MAR 20090021: EMPRESS SALT CAVERN

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PART B

AND

PART C

ASSESSMENT REPORT
Metallic and Industrial Mineral Permit Number 9307100732

EMPRESS SALT CAVERN PROJECT
NTS 72 L/9

For

Landis Energy Corporation

Submitted by
John Hilland, P. Geol.
November 17, 2009

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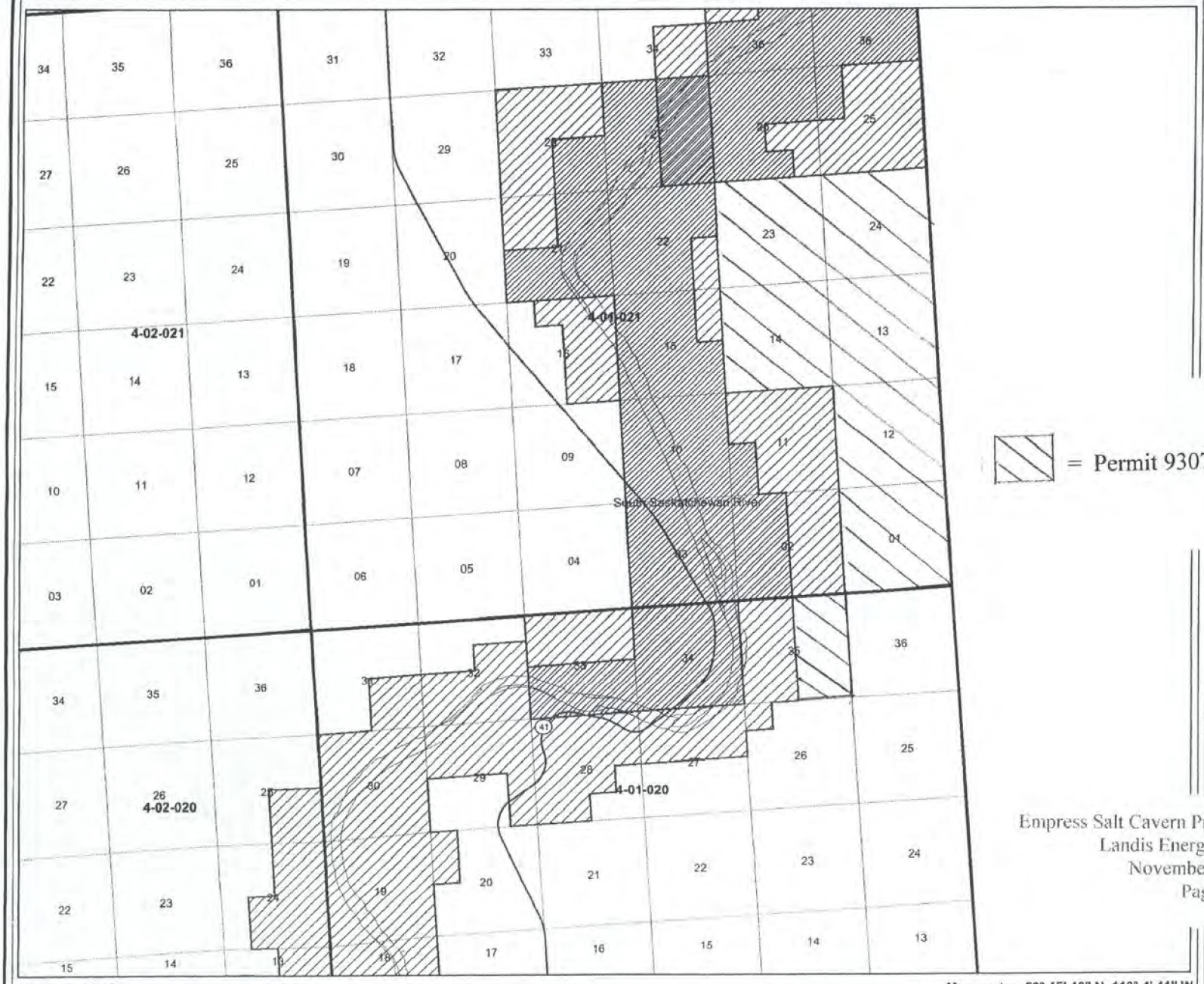
Map of Current Permit and Boundaries



Legend

- Alberta Boundary
- Meridian
- Township
- Section
- Major River
- Major Lake
- Major Road
- 30 Day Pending
- Reserved/Withdrawn - Restrictions
- No Surface Access - Restrictions
- Subject To - Restrictions
- Other - Restrictions
- Municipality
- Mineral Ownership Undetermined
- Parks and Protected Areas
- National Park

= Permit 9307100732

November 17, 2009

Map center: 50° 45' 46" N, 110° 4' 41" W

DISCLAIMER: Information presented on this map originates from various sources and is for general use only. Please be advised that some information may have been added, amended and deleted since this map was created.

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PART B – TECHNICAL REPORT

Summary

In the area of metallic and industrial permit # 9307100732 the Prairie 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, the work which was filed in an assessment report for permit # 9307010951, dated March 24, 2009. 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 Prairie 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

To determine the geometry of the salt in the area, trade 2D seismic data was purchased, reprocessed, and interpreted. A synthetic seismogram was generated from the 14-36 well sonic log to tie to the seismic data. The seismic report is presented in Part C. As the seismic trade data was purchased under a Licence Agreement, it is not possible to include purchased seismic sections in this report, other than a very short section in Appendix 1.

Conclusion and Recommendations

The seismic data indicates that the Prairie Evaporite in the area is relatively flat lying, with the top occurring between 1625m and 1630m depth. 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 9307100732 is suitable for the development of underground hydrocarbon storage caverns. Prior to cavern development a detailed 3D seismic program is recommended.

ESTIMATED 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 purchase, processing and interpretation of seismic trade data.	$ 13,655
SUBTOTAL	$ 13,655
9. Administration (10% of subtotal)	$ 1365.50
TOTAL	$ 15,020.50

[redacted]
SIGNATURE

Nov. 17/09
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 730, 138 – 4th Avenue S.W. Calgary, Alberta, T2G 4Z6.
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.

John Hilland, P. Geol., P. Geo.
Calgary, Alberta, Canada
November 17, 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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List of Maps and Figures

(back pocket) Figure 1: Prairie Evaporite Fm. Salt Well/Seismic Depth
(back pocket) Figure 2: Prairie Evaporite Fm. Salt Isopach

APPENDIX I

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).

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,

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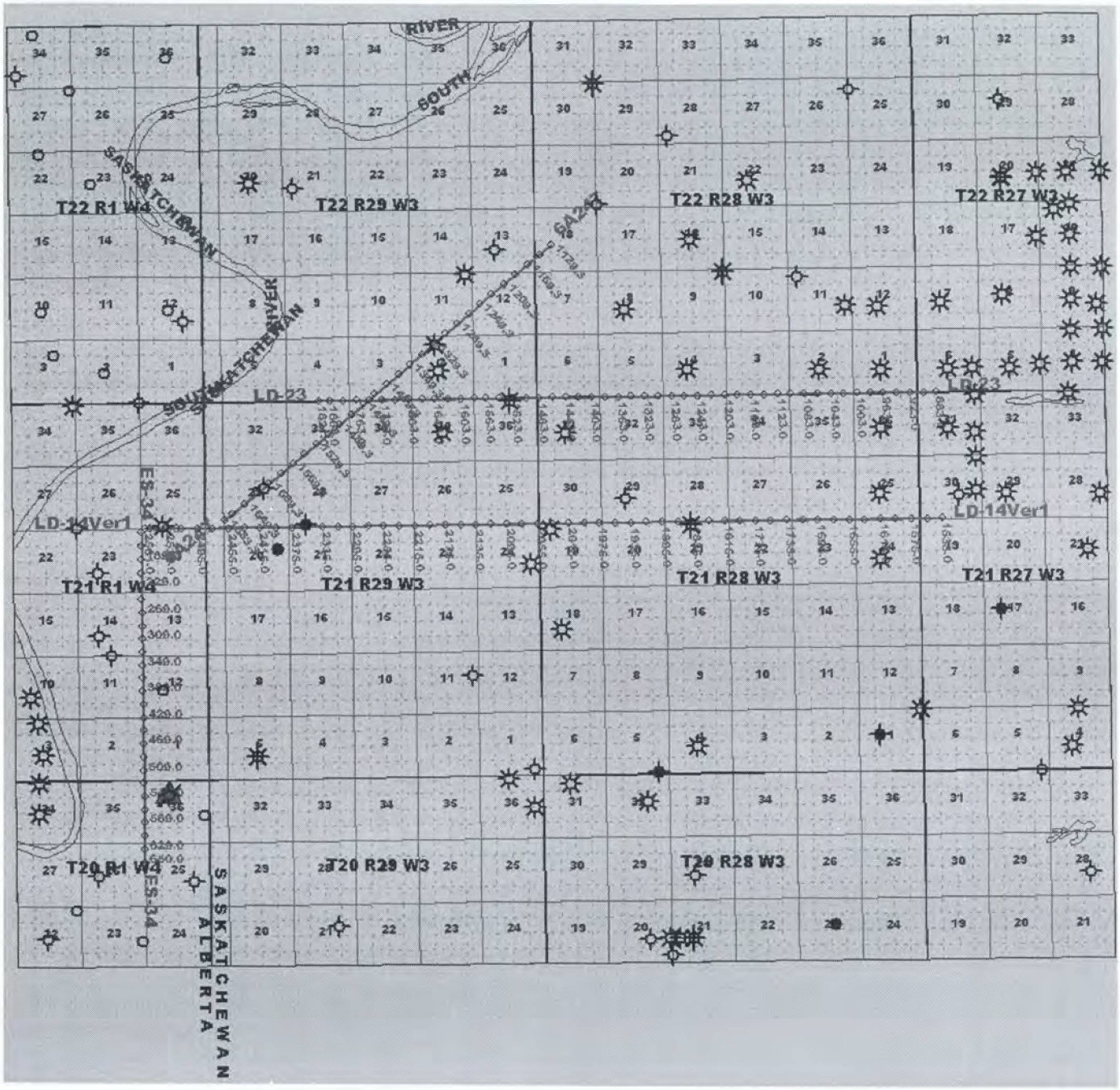

Purchased Seismic Data, Figure 1.

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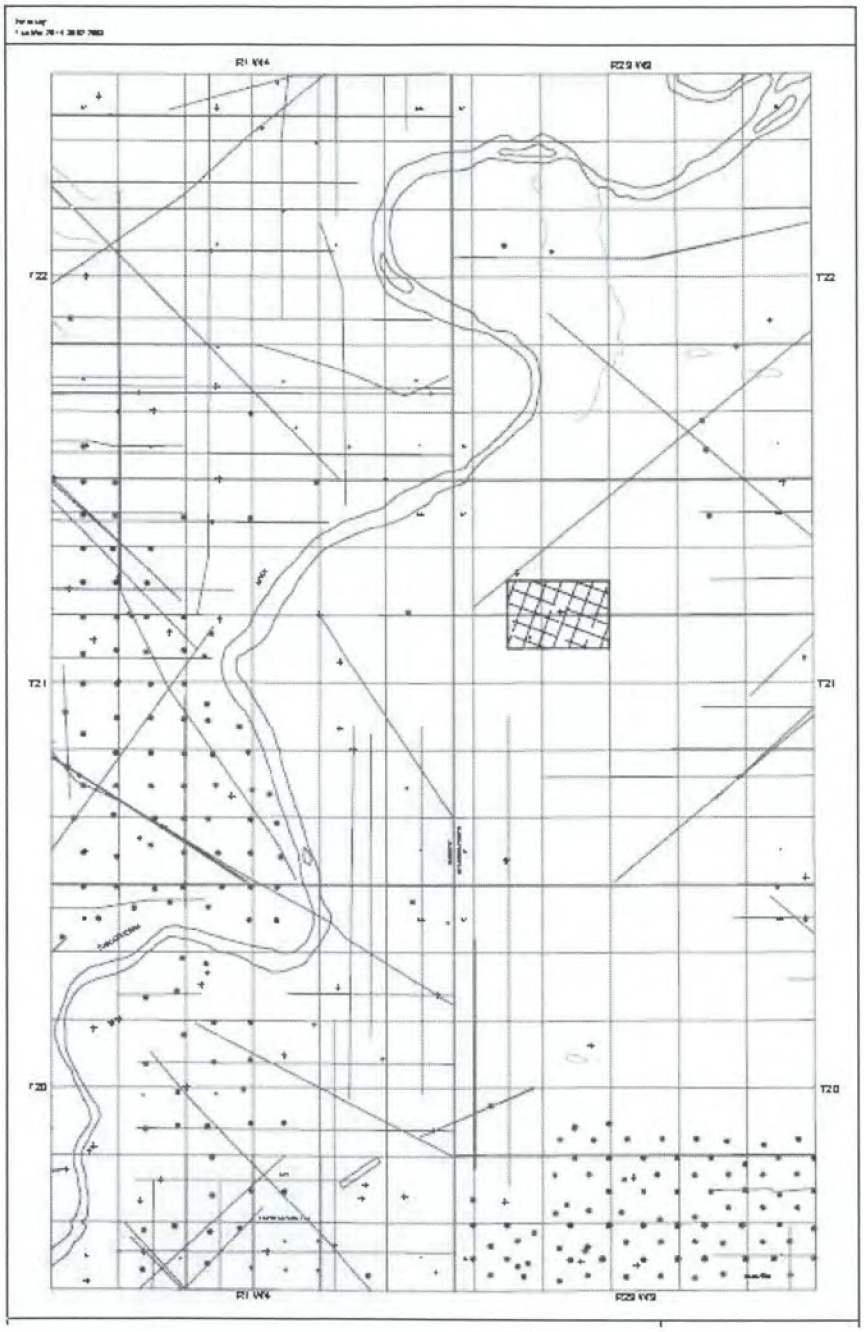

Seismic Data Available for Purchase, Figure 2.

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.

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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.

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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.

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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.

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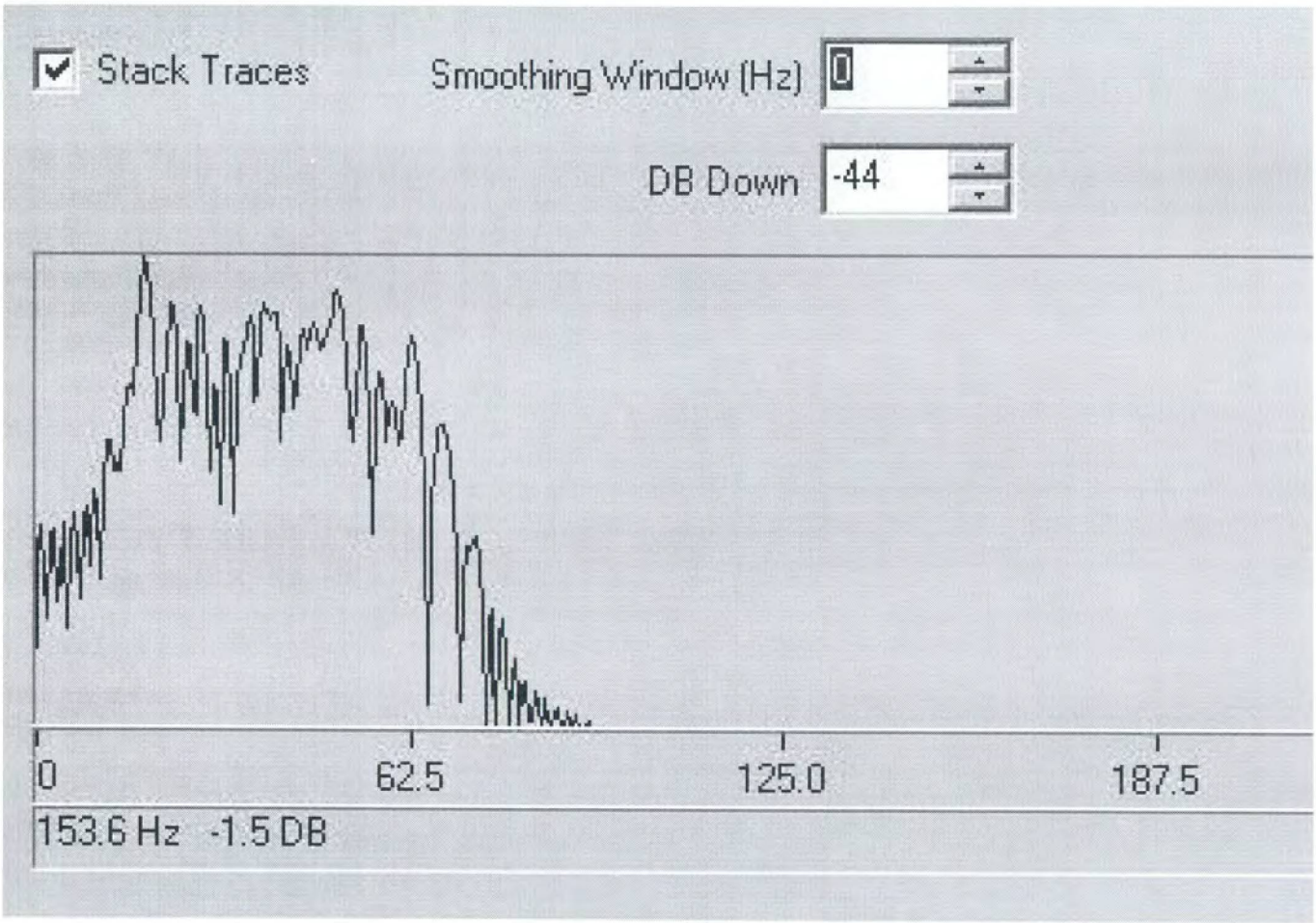

Seismic Temporal Bandwidth at Prairie Evaporite Formation Level, Figure 7.

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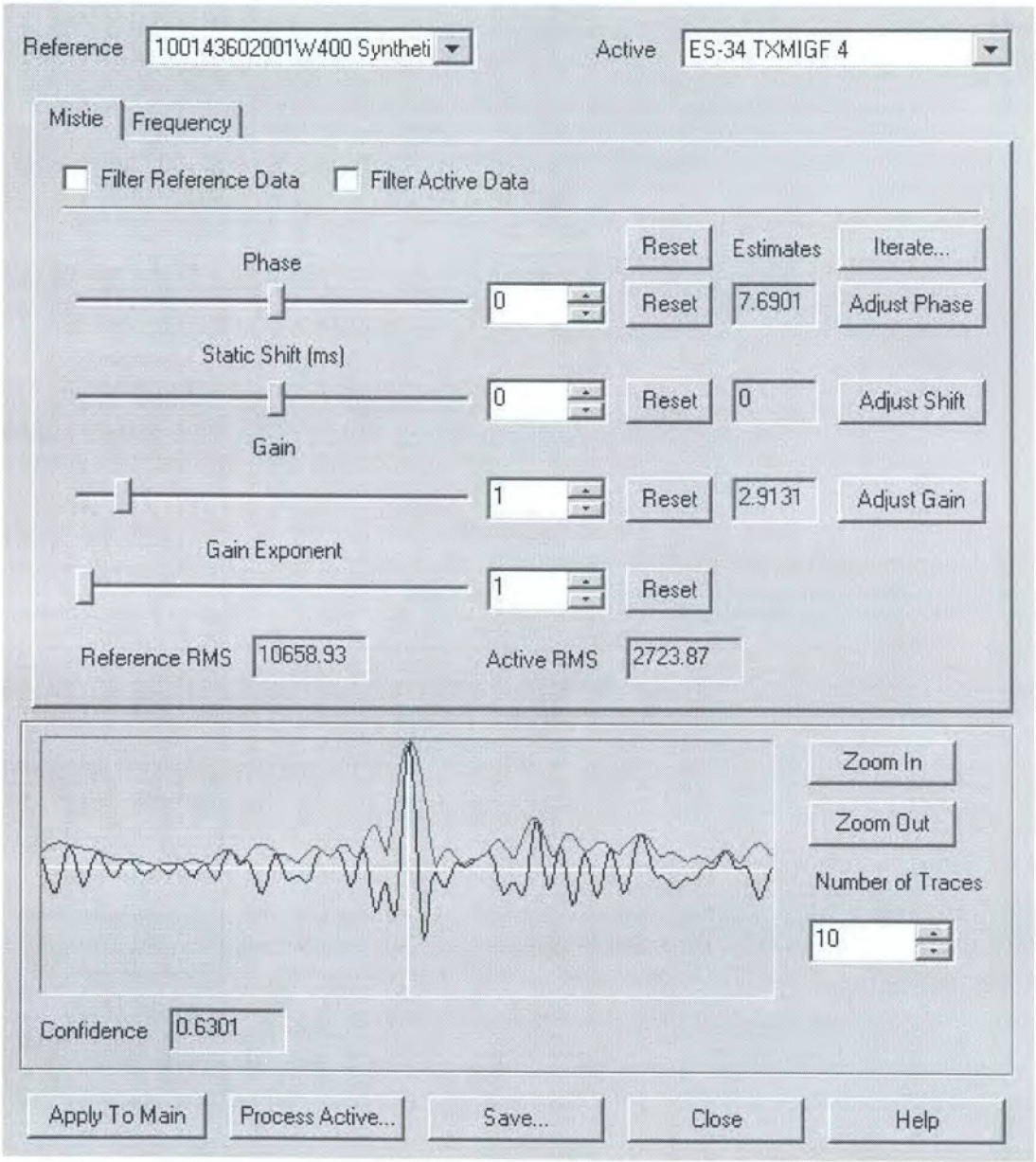

Residual Phase (Bulk Phase Shift Applied), Figure 8.

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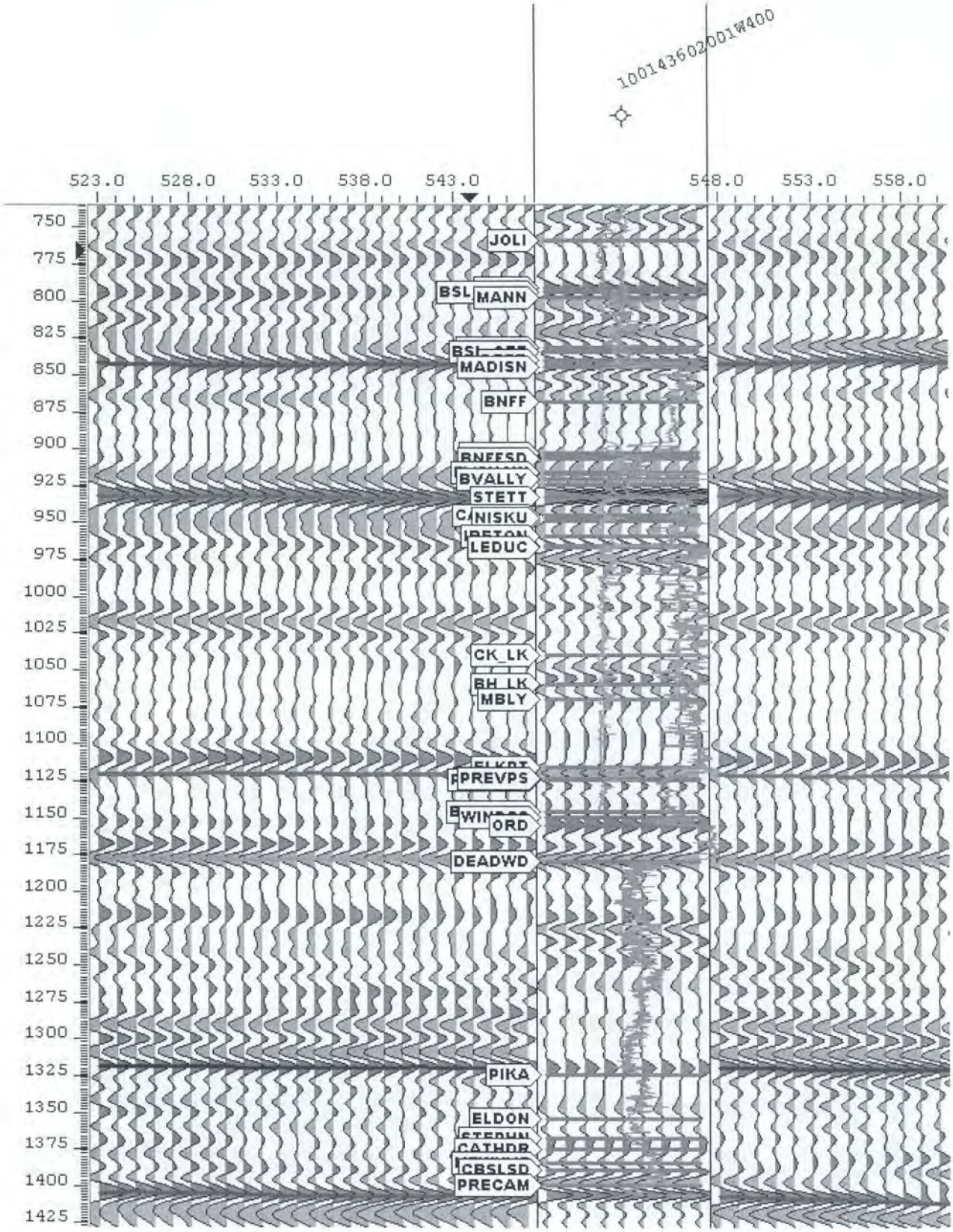

Sonic and Gamma Logs Displayed ; 10 15 80 100 Zero Phase Ormsby Filter

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

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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 CORPORATION

FIGURE 1

PRAIRIE EVAPORITE FM. SALT WELL/SEISMIC DEPTH

CI : 5 meters.

Permit 9307100732 Outlined in Yellow

Scale: 1:20000

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

0 1 2 3 4 5 6 7 8 9 10x0.1 mi

Grid(s) Displayed: DS_Salt_100 Grid

Automatic (1620 - 1722)
Rainbow Inverted Lite
1620 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

100012702101W400
100032502101W400
100062302101W400
T21 R1 W4
100061402101W400
1S0021402101W400
100061202101W400
T20 R1 W4
100143602001W400
100083602001W400
100062602001W400
100082502001W400
LD-14Ver
ES-34
GA24

LANDIS ENERGY CORPORATION

FIGURE 2

PRAIRIE EVAPORITE FM. SALT ISOPACH

CI : 5 meters.

Permit 9307100732 Outlined in Yellow

Scale: 1:20000

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

0 1 2 3 4 5 6 7 8 9 10x0.1 mi

Grid(s) Displayed: IP_Salt_100 Grid

Automatic (47 - 86)
Rainbow Inverted Lite

47 49 50 52 53 55 56 58 60 61 63 64 66 67 69 71 72 74 75 77 78 80 82 83 85 86

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