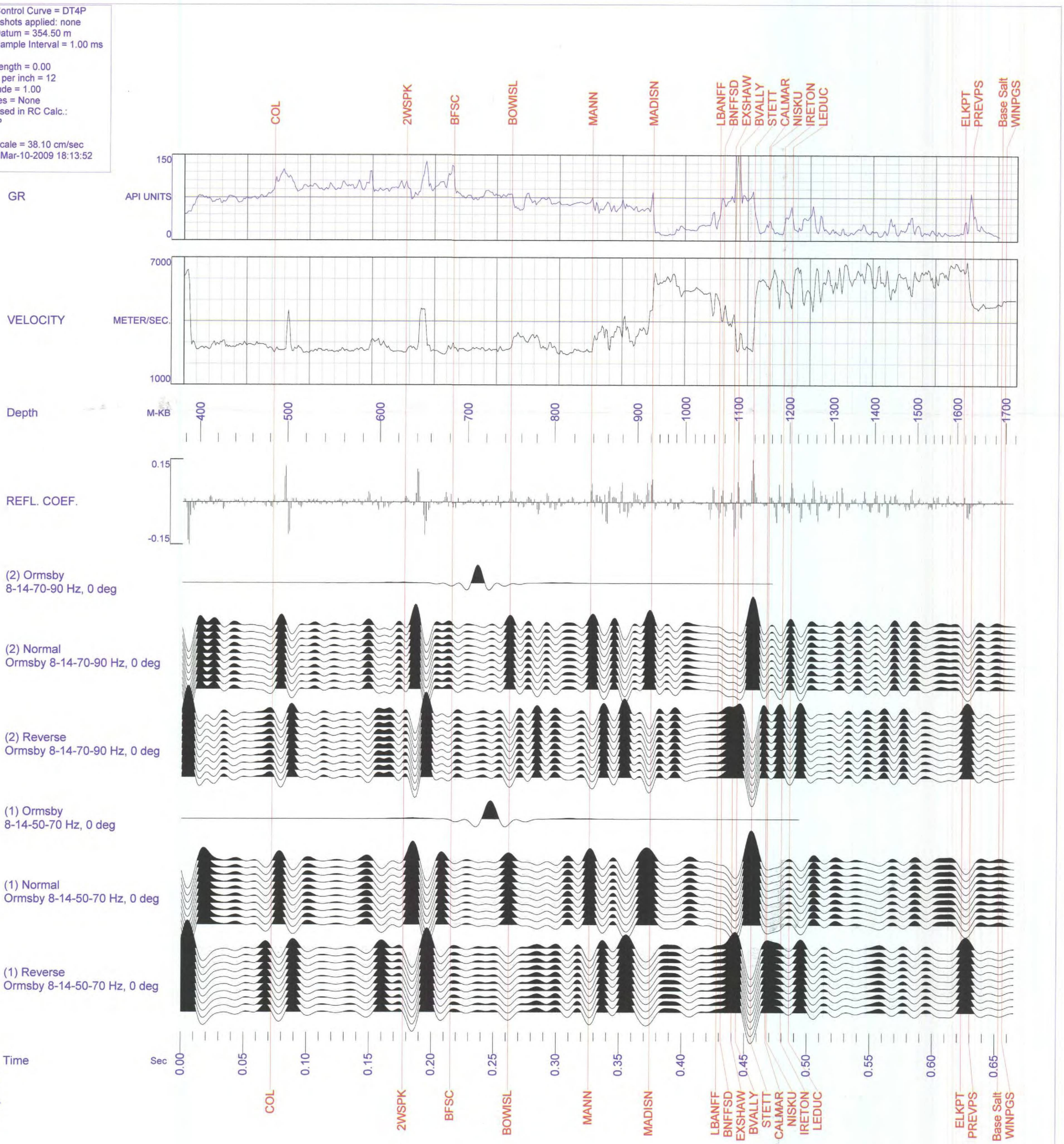
100/ 14-36-020-01W4 /00
KB = 727.50 m

Figure 3: Synthetic Seismic Model

Time Control Curve = DT4P
Check shots applied: none
Time Datum = 354.50 m
Time Sample Interval = 1.00 ms

AGC Length = 0.00
Traces per inch = 12
Amplitude = 1.00
Multiples = None
Logs Used in RC Calc.:
DT4P

Time Scale = 38.10 cm/sec
Date = Mar-10-2009 18:13:52



Landis Energy Corporation.
Empress

FORMATION	DEPTH m (KB)	DEPTH m (ASL)	TIME seconds	AVG VEL m/s	RMS VEL m/s	INT VEL m/s	INT TIME seconds	INT DEN kg/m3
COL	483.60	243.90	0.072	3072.39	3190.08	2724.68	0.105	0.00
2WSPK	627.00	100.50	0.177	2865.91	2932.91	2951.60	0.038	0.00
BFSC	683.60	43.90	0.216	2881.15	2950.16	2688.85	0.046	0.00
BOWISL	746.00	-18.50	0.262	2847.09	2905.94	2856.25	0.064	0.00
MANN	837.50	-110.00	0.326	2848.89	2899.95	3484.54	0.049	0.00
MADISN	922.00	-194.50	0.375	2931.19	2988.47	5555.35	0.053	0.00
LBANFF	1070.00	-342.50	0.428	3257.97	3419.11	4171.62	0.003	0.00
BNFFSD	1077.00	-349.50	0.431	3265.08	3425.72	4173.44	0.009	0.00
EXSHAW	1095.00	-367.50	0.440	3282.89	3442.48	2754.81	0.004	0.00
BVALLY	1100.00	-372.50	0.443	3278.57	3437.56	2874.53	0.012	0.00
STETT	1117.00	-389.50	0.455	3268.07	3424.98	5762.19	0.011	0.00
CALMAR	1150.00	-422.50	0.467	3329.28	3501.54	5357.14	0.001	0.00
NISKU	1153.00	-425.50	0.468	3334.13	3507.21	5804.75	0.011	0.00
IRETON	1186.00	-458.50	0.479	3392.74	3580.29	5160.89	0.007	0.00
LEDUC	1203.00	-475.50	0.486	3416.72	3606.80	6009.11	0.137	0.00
ELKPT	1616.00	-888.50	0.623	3988.42	4264.39	5738.43	0.007	0.00
PREVPS	1635.00	-907.50	0.630	4006.82	4283.36	4736.48	0.023	0.00
Base Salt	1690.00	-962.50	0.653	4032.76	4300.40	4984.50	0.003	0.00
WINPGS	1698.00	-970.50	0.656	4037.42	4304.02			