MAR 20120020: SOUTHERN ALBERTA POTASH

Southern Alberta Potash - A report on potash exploration near Medicine Hat in southeast Alberta.

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ASSESSMENT REPORT FOR GRIZZLY DISCOVERIES INC'S, SOUTH (MEDICINE HAT) CLAIM BLOCK, ALBERTA POTASH PROJECT, SOUTHEASTERN ALBERTA

South Block (Medicine Hat) Claims
9308110369 - 79, 9309010640 - 68, 9309050296, 9310040520 - 21, 9310080623 - 25, 9311060855, 9311080617 and 9312020265

Prepared For:
Grizzly Discoveries Inc.
#100, 9797-45 Ave
Edmonton, Alberta, Canada
T6E 5V8

Prepared by:
APEX Geoscience Ltd.
#200, 9797-45 Ave
Edmonton, Alberta, Canada
T6E 5V8

Michael Dufresne, M.Sc., P.Geol.
Kyle McMillan, M.Sc., P.Geol.
Anetta Banas, M.Sc., P.Geol.

November 15, 2012
Edmonton, Alberta, Canada

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1 Summary

APEX Geoscience Ltd. (APEX) was retained during 2008 to 2012 by Grizzly Discoveries Inc. (Grizzly) to manage exploration on Grizzly's South (Medicine Hat) Claim Block (the Property), a part of the Alberta Potash Project (the Project). This Assessment Report (the Report) summarizes the data compilation and exploration performed by APEX on behalf of Grizzly on Grizzly's 100% owned South (Medicine Hat) Claim Block. The South (Medicine Hat) Claim Block of the Alberta Potash Project is located approximately 250 km east of Calgary, overlaps the city of Medicine Hat and comprises 398,127 hectares (983,792 acres) within 49 Metallic and Industrial Mineral (MAIM) permits. The South Claim Block is part of the larger Alberta Potash Project, which is comprised of 140 MAIM permits, totaling 993,285 hectares (2,454,458 acres) extending along the Alberta Saskatchewan border from north of Lloydminster to Medicine Hat. The Alberta Potash Project is divided into the wholly owned by Grizzly South Claim Block and North Claim Block, and the 50-50 jointly owned Provost Property which is held by Grizzly and Pacific Potash Corporation. Exploration on the Property consisted of a compilation of all existing publically available data and assessment reports, a compilation and analysis of available historic drill core and down hole geophysical logs, the commission of a seismic geophysical study, and drilling of a potash test hole.

Potash is a potassium-rich salt (potassium chloride [KCl]) mined mostly from evaporite horizons around the world. Approximately 95% of the world's potash is used in fertilizers. Canada is the world's largest producer of potash with the potash ore bodies in Saskatchewan being the world's largest, richest and most economical to mine. The Prairie Evaporite Formation is the host to most of Saskatchewan's potash, where the potash mineral sylvite (KCl) has been found in substantial quantities throughout the upper 20 to 30 metres (m). The potash minerals, being explored for at the Grizzly South (Medicine Hat) Claim Block, are of the same composition, depositional sequence and depth as those found at a number of potash mines located in Saskatchewan, such as those near the municipalities of Unity and Saskatoon. The Prairie Evaporite Formation in east-central Alberta underlies most of Grizzly's South (Medicine Hat) Claim Block.

The 2008 and 2009 data compilation indicated that only limited historic data was available for previous potash exploration in Alberta. Much of the current information for the potash potential in Alberta was obtained from historic oil and gas drillhole data and archived drill core that was accessed at the Alberta Core Research Facility (CRF) of Alberta's Energy Resources and Conservation Board (ERCB). The regional compilation included the entire area of the Alberta Potash Project as well as a buffer zone around the Grizzly claims to gain a better understanding of the regional Potash potential of the area. A total of 14,651 wells were compiled with 167 wells determined to have penetrated the Prairie Evaporite. Of the 167 wells, 10 wells are located on Grizzly's South (Medicine Hat) Claim Block. A total of 110 of the 167 wells have available down hole geophysical logs, including a gamma, however, a number of those wells did not completely penetrate the Prairie Evaporite Formation or the gamma logs were of poor quality and unsuitable for use to evaluate the Prairie Evaporite Formation for potash

potential. As an example, out of the 10 wells that were drilled deep enough to intersect the Prairie Evaporite on the South Claim Block, only 8 contain a gamma log or core that permits an evaluation of the Prairie Evaporite Formation for the presence of potash. A total of 15 wells (including one re-entry well) within the compilation area had core from the Prairie Evaporite Formation and were available at the ERCB. A total of five of those wells (including one re-entry well), which contain identifiable potash beds, are located on Grizzly's South (Medicine Hat) Claim Block.

Preliminary analysis of the wells on Grizzly's South (Medicine Hat) Claim Block, indicated the presence of potash within the Prairie Evaporite Formation. A total of 3 historic wells yield greater than 10% K_2O (15.8% KCl) based upon XRF geochemical analyses or calculated values from gamma logs. The best measured or calculated grade obtained from the South (Medicine Hat) Claim Block is 21.6% K_2O (34.2% KCl) over an estimated width of 1.25 m.

In 2011, Grizzly completed one well (GZD100 MEDHAT 8-36-19-1W4) on its 100% owned Southern (Medicine Hat) Claim Block. The hole intersected a thick zone of Prairie Evaporite Formation salt, with visible potash minerals observed in a wide low-grade potash zone for the interval between 1,648.5 m and 1,670.85 m (22.35 m thickness) below surface. Within the wide low grade potash zone, the drilling intersected two zones of sylvite mineralization (Upper zone and Lower zone) within what is interpreted to be the Patience Lake Member.

Analytical results include a weighted average grade of 2.62% K_2O (4.15% KCl) over 22.35 m at a depth of 1648.5 m for the low grade zone, with higher grade portions including 6.4% K_2O (10.14% KCl) over 4.55 m, which includes 8.77% K_2O (13.88% KCl) over 2.65 m. Higher grades also include 13.0% K_2O (20.58% KCl) over 1.15 m for the Upper Zone and 2.45% K_2O (3.88% KCl) over 3.3 m for the Lower Zone. The highest assay result was 31.1% K_2O (49.2% KCl) for a 0.3 m core sample. Low grades of MgO indicate that sylvite is likely the major potash mineral, rather than carnallite ($KCl \cdot MgCl_2 \cdot 6H_2O$). In 1980, a historic oil well, located 800 m west of GZD100 MEDHAT 8-36-19-1W4, yielded a gamma log spike at a depth of approximately 1,662 m below surface for a calculated maximum potash grade of approximately 21.6% K_2O (34.2% KCl) over an estimated thickness of 1.25 m. The depth of these potash intersections is at a similar depth to the Belle Plaine Potash Solution Mine near Regina Saskatchewan and would likely be ideally suited to solution mining due to high formation temperatures. Further potash drilling is warranted on Grizzly's South (Medicine Hat) Block. Further potash drillhole tests should step out south from well GZD100 MEDHAT 8-36-19-1W4.

In March 2009, a compilation of formation water chemistry data was completed for wells in the area of Grizzly's Alberta Potash Project. A total of 2,426 wells with formation water data were available, of which 182 wells are located on Grizzly's South (Medicine Hat) Claim Block. A number of wells within the compilation area identified >1% up to 8.6% potassium (K) in formation waters within Devonian carbonate hosted aquifers immediately above the Prairie Evaporite. The highest potassium value recovered for Grizzly's South (Medicine Hat) Claim Block was 6,000 ppm (0.6% K). However,

adjacent to the north of the South Claim block lies a cluster of wells that returned >1% K up to 2.7% K. Historic scientific work by the Alberta Geological Survey (AGS) also identified high concentrations of potassium in Devonian carbonate hosted aquifers in the region of Grizzly's permits. The use of deep formation water geochemistry for potash exploration is a very promising technique, but one that needs more work before the data could be used to pick test holes for potash in the Prairie Evaporite or as an indicator of carbonate hosted formation waters that could be perhaps produced for their potassium content.

The total cost to complete exploration on the Grizzly South (Medicine Hat) Claim Block between 2008 and 2012 was $1,707,125.93.

Based upon the results of the compilation and the results of the drilling to date, further potash exploration, including drilling, is strongly recommended for Grizzly's South (Medicine Hat) Claim Block in the vicinity of well GZD100 MEDHAT 8-36-19-1W4, in order to identify additional potash zones with higher grades and greater thickness.

Strong consideration should be given to finding an appropriate technique to conduct water sampling of Devonian carbonate hosted aquifers immediately above the Prairie Evaporite in order to compare concentrations of K in the aquifers versus the potash content of the Prairie Evaporite obtained from the well intersections. The tool that was employed during the 2011 drilling was not successful in obtaining any water samples. The goal would be to (a) see if the waters could be used as a future guide to targeting the specific areas of the Prairie Evaporite for potash, and (b) determine whether K exists in high enough concentrations that it could be economically produced from the existing formation waters.

Consideration should be given to conducting some preliminary scoping level type engineering studies in order to ascertain what grade and thickness of an Alberta potash deposit will be required to support a possible future solution mine based upon the infrastructure that is in place, availability of water and Alberta's favourable tax regime.

A drilling focused program is recommended to follow-up on the results obtained from drillhole GZD100 MEDHAT 8-36-19-1W4. The drilling should consist of 2 wells that are aimed at extending the potash mineralization intersected in GZD100 MEDHAT 8-36-19-1W4. The first hole should be drilled south of the 2011 hole. If the results are positive, i.e. the hole intersects high grade and/or thick potash intervals, the second hole should be drilled even further south. If the results are negative the second hole should be drilled to the north of hole GZD100 MEDHAT 8-36-19-1W4. The budget is comprised of drilling a total of approximately 3,400 m in 2 wells at an average, all up per meter cost of $725 per meter for a total cost of $2,465,000 along with $135,000 for assaying, reclamation, and collection and analysis of water samples. The total cost to complete the drilling program is $2.6 million.

2 Introduction

APEX Geoscience Ltd. (APEX) was retained from 2008 to 2012 by Grizzly Discoveries Inc. (Grizzly) to manage all exploration on Grizzly's South (Medicine Hat) Claim Block (the Property), a part of the Alberta Potash Project (the Project). This Assessment Report (the Report) is prepared by APEX on behalf of Grizzly and details the work completed on the Property. Exploration on the South Claim Block included a data compilation, resampling and verifying of potash results from historical drill cores, a seismic study and drilling. The total cost to complete exploration on the Grizzly South (Medicine Hat) Claim Block between 2008 and 2012 was $1,707,125.93.

The South (Medicine Hat) Claim Block is comprised of 49 Metallic and Industrial Mineral (MAIM) permits, totalling 398,127 hectares (983,792 acres).

Mr. Michael B. Dufresne, M.Sc., P.Geol., the lead author, is a principal of APEX and has conducted fieldwork on, and in the vicinity of, the Alberta Potash Project, along with supervising a number of exploration programs for a variety of commodities across Alberta. Mr. Michael B. Dufresne, M.Sc., P.Geol., visited the Alberta Potash Project on June 5th and October 23rd and 24th, 2008.

3 Property Description and Location

3.1 South (Medicine Hat) Claim Block Location

The South (Medicine Hat) Claim Block is located in east central Alberta, approximately 250 km east of Calgary and overlaps the city of Medicine Hat (Figure 1). The approximate center of the South Block is within 7-12-20-02W4 using the Alberta Township System (ATS) or at 560019E (Easting) and 5614230N (Northing) relative to the North American Datum 1927 (NAD 27), Zone 12. The South (Medicine Hat) Claim Block consists of 49 MAIM permits, covering an area of approximately 398,127 hectares (983,782 acres) that are held in the name of APEX Geoscience Ltd. as the designated representative on behalf of Grizzly (Table 1; Figure 2; Appendix 1).

The Alberta Energy Interactive maps site shows that the permits are active and in good standing (http://gis.energy.gov.ab.ca/redirect_imf_metallic/imf.jsp?site=Metallic

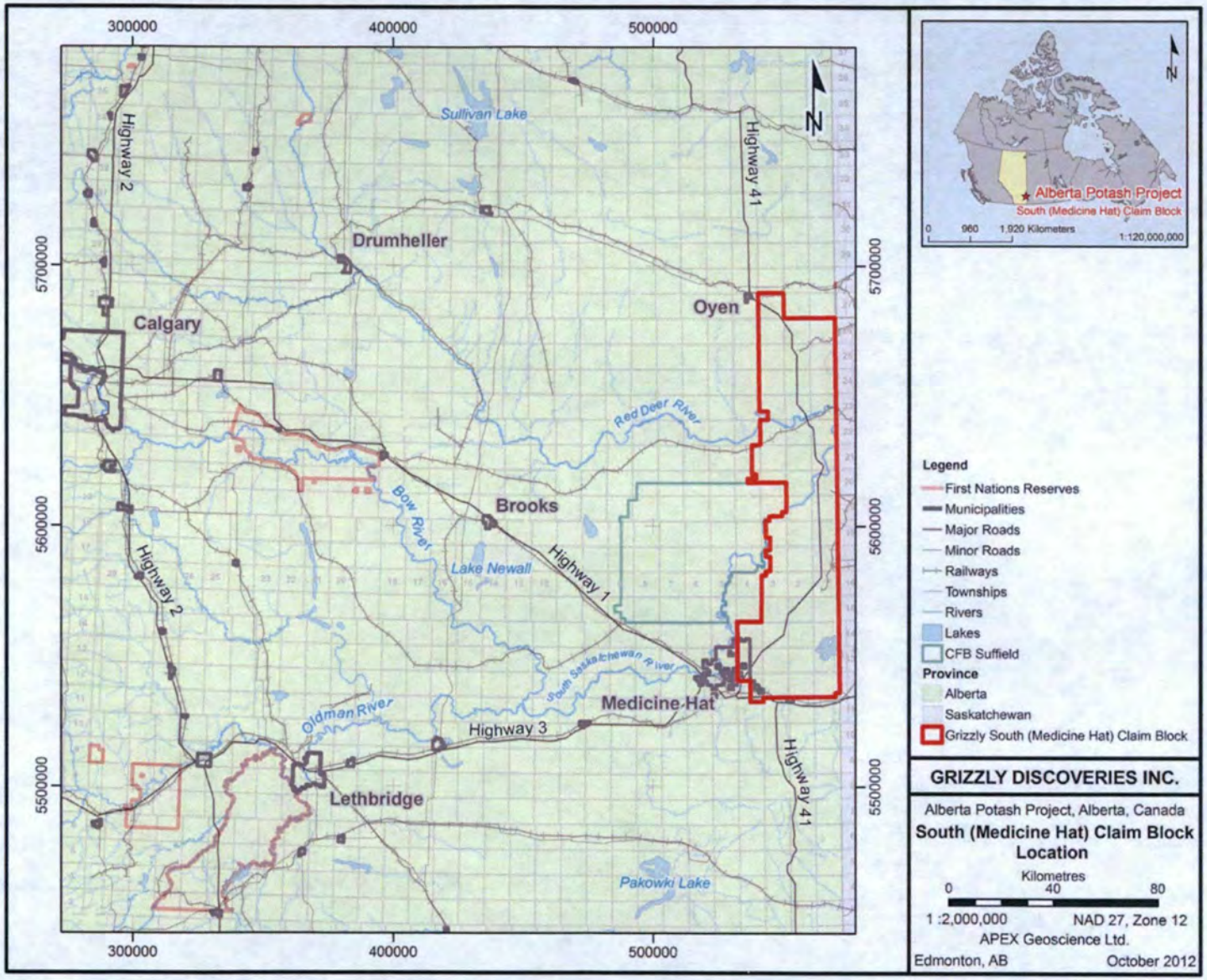

Figure 1 South (Medicine Hat) Claim Block Location

Table 1 Grizzly Discoveries Ltd. South (Medicine Hat) Claim Block Metallic and Industrial Minerals Permits

Permit Number*	Record Date*	Term Period*	Legal Description	Permit Holder*	Area (Ha)*
South (Medicine Hat) Claim Block					
9308110369	7-Nov-2008	14 Years	**4-01-013:** 02-7;09-12;14-16;17L3,L4SE,L4NE,L5-L6,SENW,NE;18L1NW,L1NE,L2,L7-L8,SWNW,NE;19-22;23SWP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04 **4-01-013:** 23NWP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04 **4-01-013:** 24-25;26NE;27-32;33SWP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04. **4-01-013:** 33NWP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04. **4-01-013:** 33NEP PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S. **4-01-013:** 33SE;34-36	Grizzly Discoveries Inc.	**8003**
9308110370	7-Nov-2008	14 Years	**4-02-013:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**

9308110371	7-Nov-2008	14 Years	**4-01-014:** 01-2;03SEP PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S. **4-01-014:** 03SWP PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S. **4-01-014:** 03NEP PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S. **4-01-014:** 03NW;04-7;09-18;20-25;26NE;27-36	Grizzly Discoveries Inc.	**8375.02**
9308110372	7-Nov-2008	14 Years	**4-02-014:** 01-6;07SEP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04. **4-02-014:** 07SWP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04. **4-02-014:** 07NWP PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04. **4-02-014:** 09-25;26NE;27-36	Grizzly Discoveries Inc.	**8593.30**
9308110373	7-Nov-2008	14 Years	**4-01-015:** 01-7;09-25;27-36	Grizzly Discoveries Inc.	**8704**
9308110374	7-Nov-2008	14 Years	**4-02-015:** 01-7;09-25;27-36	Grizzly Discoveries Inc.	**8704**
9308110375	7-Nov-2008	14 Years	**4-01-016:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9308110376	7-Nov-2008	14 Years	**4-02-016:** 01-7;09-25;35-36 **4-02-017:** 01-2;11-15;23-25	Grizzly Discoveries Inc.	**9216**

9308110377	7-Nov-2008	14 Years	**4-01-017:** 01-7;09-25;26NE;27-36 **4-02-017:** 35SW,NW,NE;36	Grizzly Discoveries Inc.	**9216**
9308110378	7-Nov-2008	14 Years	**4-02-017:** 16-22;27-34 **4-02-018:** 03-7;09-10;15-22;27-32	Grizzly Discoveries Inc.	**9216**
9308110379	7-Nov-2008	14 Years	**4-01-018:** 01-7;09-24 **4-02-018:** 01-2;11-14;23-24;26NE	Grizzly Discoveries Inc.	**8000**
9309010640	28-Jan-2009	14 Years	**4-01-012:** 02;03SW;04;06-7;08NW;09-12;13NW,NE;14-25;26NE;27-34;36	Grizzly Discoveries Inc.	**7744**
9309010641	28-Jan-2009	14 Years	**4-02-012:** 02;04;06;09-25;26NE;27-36 **4-03-012:** 12-13;24-25;36	Grizzly Discoveries Inc.	**9024**
9309010642	28-Jan-2009	14 Years	**4-03-012:** 02;04SEP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-03-012:** 04SWP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-03-012:** 04NWP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-03-012:** 04NE;09-11;14-16;18;20-22;27-35 **4-03-013:** 01-3;10-15 **4-04-012:** 24-25;27;34-36	Grizzly Discoveries Inc.	**9206.98**
9309010643	28-Jan-2009	14 Years	**4-03-013:** 04-7;09;16-25;27-36 **4-04-013:** 01-3;10-15;22-23	Grizzly Discoveries Inc.	**9216**
9309010644	28-Jan-2009	14 Years	**4-04-013:** 24-25;27;34-36 **4-04-014:** 01-3;10-24;25SW,NW,NE;26NE;27-36	Grizzly Discoveries Inc.	**8960**

9309010645	28-Jan-2009	14 Years	PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/07/29. **4-03-014:** 01-7;09-16;17P PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/07/29. **4-03-014:** 18;20-24;26SW,NW,NE;27-36 **4-03-015:** 05-6	Grizzly Discoveries Inc.	**8731.30**
9309010646	28-Jan-2009	14 Years	**4-03-015:** 01-4;07;09-25;27-36 **4-03-016:** 03-6	Grizzly Discoveries Inc.	**9216**
9309010647	28-Jan-2009	14 Years	**4-03-016:** 01-2;09-24;27-30;32-33 **4-03-017:** 04;09;16SE,NE;20NW,NE;21;25;27-29;33-36	Grizzly Discoveries Inc.	**9216**
9309010648	28-Jan-2009	14 Years	**4-02-019:** 05-7;18 **4-03-018:** 01-4;09-17;20-25;27-29;32-36 **4-03-019:** 01-4;12	Grizzly Discoveries Inc.	**9216**
9309010649	28-Jan-2009	14 Years	**4-02-019:** 17;19-20;29-32 **4-02-020:** 05-7;17-20;29-32 **4-03-020:** 19-36	Grizzly Discoveries Inc.	**9216**
9309010650	28-Jan-2009	14 Years	**4-02-021:** 05-7;16-21;27-34 **4-03-021:** 19-26;27SE,NW,NE;28-36	Grizzly Discoveries Inc.	**8896**
9309010651	28-Jan-2009	14 Years	**4-01-022:** 03-7;09-10;13-25;26NE;27-36	Grizzly Discoveries Inc.	**7744**
9309010652	28-Jan-2009	14 Years	**4-02-022:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010653	28-Jan-2009	14 Years	**4-03-022:** 01-30;31SE,NW;32-36	Grizzly Discoveries Inc.	**9088**

9309010654	28-Jan-2009	14 Years	**4-01-023:** 01-7;09-11;12SE,SW;13SWNWP PORTION(S) DESIGNATED AS RED-DEER RIVER ON A TOWNSHIP PLAN APPROVED ANDCONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1911/03/22. **4-01-023:** 13NEP PORTION(S) DESIGNATED AS RED-DEER RIVER ON A TOWNSHIP PLAN APPROVED ANDCONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1911/03/22. **4-01-023:** 14NEP PORTION(S) DESIGNATED AS RED-DEER RIVER ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1911/03/22. **4-01-023:** 14SW,NW;15-25;26NE;27-36	Grizzly Discoveries Inc.	**8343.04**
9309010655	28-Jan-2009	14 Years	**4-02-023:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010656	28-Jan-2009	14 Years	**4-03-023:** 01-3;04NW,NE;05L15-L16;09-25;26NE;27-36	Grizzly Discoveries Inc.	**7904**
9309010657	28-Jan-2009	14 Years	**4-01-024:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010658	28-Jan-2009	14 Years	**4-02-024:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010659	28-Jan-2009	14 Years	**4-03-024:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010660	28-Jan-2009	14 Years	**4-01-025:** 01-7;09-25;27-36	Grizzly Discoveries Inc.	**8704**
9309010661	28-Jan-2009	14 Years	**4-02-025:** 01-7;09-25;27-36	Grizzly Discoveries Inc.	**8704**
9309010662	28-Jan-2009	14 Years	**4-03-025:** 01-7;09-25;27-36	Grizzly Discoveries Inc.	**8704**
9309010663	28-Jan-2009	14 Years	**4-01-026:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010664	28-Jan-2009	14 Years	**4-02-026:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010665	28-Jan-2009	14 Years	**4-03-026:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**
9309010666	28-Jan-2009	14 Years	**4-03-027:** 01-7;09-25;26NE;27-36	Grizzly Discoveries Inc.	**8768**

9309010667	28-Jan-2009	14 Years	**4-03-012:** 06 **4-04-011:** 34;36 **4-04-012:** 02;10L8P PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-04-012:** 10L1-L4,L9NW,L9NE,L10NW,L10NEL11NW,L11NE,L12NW,L12NE,L13-L16;11SESWP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-04-012:** 11NWP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-04-012:** 11NEP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-04-012:** 12NWP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-04-012:** 12NEP PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908. **4-04-012:** 12SE,SW;14;22;28-30;32-33 **4-04-013:** 04-7;09;16-21;28-33 **4-04-014:** 04-7;08SW;09	Grizzly Discoveries Inc.	**9177.92**
9309010668	28-Jan-2009	14 Years	**4-03-021:** 01-18 **4-04-020:** 22-25;35-36 **4-04-021:** 01-2;11-14;23-25;26NE;35-36	Grizzly Discoveries Inc.	**9024**
9309050296	6-May-2009	14 Years	**4-01-018:** 25;26NE;34-36	Grizzly Discoveries Inc.	**1088**
9310040521	7-Apr-2010	14 Years	**4-01-020:** 01-2;11;12SE,NW,NE	Grizzly Discoveries Inc.	**960**

9310040520	7-Apr-2010	14 Years	**4-01-020:** 17;20;29;32 **4-01-021:** 04-7;09;17-18 **4-02-019:** 33-34 **4-02-020:** 03-4;09-10;15-16;21-22;27-28;33-34 **4-02-021:** 01-4;09-15	Grizzly Discoveries Inc.	**9216**
9310080623	18-Aug-2010	14 Years	**4-01-018:** 27-33 **4-01-019:** 04-7;09-10;11NW;14SW,NW;15-18;20-22;23SW,NW,NE;28SE,SW **4-02-018:** 25;33-36 **4-02-019:** 01-4;09-13	Grizzly Discoveries Inc.	**9216**
9310080624	18-Aug-2010	14 Years	**4-01-019:** 19;29-32 **4-01-020:** 05-7;18-19;30-31 **4-02-019:** 14-16;21-25;26NE;27-28;35-36 **4-02-020:** 01-2;11-14;23-25;35-36	Grizzly Discoveries Inc.	**9024**
9310080625	18-Aug-2010	14 Years	**4-01-020:** 27-28;33-34;35SW,NW **4-01-021:** 02-3;10-11;15-16;19-22;25;26NE;27-36 **4-01-022:** 01-2;11-12 **4-02-021:** 22-25;26NE;35-36	Grizzly Discoveries Inc.	**9216**
9311080617	18-Aug-2011	14 Years	**4-01-019:** 01-3;11SE,SW,NE;12-13;14SE,NE;23SE;24-25;26NE;27;28NW,NE;33-36 **4-01-020:** 03-4;09-10	Grizzly Discoveries Inc.	**4672**
9311060855	1-Jun-2011	14 Years	**4-01-020:** 13-16;21-25;36	Grizzly Discoveries Inc.	**2560**
9312020265	7-Feb-2012	14 Years	**4-01-020:** 35SE,NE **4-01-021:** 01;12-14;23-24	Grizzly Discoveries Inc.	**1664**
Total Permits 49			**Total Claim Block Area 398,126.6 ha**		

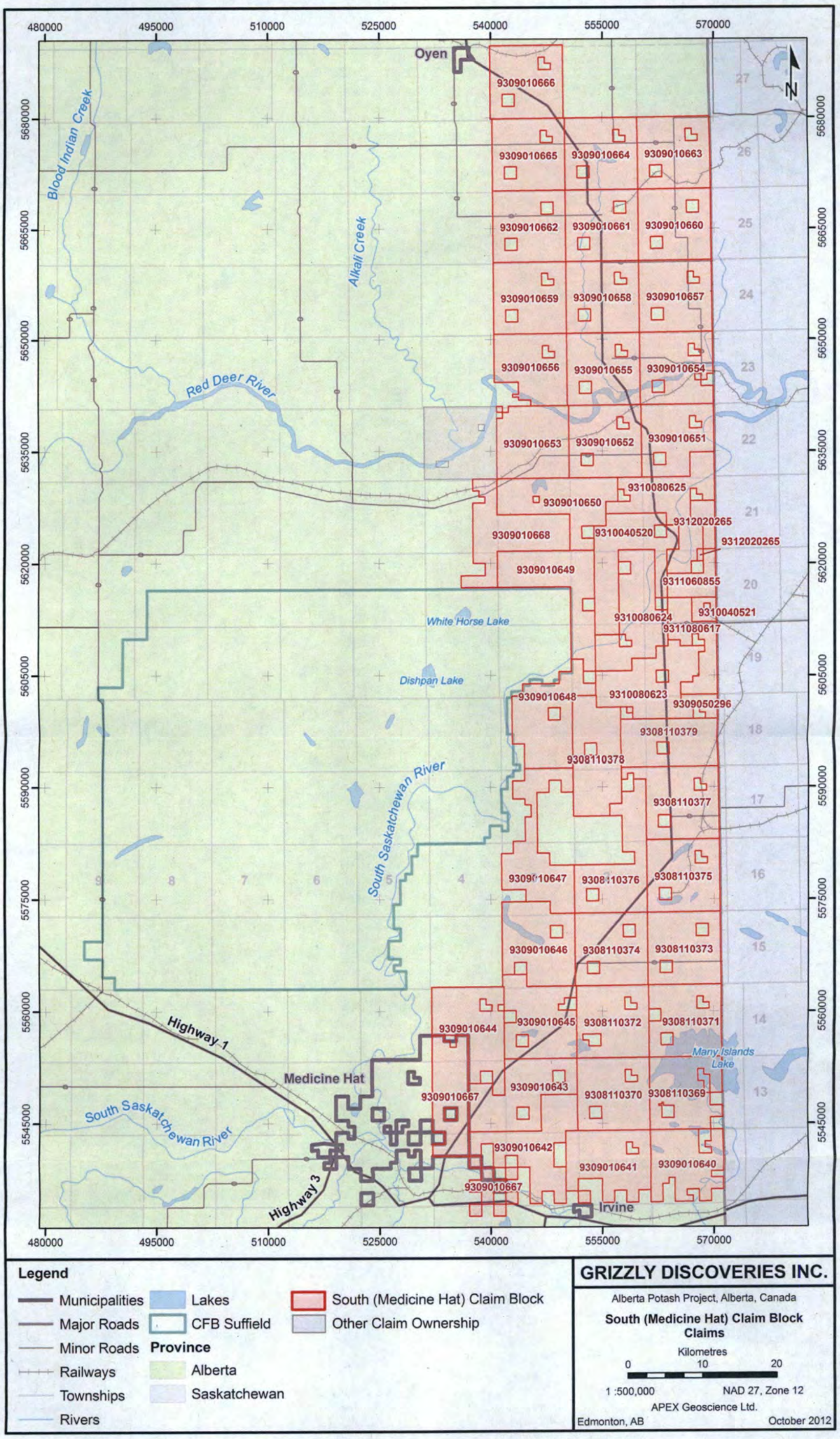

Figure 2 South (Medicine Hat) Claim Block Claims

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

Grizzly's South (Medicine Hat) Claim Block is situated in the central-eastern region of Alberta, along the Alberta-Saskatchewan border. Elevation varies between approximately 300-900 m above mean sea level (amsl). The topography consists of gentle hills with pronounced valleys, particularly at large rivers. Scattered throughout the area are small streams and ephemeral ponds. Vegetation is characterized by poplars and varieties of marsh and meadow vegetation including short to mid-height grasses. The climate of the area is dry continental, with warm summers and cold winters. Average daily temperatures reach a maximum in July (16.6°C average, maximum 36.8°C) and a minimum in January (-14.5°C average, -39.6°C minimum). Precipitation in the area of the Property is between about 250-500 millimetres (mm) annually, with maximum precipitation occurring in summer, and minimum in winter. Climate data can be found at the Environment Canada website http://climate.weatheroffice.gc.ca/climate_normals/index_e.html

The Property lies primarily within farm and grazing lands and is hospitable and conducive to exploration work and travel year-round.

The northern part of the South Claim Block is approximately 250 km east of Calgary and southern end of the Block is 10 km east of the city of Medicine Hat proper. The South Claim Block can be accessed along Trans-Canada Highway 1 (Hwy 1) from Calgary. Highway 1 runs east-west just south of the Property. Highway 41 runs roughly north-south through the length of the Property. Additionally numerous rural roads provide year round access. The Property is located mainly on freehold farm land.

The Red Deer River and the South Saskatchewan River cross the South Claim Block along with numerous creeks. Numerous small lakes are found on the Property, the largest of which is Many Island Lake in the southern part of the Property. The available water sources throughout the Property area provide ample access to water for drilling purposes.

5 History

Exploration for potash in Alberta has been limited when compared to Saskatchewan. Historically, the only interest in potash exploration in Alberta took place in the 1960's in conjunction with petroleum exploration and no wells were drilled solely for potash at that time (Golden, 1965, 1966; Bayfield Oil and Gas, Ltd., 1966; Brownless, 1966; Irwin, 1966).

Most wells drilled in the vicinity of the Grizzly Alberta Potash Project area were either for oil and gas exploration or water. More than 14,000 wells were identified to have been drilled within a compilation area, which included all of Grizzly's Alberta Potash Project permits. Potash is most prospective within the Prairie Evaporite; however, the majority of petroleum and water resources in the area occur at shallower depths than the Prairie Evaporite Formation. Thus, in the vicinity of Grizzly's Alberta Potash Project, including the South (Medicine Hat) Claim Block, relatively few wells have been drilled to depths

great enough to penetrate the Prairie Evaporite Formation. Historically, a total of 185 wells in Alberta and 91 wells in Saskatchewan were drilled in the central-eastern region along the Alberta-Saskatchewan border in close proximity to Grizzly's Alberta Potash Project. These wells penetrated to at least the top of the Elk Point Group (of which the Prairie Evaporite Formation is a part of). Of these wells, 167 have been identified to penetrate the Prairie Evaporite formation, with potash occurrences observed in 38 of those wells (Figure 3). A total of 7 of the 38 wells are on Grizzly's South (Medicine Hat) Claim Block. At least 2 wells are documented by historic reports to have encountered deposits of potash in east-central Alberta: Vermilion Consolidated Oils #15 (6-12-49-6W4; VCO #15) and Canadian Seaboard Ernestina Lake well #10-13 (10-13-60-4W4). Table 2 shows the locations and potash grades of selected wells from east central Alberta and the adjacent western part of Saskatchewan.

Table 2. Reported historic potash grades from wells proximal to Grizzly's Alberta Potash Project.

Well name	Location	Province	Total Potash Grade (% K2O)	Maximum Potash Grade (%K2O)	Reference
VCO #15	06-12-49-06W4	AB	not determined*	not determined*	Golden, 1965
Imperial Provost #2	01-33-37-03W4	AB	0.5% over 31.7 m	4.1% over 2.7 m	Cole, 1948
Ernestina Lake #10-13	10-13-60-04W4	AB	not given	not given	Brownless,1966; Golden, 1966
Petcal Dina	10-32-45-01W4	AB	not given	not given	Meijer Drees, 1986
Ogema #1	04-24-07-23W2	SK	4.9% over 23.2 m	20.0% over 0.8 m	Cole, 1948
Radville #1	16-36-05-19W2	SK	8.0% over 10.3 m	16.4% over 3.2 m	Cole, 1948
Davidson #1	16-08-27-01W3	SK	10.8% over 3.0 m	10.8% over 3.0 m	Cole, 1948
Verbata #2	07-24-41-24W3	SK	4.7% over 15.5 m	21.6% over 3.4 m	Cole, 1948
Prairie Salt #1	13-04-40-22W3	SK	3.2% over 15.3 m	17.2% over 1.7 m	Cole, 1948
Prairie Salt #2	13-04-40-22W3	SK	3.4% over 15.2 m	17.4% over 1.5 m	Cole, 1948

*Potash grades were never published for the Vermillion #15 well because the cores were damaged before accurate measurements could be completed, however Cole (1948) lists this well as having "no potash over 10% K_2O".

Well VCO #15 (6-12-49-6W4) was drilled in 1944. Prior to analysis, the cores were left exposed to the open atmosphere for several weeks and were affected by dissolution preventing an accurate assessment of the potash grade. The well was revisited in 1965 and reported to contain 3.7 m (12 feet) of carnalite ($KCl \cdot MgCl_2 \cdot 6H_2O$) in the upper part of the Prairie Evaporite Formation, underlain by 122 m (400 feet) of rock salt (halite ($NaCl$)). A 15.2 m (50 feet) section containing a pinkish-grey potash mineral (possibly sylvite (KCl)) was also noted in the top part of the Prairie Evaporite Formation (Golden, 1965, 1966). The potash bearing section is reported to be underlain by 122 m (400 feet) of halite.

No detailed discussion of the Imperial Provost #2 well (1-33-37-3W4) is available in the literature (most likely because it does not contain economically significant potash beds).

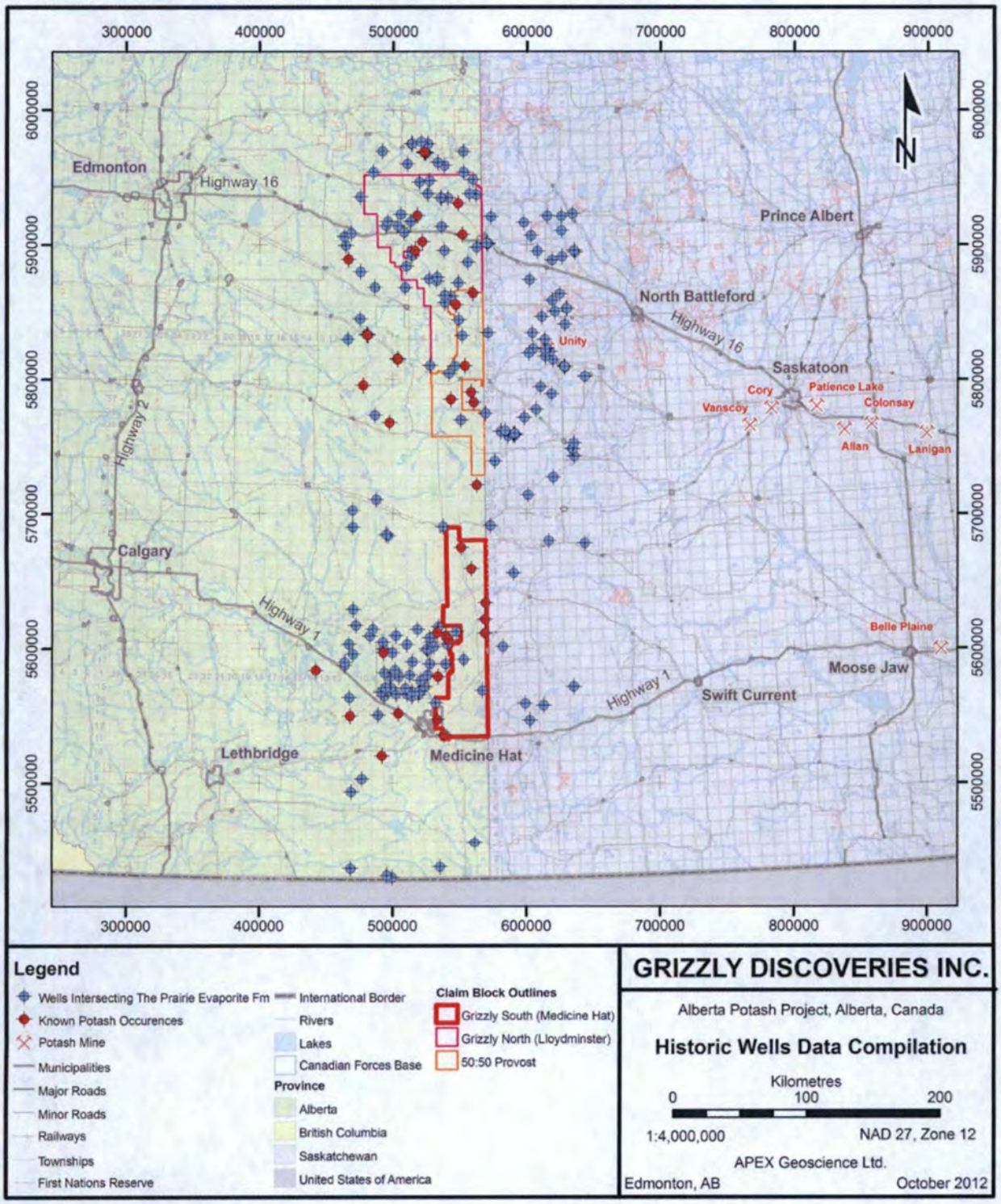

Figure 3 Historic Wells Data Compilation

The Ernestina Lake well (10-13-60-4W4) contains deflections in the natural gamma-ray and neutron-porosity wireline logs, indicative of potash at 804 to 806 m (2,637 to 2,644 feet), 817 to 819 m (2,681 to 2,688 feet), 978 to 981 m (3,210 to 3,220 feet), and 1064 to 1067 m (3,490 to 3,500 feet) (Brownless, 1966). Brownless (1966) also noted that carnallite was observed in the Lotsberg and Cold Lake Formations of the Elk Point Group in the same well, although the depths and thickness of the beds were not given. Both of these formations are known to consist of almost pure halite elsewhere in Alberta (Hamilton, 1971; Meijer Drees, 1986), thus it is not believed that any potentially economic potash deposits occur in these formations.

Brownless (1966) concluded that in both the VCO #15 and Ernestina Lake wells the potash mineral present is likely mostly carnallite, however he maintained that sylvite may be present in more significant quantities in that area. Due to the mineralogy, depth, and shale content it was concluded that exploration and development of these deposits would not be economical at the time (Brownless, 1966).

The Petcal Dina well (10-32-45-1W4) is mentioned by Meijer Drees (1986) as containing some potash, although the grade is not given, and may not have been determined.

Additional information of interest to potash exploration, is the historic examination of formation waters of the Beaverhill Lake Group, which overlies the Elk Point Group. The Beaverhill Lake Group was found to contain up to 19,000 mg/L K (milligrams per litre potassium) and up to 2,786 mg/L Br (bromine) (Hitchon et al., 1993; Underschultz et al., 1994; Bachu et al., 1995). The high bromine compositions suggest that not all of the salt was dissolved and redeposited by fresh water (Braitsch, 1962; Wardlaw, 1968). Hitchon et al. (1993) first suggested that the potassium-bromine anomaly in the waters of Beaverhill Lake Group might correspond to potash mineralization in the underlying Prairie Evaporite salt (Eccles et al., 2009).

6 Geological Setting and Mineralization

6.1 Regional Stratigraphy

Grizzly's South Claim Block lies within the Western Canadian Sedimentary Basin (WCSB), which is comprised of a massive wedge of Phanerozoic sedimentary rocks extending from the Rocky Mountains in the west to the Canadian Shield in the east. This wedge is about 6 km thick in the western regions, but thins to zero at its eastern margins. The sediments of the basin are covered by glacial deposits. Excellent summaries of the geology of the WCSB are presented in Glass (1990) and Mossop and Shetson (1994).

At Grizzly's South Claim Block bedrock beneath the glacial unconformity is generally mapped as the Upper Cretaceous Bearpaw Formation and the Pakowki, Oldman (Belly River Group; Figures 4 and 5). Phanerozoic units below these units are known mostly from well log data accessible from government databases and are discussed in detail in

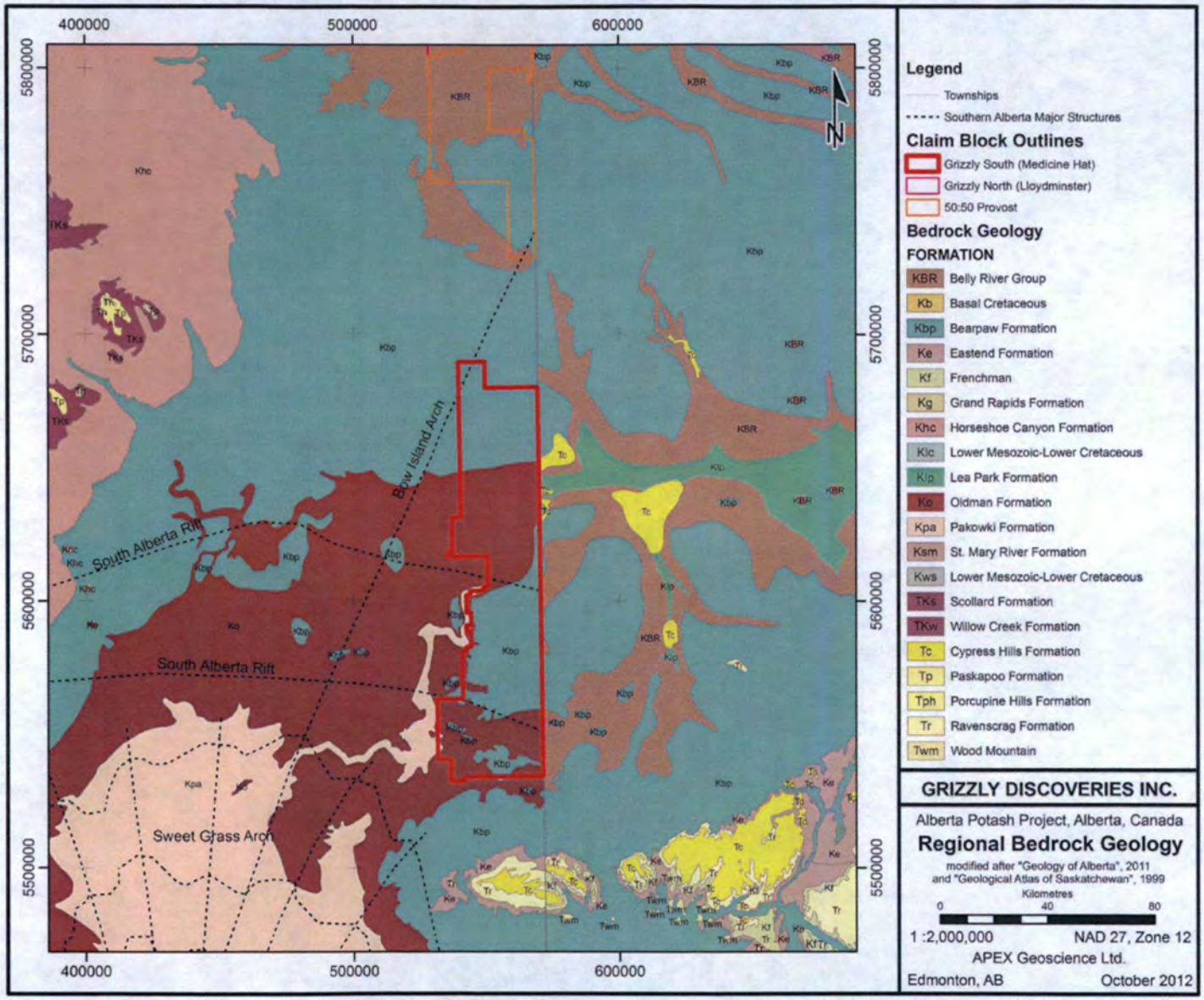

Figure 4 Regional Bedrock Geology

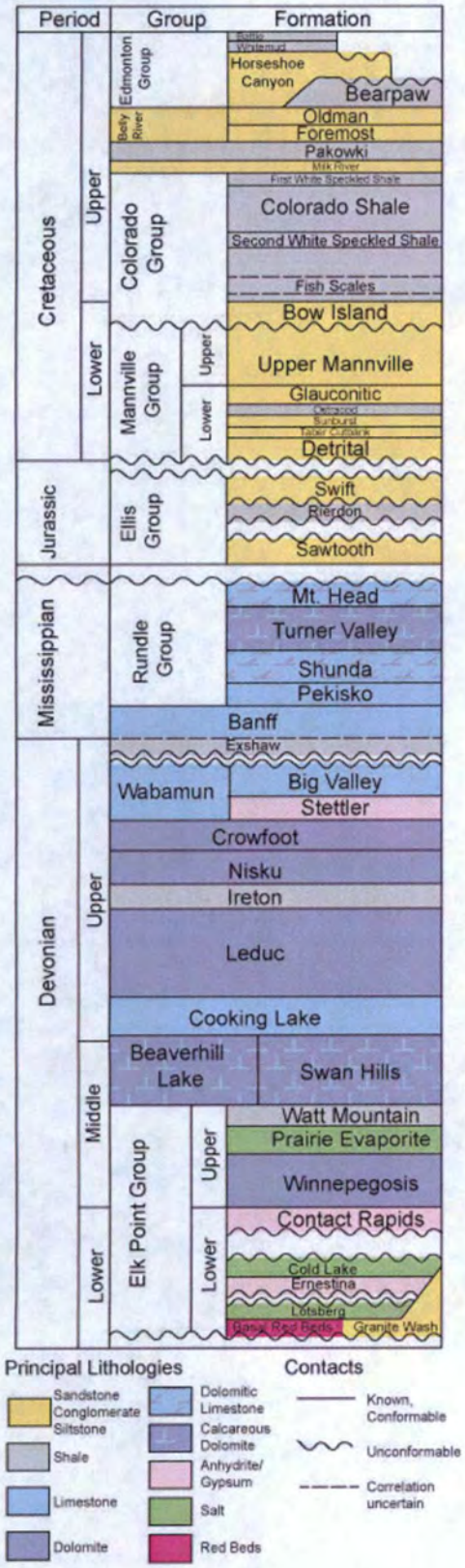

Figure 5 Southeast Alberta Stratigraphy

APEX Geoscience Ltd.

a number of previous studies (Glass, 1990; Mossop and Shetson, 1994; Grobe, 2000). A summary of the units of interest in presented below.

The Bearpaw Formation consists of laminated shale and siltstone with minor sandstone beds and lenses of kaolinite claystone. This formation extends from the northwest region of Edmonton towards the foothills in the southwest (Dawson et al., 1994). The underlying Oldman unit is a subunit of the Belly River Group that is comprised of sandstones and noncalcareous mudstones (Hamblin, 1997). The underlying Belly River Group (late Campanian), including the Oldman Unit, is comprised of fluvial sandstones and siltstones along with minor mudstones and coal. The Pakowki Formation underlies the Belly River Group and was deposited during the late Campanian time. It consists of mudstone and siltstone. The base of the unit is abrupt, which is shown by a pebble lag; whereas the top of the unit is gradational, with overlying clastics from the Belly River Formation.

The Colorado Group, underling the Belly River Formation, is described as dominantly argillaceous with minor shaly conglomerate, sandstone and siltstone. Occurrences of minor shaly chalk, chalky limestone, bentonite, and accumulations of fish skeletal debris and pyrite have been noted. The Colorado Group has been divided into an upper calcareous and a lower non-calcareous part at the base of the Second White Speckled Shale (one of two widespread marker units). The First and Second White Speckled Shale markers are described as being abundant in white flakes of coccolithic debris. These shales, along with an intervening shale of noncalcareous composition make up the upper Colorado sequence. In the vicinity of the South (Medicine Hat) Claim Block, the First White Speckled Shale includes the Medicine Hat Sandstone. The lower Colorado succession is made up of the non-calcareous shales of the Big River and Joli Fou formations. These two formations are separated by an apparently poor developed wedge of Bow Island sandstone (Equivalent to the Viking Formation). The Big River Formation includes the Fish Scale Sandstones, a widespread, highly radioactive marker unit that is known to contain fish skeletal debris in shaly sandstone layers. The base of the Colorado Group in this area is found to be the Bow Island Sandstone (Leckie et al., 1994).

The Colorado Group is separated from the Mannville Group beneath it by an unconformity. In southern Alberta, the Mannville Group is described as interbedded nonmarine sands and shales overlain by a thin, non-marine member, which in turn is overlain by marine shales, glauconitic sands and non-marine salt and pepper sands. In central and southern Alberta, the Mannville Group is divided into the upper Mannville and the lower Mannville. The upper Mannville contains the Glauconitic Sandstone, described as very fine to medium grained quartz sandstone with abundant glauconite. The Glauconitic Sandstone is overlain by the non-marine deposits of the upper Mannville. The lower Mannville is composed of the Ostracod Beds and the Ellerslie Member. The Ostracod Beds are composed of a mix of fossiliferous limestones, shales, and sandstones. The formation is notable because of the abundant Ostracod fossils which also include charophytes, gastropods, pelecypods, and fish teeth. The Mannville rests on the post Paleozoic unconformity.

In the area of the South (Medicine Hat) Claim Block, the Cretaceous strata rests upon the Pekisko Formation of the Rundle Group. The Mississippian aged Pekisko has been described as light colored, coarsely crinoidal and fragmental, to fine grained, sparsely crinoidal and in part dense limestone. Below the Pekisko is the Banff Formation, which is composed predominantly of shale and marlstones. The Banff formation unconformably overlies the Exshaw Formation. The Exshaw Formation ranges in age from Lower Mississippian to Middle Tournaisian (Late Devonian) and is a black shale horizon that marks the Devonian – Mississippian boundary. The Exshaw is described as an anomalously radioactive, brownish to black, sparsely fossiliferous shale.

Underlying the Exshaw is the Big Valley Formation, a grey tan and brown micritic limestone. It is described to be locally bioclastic and commonly fossiliferous. The Big Valley conformably overlies the Stettler Formation. The Upper Devonian Stettler Formation is composed of dolostones and evaporites. The dolostones range from microsucrosic to coarsely crystalline in texture. Beneath the Stettler lies the Crowfoot Formation of the Winterburn Group. The Crowfoot Formation is described as light grey to brown and red anhydrite and red to grey silty dolomite. The Nisku Formation of the Winterburn Group is described as light brown to light grey crystalline dolomite with minor brownish dolomitic siltstones, green shales and anhydrite. The lower portion of the Nisku is known to contain small stromatoporoid coral bioherms.

Below the Nisku Formation, the upper Ireton is known to contain argillaceous dolomites and limestones, fine crystalline dolomites and biomicrites that are quite fossiliferous. The lower Ireton Formation is made up of greenish grey and grey shales with interbedded argillaceous limestone or micrite. Beneath the Ireton Formation, the Leduc Formation is comprised of a wide variety of facies attributable to a shallow water reef depositional environment. Reef texture is dominated by stromatoporoid buildups. Sediments include skeletal mudstones, boundstones, and floatstones to muddy skeletal packstones and wackestones. Below the Leduc Formation, the Cooking Lake Formation is described as being predominately limestones that show a range in textures from mudstone to wackestones containing gastropods and ostrocods, non-skeletal grainstones with pellets, intraclasts and coated grains, and light to medium brown stromatoporoid rudstones and floatstones. The Beaverhill Lake Formation, below the Cooking Lake Formation, is described as being composed of limey shales and argillaceous micrites. The reefal portion of the Beaverhill Lake Group, the Swan Hills Formation, is composed of stromatoporoids.

The major salt deposits of the WCSB occur within the Lower to Middle Devonian Elk Point Group, which comprises limestone, dolomite, anhydrite, rock salt, redbed and fine- to coarse-grained siliciclastic rocks (Figures 5 and 6). The Elk Point Group unconformably overlies Precambrian or lower Paleozoic rocks that have up to 1,400 m of relief, and is overlain by a thin, flat layer of green or reddish brown shale of the Watt Mountain Formation (Meijer Drees, 1994; Grobe, 2000). The Watt Mountain Formation is composed of red and green shales, sandstones, limestone breccia, anhydrite, dolostone, and limestone (First Red Beds). In well GZD100 MEDHAT 8-36-19-1W4, the

Watt Mountain Formation was observed to be dominantly green shale. The deposition of the Watt Mountain Formation marked the end of Elk Point deposition.

The Elk Point Group has been mapped and studied in Alberta by Hamilton (1971), Meijer Drees (1986, 1994) and Grobe (2000); in Saskatchewan by Holter (1969) and Yang et al. (2009a–c); and in Manitoba by Bezys et al. (2008a, b). The Prairie Evaporite Formation within the Elk Point Group is the predominant, economic formation containing the potash deposits of Saskatchewan. Grizzly's entire Alberta Potash Project is underlain by the Prairie Evaporite Formation.

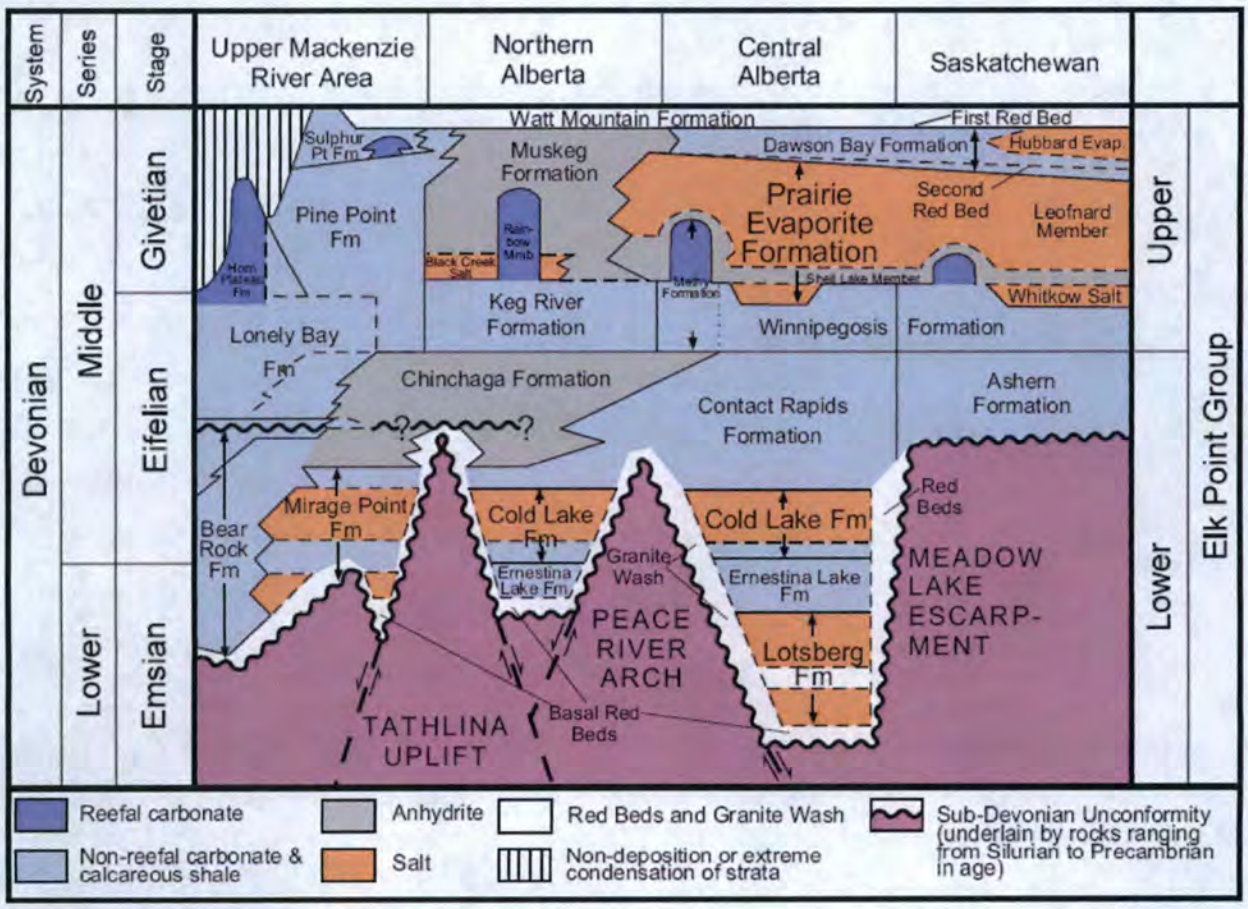

Figure 6 Elk Point Stratigraphy (after Grobe, 2000)

In general, the underlying Prairie Evaporite Formation of the Elk Point Group, grades upward from layered halite and anhydrite into massive halite with several colour variations: colourless, white, light and dark grey, light and dark brown, light and dark pinkish to red. In Saskatchewan, the upper 60 m of the Prairie Evaporite Formation includes three potash-bearing members: the Esterhazy, Belle Plaine and Patience Lake members (e.g., Holter, 1969; Fuzesy, 1982; Yang et al., 2009a–c). Based on the work of Yang et al. (2009a), the Patience Lake Member is the most probable unit within the Prairie Evaporite Formation that extends into southeastern Alberta. The potash zones are generally between 6 and 15 m thick and contain one or more beds of potash with intervening beds of lesser amounts of potash or barren salt. All three members contain

sylvite and are mined for potash in Saskatchewan, where there are currently eleven underground and/or solution mines in operation. Carnallite increases towards the margins of each member (Holter, 1969), except along the southern boundary of the Prairie Evaporite Formation. The uppermost member of the Prairie Evaporite Formation, the Patience Lake Member, ranges in thickness from 0 to 27 m (Holter, 1969) and contains sylvite-rich beds (10% to >30% sylvite; Holter, 1969) with halite and clay bands. The Patience Lake Member is mined in the Saskatoon (Cory), Lanigan and Belle Plaine potash mines. Grobe (2000) showed that in southeastern Alberta the Prairie Evaporite Formation is between 100 and 130 m thick.

6.2 Regional Structures

The Southern Alberta rift is described as a deep-seated, graben-like structure that runs from 450 km north of Medicine Hat to the Rocky Mountains, southwest of Cranbrook, near the Idaho border (Figure 4; Kanasewich, 1968). This rift is approximately Precambrian in age and penetrates the crust until the Moho Discontinuity (Kanasewich et al., 1969). During the lower Cretaceous, reactivation of the rift was evident from the presence of a thick deposit of the Crowsnest volcanics centered in the rift (Pearce, 1969). Step-like structures related to the Southern Alberta rift, such as the Lewis and Clark fault system and the Great Falls Techtonic Zone are also deep-seated and have a history of recurrent fault movements.

Other structural features that affected the area include the Sweetgrass Arch and Bow Island Arch (Figure 4). Both these structures were formed during the late Paleozoic.

6.3 Diagenesis

Diagenesis has affected the rocks of the Prairie Evaporite Formation in two major ways. First, the soluble minerals within the Prairie Evaporite Formation have been re-precipitated. Trace element studies, as well as mineralogical and stratigraphic associations preclude the possibility of formation directly from oceanic brine (Holter, 1969; Fuzesy, 1982). This poses additional difficulties when predicting the proportions of sylvite and carnallite regionally. Secondly, and more importantly, dissolution has regionally removed parts of the Prairie Evaporite Formation in Saskatchewan and Alberta, including in a small part of the Grizzly Alberta Potash Project (Holter, 1969, Fuzesy, 1982, Grobe, 2000). Prairie Evaporite salts have been removed by dissolution along the northeastern margin of the formation (Holter, 1969; Hamilton, 1971; Fuzesy, 1982; Grobe, 2000). Although the Grizzly's Alberta Potash Project claims are well within the area of potash occurrence, Grobe (2000) indicates that the edge of associated salt dissolution, which parallels the edge of complete salt removal to the northeast, lies adjacent to the North (Lloydminster) Block. Due to the lack of well control in this area, dissolution of the Prairie Evaporite Formation should be considered a possibility in this area.

6.4 Mineralization

The term potash refers to naturally occurring potassium-bearing salts and the commercial products derived from them. In the potash deposits of Western Canada, the minerals sylvite and carnallite are the most important. When sylvite is present with halite, they are collectively referred to as sylvinite, which comprises the high grade

preferred ore. Carnallite is common in variable amounts, but its presence lowers the ore grade. Sylvite and carnallite may occur together or separately and it is believed that at least some carnallite mineralization is secondary, especially near the margins of the sylvinite beds (Fuzesy, 1982). Potassium is slightly radioactive, therefore, minerals such as sylvite and carnallite when present yield gamma log spikes on downhole geophysical surveys.

The Devonian aged Prairie Evaporite Formation is the predominant, economic formation containing the potash deposits of Saskatchewan. Grizzly's entire Alberta Potash Project is underlain by the Prairie Evaporite Formation, which based upon down hole geophysical logs and examination of core contains at least two and possibly three potash bearing beds within the uppermost portion of the formation. Grizzly's Alberta Potash Project encompasses the historic VCO #15 well (approximately 200 north of the northern border of the South (Medicine Hat) Claim Block), the first recorded occurrence of potash in east-central Alberta. As discussed in the History section, the well was originally completed in 1944 to test for oil and gas. The core was then revisited in 1965 and it was recognized to contain potash similar in nature to the potash deposits of Saskatchewan (Golden, 1965; 1966).

In a compilation area of more than 62,000 square kilometres (km^2) there are only 15 wells (including one re-entry) that have penetrated the Prairie Evaporite Formation and have core available at the ERCB (Appendix 2). However, there are more than 100 wells that have penetrated the Prairie Evaporite Formation and that have corresponding down hole gamma logs that can also be used to identify the presence of potash minerals. The analysis of well logs in and around Grizzly's Alberta Potash Project has provided significant results with regards to identifying potential potash mineralization.

At least 14 wells within the compilation yield calculated potash values of greater than 5% K_2O (7.9% KCl) based upon gamma logs or XRF geochemical analyses from drill core. Of the 14 wells, 5 were drilled on or within the confines of Grizzly's South Claim Block, 5 on other parts of the Alberta Potash Project, and the remaining 4 wells are very close proximity to the project (<7 km from the boundary). A total of 3 of the wells on the South (Medicine Hat) Claim Block yielded greater than 10% K_2O (15.8% KCl) based upon XRF geochemical analyses or calculated values from gamma logs (Appendix 3).

In 2008, samples collected from cores from several Alberta wells were submitted to the Saskatchewan Research Council (SRC) for physical geochemical analyses. At least one sample from each drill core viewed yielded greater than 1.0% K_2O and up to a high of 4.1% K_2O (6.5% KCl). The well that yielded the sample, which returned 4.1% K_2O, also yielded a second sample result of 1.31% K_2O. This well exists immediately adjacent to North (Lloydminster) Claim Block of the Project.

During February 2009, a number of cores at the ERCB's Core Research Facility were examined and analyzed by a team that included personnel from APEX and the Alberta Geological Survey (AGS; Eccles et al., 2009). Historic well VCO #15, the original potash discovery hole that is located approximately 1.5 km from the boundary of Grizzly's North (Lloydminster) Claim Block, was analysed and yielded values up to 18.6% K_2O (29.4%

KCl) within an interval from 1,061.27 to 1,065.7 metres that averaged 3.6% K_2O (5.8% KCl) over 4.42 m. Portions of the core were missing from the examined and assayed interval. A total of 7 out of 22 analyses for the interval assayed between 7.73% K_2O (12.2% KCl) and 18.58% K_2O (29.4% KCl). It should be noted that more than half of the core in the main potash interval is missing from VCO #15, therefore the assays described here likely understate the grades that may have existed in this hole. Other holes of note include Wildemere Husky 10-3-49-6W4, which was drilled in close proximity to VCO #15 and yielded up to 11.5% K_2O (18.2% KCl) over 1.46 m and DEML MEDHAT 06-36-19-1W4, which exists within the central portion of the South (Medicine Hat) Claim Block and yielded approximately 21.6% K_2O (34.2% KCl) over 1.0 m based upon the gamma log signature.

7 Exploration

Exploration on the South Claim Block was completed between 2008 and 2012. During this period a data compilation, resampling and verifying of potash results from historical drill cores, a seismic study and drilling were completed. The total cost to complete exploration on the Grizzly South (Medicine Hat) Claim Block between 2008 and 2012 was $1,707,125.93.

7.1 Data Compilation

During 2008 and 2009, APEX Geoscience Ltd. was contracted by Grizzly to conduct a regional compilation of historical data along with available oil and gas data for the areas enclosed by and surrounding Grizzly's Alberta Potash Project. The regional nature of the compilation was intended to gain a better understanding of the Potash distribution and economic potential in Alberta which at the time had only been assessed to a very limited degree. In 2012, the compilation area was expanded to create a continuous block encompassing the all of the claim blocks that form the Alberta Potash Project. Available information consisted primarily of well log data, as well as archived drill core and published reports. Well logs provided the most extensive information source for this compilation. The petroleum industry uses downhole geophysical surveys (also known as wireline surveys) as a diagnostic tool to identify rock and fluid properties along the depth of a well, the results are known as well logs. Downhole geophysical surveys include gamma ray, caliper, electron, neutron, resistivity, and sonic. Gamma radiation is recorded in API units. The well logs in the compilation area were obtained through the GeoSCOUT™ software package. Over 14,000 wells exist in the compilation area, of these, 185 wells intersect the Elk Point Group (of which the Prairie Evaporite Formation is a part) and 167 wells directly intersect the Prairie Evaporite Formation (Figure 3; Appendix 2). The logs for these wells were available and obtained from GeoSCOUT™. Of the 167 wells that intersect the Prairie Evaporite Formation, a total of 53 wells are located on the Alberta Potash project with 10 of the wells directly located on Grizzly's South Claim Block.

All logs were examined for each of the 167 wells of interest, to confirm the accuracy of the assigned stratigraphic picks (Appendix 2). An example of a well log and associated picks for the tops of the Elk Point Group and Prairie Evaporite Formation is illustrated in Figure 7.

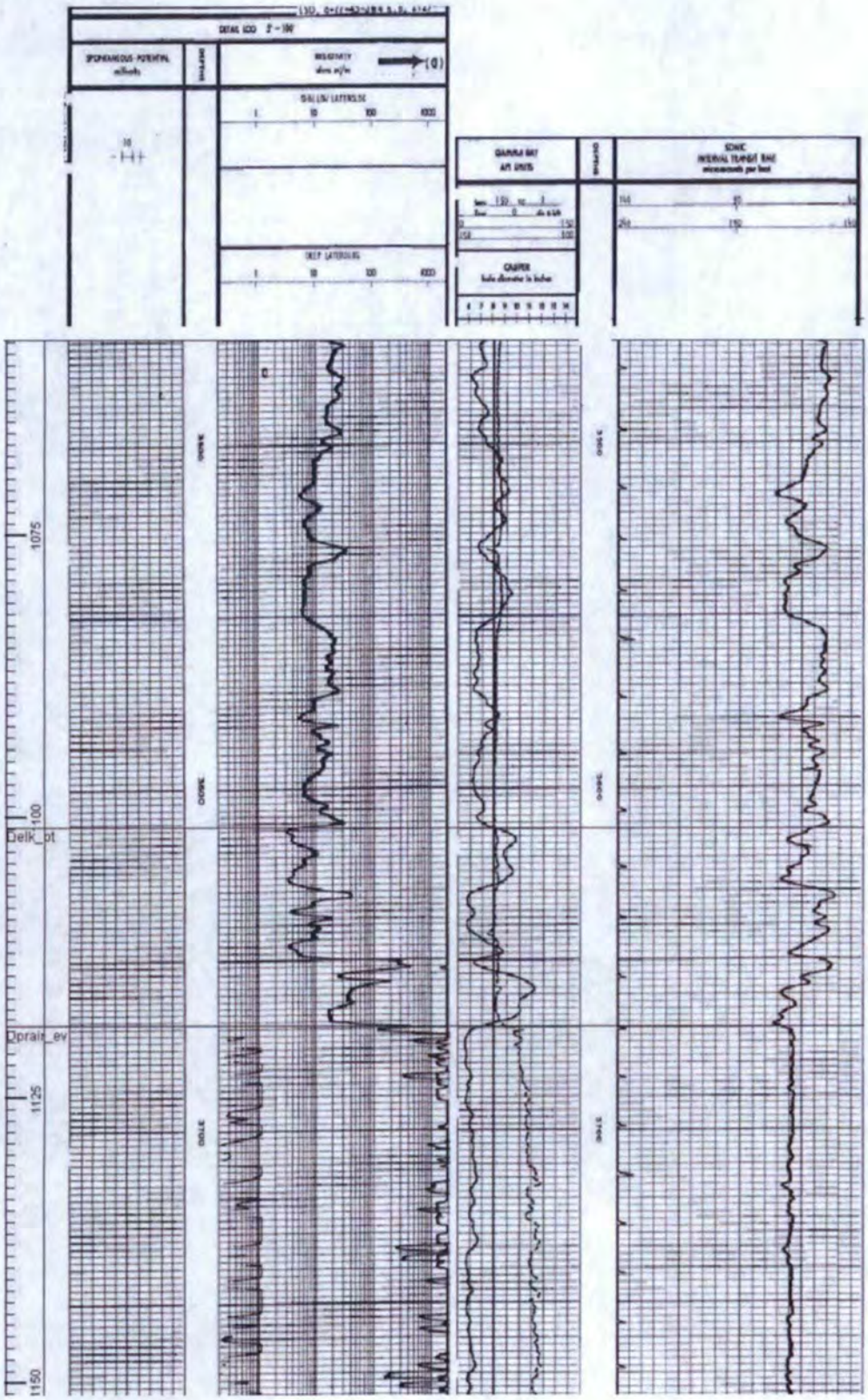

Figure 7 Well Log Example

A rigorous method was applied to identify and isolate potash beds on the compiled well log data. Potash beds are most easily identifiable on gamma ray logs due to the presence of the naturally occurring, radioactive isotope Potassium-40 (^{40}K) which produces a distinct signature (peak) on the gamma-ray log. Shale beds, which are locally present in the Prairie Evaporite Formation, may also contain significant concentrations of ^{40}K and therefore may also produce peaks on the gamma-ray logs. These shale beds can generally be differentiated from the potash beds using alternate properties identifiable from the other wireline logs. For example in a shale bed, caliper logs may show a significant decrease in borehole diameter (particularly if freshwater-based drilling muds are used), resistivity logs will show a significant decrease, and sonic travel time will be significantly increased in response to a shale bed.

The gamma-ray logs were also used to calculate estimated potash grades using an equation that includes the thickness of the unit and the radiation-intensity integral of the each peak, all calibrated against reported values for gamma intensity in the potash beds (based on Nelson, 2007). The response on the gamma-ray log is different for sylvite and carnallite, but it is not possible to differentiate potash beds with carnallite versus sylvite. The actual ratio of sylvite to carnallite is not actually known for the potash in the Grizzly Alberta Potash Project, so grade-estimates from well logs should be considered rough-estimates only.

Examination of the data collected indicates that potash occurrences and grades in Alberta increase towards the Saskatchewan border. Of the 167 wells that intersect the Prairie Evaporite Formation, 38 wells contain identifiable potash beds. Of those 38 wells, 7 wells are located on Grizzly's South (Medicine Hat) Claim Block (Figure 3; Appendix 3). The data available indicate that both potash occurrences and grades appear to be patchy, and from the data available individual beds cannot be accurately correlated over long distances. However, it was possible to identify areas where potash occurrences are more common (Figure 8).

A total of 110 of the 167 wells, that intersect the Prairie Evaporite Formation, have available down hole geophysical logs including a gamma log, however, a number of those wells were either not drilled deep enough, their gamma logs did not completely test the Prairie Evaporite Formation, or their gamma logs were of poor quality and unable to evaluate the Prairie Evaporite Formation for potash potential. As an example, out of the 53 wells that were drilled deep enough to intersect the Prairie Evaporite on Grizzly's Alberta Potash Project, only 36 contain a gamma log or core that permits an evaluation of the Prairie Evaporite Formation for the presence of potash. Of those 36 wells 8 are located on Grizzly's South Claim Block (Appendix 2). A total of 15 wells (including one re-entry well) within the compilation area with core from the Prairie Evaporite were available at the ERCB, with 5 (including one re-entry well) of the wells on or within the confines of Grizzly's Alberta Potash Project. From Grizzly's South (Medicine Hat) Claim Block, one well with core from the Prairie Evaporite was available at the ERCB (Appendix 2).

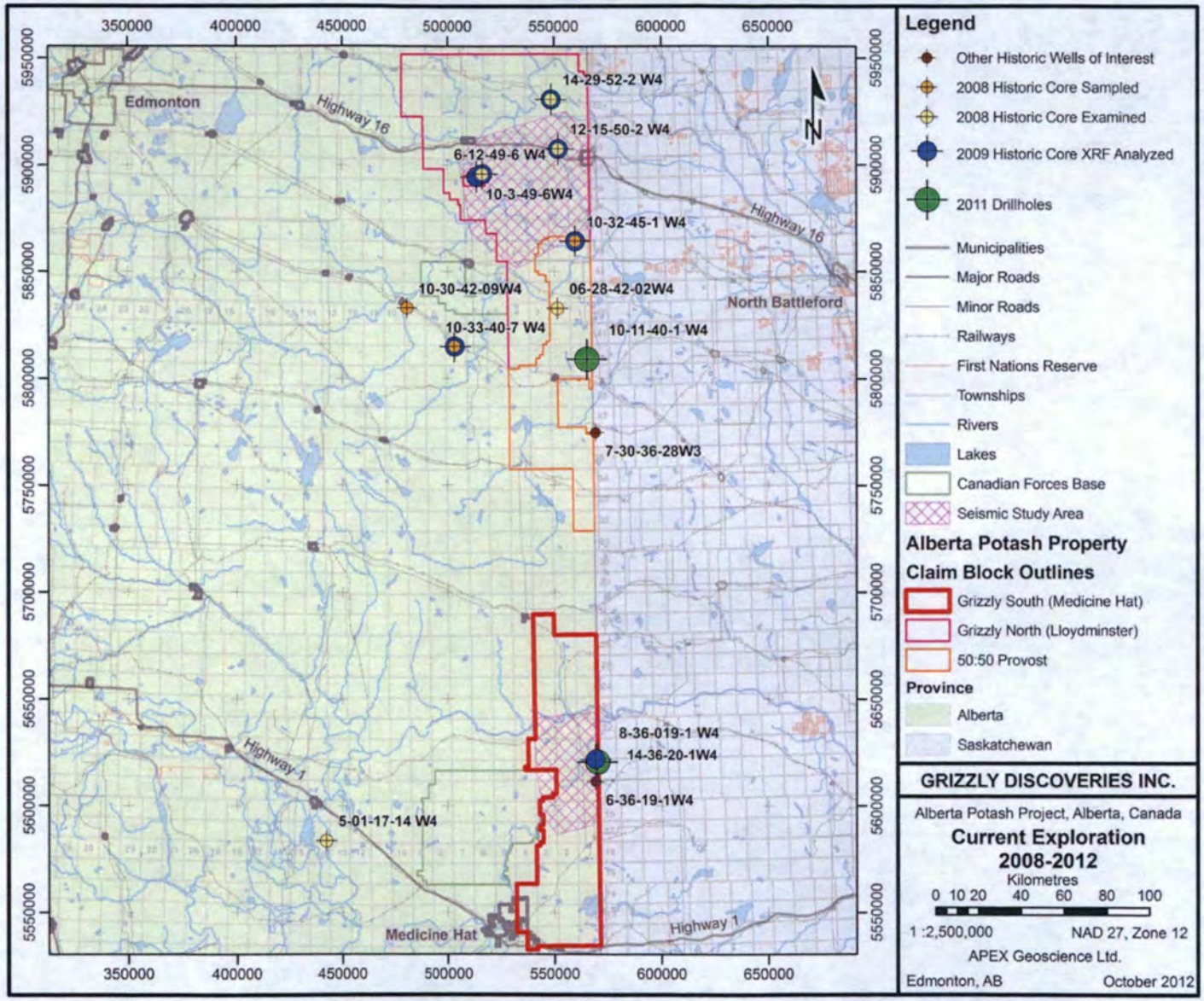

Figure 8 Current Exploration 2008 – 2012

APEX Geoscience Ltd.

Preliminary analysis by APEX determined that the Prairie Evaporite Formation underlies the vast majority of Grizzly's Alberta Potash Project, including the South Claim Block, and at a number of locations, appears to yield indications of potash. At least 14 wells within the compilation area yielded values of greater than 5% K_2O (7.9% KCl) based upon XRF geochemical analyses or calculated values from gamma logs (Appendices 2, 3, 4 and 5). Of the 14 wells, 5 were drilled on or within the confines of Grizzly's South Claim Block, 5 on other parts of the Alberta Potash Project, and the remaining 4 wells are very close proximity to the project (<7 km from the boundary). A total of 3 of the wells on the South (Medicine Hat) Claim Block yielded greater than 10% K_2O (15.8% KCl) based upon XRF geochemical analyses or calculated values from gamma logs. The best measured or calculated grade obtained from the South (Medicine Hat) Claim Block was from DEML MEDHAT 06-36-19-1W4, which yielded 21.6% K_2O (34.2% KCl) over 1.0 m (Figure 8; Appendices 2, 3, 4 and 5).

7.2 Re-Sampling of Historical Core

In September, 2008, core from 8 historical archived wells was examined at the ERCB Core Research Facility in Calgary, Alberta, by APEX personnel (Table 3; Figure 8; Appendices 2, 3, 4 and 5). None of the 8 wells are directly on the South Claim Block, however one well (5-01-17-14W4) lies 100 km east of the South Claim Block. Three historical wells 10-30-42-9W4, 10-33-40-7W4 (both west of the North Block of Grizzly's Alberta Potash Project) and 10-32-45-1W4 (located directly on the 50:50 Provost Property) were reviewed and sampled. The results are reported below as the data was used in the verification of historical results and correlation with well log data for the regional compilation area which includes the South Claim Block. A total of seven potash samples were collected. These potash samples were cut from the core at points that appeared to be representative of potential potash beds. The samples weighed between 80 and 255 grams and were sampled from the upper part of the Prairie Evaporite Formation. Several of the cores were visibly water-degraded, and a wet-saw had been accidently used by the ERCB on at least two of the cores. All cut-surfaces (but not freshly-broken surfaces) were sanded with a standard home-workshop belt sander (using latex gloves to prevent dissolution by perspiration) to remove the outermost, potentially damaged, layer (about 2 mm) so that a truly representative sample could be analyzed. The ERCB would not allow any more extensive sampling.

The samples were placed in individual plastic sample bags labeled with the sample number and sealed with a zip tie. Sample numbers and relevant associated data was noted in a field book and later transcribed into an excel file. The sample bags were placed in a bucket sealed with zip ties and shipped to the Saskatchewan Research Council's Geoanalytical Laboratories (SRC) in Saskatoon, Saskatchewan. The SRC is an ISO 17025:2005 accredited laboratory. The laboratory reported nothing unusual with respect to the samples once they were received.

Table 3 Cores Examined at the ERCB, September, 2008

Well	location	potash depths	samples
IMP Calstan Lake Newell	05-01-17-14W4	1749.0-1759.0	
Newalta Hughenden	10-33-40-07W4	1377.4-1384.1	1381.11
			1383.13
Federated LPG3S Hardisty	10-30-42-09W4	1359.8-1369.8	1360.99
			1363.23
BP Chauvin South	06-28-42-02W4	none	
Petcal Dina	10-32-45-01W4	1352.4-1360.1	1055.68
			1058.64
			1060.92
VCO #15	06-12-49-06W4	1060.7-1076.2*	
		1137.2-1158.2*	
Devonian Blackfoot test well	12-15-50-02W4	1025.7-1034.0	
Calstan Pacific Marwayne	14-29-52-02W4	916.3-917.4	

*note: potash depths taken from Golden, 1965, because cores were too degraded in September 2008 to obtain accurate values

At the SRC, the samples were analysed to determine their K_2O, MgO and CaO contents as well as moisture content. The rock samples were jaw crushed to 60% passing through -2 mm. From the crush a 100-200 g sub sample was rifle split. The sub sample was pulverised to 90% passing through -106 microns using a puck and ring grinding mill. The pulp was then transferred to a labeled plastic snap top vial. For the measurement of the soluble component a 0.125 g aliquot of pulp was placed in a test tube with 2.25 ml of 30°C deionized water and shaken. The soluble solution was analysed by Inductively-Coupled Plasma Optical Emission Spectroscopy (ICP-OES) (Appendix 4; SRC, 2012). For the measurement of the insoluble component a 2.00 g aliquot of pulp was placed in a test tube with 15 ml of 30°C deionized water and centrifuged for 2 minutes, decanted and repeated. The remaining sample material (insoluble) was dried and weighed. To measure the moisture content an 1.00 g aliquot of pulp was placed into a pre-weighed crucible and heated overnight. The sample was then weighed again and the moisture was calculated as wt.%.

The seven core samples that were analyzed returned a broad range of K_2O contents. An analytical results summary table and all laboratory certificates are included in Appendix 4. The highest value, 4.1% K_2O (6.5% KCl), was returned from the sample collected from 1,055.7 m depth in hole 10-32-45-1W4. The lowest value, 0.2% K_2O, was returned from the sample collected from 1,361.0 m depth in hole 10-30-42-9W4. The cores that were sampled were several decades old (drilled in 1966, 1967 and 1958, respectively) and hence the core was of poor quality (see Golden, 1966). The potash minerals, carnallite and sylvite, are highly soluble and are selectively dissolved before halite. The analyses that were conducted on the samples are considered a preliminary series of tests on mineralization and give minimum grades of potash only.

7.3 X-Ray Fluorescence (XRF) Analyses

In February 2009, cores from seven wells within the compilation area were analysed using a portable XRF (X-Ray Fluorescence) analyzer in order to provide a more comprehensive analytical dataset that could not be obtained due to limitations on physical sampling of the core (Appendix 5). Of wells analyzed, one (14-36-20-1W4) is located on Grizzly's South (Medicine Hat) Claim Block (Figure 8). The work was completed at the ERCB Core Research Facility by a team from Elemental Controls Ltd., the Alberta Geological Survey and APEX (Eccles et al., 2009).

The analyses were performed using a portable Niton XL3t 900 XRF analyzer with geometrically optimized large area drift detector (GOLDD™) technology. This analyzer uses a miniature x-ray tube (50 kV with silver anode) for production of primary radiation and a silicon drift detector with approximately 150 electron volts (eV) resolution. It is equipped with a ^{109}Cd isotope source and uses NpL-shell emissions and 23.0 gamma-ray emission. The GOLDD technology collects 10 times the counts per second of previous analyzers, resulting in reduced measuring times and decreased error. The analyzer displays a primary screen of elements that are within the 95% confidence band, and is capable of storing and downloading up to 10, 000 assays with full spectral data (Eccles et al., 2009). Mr. Dufresne, of APEX and a qualified person, was present during XRF analyses conducted in early 2009.

Spot measurements were conducted by placing the exposure window of the analyzer, which measures 1.0 by 2.0 cm in diameter, in direct contact with a flat core surface. The measurements were collected down the axis of the core to create a profile of elemental concentrations for potassium. Generally, in zones of visually observed mineralization, 25 cm spot spacing was used (Appendix 5). In zones that appeared less prospective for potash minerals, a spot spacing of 75 cm was used. Homogenous-looking samples were preferentially selected to reduce sample matrix effects.

The analyses were conducted using two modes: Soil Mode and Mining Mode. Soil Mode uses a Compton backscatter calibration method and provides accurate results in the limit of detection range 50–30,000 ppm for elements from sulfur (S, atomic number 16) to uranium (U, atomic number 92). Mining Mode uses the fundamental parameters calibration method and provides accurate results in the range 0.1%–100% for most elements. Mining Mode is the only mode that has the ability to detect the light elements from magnesium (Mg) to phosphorus (P), making this mode best suited for measuring the evaporite samples. A helium cylinder was coupled to the analyzer to lower the minimum limit of detection for the light elements. Measurement times used during this study were 90 seconds: 15 seconds for the Soil Mode and 75 seconds for the Mining Mode (Eccles et al., 2009; McMillan and Dufresne, 2009).

Analyses were begun at the top of the Prairie Evaporite Formation and continued until either no more core was available for analyses or until it was deemed there was no significant possibility of encountering further potash. Analytical results were available immediately for each measurement. The analyzer was calibrated against a standard before beginning each day and periodically throughout each day. The SRC returned the

sample pucks from the seven samples that were analyzed by ICP-OES and these were also analyzed with the XRF (Appendices 4 and 5).

In one instance it was possible to compare a K_2O grade estimated from a gamma log with the K_2O grade determined by XRF. For the well Pectal Dina 10-32-45-1W4, McMillan and Dufresne (2009) estimated the K_2O content between 1,056.3 and 1,059.3 m to be 2.8% (Appendix 3). Averaging the XRF-K_2O values collected every 30 to 50 cm for the core between 1,056.50 and 1,059.48 m yields a K_2O value of 2.5% (with a standard deviation of 1.94; Appendix 5). Although a single comparison is not a statistical analysis, the fairly good match between these two methods is encouraging.

Core from the 7 wells was analyzed using the hand held XRF analyzer. Six of the seven wells yielded spot values greater than 7% K_2O (11.1% KCl). The seventh core did not have core available from the top of the Prairie Evaporite Formation, where potash bed are normally present (McMillan and Dufresne, 2009; Eccles et al., 2009). Spot tests as high as 18.6% K_2O (29.4% KCl) were returned from cores taken from well VCO#15 (6-12-49-6W4), near Grizzly's Alberta Potash Project; however, observed spot grades were heterogeneous even on the scale of decimeters. Analyses of core from well 14-36-20-1W4, on the South Claim Block, returned spot test as high as 11.5% K_2O (18.2% KCl). As the core tested has undergone degradation, the values yielded by the core are minimum possible values. In general, core condition ranged from good-moderate to very poor, and the K_2O concentrations as determined by XRF represent minimum values, since the potash in the cores may have partially dissolved particularly on the surface of the cores where the XRF analyzer is collecting its analyses from. Potash salts are significantly more soluble than halite, some of the cores analyzed are known to have been left exposed to the atmosphere for extended periods (e.g., Golden, 1965; Richner et al., 1992). Complete results of the XRF analyses are given in Appendix 5 and are discussed in Eccles et al. (2009). Wide low grade potash bearing zones were confirmed in four of the cores (McMillan and Dufresne, 2009; Eccles et al., 2009; Appendix 5).

7.4 Water Chemistry Compilation

In March, 2009, a compilation of formation water chemistry data was completed for wells in the area of Grizzly's Alberta Potash Project. The compilation was restricted to wells that tested within or below Devonian strata and reported the test type as drillstem or swab test. With these criteria, 2,426 wells with formation water chemistry were available and were accessed from the Geofluids module of the GeoSCOUT™ software package (Figure 9). On the South Claim Block, a limited number of wells were available, with 182 (including numerous re-entry wells) containing formation water data. The intent of the study was to see if high K in formation water in the Beaverhill Lake or Leduc formations (which sit immediately above the Prairie Evaporite Formation) could, a) be an indicator of high K in the Prairie Evaporite and b) to see if there are areas of high concentrations of K in formation waters that could be produced for their K content. A number of wells were identified with >1% (and up to 8.6%) K in formation waters within carbonate hosted aquifers immediately above the Prairie Evaporite Formation (Figure 9). The highest potassium value recovered for Grizzly's South (Medicine Hat) Claim Block was 6,000 ppm (0.6% K). However, adjacent to the north of the South Claim block lies a cluster of wells that returned >1% K up to 2.7% K. The data for many of the

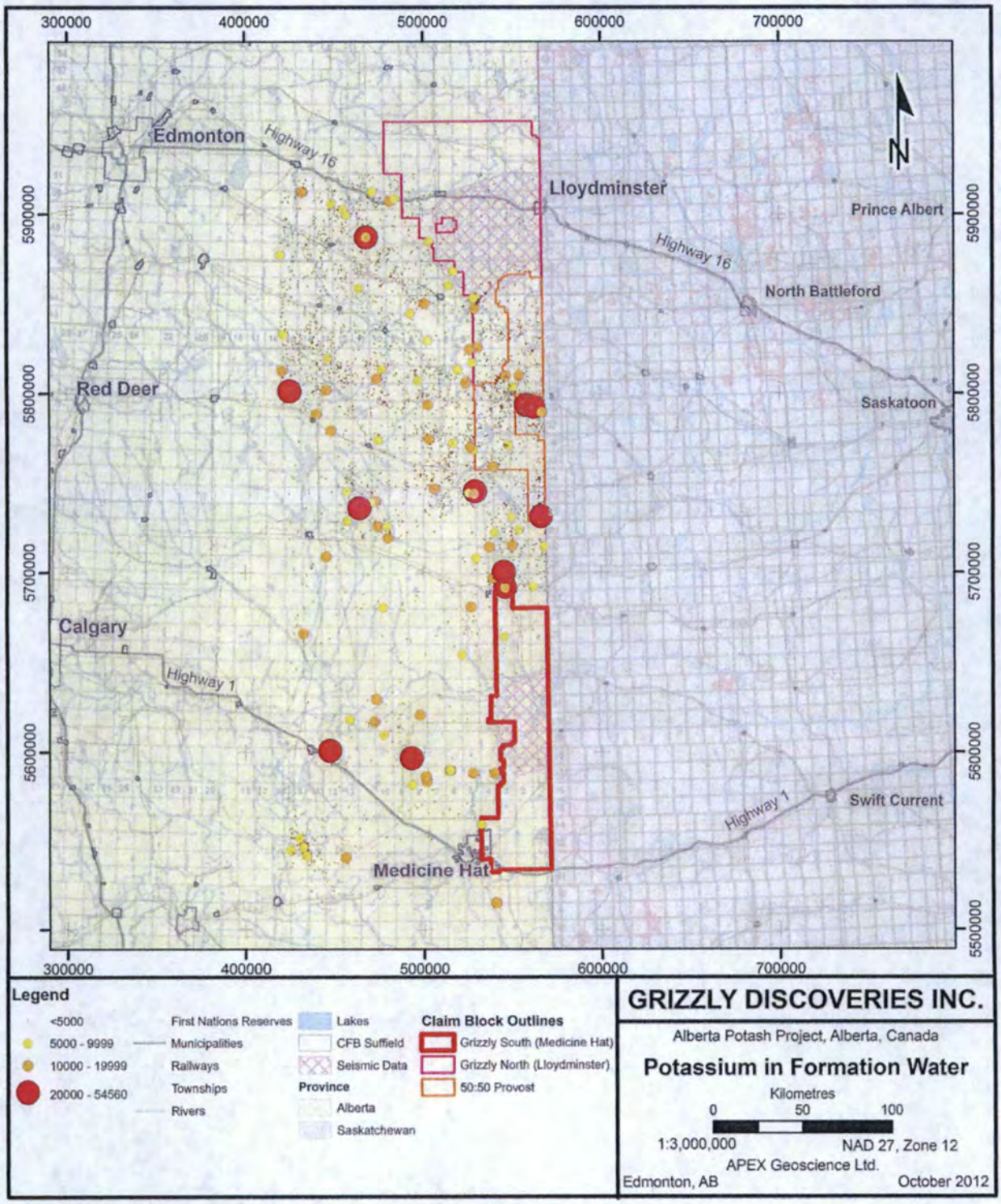

Figure 9 Potassium in Formation Water

wells is subject to contamination and in many cases is suspect. An effort was made to eliminate any wells with indications of contamination including wells with comments such as 'Acid Completion Fluid' or 'Mud Filtrate KCl' along with a number of other comments. In addition, mass balance of the formation water was also reviewed in order to help eliminate suspect analyses.

Hitchon et al. (1995), after a fairly exhaustive quality review of wells with formation waters, also identified high concentrations of K in Devonian aquifers in the region of Grizzly's Alberta Potash Project.

The use of anomalous K in well water has been proposed as a potential indicator of potash mineralization in the underlying Prairie Evaporite Formation because potash minerals are highly soluble, especially sylvite and carnallite. A number of potassium in formation water anomalies have been identified that show a patchy distribution in eastern Alberta (Figure 9). This is comparable to the patchy distribution observed for potash in the well logs. Given that the potash beds in eastern Alberta occur near the edge of the much larger potash deposits in Saskatchewan, and are a continuation of the Saskatchewan deposits (e.g., Worsley and Fuzesy, 1979), it is not difficult to reconcile the patchy distribution of potash in this area with geologic models of evaporite formation and diagenesis. It is possible that the patchy distribution is due to isolated deposition in small restricted sub-basins, partial dissolution by influxes of seawater from the northwest, post depositional dissolution due to the far greater solubility of potash salts vs. halite, or some combination of these possibilities. However, the limited number of wells, along with the sampling which covers everything within or below the Devonian, precludes any definitive mapping or conclusions. In addition, K contamination from drilling muds and kill fluids is of serious concern as a number of water chemistry analyses with reported high K in formation water in the GeoSCOUT™ database are likely due to contamination.

The use of deep water geochemistry for potash exploration is a very promising technique, but one that needs more work before the data could be used to pick test holes for potash in the Prairie Evaporite Formation or as an indicator of carbonate hosted formation waters that could be produced for their K content. It is possible that Devonian groundwater movement is spatially variable and structurally controlled to some extent within the Alberta Potash Project, and therefore it is not known with certainty whether a formation water K anomaly represents a potash bed at a specific location and depth. If the use of formation water chemistry is better understood it could become a useful exploration technique to help in the search for potash and potentially formation waters that could be produced for their K content as well as a number of other elements.

7.5 Seismic Data Interpretation

In the summer of 2011, Grizzly retained RPS Boyd PetroSearch of Calgary, Alberta, to compile and interpret all available seismic data over a central area of the South Claim Block (Figures 8 and 9). Existing 2D (2 dimensional) seismic data was purchased and reprocessed to increase data quality. The data was then modelled and correlated to local geology using well bore data. Depth conversion of the data produced structure

maps for the tops of the Prairie Evaporite and Winnipegosis Formations and a resultant isopach map for the Prairie Evaporite Formation (Appendix 6). In the Suffield compilation area, which covers the center of the South (Medicine Hat) Claim Block, the initial interpretation produced structure maps for both the Prairie Evaporite and Winnipegosis Formations that show a regional dip down towards the northeast (Appendix 6). No major perturbations were discovered that need to be avoided for drill targeting.

8 Drilling

8.1 2011 Alberta Potash Project Drilling Program Overview

In 2011, Grizzly drilled one well GZD100 Med Hat 8-36-19-1W4 on the South Claim Block (Figure 8). The well was drilled by Ensign Energy Services of Calgary, Alberta and was managed by personnel from APEX and Barlon Engineering Group Ltd. (Barlon) of Calgary, Alberta.

At the well site, the core was quick-logged, photographed and semi-quantitatively measured using a portable handheld XRF analyzer by APEX staff. Downhole geophysical surveys, including induction, acoustic, density, neutron, gamma and calliper logs, were completed for the entire depth of both wells by Baker Hughes Canada (Baker Hughes), of Calgary, Alberta.

8.1.1 GZD100 MEDHAT 8-36-19-1W4 Drillcore Sampling

Between November 28th and December 12th 2011, Grizzly drilled test well, GZD100 MedHat 8-36-19-1W4, on the South (Medicine Hat) Claim Block. An APEX geologist was present for the complete duration of the drilling operations. The well was drilled to a total of 1,745 m depth and terminated in the Winnipegosis Formation. The well was conventionally drilled to a depth of 1,642 m, cored from 1,642 m to 1,678 m and then once again drilled conventionally to the final depth of 1,745 m (Appendix 7). There was full recovery in the coring interval.

The well cored a thick zone of Prairie Evaporite Formation salt intersecting a wide, low grade potash zone (22.35 m) near the top of the unit at a depth of 1,648.5 m (Appendix 7). Within the wide low grade potash zone, the drilling intersected two zones of sylvite mineralization (an Upper zone and Lower zone) within what is likely the Patience Lake Member (Figure 10).

The core was quick-logged, photographed and semi-quantitatively measured using a portable handheld XRF analyzer (with measurements taken every 0.5 m, with 0.25 m intervals over zones of visible potash mineralization) by APEX staff (Appendix 8). The core was then covered in plastic and the boxes were taped shut and loaded for transport. The core was shipped to Exova Holdings Limited laboratory (Exova; formerly Norwest Laboratories) in Calgary, Alberta, under the supervision of a representative of Barlon Engineering.

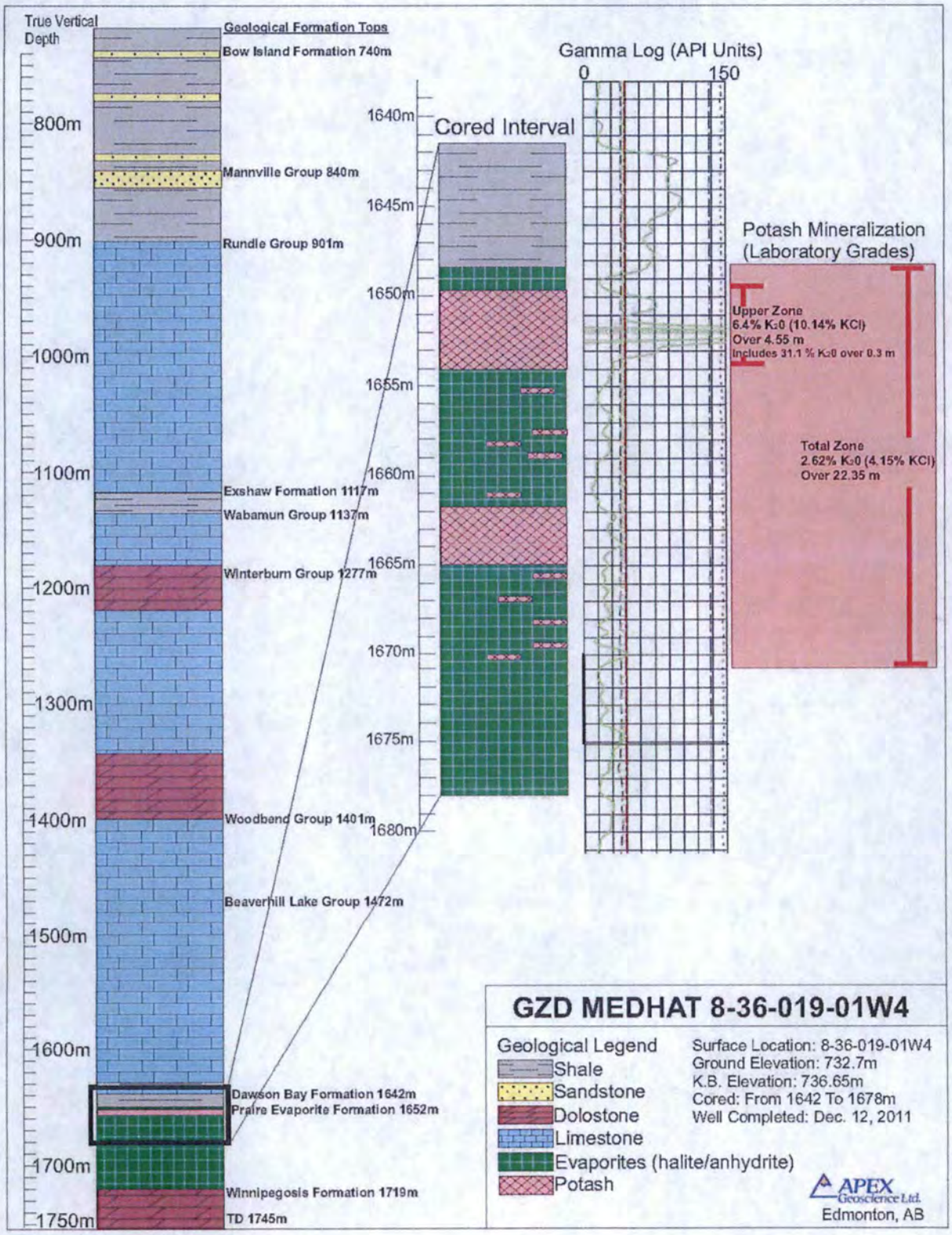

Figure 10 GZD MEDHAT 8-36-019-01W4 geological cross-section and gamma log

At Exova, the core was unboxed, described, photographed, and depth corrected to the well logs (Appendix 7). APEX personnel were on site for part of the sampling process. The core was cut into slabs using a dry saw and the half cores were geologically logged in detail and photographed (Appendix 7). The analysis also included geological and geotechnical characteristics of the salt back and units that overlie the ore zone. Sample intervals were determined based on geological boundaries. A total of 55 samples with sample intervals ranging from 0.15 m to 0.7 m were collected from MED HAT 8-36-019-1W4 (Appendices 7 and 8).

The Exova building is secured by passcard and all visitors are required to sign in and out of the building. The core was stored by itself in room 2A. The samples were placed in sealed plastic buckets and shipped to the Saskatchewan Research Council (SRC) Geoanalytical Laboratories in Saskatoon, Saskatchewan. The SRC reported nothing unusual with respect to the samples once they were received.

The samples were analyzed at the SRC using their analytical package for potash. The rock samples were jaw crushed to 95% passing through -2 mm. A representative sub-sample was collected from riffle splitter. All crushed "rejects" were vacuum sealed, returned to the original pails and stored until requested by the client. The sub-sample was homogenized by mild steel grind to 95% passing minus 0.106 mm. A portion of the homogenized aliquot was transferred to a bar-coded plastic snap top vial with the remaining ground material (pulp) sealed in the pulp bag. An aliquot of pulp was placed in a test tube with deionized water and shaken. The solution was then analysed by ICP-OES to measure the highly soluble evaporites. To measure the insoluble component an aliquot of pulp was placed in a test tube with deionized water. The sample was shaken and centrifuged until the solution was clear. The solution was decanted and diluted with 15 ml of deionized water, shaken and centrifuged again. The remaining sample material (insoluble) was dried and weighed. To measure the moisture content an aliquot of pulp was placed into a pre-weighed crucible and heated. The sample was then weighed again and the moisture was calculated as wt.%.

Analytical results include a weighted average grade of 2.62% K_2O (4.15% KCl) over 22.35 m at a depth of 1,648.5 m for the low grade zone, with higher grade portions including 6.4% K_2O (10.14% KCl) over 4.55 m, which includes 8.77% K_2O (13.88% KCl) over 2.65 m. Higher grades also include 13.0% K_2O (20.58% KCl) over 1.15 m for the Upper Zone and 2.45% K_2O (3.88% KCl) over 3.3 m for the Lower Zone. The highest assay from the zone was 31.1% K_2O (49.2% KCl) for a 0.3 m core sample (Figure 10; Appendix 8). Low grades of MgO indicate that sylvite is likely the major potash mineral, rather than carnallite.

Visible sylvite mineralization was observed in the core primarily from 1,649.7 m to 1,653.0 m (Appendix 7). A coincident response of about 340 API was observed on the gamma log centered at a depth of about 1,652 m yielding a calculated grade of approximately 22.7% K_2O (35.8% KCl) over about 1.25 m, roughly confirming the geochemical grades obtained from the core analyses. The upper zone yielded 6.4% K_2O (10.14 % KCl) over 4.55 m that includes 8.77% K_2O (13.88% KCl) over 2.65 m with

a higher grade of 13.0% K_2O (20.58 wt.% KCl) over 1.15 m (Table 4).The gamma log seems to indicate that higher grades (over the 1.15 m high grade upper zone) might

Table 4. Summary of 2011 GZD100 MEDHAT 8-36-19-1W4 Drill Core Sample Assay Results

	Depth				Thickness		Grade K2O (wt. %)	Grade KCl (wt.%)	Grade MgO (wt.%)
	From		To						
	(m)	(ft)	(m)	(ft)	(m)	(ft)			
average	1648.5	5408.5	1670.9	5481.8	22.4	73.3	2.62	4.15	0.09
Upper Zone	1649.4	5411.4	1654	5426.4	4.55	14.9	6.4	10.14	0.11
Includes	1649.7	5412.4	1652.4	5421.1	2.65	8.69	8.77	13.88	0.1
Includes	1651.2	5417.3	1652.4	5421.1	1.15	3.77	13	20.58	0.14
Includes	1651.7	5419	1652	5420	0.3	0.98	31.1	49.23	0.09
Lower Zone	1661.7	5451.8	1665	5462.6	3.3	10.8	2.45	3.88	0.06

have been expected. The lower high grade zone does show up on the gamma log with a couple of visible peaks of up to 40 API at 1,662 and 1,664 m. Below the main potash zone, low grade potash in halite mineralization was encountered throughout much of the rest of the core

In 1980, a historic oil well DEML MEDHAT 6-36-19-1W4, located 800 m west of the current well location for GZD100 MEDHAT, yielded a gamma log spike of about 218 API units at a depth of approximately 1,662 m below surface for a calculated maximum potash grade of approximately 21.6% K_2O (34.2% KCl) over 1.0 m (Appendix 3). The depth of the potash intersections in DEML MEDHAT and GZD100 MEDHAT is at a similar depth to the Belle Plaine Potash Solution Mine near Regina Saskatchewan and would likely be ideally suited to solution mining due to high formation temperatures. Therefore further potash drilling is warranted on Grizzly's South (Medicine Hat) Claim Block. Further potash drillhole tests should step out south from well GZD100 MEDHAT 8-36-19-1W4.

8.1.2 GZD100 MEDHAT 8-36-19-1W4 Drillcore XRF Analyses

Hand held XRF spot analyses of the drill core at the well site yielded up to 17.64% K (21.2% K_2O; Appendix 8).

A detailed discussion of the analytical comparisons between the XRF analyzer and seven laboratory geochemical values from powdered samples obtained from three separate Prairie Evaporite Formation cores (10-30-42-9W4, 10-32-45-1W4 and 10-32-40-7W4) is discussed by Eccles et al. (2009) and summarized below.

The measurements with the $XL3_t$ 900S XRF analyzer were made on aliquots of the same powders that were used in the geochemical laboratory analysis. It was

determined that the two methods showed a moderate to excellent correlation and that the XRF analyzer provided sufficient precision for these elements to conduct spot XRF analysis on the cores of interest. The r^2 values for K_2O, MgO, CaO and S are 82%, 96%, 71% and 97%, respectively.

Duplicate XRF measurements were collected on 22 randomly selected separates. The relative standard deviation showed significant variability for most elements including K_2O and MgO. Eccles et al. (2009) recommended that the potash values obtained by the XRF analysis be used with caution.

Eleven measurements were completed on reference material CCRMP Till-4, which has a certified potassium value of 3.25% K_2O or 2.69% K (Lynch, 1996). Measurements of the potassium content of Till-4 using the portable XRF analyzer were 2.828%, 2.348%, 3.148%, 2.359%, 2.277%, 2.333%, 2.41%, 2.37%, 2.26%, 2.369% and 2.367%; the average of these is 2.46% K and the standard deviation is 0.274. This error is on uncorrected data that could have a bias.

8.1.3 GZD100 MEDHAT 8-36-19-1W4 Drillcore Data Verification

The SRC performs Quality Control Monitoring during the sample preparation and analysis process. A screen size analysis on 5% of samples was completed after crushing to minus 2 mm and after pulverization to minus 0.106mm with the criteria of 95% passing. Loss of mass monitoring on 5% of samples was completed after crushing to minus 2 mm and after pulverization to minus 0.106 mm with the criteria of 95% passing. The Grinding mills are cleaned with Quintus quartz (QQ) at the start of every group and as required between samples (i.e. for sticky samples). Sample blanks (QQ) are performed in the rate of 5% per group (Appendix 8). All data is tracked and available to client. The QQ sand blank, is run 1 per 20 samples or 1 per batch in case batches are less than 20. A pulp repeat is included with every set of 36 samples and 1 split sample repeat is included with every group. Additionally 1 reagent blank per group is included. The SRC analyzed a potash standard (either POT003 or POT004) every 20 sample analyses (Appendix 8).

The main potash intersection for the well GZD100 MEDHAT was re-assayed at the SRC at the request of APEX and using larger aliquots for the dissolution and ICP analysis. The results compared well to the original lab results and no issues were indicated (Appendix 8).

9 Exploration Expenditures

Between 2008 and 2012 a data compilation, resampling and verifying of potash results from historical drill cores, a seismic study and drilling were completed on the South (Medicine Hat) Claim Block mineral permits within Grizzly's Alberta Potash Project. A total of CDN$1,707,125.93 (not including GST) was spent on exploration during the period. A summary of exploration costs and a detailed expense report is provided in Appendix 9.

10 Interpretation and Conclusions

Potash is a potassium-rich salt mined from underground deposits and is essential for all plant, animal and human life. Approximately 95% of the world's potash is used in fertilizers. Potash is a critical component of fertilizer required for root system strengthening, for which there is currently no economically viable alternative. Potash fertilizers increase global food production, which is demanded from finite agricultural lands. Canada is the world's largest producer of potash, with the potash ore bodies in Saskatchewan being the world's largest, richest and most economical to mine. A large portion of the world's potash supply is being produced by 11 mines in Saskatchewan that are all producing out of the Prairie Evaporite Formation. Saskatchewan's potash resources are estimated to be approximately 23 billion tonnes of KCl (Cocker et al., 2010) with potash ore grades between 16% and 27% K2O (25% and 42% KCl).

Grizzly Discoveries Inc.'s South (Medicine Hat) Claim Block is located approximately 250 km east of Calgary, overlaps the city of Medicine Hat and comprises 398,127 hectares (983,792 acres) within 49 MAIM permits. The South Claim Block is part of the larger Alberta Potash Project which is comprised of 140 MAIM permits, totaling 993,285 hectares (2,454,458 acres) extending along the Alberta Saskatchewan border from north of Lloydminster to Medicine Hat. The Alberta Potash Project is divided into the wholly owned by Grizzly South Claim Block and North Claim Block, and the 50-50 jointly owned Provost Property which is held by Grizzly and Pacific Potash Corporation.

Between 2008 and 2012 APEX was retained by Grizzly to manage an exploration program for its South (Medicine Hat) Claim Block. Exploration on the South Claim Block consisted of a compilation of all existing publically available data and assessment reports, a compilation and analysis of available historic drill core and down hole geophysical logs, the commission of a seismic geophysical study, and drilling of a potash test hole.

The 2008 and 2009 regional compilation indicated that only limited historic data existed for previous potash exploration in Alberta. The majority of the current information for the potash potential of Alberta was obtained from historic oil and gas well drill hole data and archived drill core found at the government core storage facility at Alberta's ERCB. The compilation area included the entire area of the Alberta Potash Project and a buffer zones around the permits to gain a better understanding of the potential regional distribution of potash in the area. The compilation resulted in the identification of 14,651 available wells with 167 wells that penetrated the Prairie Evaporite. Of the 167 wells, 10 wells are located on Grizzly's South (Medicine Hat) Claim Block.

A total of 110 of the 167 wells have available down hole geophysical logs including a gamma log, however, a number of those wells were not drilled deep enough, or their gamma logs did not completely test the Prairie Evaporite Formation or the gamma logs were of poor quality and unable to evaluate the Prairie Evaporite Formation for potash potential. As an example, out of the 10 wells that were drilled deep enough to intersect the Prairie Evaporite on the South Claim Block, only 8 contain a gamma log or core that permits an evaluation of the Prairie Evaporite Formation for the presence of potash. A

total of 15 wells (including one re-entry well) within the compilation area that had core from the Prairie Evaporite were available at the ERCB. A total of five of those wells (including one re-entry well), which contain identifiable potash beds, are located on Grizzly's South (Medicine Hat) Claim Block.

Preliminary analysis determined that the Prairie Evaporite Formation underlies the vast majority of the South Claim Block, and the other portions of the Alberta Potash Project, and at a number of locations, appears to yield indications of potash. At least 14 wells within the compilation area yielded values of greater than 5% K2O (7.9% KCl) based upon XRF geochemical analyses or calculated values from gamma logs Of the 14 wells, 5 were drilled on or within the confines of Grizzly's South Claim Block, 5 on other parts of the Alberta Potash Project, and the remaining 4 wells are very close proximity to the project (<7 km from the boundary). A total of 3 of the wells on the South (Medicine Hat) Claim Block yielded greater than 10% K_2O (15.8% KCl) based upon XRF geochemical analyses or calculated values from gamma logs. The best measured or calculated grade obtained from the South (Medicine Hat) Claim Block was from DEML MEDHAT 06-36-19-1W4, which yielded 21.6% K_2O (34.2% KCl) over 1.0 m.

In September, 2008, resampling of historical core from 3 wells north of the South Claim Block returned a broad range of K_2O contents, with the highest value, 4.1% K_2O (6.5% KCl), was returned from the sample collected from 1,055.7 m depth in hole 10-32-45-1W4. The lowest value, 0.2% K_2O, was returned from the sample collected from 1,361.0 m depth in hole 10-30-42-9W4. The cores that were sampled were several decades old and deemed to be of poor quality and therefore the analyses that were conducted on the samples are considered minimum grades of potash only.

In March, 2009, a compilation of formation water chemistry data was completed for wells in the compilation area of the Grizzly Alberta Potash Project including the South Claim Block. A total of 2,426 wells (including re-entry wells) with water chemistry data were available. A total of 182 wells (including re-entry wells) are located on the South Claim Block. A number of wells in the compilation area were identified with >1% up to 8.6% K in formation waters within carbonate hosted aquifers immediately above the Prairie Evaporite. The highest potassium value recovered for Grizzly's South (Medicine Hat) Claim Block was 6,000 ppm (0.6% K). However, adjacent to the north of the South Claim block lies a cluster of wells that returned >1% K up to 2.7% K. The use of deep formation water geochemistry for potash exploration is a very promising technique, but one that needs more work before the data could be used to pick test holes for Potash in the Prairie Evaporite or as an indicator of carbonate hosted formation waters that could be produced for their K content.

In the summer of 2011, Grizzly retained RPS Boyd PetroSearch of Calgary, Alberta, to compile and interpret all available seismic data over a central area of the South Claim Block. Existing 2D (2 dimensional) seismic data was purchased and reprocessed to increase data quality. The data was then modelled and correlated to local geology using well bore data. Depth conversion of the data produced structure maps for the tops of the Prairie Evaporite and Winnipegosis Formations and a resultant isopach map for

the Prairie Evaporite Formation. On the South Claim Block (Suffield compilation area), the initial interpretation produced structure maps for both the Prairie Evaporite and Winnipegosis Formations that show a regional dip down towards the northeast.

In 2011, Grizzly drilled one well GZD100 Med Hat 8-36-19-1W4 on the South Claim Block. The GZD100 Med Hat 8-36-19-1W4 well was drilled on Grizzly's South (Medicine Hat) Claim Block. Visible potash minerals were observed in the drill core for the interval between 1,648.5 m and 1,670.85 m below surface. The well cored a thick zone of Prairie Evaporite Formation salt intersecting a wide, low grade potash zone (22.35 m) at a depth of 1,648.5 m. Within the wide low grade potash zone, the drilling intersected two zones of sylvite mineralization (Upper zone and Lower zone) within the Patience Lake Member. Hand held XRF spot analyses of the drill core where performed at the well site and yielded up to 17.64% K (21.2% K 2O).

Laboratory analytical results include a weighted average grade of 2.62% K2O (4.15% KCl) over 22.35 m at a depth of 1,648.5 m for the low grade zone, with higher grade portions including 6.4% K2O (10.14% KCl) over 4.55 m, which includes 8.77% K2O (13.88% KCl) over 2.65 m. Higher grades also include 13.0% K2O (20.58% KCl) over 1.15 m for the Upper Zone and 2.45% K2O (3.88% KCl) over 3.3 m for the Lower Zone. The highest assay from the zone was 31.1% K2O (49.2% KCl) for a 0.3 m core sample. Low grades of MgO indicate that sylvite likely is the major potash mineral, rather than carnallite.

Visible sylvite mineralization was observed in the core primarily from 1,649.7 m to 1,653.0 m. A coincident response of about 340 API was observed on the gamma log centered at a depth of about 1,652 m yielding a calculated grade of approximately 22.7% K2O (35.8% KCl) over about 1.25 m, roughly confirming the geochemical grades obtained from the core analyses. The upper zone yielded 6.4% K2O (10.14% KCl) over 4.55 m that includes 8.77% K2O (13.88.% KCl) over 2.65 m with a higher grade of 13.0% K2O (20.58 wt.% KCl) over 1.15 m. The gamma log seems to indicate that higher grades (over the 1.15 m high grade upper zone) might have been expected. The lower high grade zone does show up on the gamma log with a couple of visible peaks of up to 40 API at 1,662 and 1,664 m. Below the main potash zone, low grade potash in halite mineralization was encountered throughout much of the rest of the core.

11 Recommendations

Based upon the results of the compilation and the results of drilling to date, further potash exploration, including drilling, is strongly recommended for Grizzly Discoveries' 100% owned South (Medicine Hat) Claim Block. Further drilling surrounding well GZD100 MEDHAT 8-36-19-1W4 is recommended in order to identify additional potash with higher grades and greater thickness.

Strong consideration should be given to finding an appropriate technique to conduct water sampling of Devonian aquifers immediately above the Prairie Evaporite in order to compare concentrations of K in the aquifers versus the potash content of the Prairie Evaporite obtained from the well intersections. The tool that was employed during the

2011 drilling was not successful in obtaining any reliable water samples. The goal would be to see if the waters could be used as a future guide to targeting the Prairie Evaporite for potash and also whether K exists in high enough concentrations that it could be economically produced from the existing formation waters.

Consideration should be given to conducting some preliminary scoping level type engineering studies in order to ascertain what grade and thickness of an Alberta potash deposit will be required to support a possible future solution mine based upon the infrastructure that is in place, availability of water and Alberta's favourable tax regime, which should have an impact on the economics of any future development.

A drilling focused program is recommended to follow-up on the results obtained from drillhole GZD100 MEDHAT 8-36-19-1W4. The drilling should consist of 2 wells that are aimed at extending the potash mineralization intersected in GZD100 MEDHAT 8-36-19-1W4. The first hole should be drilled south of the 2011 hole. If the results are positive, i.e. the hole intersects high grade and/or thick potash intervals, the second hole should be drilled even further south. If the results are negative the second hole should be drilled to the north of hole GZD100 MEDHAT 8-36-19-1W4. The budget is comprised of drilling a total of approximately 3,400 m in 2 wells at an average, all up per meter cost of $725 per meter for a total cost of $2,465,000 along with $135,000 for assaying, reclamation, and collection and analysis of water samples. The total cost to complete the drilling program is $2.6 million.

Michael B. Dufresne, M.Sc., P.Geol.
APEX Geoscience Ltd.
November 15th, 2012
Edmonton, Alberta, Canada

Anetta Banas, M.Sc., P.Geol.
APEX Geoscience Ltd.
November 15th, 2012
Edmonton, Alberta, Canada

Kyle McMillan, M.Sc., P.Geol.
APEX Geoscience Ltd.
November 15th, 2012
Edmonton, Alberta, Canada

12 References

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13 Certificate of Author

I, Michael B. Dufresne, residing at [redacted] Canada do hereby certify that:

1. I am a principal and President of APEX Geoscience Ltd. ("APEX"), Suite 200, 9797 – 45th Avenue, Edmonton, Alberta, Canada. I am the author of the report entitled: ***"ASSESSMENT REPORT FOR GRIZZLY DISCOVERIES INC'S, SOUTH (MEDICINE HAT) CLAIM BLOCK, ALBERTA POTASH PROJECT, SOUTHEASTERN ALBERTA, South Block (Medicine Hat) Claims 9308110369 - 79, 9309010640 - 68, 9309050296, 9310040520 - 21, 9310080623 - 25, 9311060855, 9311080617 and 9312020265"*** dated November 15th, 2012, and am responsible for the preparation of the entire report.

2. I graduated with a B.Sc. in geology from University of North Carolina at Wilmington in 1983 and a M.Sc. in Economic Geology from University of Alberta in 1987.

3. I am a Professional Geologist registered with APEGGA (Association of Professional Engineers, Geologists and Geophysicists) and a 'Qualified Person' in relation to the subject matter of this report. I have worked as a consulting geologist for more than 20 years since my graduation from university and I have conducted and directed exploration programs, property examinations and evaluations for a number of commodities and deposit types.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the South (Medicine Hat) Claim Block or the securities of Grizzly Discoveries Inc.

5. To the best of my knowledge, I am not aware of any material fact or material change with respect to the subject matter of the technical report that is not reflected in the technical report, the omission to disclose which would make the report misleading.

6. I consent to the filing of the Assessment Report with any regulatory authority. I also authorize publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Assessment Report after the end of one-year confidentiality.

7. I have visited the Property and directed exploration by APEX Geoscience Ltd. at the Property over the last four years on behalf of Grizzly Discoveries Inc.

Michael B. Dufresne, M.Sc., P.Geol.
November 15th, 2012
Edmonton, Alberta, Canada

I, Kyle McMillan, M.Sc., P.Geol., do hereby certify that:

1. I am a geologist employed by: APEX Geoscience Ltd.
   Suite 200, 9797 – 45th Avenue
   Edmonton, Alberta T6E 5V8
   Phone: 780-439-5380

2. I graduated from the University of Manitoba with a B.Sc. (Hons.) in Geology in 2003 and a M.Sc. in Geology in 2006.

3. I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta since 2012 and have worked as a geologist for more than four years since my graduation from university.

4. I assisted in the preparation of the Assessment Report titled ***"ASSESSMENT REPORT FOR GRIZZLY DISCOVERIES INC'S, SOUTH (MEDICINE HAT) CLAIM BLOCK, ALBERTA POTASH PROJECT, SOUTHEASTERN ALBERTA, South Block (Medicine Hat) Claims 9308110369 - 79, 9309010640 - 68, 9309050296, 9310040520 - 21, 9310080623 - 25, 9311060855, 9311080617 and 9312020265"*** dated November 15th, 2012.

5. I am not aware of any scientific or technical information with respect to the subject matter of the Report that is not reflected in the Report, the omission to disclose which makes the Report misleading.

6. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the South (Medicine Hat) Claim Block or the securities of Grizzly Discoveries Inc.

7. I consent to the filing of the Assessment Report with any regulatory authority. I also authorize publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Assessment Report after the end of one-year confidentiality.

8. I have not visited the property that is the subject of this Report.

Kyle McMillan, M.Sc., P.Geol.
November 15th, 2012
Edmonton, Alberta, Canada

I, Anetta Banas, do hereby certify that:

1. I am a geologist employed by: APEX Geoscience Ltd.
   Suite 200, 9797 – 45th Avenue
   Edmonton, Alberta T6E 5V8
   Phone: 780-439-5380

2. I am a graduate of the University of Alberta with a BSc Degree in Geology (2002) and a MSc degree in Earth and Atmospheric Sciences (2005) and have practiced my profession continuously since January, 2006.

3. I am a Professional Geologist registered with APEGGA (Association of Professional Engineers, Geologists and Geophysicists).

4. I assisted in the preparation of the Assessment Report titled ***"ASSESSMENT REPORT FOR GRIZZLY DISCOVERIES INC'S, SOUTH (MEDICINE HAT) CLAIM BLOCK, ALBERTA POTASH PROJECT, SOUTHEASTERN ALBERTA, South Block (Medicine Hat) Claims 9308110369 - 79, 9309010640 - 68, 9309050296, 9310040520 - 21, 9310080623 - 25, 9311060855, 9311080617 and 9312020265"*** dated November 15th, 2012.

5. I have not received, nor do I expect to receive, any interest directly or indirectly, in the South (Medicine Hat) Claim Block Property.

6. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report of the omission to disclose which makes the Report misleading.

7. I consent to the filing of the Assessment Report with any regulatory authority. I also authorize publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Assessment Report after the end of one-year confidentiality.

8. I have not visited the property that is the subject of this Report.

PROFESSIONAL GEOLOGIST ANETTA BANAS ALBERTA

Anetta Banas, MSc., P.Geol.
November 15th, 2012
Edmonton, Alberta, Canada

Appendix 1

South (Medicine Hat) Claim Block Metallic and Industrial Mineral Permits

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:37:54 PM

Agreement Number: 093 9308110369

Status: ACTIVE
Agreement Area: 8003.0000

Term Date: 2008/11/07
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-013: 02-7;09-12;14-16;17L3,L4SE,L4NE,L5-L6,SENW,NE;18L1NW,L1NE,L2,L7-L8,SWNW,NE;19-22;23SWP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04

4-01-013: 23NWP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04

4-01-013: 24-25;26NE;27-32;33SWP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04.

4-01-013: 33NWP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04.

4-01-013: 33NEP
PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S.

4-01-013: 33SE;34-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:37:11 PM

Agreement Number: 093 9308110370

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2008/11/07
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-013: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:32:15 PM

Agreement Number: 093 9308110371

Status: ACTIVE
Agreement Area: 8375.0200

Term Date: 2008/11/07
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-014: 01-2;03SEP
PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S.

4-01-014: 03SWP
PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S.

4-01-014: 03NEP
PORTION(S) SHOWN AS DRY LAKE BED ON A PLAN OF SURVEY 0711567 BY C. J.ZAROWNY, A. L. S.

4-01-014: 03NW;04-7;09-18;20-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:32:45 PM

Agreement Number: 093 9308110372

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 8593.3000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-014: 01-6;07SEP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04.

4-02-014: 07SWP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04.

4-02-014: 07NWP
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/08/04.

4-02-014: 09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:31:47 PM

Agreement Number: 093 9308110373

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 8704.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-015: 01-7;09-25;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:31:19 PM

Agreement Number: 093 9308110374

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 8704.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-015: 01-7;09-25;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:29:37 PM

Agreement Number: 093 9308110375

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 8768.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-016: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:30:12 PM

Agreement Number: 093 9308110376

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-016: 01-7;09-25;35-36
4-02-017: 01-2;11-15;23-25

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:29:08 PM

Agreement Number: 093 9308110377

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-017: 01-7;09-25;26NE;27-36
4-02-017: 35SW,NW,NE;36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:28:35 PM

Agreement Number: 093 9308110378

Status: ACTIVE
Agreement Area: 9216.0000

Term Date: 2008/11/07
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-017: 16-22;27-34
4-02-018: 03-7;09-10;15-22;27-32

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:42:53 PM

Agreement Number: 093 9308110379

Status: ACTIVE
Term Date: 2008/11/07
Agreement Area: 8000.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-018: 01-7;09-24
4-02-018: 01-2;11-14;23-24;26NE

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:38:25 PM

Agreement Number: 093 9309010640

Status: ACTIVE
Agreement Area: 7744.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-012: 02;03SW;04;06-7;08NW;09-12;13NW,NE;14-25;26NE;27-34;36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:38:56 PM

Agreement Number: 093 9309010641

Status: ACTIVE
Agreement Area: 9024.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-012: 02;04;06;09-25;26NE;27-36
4-03-012: 12-13;24-25;36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:35:51 PM

Agreement Number: 093 9309010642

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 9206.9800
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-012: 02;04SEP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.

4-03-012: 04SWP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.

4-03-012: 04NWP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.

4-03-012: 04NE;09-11;14-16;18;20-22;27-35

4-03-013: 01-3;10-15

4-04-012: 24-25;27;34-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:35:15 PM

Agreement Number: 093 9309010643

Status: ACTIVE
Agreement Area: 9216.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-013: 04-7;09;16-25;27-36
4-04-013: 01-3;10-15;22-23

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:33:38 PM

Agreement Number: 093 9309010644

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 8960.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-04-013: 24-25;27;34-36
4-04-014: 01-3;10-24;25SW,NW,NE;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:33:13 PM

Agreement Number: 093 9309010645

Status: ACTIVE
Agreement Area: 8731.3000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-014: 01-7;09-16;17P
PORTION(S) SHOWN AS A LAKE ON A TOWNSHIP PLAN APPROVED AND CONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1884/07/29.
4-03-014: 18;20-24;26SW,NW,NE;27-36
4-03-015: 05-6

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:30:48 PM

Agreement Number: 093 9309010646

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-015: 01-4;07;09-25;27-36
4-03-016: 03-6

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:27:51 PM

Agreement Number: 093 9309010647

Status: ACTIVE
Agreement Area: 9216.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-016: 01-2;09-24;27-30;32-33
4-03-017: 04;09;16SE,NE;20NW,NE;21;25;27-29;33-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:11:51 PM

Agreement Number: 093 9309010648

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-019: 05-7;18
4-03-018: 01-4;09-17;20-25;27-29;32-36
4-03-019: 01-4;12

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:08:41 PM

Agreement Number: 093 9309010649

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-019: 17;19-20;29-32
4-02-020: 05-7;17-20;29-32
4-03-020: 19-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:04:29 PM

Agreement Number: 093 9309010650

Status: ACTIVE
Agreement Area: 8896.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-021: 05-7;16-21;27-34
4-03-021: 19-26;27SE,NW,NE;28-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:03:24 PM

Agreement Number: 093 9309010651

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 7744.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-022: 03-7;09-10;13-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:02:38 PM

Agreement Number: 093 9309010652

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-022: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:02:00 PM

Agreement Number: 093 9309010653

Status: ACTIVE
Agreement Area: 9088.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-022: 01-30;31SE,NW;32-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:00:55 PM

Agreement Number: 093 9309010654

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 8343.0400
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-023: 01-7;09-11;12SE,SW;13SWNWP
PORTION(S) DESIGNATED AS RED-DEER RIVER ON A TOWNSHIP PLAN APPROVED ANDCONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1911/03/22.

4-01-023: 13NEP
PORTION(S) DESIGNATED AS RED-DEER RIVER ON A TOWNSHIP PLAN APPROVED ANDCONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1911/03/22.

4-01-023: 14NEP
PORTION(S) DESIGNATED AS RED-DEER RIVER ON A TOWNSHIP PLAN APPROVED ANDCONFIRMED BY THE SURVEYOR GENERAL AT OTTAWA ON 1911/03/22.

4-01-023: 14SW,NW;15-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:00:13 PM

Agreement Number: 093 9309010655

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-023: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:59:29 AM

Agreement Number: 093 9309010656

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 7904.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-023: 01-3;04NW,NE;05L15-L16;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:58:39 AM

Agreement Number: 093 9309010657

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-024: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:58:00 AM

Agreement Number: 093 9309010658

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 8768.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-024: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:57:14 AM

Agreement Number: 093 9309010659

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-024: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:56:22 AM

Agreement Number: 093 9309010660

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 8704.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-025: 01-7;09-25;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:55:41 AM

Agreement Number: 093 9309010661

Status: ACTIVE
Agreement Area: 8704.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-025: 01-7;09-25;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:54:08 AM

Agreement Number: 093 9309010662

Status: ACTIVE
Agreement Area: 8704.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-025: 01-7;09-25;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:52:10 AM

Agreement Number: 093 9309010663

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-026: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:50:31 AM

Agreement Number: 093 9309010664

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-02-026: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:49:08 AM

Agreement Number: 093 9309010665

Status: ACTIVE
Agreement Area: 8768.0000

Term Date: 2009/01/28
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-026: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 11:45:42 AM

Agreement Number: 093 9309010666

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 8768.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-027: 01-7;09-25;26NE;27-36

METALLIC AND INDUSTRIAL MINERALS

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:39:51 PM

Agreement Number: 093 9309010667

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 9177.9180
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-012: 06
4-04-011: 34;36
4-04-012: 02;10L8P
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.
4-04-012: 10L1-L4,L9NW,L9NE,L10NW,L10NEL11NW,L11NE,L12NW,L12NE,L13-L16;11SESWP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.
4-04-012: 11NWP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.
4-04-012: 11NEP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.
4-04-012: 12NWP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.
4-04-012: 12NEP
PORTION(S) LYING OUTSIDE THE RAILWAY RIGHT OF WAY AS SHOWN ON PLAN RY22908.
4-04-012: 12SE,SW;14;22;28-30;32-33
4-04-013: 04-7;09;16-21;28-33
4-04-014: 04-7;08SW;09

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:04:00 PM

Agreement Number: 093 9309010668

Status: ACTIVE
Term Date: 2009/01/28
Agreement Area: 9024.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-03-021: 01-18
4-04-020: 22-25;35-36
4-04-021: 01-2;11-14;23-25;26NE;35-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:09:45 PM

Agreement Number: 093 9310040520

Status: ACTIVE
Term Date: 2010/04/07
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-020: 17;20;29;32
4-01-021: 04-7;09;17-18
4-02-019: 33-34
4-02-020: 03-4;09-10;15-16;21-22;27-28;33-34
4-02-021: 01-4;09-15

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:45:36 PM

Agreement Number: 093 9310040521

Status: ACTIVE
Agreement Area: 960.0000

Term Date: 2010/04/07
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-020: 01-2;11;12SE,NW,NE

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:12:32 PM

Agreement Number: 093 9310080623

Status: ACTIVE
Term Date: 2010/08/18
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-018: 27-33
4-01-019: 04-7;09-10;11NW;14SW,NW;15-18;20-22;23SW,NW,NE;28SE,SW
4-02-018: 25;33-36
4-02-019: 01-4;09-13

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:08:10 PM

Agreement Number: 093 9310080624

Status: ACTIVE
Agreement Area: 9024.0000

Term Date: 2010/08/18
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-019: 19;29-32
4-01-020: 05-7;18-19;30-31
4-02-019: 14-16;21-25;26NE;27-28;35-36
4-02-020: 01-2;11-14;23-25;35-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:05:18 PM

Agreement Number: 093 9310080625

Status: ACTIVE
Term Date: 2010/08/18
Agreement Area: 9216.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-020: 27-28;33-34;35SW,NW
4-01-021: 02-3;10-11;15-16;19-22;25;26NE;27-36
4-01-022: 01-2;11-12
4-02-021: 22-25;26NE;35-36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:06:27 PM

Agreement Number: 093 9311060855

Status: ACTIVE
Term Date: 2011/06/01
Agreement Area: 2560.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-020: 13-16;21-25;36

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:07:00 PM

Agreement Number: 093 9311080617

Status: ACTIVE
Agreement Area: 4672.0000

Term Date: 2011/08/18
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-019: 01-3;11SE,SW,NE;12-13;14SE,NE;23SE;24-25;26NE;27;28NW,NE;33-36
4-01-020: 03-4;09-10

METALLIC AND INDUSTRIAL MINERALS

Alberta

MINERAL AGREEMENT DETAIL REPORT

Report Date: September 14, 2012 12:05:56 PM

Agreement Number: 093 9312020265

Status: ACTIVE
Term Date: 2012/02/07
Agreement Area: 1664.0000
Continuation Date:

DESIGNATED REPRESENTATIVE

Client Id: 8048015
Client Name: APEX GEOSCIENCE LTD.

Address: 9797 45 AVE NW SUITE 200

EDMONTON, AB
CANADA T6E 5V8

LAND / ZONE DESCRIPTION

4-01-020: 35SE,NE
4-01-021: 01;12-14;23-24

METALLIC AND INDUSTRIAL MINERALS

Appendix 2

Compilation Well Data Summary

Appendix 2
Wells Intersecting the Prairie Evaporite

Unique Well ID	LSD	Section	Township	Range	Meridian	Well Number	Latitude NAD27	Longitude NAD27	Government KB Elevation (m)	Logs KB Elevation (m)	Government Ground Level (m)	Total Depth (m)	Notes	On Grizzly Potash Project	Core in Prairie Evaporite Formation	Core Comments	Gamma Logs
100 /06-29-055-03W4/00	6	29	55	3	4	1	53.78	-110.42	592.0	592.0	588.1	835.0	Water disposal well	No	No		No
100/01-13-057-05W4/00	1	13	57	5	4	1	53.92	-110.60	664.8	665.0	660.5	0.0		No	Yes	Cored, but gamma indicates no potash (we can examine cores to be sure)	Yes
100/01-24-020-11W4/00	1	24	20	11	4	1	50.71	-111.39	755.7	755.5	751.3	0.0		No	No		No
100/01-24-050-11W4/00	1	24	50	11	4	1	53.32	-111.47	653.8	652.9	651.1	0.0		No	No		Yes
100/01-26-056-05W4/00	1	26	56	5	4	1	53.86	-110.63	577.1	577.5	573.3	0.0		No	No		Yes
100/01-33-037-03W4/00	1	33	37	3	4	1	52.22	-110.36	737.6	737.6	734.6	2126.6		Provost	No		No
100/02-04-015-11W4/00	2	4	15	11	4	1	50.22	-111.46	749.0	749.0	744.6	0.0		No	No		Yes
100/02-19-053-01W4/00	2	19	53	1	4	1	53.59	-110.14	610.8	610.3	607.3	1140.0		North Block	No		Yes
100/02-21-057-05W4/00	2	21	57	5	4	1	53.94	-110.68	632.8	632.8	630.3	0.0		No	Yes	Cored, but gamma indicates no potash (we can examine cores to be sure)	Yes
100/02-22-015-01W4/00	2	22	15	1	4	1	50.27	-110.06	817.2	817.3	813.8	1743.2		South Block	No		No
100/03-10-047-04W4/00	3	10	47	4	4	1	53.03	-110.51	657.5	657.5	653.8	1362.5		North Block	No		Yes
100/03-14-057-06W4/00	3	14	57	6	4	1	53.92	-110.79	566.3	566.3	563.9	0.0		No	No		No
100/03-15-027-08W4/00	3	15	27	8	4	1	51.30	-111.05	795.2	795.8	791.6	0.0		No	No		Yes
100/03-27-013-09W4/00	3	27	13	9	4	1	50.11	-111.16	771.1	771.4	767.8	0.0		No	No		No
100/03-32-015-05W4/00	3	32	15	5	4	1	50.30	-110.66	723.3	723.3	719.0	1720.0		No	No		Yes
100/04-01-028-11W4/00	4	1	28	11	4	1	51.36	-111.43	803.5	803.3	799.2	0.0		No	No		Yes
100/04-11-055-02W4/00	4	11	55	2	4	1	53.73	-110.20	579.4	579.4	576.4	1371.6		No	No		Yes
100/04-18-038-01W4/00	4	18	38	1	4	1	52.26	-110.14	696.2	696.2	691.9	1585.0	Elk Point and Watt Mntn picked at different depths (!?); well was deepened in 2004	No	No		Yes
100/04-26-056-05W4/00	4	26	56	5	4	1	53.87	-110.64	531.9	531.9	526.4	0.0		No	No		Yes
100/05-01-017-14W4/00	5	1	17	14	4	1	50.40	111.81	751.6	751.6	747.7	2219.2		No	Yes	Cores have been examined	Yes
100/05-02-020-03W4/00	5	2	20	3	4	1	50.66	-110.33	729.9	730.0	725.9	2195.0		No	No		Yes
100/05-11-020-06W4/00	5	11	20	6	4	1	50.68	-110.74	793.1	793.1	788.5	2231.1		No	No		Yes
100/05-26-056-05W4/00	5	26	56	5	4	1	53.87	-110.64	526.7	526.5	523.3	0.0		No	Yes	Cored, but gamma indicates no potash (we can examine cores to be sure)	Yes
100/05-32-017-02W4/00	5	32	17	2	4	1	50.48	-110.25	802.5	802.4	797.9	1717.0		South Block	No		No
100/06-01-019-07W4/02	6	1	19	7	4	1	50.58	-110.85	791.9	792.5	787.6	1786.1		No	No		Yes
100/06-05-048-06W4/02	6	5	48	6	4	1	53.11	-110.85	703.5	703.5	699.5	1405.1	Well may actually end in the Winnipegosis Fm; gamma peaks seem to be shale beds, based on other logs	North Block	No		Yes
100/06-09-031-01W4/02	6	9	31	1	4	1	51.64	-110.09	734.3	734.3	730.0	2191.2		No	No		Yes
100/06-12-049-06W4/00	6	12	49	6	4	1	53.21	-110.75	604.4	604.4	602.9	1228.6	VCO # 15 well; cores in sad shape; put this well under well code #1, though it could easilly be called #5; logs poor, only has resistivity and SP and they end above the E.P Group	North Block	Yes	Cores have been examined (has a re-entry well)	No
100/06-12-053-04W4/00	6	12	53	4	4	1	53.56	-110.47	599.9	600.2	596.2	1105.0		North Block	No		Yes
100/06-14-046-09W4/00	6	14	46	9	4	1	52.97	-111.20	704.7	704.7	701.3	2058.0	Well goes to basement; GeoScout picks seem fine, but logs are very low quality	No	No		No
100/06-19-054-04W4/00	6	19	54	4	4	1	53.68	-110.59	613.3	613.3	609.6	1362.5		North Block	No		Yes
100/06-24-053-05W4/00	6	24	53	5	4	1	53.59	-110.61	627.3	627.3	625.1	946.4	Licence date is 1952	North Block	No		No
100/06-25-019-04W4/00	6	25	19	4	4	1	50.64	-110.43	665.7	666.2	661.7	1691.6		No	No		Yes
100/06-27-045-03W4/00	6	27	45	3	4	1	52.91	-110.36	648.3	648.3	644.3	1316.7		Provost	No		Yes
100/06-28-016-05W4/02	6	28	16	5	4	1	50.37	-110.64	747.7	749.2	744.6	1772.4		No	No		No
100/06-28-018-05W4/00	6	28	18	5	4	1	50.55	-110.64	701.1	702.0	697.1	1700.0		No	No		Yes
100/06-28-042-02W4/03	6	28	42	2	4	1	52.64	-110.24	661.2	661.0	656.6	1944.0		Provost	No		No
100/06-30-016-06W4/02	6	30	16	6	4	1	50.37	-110.82	758.6	0.0	755.6	1761.7		No	No		Yes
100/06-30-019-07W4/02	6	30	19	7	4	1	50.64	-110.97	807.1	807.7	802.8	2269.2		No	No		Yes
100/06-30-019-09W4/00	6	30	19	9	4	1	50.64	-111.24	814.4	814.4	810.5	0.0		No	No		Yes
100/06-36-018-05W4/00	6	36	18	5	4	1	50.56	-110.57	658.1	658.7	654.1	1664.2		No	No		Yes
100/06-36-019-01W4/00	6	36	19	1	4	1	50.65	-110.02	646.6	647.0	740.8	2231.0	See core notes	South Block	Yes	Core is almost certainly BELOW the PE Fm (though geoSCOUT has it listed as being at the base of PE Fm / top of Winnipgosis), and is definitely well below the potash interval	Yes
100/07-01-045-03W4/00	7	1	45	3	4	1	52.85	-110.30	662.0	662.0	658.4	1330.5	All gamma peaks are small except 1147.9-1149.1 m. Small peaks don't look like shale, but certainly not great potash beds either	Provost	No		Yes
100/07-01-047-05W4/00	7	1	47	5	4	1	53.02	-110.60	591.6	591.6	587.7	1246.6		North Block	No		Yes
100/07-01-051-04W4/00	7	1	51	4	4	1	53.37	-110.46	663.9	663.9	659.9	1243.6		North Block	No		Yes
100/07-02-028-04W4/00	7	2	28	4	4	1	51.36	-110.46	765.7	765.6	761.9	2240.0		No	No		Yes
100/07-02-036-08W4/00	7	2	36	8	4	1	52.06	-111.04	786.7	786.7	783.0	1693.2		No	No		Yes
100/07-07-045-03W4/00	7	7	45	3	4	1	52.86	-110.42	748.3	748.4	744.0	1257.3	Logs and well tickets disagree on picks (ticket picks are shown here)	North Block	No		No
100/07-07-049-03 W4/00	7	7	49	3	4	1	53.21	-110.43	696.2	696.2	692.5	1292.4		North Block	No		Yes
100/07-11-019-05W4/00	7	11	19	5	4	1	50.59	-110.59	661.1	661.4	656.8	2132.1	Gamma logs on different master logs are off by about 2 m (I went with the one on the sonic	No	No		Yes
100/07-11-055-09W4/00	7	11	55	9	4	1	53.73	-111.23	655.6	655.6	651.7	1066.8		No	No		No
100/07-12-022-01W4/00	7	12	22	1	4	1	50.85	-110.01	666.9	666.8	662.6	1764.2	Caliper doesn't change much: so either oil based mud, or not evaporites; peaks are abnormally broac	South Block	No		Yes
100/07-14-057-06W4/00	7	14	57	6	4	1	53.92	-110.78	604.7	604.1	601.1	0.0		No	No		Yes
100/07-15-040-02W4/00	7	15	40	2	4	1	52.44	-110.21	677.3	677.3	673.0	1517.0		Provost	No		Yes
100/07-18-019-03W4/00	7	18	19	3	4	1	50.61	-110.41	698.1	698.5	693.7	1734.0	Other small blips in the PE Fm logs are likely shale beds	No	No		Yes
100/07-22-017-05W4/00	7	22	17	5	4	1	50.45	-110.61	631.9	632.2	628.0	1645.0		No	No		Yes
100/07-23-048-11W4/00	7	23	48	11	4	1	53.15	-111.50	710.2	710.2	706.5	0.0		No	No		Yes
100/07-26-021-11W4/00	7	26	21	11	4	1	50.81	-111.42	730.0	731.2	726.3	0.0		No	No		Yes
100/07-26-056-05W4/00	7	26	56	5	4	1	53.87	-110.63	560.8	560.8	558.4	0.0		No	No		No
100/07-29-017-06W4 /03	7	29	17	6	4	1	50.46	-110.79	766.8	767.7	762.9	1754.0		No	No		Yes
100/07-31-016-08W4/00	7	31	16	8	4	1	50.39	-111.09	807.5	808.0	802.4	0.0		No	No		Yes
100/07-31-051-05W4/00	7	31	51	5	4	1	53.44	-110.73	625.4	625.8	622.1	1356.4	Gamma peak doesn't look like shale, but certainly not a great potash bed either	North Block	No		Yes
100/07-33-049-05W4/00	7	33	49	5	4	1	53.27	-110.67	659.3	659.3	655.3	1288.7	Gamma peak doesn't exactly look like shale, but certainly not a great potash bed either	North Block	No		Yes
100/08-01-019-04W4/00	8	1	19	4	4	1	50.58	-110.42	698.0	698.0	693.4	1720.0		No	No		Yes
100/08-08-020-09W4/00	8	8	20	9	4	1	50.68	-111.21	776.2	776.8	772.2	0.0		No	No		No
100/08-09-053-03W4/00	8	9	53	3	4	1	53.56	-110.38	591.2	591.7	587.7	1400.0	Core is almost certainly well below the potash interval	North Block	Yes	Core is almost certainly below the potash interval	Yes
100/08-12-053-04W4/00	8	12	53	4	4	1	53.56	-110.45	600.5	600.5	596.5	1475.5		North Block	No		No
100/08-14-040-03W4/02	8	14	40	3	4	1	52.44	-110.32	701.7	702.7	698.1	1500.0		Provost	No		No
100/08-17-020-04W4/00	8	17	20	4	4	1	50.69	-110.51	740.4	740.7	736.1	2204.6	Geoscout pics are way off	No	No		Yes
100/08-21-018-05W4/00	9	21	18	5	4	1	50.54	-110.63	660.3	660.6	656.4	1650.0	SP is really acting up	No	No		Yes
100/08-22-019-05W4/00	8	22	19	5	4	1	50.62	-110.61	748.9	750.1	744.9	1762.0		No	No		Yes
100/08-23-010-09W4/00	8	23	10	9	4	1	49.83	-111.11	829.1	829.5	825.1	0.0		No	Yes	Cored, but gamma indicates no potash (we can examine cores to be sure)	Yes
100/08-23-017-04W4/00	8	23	17	4	4	1	50.45	-110.44	754.7	754.7	750.7	1785.0		No	No		Yes
100/08-30-046-02W4/00	8	30	46	2	4	1	52.99	-110.27	638.3	638.3	636.1	1058.3		North Block	No		No
100/08-31-043-02W4/00	8	31	43	2	4	1	52.75	-110.27	626.7	626.7	623.6	1159.8		Provost	No		No
100/08-33-046-04W4/00	8	33	46	4	4	1	53.01	-110.52	655.6	655.6	652.0	1694.7	Gamma log is fairly active, but doesn't seem to show any significant potash beds	North Block	No		Yes
100/09-27-015-08W4/00	9	27	15	8	4	1	50.29	-111.02	755.2	755.0	751.2	0.0		No	No		Yes
100/09-33-040-07W4/00	9	33	40	7	4	1	52.49	-110.94	694.3	694.6	690.7	1468.5		No	No		Yes
100/10-01-017-08W4/00	10	1	17	8	4	1	50.41	-110.98	754.2	754.2	750.5	0.0		No	No		Yes
100/10-03-012-04W4/00	10	3	12	4	4	1	49.97	-110.47	766.6	767.1	762.6	1765.0		South Block	No		Yes
100/10-03-049-06W4/00	10	3	49	6	4	1	53.20	-110.79	655.0	655.0	651.7	1822.1	Gamma log indicates vast potash deposit with some halite beds	North Block	No		Yes
100/10-03-051-07W4/00	10	3	51	7	4	1	53.38	-110.95	621.5	621.5	617.5	1402.1		North Block	No		Yes
100/10-04-019-11W4/00	10	4	19	11	4	1	50.58	-111.47	773.0	773.0	769.0	0.0		No	No		No
100/10-06-015-08W4/00	10	6	15	8	4	1	50.23	-111.09	737.7	738.0	733.7	0.0		No	No		Yes
100/10-07-001-08W4/00	10	7	1	8	4	1	49.02	-111.06	1082.6	1082.9	1079.0	0.0		No	No		No
100/10-09-050-11W4/00	10	9	50	11	4	1	53.30	-111.55	664.8	664.8	661.1	0.0		No	No		No
100/10-13-040-05W4/00	10	13	40	5	4	1	52.44	-110.59	684.6	684.6	680.6	1301.9		No	No		No
100/10-15-042-11W4/00	10	15	42	11	4	1	52.62	-111.50	691.6	691.3	687.9	0.0		No	No		Yes
100/10-15-049-01W4/00	10	15	49	1	4	1	53.23	-110.06	667.5	667.6	664.5	1782.2	Used GeoScout pick for Watt Mountain thickness	North Block	No		Yes

Appendix 2
Wells Intersecting the Prairie Evaporite

Unique Well ID	LSD	Section	Township	Range	Meridian	Well Number	Latitude NAD27	Longitude NAD27	Government KB Elevation (m)	Logs KB Elevation (m)	Government Ground Level (m)	Total Depth (m)	Notes	On Grizzly Potash Project	Core in Prairie Evaporite Formation	Core Comments	Gamma Logs
100/10-15-051-06W4/00	10	15	51	6	4	1	53.40	-110.80	629.1	629.0	625.1	1809.0	Logs and well tickets disagree on Elk Point pick (ticket picks are shown here)	North Block	No		Yes
100/10-15-053-01W4/00	10	15	53	1	4	1	53.58	-110.06	566.9	567.0	563.3	1095.8		North Block	No		Yes
100/10-16-027-08W4/00	10	16	27	8	4	1	51.31	-111.07	792.7	791.4	788.4	0.0		No	No		No
100/10-17-054-05W4/00	10	17	54	5	4	1	53.67	-110.70	640.4	640.4	636.7	1407.3		North Block	No		Yes
100/10-18-026-02W4/00	10	18	26	2	4	1	51.22	-110.27	762.6	762.3	758.6	1708.4	Gamma header not totally clear; I think the API scale goes from 0 to 150, though the other standard scales (100 and 120) would mean the grades are even higher)	South Block	No		Yes
100/10-21-013-11W4/00	10	21	13	11	4	1	50.10	-111.45	751.0	757.1	747.1	0.0		No	No		Yes
100/10-28-007-11W4/00	10	28	7	11	4	1	49.59	-111.43	857.7	857.6	853.4	1724.3	Logs do cross the right depths, but I see no sign of the normal signitures (esp. gamma) in these logs	No	No		Yes
100/10-29-008-10W4/00	10	29	8	10	4	1	49.68	-111.32	848.6	848.9	844.9	2083.6	Logs do cross the right depths, but I see no sign of the normal signitures (esp. gamma) in these logs	No	No		Yes
100/10-30-045-03W4/00	10	30	45	3	4	1	52.91	-110.42	656.2	656.2	651.4	1125.3		North Block	No		No
100/10-32-045-01W4/00	10	32	45	1	4	1	52.92	-110.11	630.9	631.0	628.2	1336.5		Provost	Yes	Cores have been examined	Yes
100/10-33-040-07W4/03	10	33	40	7	4	1	52.49	-110.95	698.9	698.9	694.9	1485.6	This well was later converted into gas-storage and effluent disposal	No	Yes	Cores have been examined	Yes
100/10-36-016-08W4/00	10	36	16	8	4	1	50.39	-110.97	778.5	778.0	773.9	0.0		No	No		Yes
100/11-02-051-08W4/02	11	2	51	8	4	1	53.38	-111.08	624.8	625.0	621.2	1089.1	Well was deepened in 1961	North Block	No		No
100/11-05-015-06W4/00	11	5	15	6	4	1	50.23	-110.80	762.0	761.7	757.7	1750.0		No	No		Yes
100/11-13-015-09W4/00	11	13	15	9	4	1	50.26	-111.12	756.5	757.0	751.4	0.0		No	No		No
100/11-14-018-08W4/00	11	14	18	8	4	1	50.52	-111.00	789.0	789.3	785.1	0.0		No	No		No
100/11-18-018-08W4/00	11	18	18	8	4	1	50.52	-111.10	797.8	797.1	793.9	0.0		No	No		Yes
100/11-19-050-06W4/00	11	19	50	6	4	1	53.33	-110.88	624.2	624.4	621.2	1827.6		North Block	No		Yes
100/11-20-016-04W4/00	11	20	16	4	4	1	50.36	-110.52	753.5	753.0	749.8	0.0		No	No		Yes
100/11-20-016-07W4/00	11	20	16	7	4	1	50.36	-110.93	774.9	775.0	769.8	2208.0	PE Fm seems shaley	No	No		Yes
100/11-20-037-01W4/00	11	20	37	1	4	1	52.20	-110.11	693.4	694.0	691.0	1555.1		No	No		Yes
100/11-21-054-01W4/00	11	21	54	1	4	1	53.68	-110.10	600.2	600.2	596.6	1211.6		North Block	No		Yes
100/11-22-016-08W4/00	11	22	16	8	4	1	50.36	-111.02	767.5	769.0	765.0	0.0		No	No		No
100/11-22-049-11W4/00	11	22	49	11	4	1	53.24	-111.53	671.5	671.5	671.5	0.0		No	No		No
100/11-25-024-02W4/00	11	25	24	2	4	1	51.08	-110.16	740.9	741.3	737.6	1675.0	Gamma spikes corespond to small sonic lows, which are probably due to carnalite	South Block	No		Yes
100/11-35-038-10W4/00	11	35	38	10	4	1	52.31	-111.33	766.3	766.3	762.3	0.0		No	Yes	Cored, but gamma indicates no potash (we can examine cores to be sure)	Yes
100/11-35-055-04W4/02	11	35	55	4	4	1	53.80	-110.49	627.6	627.1	624.0	824.0		No	No		No
100/12-07-015-07W4/00	12	7	15	7	4	1	50.25	-110.96	718.6	718.0	714.0	1675.0		No	No		Yes
100/12-12-015-07W4/00	12	12	15	7	4	1	50.25	-110.85	717.3	717.1	713.0	2152.0	Based on the sonic log, the whole PE Fm seems to be super dirty (shaley)	No	No		Yes
100/12-13-051-08W4/00	12	13	51	8	4	1	53.40	-111.06	652.3	652.3	650.4	1103.4	Logs I have don't extend to PE Fm.	North Block	No		No
100/12-19-014-04W4/00	12	19	14	4	4	1	50.19	-110.55	740.3	743.1	735.7	2215.8		South Block	No		Yes
100/12-21-015-08W4/00	12	21	15	8	4	1	50.27	-111.06	747.5	747.0	742.4	0.0		No	No		No
100/12-26-056-02W4/00	12	26	56	2	4	1	53.87	-110.20	661.7	661.7	656.7	0.0		No	No		Yes
100/12-29-015-08W4/00	12	29	15	8	4	1	50.29	-111.08	755.6	757.0	751.6	0.0		No	No		No
100/12-32-001-04W4/00	12	32	1	4	4	1	49.08	-110.51	914.4	914.4	910.4	0.0		No	No		No
100/13-03-001-08W4/00	13	3	1	8	4	1	49.01	-111.01	1064.5	1064.0	1060.6	0.0		No	No		No
100/13-11-018-11W4/00	13	11	18	11	4	1	50.51	-111.42	765.4	765.4	761.0	0.0		No	No		No
100/13-25-003-02W4/00	13	25	3	2	4	1	49.24	-110.16	949.0	949.0	944.2	2021.0	Logs do cross the right depths, but I see no sign of the normal signitures (esp. gamma) in these logs	No	No		Yes
100/13-28-039-03W4/00	13	28	39	3	4	1	52.39	-110.38	668.1	668.1	664.5	1281.1		Provost	No		No
1A0/12-15-050-02W4/00	12	15	50	2	4	1	53.32	-110.22	697.1	697.2	695.6	1041.2	Cores are highly degraded; only SP and resistivity logs present (both extremely poor quality and do not extend to E.P. Group)	North Block	Yes	Cores have been examined	No
100/14-11-053-10W4/00	14	11	53	10	4	1	53.57	-111.37	627.6	627.6	624.5	0.0		No	No		No
100/14-12-016-06W4/00	14	12	16	6	4	1	50.34	-110.71	695.9	696.0	691.6	1761.7		No	No		Yes
100/13-36-051-07W4/00	13	36	51	7	4	1	53.45	-110.91	629.1	629.1	625.1	1041.2		North Block	No		No
100/14-17-015-06W4/00	14	17	15	6	4	1	50.26	-110.80	715.1	715.7	712.0	1698.7		No	No		Yes
100/14-28-055-06W4/02	14	28	55	6	4	1	53.79	-110.84	673.0	673.1	668.0	1398.0		No	No		Yes
100/14-12-048-02W4/00	14	12	48	2	4	1	53.13	-110.17	669.6	669.6	666.3	1034.2	I don't think the GeoScout pics are correct; I think the well ends before the PE Fm	North Block	No		No
100/14-30-042-09W4/00	14	30	42	9	4	1	52.65	-111.29	639.8	639.6	635.5	1467.6		No	No		Yes
100/14-32-019-04W4/00	14	32	19	4	4	1	50.66	-110.53	708.1	708.7	704.1	1734.0		No	No		Yes
100/14-36-020-01W4/00	14	36	20	1	4	1	50.74	-110.02	727.5	727.5	723.2	1704.0	First peak has a broad base; well was converted to H2O disposal in 1997, but the new logs look differen	South Block	No		Yes
100/15-07-013-04W4/00	15	7	13	4	4	1	50.08	-110.53	714.1	714.1	709.7	1701.2		South Block	No		Yes
100/15-14-015-06W4/00	15	14	15	6	4	1	50.26	-110.72	702.3	703.2	699.2	1690.4	Has a gamma log, but it's very straightà a little too straight if you ask me.	No	No		No
100/15-34-043-10W4/00	15	34	43	10	4	1	52.75	-111.36	672.5	672.6	667.9	0.0		No	No		Yes
100/16-03-030-09W4/00	16	3	30	9	4	1	51.55	-111.18	770.5	770.5	766.9	0.0		No	No		Yes
100/16-22-036-09W4/00	16	22	36	9	4	1	52.11	-111.20	795.2	795.2	791.9	1787.7		No	No		No
100/14-29-052-02W4/00	14	29	52	2	4	1	53.52	-110.27	636.7	636.4	633.1	1677.0		North Block	Yes	Cores have been examined	No
100/16-28-056-08W4/00	16	28	56	8	4	1	53.87	-111.12	630.0	630.0	626.4	0.0		No	No		Yes
100/16-29-001-11W4/00	16	29	1	11	4	1	49.07	-111.43	983.0	983.0	979.0	0.0		No	No		No
100/16-30-013-07W4/00	16	30	13	7	4	1	50.12	-110.94	783.3	783.3	779.4	1749.6	Very thin (3 m) salt interval; if there is potash, it's within a very very thin interval	No	No		Yes
100/16-33-040-07W4/00	16	33	40	7	4	1	52.49	-110.95	694.0	694.0	690.1	1488.0		No	No		Yes
102/02-13-057-05W4/00	2	13	57	5	4	2	53.92	-110.61	665.7	665.7	660.9	0.0		No			Yes
102/03-30-017-11W4/00	3	30	17	11	4	2	50.46	-111.51	754.2	754.2	749.8	0.0		No	No		No
102/06-07-019-08W4/00	6	7	19	8	4	2	50.59	-111.10	802.8	803.8	798.6	0.0		No	No		No
102/06-11-015-06W4/00	6	11	15	6	4	2	50.24	-110.73	712.9	712.9	709.3	1703.8		No	No		Yes
102/06-18-046-06W4/00	6	18	46	6	4	2	52.96	-110.87	675.7	676.0	671.8	1389.9		No	No		No
102/06-26-015-07W4/02	6	26	15	7	4	2	50.29	-110.87	707.2	706.8	702.9	1679.4	Based on the sonic log, the whole PE Fm seems to be super dirty (shaley)	No	No		Yes
102/06-30-018-08W4/00	6	30	18	8	4	2	50.55	-111.10	799.8	800.4	795.5	0.0		No	No		No
102/11-08-036-02W4/00	11	8	36	2	4	2	52.08	-110.26	723.1	722.9	718.4	1595.0		Provost	No		Yes
102/11-23-047-10W4/00	11	23	47	10	4	2	53.07	-111.36	710.5	710.2	706.5	0.0		No	No		No
102/12-26-056-05W4/00	12	26	56	5	4	2	53.87	-110.64	534.6	534.3	529.1	0.0		No	No		Yes
102/14-18-017-11W4/00	14	18	17	11	4	2	50.44	-111.51	750.9	0.0	746.4	0.0		No	No		Yes
102/15-33-040-07W4/00	15	33	40	7	4	2	52.49	-110.95	699.3	699.2	694.4	1495.0		No	No		Yes
103/09-30-042-09W4/00	9	30	42	9	4	3	52.65	-111.28	653.1	652.9	648.6	0.0		No	No		No
103/15-30-042-09W4/00	15	30	42	9	4	3	52.65	-111.29	647.9	647.6	643.9	0.0		No	No		No
103/16-23-056-05W4/00	16	23	56	5	4	3	53.86	-110.63	574.3	575.5	570.9	0.0		No	No		Yes
104/07-27-056-05W4/00	7	27	56	5	4	4	53.87	-110.65	533.0	533.3	529.2	0.0		No	No		No
104/10-30-042-09W4/00	10	30	42	9	4	4	52.65	-111.28	644.0	644.0	639.1	0.0		No	Yes	Cores have been examined	No
100/16-27-048-06W4/00	16	27	48	6	4	1	53.17	-110.79	655.6	655.6	652.6	1110.4	Logs very unclear, wouldn't trust the GeoScout pick for the PE Fm top; no headers on log	North Block	No		No
1W0/13-12-029-11W4/00	13	12	29	11	4	0	51.47	-111.43	758.0	758.6	754.7	0.0		No	No		Yes

Appendix 3

Compilation Potash Occurrences Summary

										CORE DATA:						LOG DATA:															
Well Name	**Government KB Elevation (m)**	**Government Ground Level (m)**	**LSD**	**Section**	**Township**	**Range**	**Well Number**	**Latitude NAD27**	**Longitude NAD27**	**TOP (depth)**	**BOTTOM (depth)**	**TOP A.S.L.**	**BOTTOM A.S.L.**	**Thickness**	**Lab Grade**	**TOP (depth)**	**BOTTOM (depth)**	**TOP A.S.L.**	**BOTTOM A.S.L.**	**Thickness**	**Gamma Units**	**API x m2 (calibration)**	**Pixels**	**1 px = ... API x M2**	**K-factor**	**Peak Size (px)**	**API x m integral**	**Log Grade (% K20)**	**On Alberta Potash Project**	**Notes**	**Reference**
ENERMARK MEDHAT 10-3-12-4	766.6	762.6	10	3	12	4		49.97117	-110.46547							1674.5	1675.6	-903.9	-905.0	1.1	API	3750	27664	0.135555234	0.1055	587	79.5709225	7.6	South Block		well logs
ENERPLUS PCP MEDICINE HAT 15-7-13-4	714.1	709.7	15	7	13	4		50.07648	-110.53478							1625.8	1627.8	-907.3	-909.3	2.0	API	3750	26568	0.141147245	0.1055	160	22.58355917	1.2	South Block	weak or questionable peak	well logs
CHEVRON MEDHAT 16-30-13-7	783.3	779.4	16	30	13	7		50.11889	-110.93939							-1673.3	1674.0	-886.1	-886.8	0.7	API	3750	25544	0.146805512	0.1055	60	8.808330723	1.3	No	weak or questionable peak	well logs
RICHFIELD-SHELL-RAPID NARROWS-11-20	753.5	749.8	11	20	16	4		50.36261	-110.52222							1666.2	1666.7	-909.0	-909.5	0.5	? Units not shown								No	weak or questionable peak	well logs
RICHFIELD-SHELL-RAPID NARROWS-11-20	753.5	749.8	11	20	16	4		50.36261	-110.52222							1668.0	1669.2	-910.8	-912.0	1.2	? Units not shown								No	weak or questionable peak	well logs
RICHFIELD-SHELL-RAPID NARROWS-11-20	753.5	749.8	11	20	16	4		50.36261	-110.52222							1672.9	1674.0	-915.7	-916.8	1.1	? Units not shown								No	weak or questionable peak	well logs
IMP CALSTAN LAKE NEWELL 5-1-17-14	751.6	747.7	5	1	17	14		50.40286	-111.81067	1749.0	1759.0	-993.5	-1003.5	10.0		1750.0	1761.2	-994.5	-1005.7	11.2	? No header								No	traces of potash (carnallite veins) from about 1749-1759 m; also apperant in logs;	core, well logs
DEML MEDHAT 6-36-19-1	746.6	740.8	6	36	19	1		50.65043	-110.02022							1660.5	1661.5	-908.1	-909.1	1.0	API	1500	36890	0.040661426	0.1055	4207	171.0626186	18.0	South Block	ranges from 14.5 to 21.6 using constants for carnallite and sylvite respectively; did on paper first	well logs
CS ET AL AEC SUFFIELD 7-18-19-3	698.1	693.7	7	18	19	3		50.60678	-110.40641							1594.5	1601.0	-892.0	-898.5	6.5	API	1500	38001	0.039472645	0.1055	8968	353.9906845	5.7	No	did on paper first	well logs
CS ET AL AEC SUFFIELD 7-18-19-3	698.1	693.7	7	18	19	3		50.60678	-110.40641							1602.9	1603.9	-900.4	-901.4	1.0	API	1500	38001	0.039472645	0.1055	1020	40.26209837	4.2	No	did on paper first	well logs
AECOG (E) CS ET AL SUFF 6-25-19-4	665.7	661.7	6	25	19	4		50.63515	-110.43492							1569.3	1570.3	-899.6	-900.6	1.0	API	3750	27390	0.136911281	0.1055	120	16.42935378	1.7	No	weak or questionable peak	well logs
AECOG (E) CS ET AL SUFF 6-25-19-4	665.7	661.7	6	25	19	4		50.63515	-110.43492							1577.0	1578.2	-907.3	-908.5	1.2	API	3750	27390	0.136911281	0.1055	124	16.9769989	1.5	No	weak or questionable peak	well logs
CS ET AL AEC SUFFIELD 14-32-19-4	708.1	704.1	14	32	19	4		50.65725	-110.52607							1613.6	1614.3	-901.5	-902.2	0.7	API	3750	25896	0.144810009	0.1055	75	10.8607507	1.6	No	weak or questionable peak	well logs
CS ET AL AEC SUFFIELD 14-32-19-4	708.1	704.1	14	32	19	4		50.65725	-110.52607							1618.1	1620.3	-906.0	-908.2	2.2	API	3750	25896	0.144810009	0.1055	174	25.19694161	1.2	No	weak or questionable peak	well logs
CS ET AL AEC SUFFIELD 14-32-19-4	708.1	704.1	14	32	19	4		50.65725	-110.52607							1624.6	1626.8	-912.5	-914.7	2.2	API	3750	25896	0.144810009	0.1055	124	17.95644115	0.9	No	weak or questionable peak	well logs
CS ET AL AEC SUFFIELD 14-32-19-4	708.1	704.1	14	32	19	4		50.65725	-110.52607							1630.5	1632.1	-918.4	-920.0	1.6	API	3750	25896	0.144810009	0.1055	108	15.639481	1.0	No	weak or questionable peak	well logs
AMOCO MEDHAT 14-36-20-1	727.5	723.2	14	36	20	1		50.74294	-110.01846							1636.3	1639.1	-904.5	-907.3	2.8	API	3750	25688	0.14598256	0.1055	641	93.57482093	3.5	South Block		well logs
AMOCO MEDHAT 14-36-20-1	727.5	723.2	14	36	20	1		50.74294	-110.01846							1648.7	1649.9	-916.9	-918.1	1.2	API	3750	25688	0.14598256	0.1055	212	30.94830271	2.7	South Block		well logs
PACIFIC AMOCO EMPRESS 7-12-22-1	666.9	662.6	7	12	22	1		50.8525	-110.01148							1560.4	1566.0	-889.2	-894.8	5.6	API	2500	25647	0.097477288	0.1055	1362	132.764066	2.5	South Block	density logs indicate that this may be impure gypsum	well logs
PACIFIC AMOCO EMPRESS 7-12-22-1	666.9	662.6	7	12	22	1		50.8525	-110.01148							1567.4	1568.7	-896.2	-897.5	1.3	API	2500	25647	0.097477288	0.1055	106	10.33259251	0.8	South Block		well logs
PACIFIC AMOCO EMPRESS 7-12-22-1	666.9	662.6	7	12	22	1		50.8525	-110.01148							1573.9	1578.1	-902.7	-906.9	4.2	API	2500	25647	0.097477288	0.1055	1105	107.712403	2.7	South Block	gamma spikes abnormally broad	well logs
GBASINS ET AL EMPRESS 11-25-24-2	740.9	737.6	11	25	24	2		51.07588	-110.16068							1606.5	1607.6	-862.3	-863.4	1.1	API	3750	26536	0.141317456	0.1055	487	68.82160084	6.6	South Block		well logs
GBASINS ET AL EMPRESS 11-25-24-2	740.9	737.6	11	25	24	2		51.07588	-110.16068							1613.3	1614.4	-869.1	-870.2	1.1	API	3750	26536	0.141317456	0.1055	288	40.69942719	3.9	South Block		well logs
DANSON NATOL ET AL ACADIA 10-18-26-2	762.6	758.6	10	18	26	2		51.22229	-110.26721							1606.4	1607.7	-839.8	-841.1	1.3	API	3750	25620	0.146370023	0.1055	822	120.3161593	9.8	South Block	gamma header not totally clear; I *think* the API scale goes from 0 to 150, though the other standard scales (100 and 120) would mean the grades are even higher)	well logs
DANSON NATOL ET AL ACADIA 10-18-26-2	762.6	758.6	10	18	26	2		51.22229	-110.26721							1612.1	1613.1	-845.5	-846.5	1.0	API	3750	25620	0.146370023	0.1055	256	37.470726	4.0	South Block		well logs
CNRL ESTHER 6-9-31-1	734.3	730.0	6	9	31	1		51.63981	-110.08989							1514.0	1515.3	-775.4	-776.7	-92.4	*not* API								No	the only other gamma log has no header	well logs
CNRL ESTHER 6-9-31-1	734.3	730.0	6	9	31	1		51.63981	-110.08989							1520.2	1520.9	-781.6	-782.3	6.9	*not* API								No		well logs
CNRL ESTHER 6-9-31-1	734.3	730.0	6	9	31	1		51.63981	-110.08989							1607.7	1609.4	-869.1	-870.8	89.2	*not* API								No		well logs
ALTAIR KATEX VETERAN 7-2-36-8	786.7	783.0	7	2	36	8		52.06122	-111.03681							1588.5	1590.1	-798.1	-799.7	1.6	? No header								No		well logs
SAGE ET AL PROVOST 11-20-37-1	693.4	691.0	11	20	37	1		52.19566	-110.11421							1338.0	1341.6	-642.2	-645.8	3.6	*not* API								No		well logs
SAGE ET AL PROVOST 11-20-37-1	693.4	691.0	11	20	37	1		52.19566	-110.11421							1344.4	1345.6	-648.6	-649.8	1.2	*not* API								No		well logs
SAGE ET AL PROVOST 11-20-37-1	693.4	691.0	11	20	37	1		52.19566	-110.11421							1352.3	1355.9	-656.5	-660.1	3.6	*not* API								No		well logs
SAGE ET AL PROVOST 11-20-37-1	693.4	691.0	11	20	37	1		52.19566	-110.11421							1357.1	1359.7	-661.3	-663.9	2.6	*not* API								No		well logs
SAGE ET AL PROVOST 11-20-37-1	693.4	691.0	11	20	37	1		52.19566	-110.11421							1361.3	1363.2	-665.5	-667.4	1.9	*not* API								No		well logs
SAGE ET AL PROVOST 11-20-37-1	693.4	691.0	11	20	37	1		52.19566	-110.11421							1367.5	1368.4	-671.7	-672.6	0.9	*not* API								No		well logs
IMPERIAL-PROVOST NO. 2	737.6	734.6	1	33	37	3		52.21643	-110.36290	1405.7	1408.5	-665.1	-667.9	2.8	4.1														No		Cole, 1948
IMPERIAL-PROVOST NO. 2	737.6	734.6	1	33	37	3		52.21643	-110.36290	1435.9	1437.4	-695.3	-696.8	1.5	3.32														No		Cole, 1948
PVR PROVOST 4-18-38-1	696.2	691.9	4	18	38	1		52.26241	-110.14228							1309.3	1313.5	-608.8	-613.0	4.2	API	2500	26536	0.094211637	0.1055	7938	747.8519747	18.8	No	very nice	well logs
RENAISSANCE PROVOST 7-15-40-2	677.3	673.0	7	15	40	2		52.43937	-110.20728							1259.5	1261.4	-577.9	-579.8	1.9	API	3750	24040	0.155990017	0.1055	2004	312.6039933	17.4	No		well logs
RENAISSANCE PROVOST 7-15-40-2	677.3	673.0	7	15	40	2		52.43937	-110.20728							1264.1	1266.8	-582.5	-585.2	2.7	API	3750	24040	0.155990017	0.1055	553	86.2624792	3.4	No		well logs
NEWALTA HUGHENDEN 10-33-40-7	698.9	694.9	10	33	40	7	1	52.48521	-110.94888	1377.37	1384.07	-674.5	-681.2	6.7	3.17 (@1381.11), 0.89 (@1383.13)	1376.6	1379.0	-673.7	-676.1	2.4	*not* API								No	decent potash in core, though logs don't look that great; the good gamma log has a smudged header, but I'm virtually sure it's the same units as the other one, which are not API	core, well logs
NEWALTA HUGHENDEN 10-33-40-7	698.9	694.9	10	33	40	7	1	52.48521	-110.94888							1383.1	1384.2	-680.2	-681.3	1.1	*not* API								No		core, well logs
NEWLATA PROVOST 9-33-40-7	694.3	690.7	9	33	40	7		52.48521	-110.94440							1373.9	1374.9	-676.0	-677.0	1.0	*not* API								No	weak or questionable peak	well logs
NEWLATA PROVOST 9-33-40-7	694.3	690.7	9	33	40	7		52.48521	-110.94440							1379.2	1380.2	-681.3	-682.3	1.0	*not* API								No	weak or questionable peak	well logs
NEWLATA PROVOST 9-33-40-7	694.3	690.7	9	33	40	7		52.48521	-110.94440							1401.7	1403.5	-703.8	-705.6	1.8	*not* API								No	weak or questionable peak	well logs
NEWALTA 15A1 PROVOST 15-33-40-7	699.3	694.4	15	33	40	7		52.48885	-110.94752							1378.2	1382.3	-674.0	-678.1	4.1	API	3750	26536	0.141317456	0.1055	291	41.12337956	1.1	No	weak or questionable peak	well logs
NEWALTA HUGHENDEN 16-33-40-7	694.0	690.1	16	33	40	7		52.48905	-110.94528							1374.2	1376.6	-676.3	-678.7	2.4	? Units not shown								No	weak or questionable peak	well logs
FEDERATED LPGS3 HARDISTY 10-30-42-9	643.7	639.8	10	30	42	9	1	52.64737	-111.28485	1359.8	1369.8	-712.2	-722.2	10.0	0.16 (@1360.99 m), 1.54 (@1363.23 m),	possible													No		core
PETCAL DINA 10-32-45-1	630.9	628.2	10	32	45	1		52.92461	-110.10950	1052.4	1060.1	-418.8	-426.5	7.7	4.10 (@1055.68 m), 1.31 (@1058.64 m), 0.66 (@1060.92 m)	1056.3	1059.3	-422.7	-425.7	3.0	API	5000	26182	0.190970896	0.1055	422	80.58971813	2.8	Provost		Meijer Drees, 1986; core, well logs
HUSKY D. H. PROSPECT 7-1-45-3	662.0	658.4	7	1	45	3		52.84766	-110.30097							1142.4	1143.6	-476.8	-478.0	1.2	API	3000	15072	0.199044586	0.1055	67	13.33598726	1.2	No	did on paper first	well logs
HUSKY D. H. PROSPECT 7-1-45-3	662.0	658.4	7	1	45	3		52.84766	-110.30097							1147.9	1149.1	-482.3	-483.5	1.2	API	3000	15072	0.199044586	0.1055	201	40.00796178	3.5	No	did on paper first	well logs
HUSKY D. H. PROSPECT 7-1-45-3	662.0	658.4	7	1	45	3		52.84766	-110.30097							1169.5	1172.6	-503.9	-507.0	3.1	API	3000	15072	0.199044586	0.1055	186	37.02229299	1.3	No	questionable; did on paper first	well logs
HUSKY D. H. PROSPECT 7-1-45-3	662.0	658.4	7	1	45	3		52.84766	-110.30097							1203.4	1204.9	-537.8	-539.3	1.5	API	3000	15072	0.199044586	0.1055	106	21.09872611	1.5	No	questionable; did on paper first	well logs
HUSKY DH KOKNEE 7-33-49-5	659.3	755.3	7	33	49	5		53.26786	-110.67044							1157.6	1160.2	-594.3	-596.9	2.6	API	3000	15778	0.190138167	0.1055	184	34.98542274	1.4	North Block	IF this is PE Fm, it's at the bottom, and this is virtually certain to be a shale bed; weak pr questionable peak with almost unreadable header; did on paper first	well logs
VERMILION CONSOLIDATED OILS #15	604.4	602.9	6	12	49	6		53.21138	-110.75252	1060.7	1076.2	-454.8	-470.3	15.5		possible													North Block	no gamma log	Golden, 1965, Cole, 1948, indirect reference from every other 1960's paper out there
VERMILION CONSOLIDATED OILS #15	604.4	602.9	6	12	49	6		53.21138	-110.75252	1137.2	1158.2	-531.3	-552.3	21.0		possible													North Block	all data from publications	the interval between the 2 potash occurances was not cored, so it may be potash too
BLACKFOOT DEVONIAN TEST SYNDICATE #1	697.1	695.6	12	15	50	2		53.31530	-110.21949	1025.7	1034.0	-327.1	-335.4	8.3		possible													North Block	cores are a highly degraded	core
HUSKY DH VERMILION 7A-31-51-5	625.4	622.1	7	31	51	5		53.44323	-110.72502							1032.6	1036.3	-403.9	-407.6	3.7	API	2500	23959	0.104344923	0.1055	297	30.99044201	0.9	North Block	weak or questionable peak	well logs
HUSKY DH VERMILION 7A-31-51-5	625.4	622.1	7	31	51	5		53.44323	-110.72502							1030.2	1036.3	-401.5	-407.6	6.1		10000	4000	2.5	0.1055	15	37.5	0.6	North Block	weak or questionable peak; did on paper first	well logs
CALSTAN PACIFIC MARWAYNE 14-29-52-2	636.7	633.1	14	29	52	2		53.52438	-110.26592	916.3	917.4	-276.0	-277.1	1.1		possible													North Block	traces of potash (carnallite veins), which may go deeper in the core	core

Log assumtions:
Assumes a uniform radioactivity in each bed
Beds should be at least a metre thick for this to work properly
Only logs in API units can be used
gamma integrals determined for above the background gamma radiation
Log response value (K) from Tixier and Algers, 1970 (p 132)
Log response value (K) I averaged the constants given for carnallite and sylvite
K factors for sylvite and carnallite are 0.126 and 0.085, respectively
1 API = 0.1055 % K2O

Appendix 4

Historic Core Sample Assay Results

Appendix 4

Summary of Analytical Chemistry (ICP OES) of Historic Potash Samples

Group Number	Sample Description	Located on Alberta Potash Project	Date	Sample Type	CaO Potash ICP1 Soluble (wt %)	K2O Potash ICP1 Soluble (wt %)	MgO Potash ICP1 Soluble (wt %)	Insoluble Determination (%)	Moisture (wt %)
G-2008-1589	POT003	No	10-06-2008	Standard	0.15	19.70	1.31		
G-2008-1589	10-30-42-9W4/1360.99	No	10-06-2008	Potash	0.16	0.16	0.06	0.6	<0.1
G-2008-1589	10-30-42-9W4/1363.23	No	10-06-2008	Potash	0.28	1.54	0.04	0.1	0.1
G-2008-1589	10-32-45-1W4/1055.68	Provost	10-06-2008	Potash	0.19	4.10	3.58	0.4	5.9
G-2008-1589	10-32-45-1W4/1058.64	Provost	10-06-2008	Potash	0.38	1.31	1.11	2.4	1.6
G-2008-1589	10-32-45-1W4/1060.92	Provost	10-06-2008	Potash	0.20	0.66	0.53	0.5	0.8
G-2008-1589	10-33-40-7W4/1381.11	No	10-06-2008	Potash	0.19	3.17	0.06	0.2	<0.1
G-2008-1589	10-33-40-7W4/1383.13	No	10-06-2008	Potash	0.60	0.88	0.04	0.5	<0.1
G-2008-1589	10-33-40-7W4/1383.13 R	No	10-06-2008	Repeat	0.58	0.89	0.04	0.5	<0.1

Appendix 5

Historic Core XRF Analyses Results

Appendix 5

Historic Core XRF Results

Sample ID	Well	Sample Depth (m)	Located on Alberta Potash Project	Description	Unit	Carnallite[1] (%)	KCl in Carnallite[1] (%)	KCl total[1] (%)	KCl sylvite[1] (%)	$CaSO_4$[1] (%)	K/Mg molar[2]	$MgCl_2$[3]	Carnallite[3]	SiO2	Al2O3	Fe2O3	MgO	CaO	K2O	TiO2	P2O5	MnO	Cr2O3	SO4	V2O5	NiO	Sb	Sb Error	Sn	Sn Error	Cd	Cd Error	Pd	Pd Error	Ag	Ag Error	Bal	Bal Error	Mo	Mo Error
690	CH LPGS 2 Hughenden 10-33-40-7W4	1374.13	No		%	16.865	4.527	0.000	0.000	22.031	0.000	5.771	16.852	4.623	1.882	0.164	2.447	9.074	0.000	0.052	0.000	0.015	0.000	17.144	0.000	0.001	0.006	0.005	0.002	0.004	0.001	0.003	0.000	0.001	0.007	0.005	32.026	0.750	0.000	0.001
691	CH LPGS 2 Hughenden 10-33-40-7W4	1374.28	No		%	0.000	0.000	0.000	0.000	3.353	#DIV/0!	0.000	0.000	1.386	0.831	0.041	0.000	1.381	0.000	0.010	0.023	0.004	0.004	0.428	0.000	0.000	0.004	0.005	0.000	0.004	0.001	0.003	0.000	0.001	0.006	0.005	31.355	0.833	0.000	0.001
692	CH LPGS 2 Hughenden 10-33-40-7W4	1374.51	No		%	2.422	0.650	0.000	0.000	5.113	0.000	0.829	2.420	1.619	0.465	0.132	0.351	2.106	0.000	0.042	0.000	0.003	0.000	4.647	0.007	0.000	0.000	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.003	0.002	38.296	0.738	0.001	0.001
693	CH LPGS 2 Hughenden 10-33-40-7W4	1374.79	No		%	17.791	4.775	10.936	6.161	7.287	3.683	6.088	17.777	5.342	2.143	0.206	2.581	3.001	6.908	0.047	0.000	0.006	0.004	2.124	0.007	0.000	0.003	0.005	0.001	0.004	0.000	0.003	0.000	0.001	0.005	0.004	29.558	0.781	0.001	0.001
694	CH LPGS 2 Hughenden 10-33-40-7W4	1375.02	No		%	6.433	1.727	0.654	0.000	7.073	0.609	2.201	6.428	2.815	0.964	0.102	0.933	2.913	0.413	0.003	0.000	0.004	0.015	1.609	0.000	0.000	0.000	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.004	0.003	34.970	0.764	0.000	0.001
695	CH LPGS 2 Hughenden 10-33-40-7W4	1375.3	No		%	12.957	3.478	1.119	0.000	10.759	0.518	4.434	12.947	5.677	2.146	0.336	1.880	4.431	0.707	0.068	0.000	0.005	0.000	2.745	0.014	0.000	0.000	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.004	0.003	34.637	0.739	0.001	0.001
697	CH LPGS 2 Hughenden 10-33-40-7W4	1375.56	No		%	20.464	5.493	2.532	0.000	14.975	0.741	7.003	20.448	6.987	2.436	0.466	2.969	6.168	1.600	0.093	0.000	0.005	0.013	4.234	0.000	0.000	0.001	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.004	0.003	36.637	0.724	0.001	0.001
698	CH LPGS 2 Hughenden 10-33-40-7W4	1375.78	No		%	18.556	4.980	0.000	0.000	7.861	0.000	6.350	18.542	4.497	1.944	0.146	2.692	3.238	0.000	0.045	0.037	0.003	0.010	2.091	0.018	0.000	0.000	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.005	0.004	29.880	0.810	0.000	0.001
699	CH LPGS 2 Hughenden 10-33-40-7W4	1376.03	No		%	13.483	3.619	0.368	0.000	10.290	0.164	4.614	13.472	4.841	1.744	0.193	1.956	4.238	0.232	0.042	0.000	0.005	0.015	3.050	0.002	0.000	0.004	0.005	0.003	0.004	0.000	0.003	0.000	0.001	0.006	0.005	31.841	0.849	0.001	0.001
700	CH LPGS 2 Hughenden 10-33-40-7W4	1376.31	No		%	12.637	3.392	6.888	3.496	16.225	3.266	4.324	12.627	8.510	2.481	0.330	1.834	6.683	4.351	0.060	0.000	0.013	0.015	6.750	0.007	0.001	0.002	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.005	0.004	38.658	0.691	0.001	0.001
701	CH LPGS 2 Hughenden 10-33-40-7W4	1376.55	No		%	8.261	2.217	0.467	0.000	9.064	0.339	2.827	8.255	3.309	1.100	0.153	1.199	3.733	0.295	0.045	0.000	0.000	0.007	4.956	0.016	0.000	0.000	0.005	0.002	0.004	0.000	0.003	0.000	0.001	0.005	0.004	34.328	0.746	0.001	0.001
702	CH LPGS 2 Hughenden 10-33-40-7W4	1376.83	No		%	2.251	0.604	15.352	14.748	6.873	40.868	0.770	2.249	3.187	1.175	0.149	0.327	2.831	9.698	0.005	0.000	0.009	0.003	2.127	0.032	0.000	0.001	0.005	0.000	0.004	0.001	0.003	0.000	0.001	0.006	0.004	33.303	0.744	0.001	0.001
703	CH LPGS 2 Hughenden 10-33-40-7W4	1377.01	No		%	8.078	2.168	4.861	2.692	9.519	3.605	2.764	8.072	6.948	2.532	0.300	1.172	3.921	3.071	0.027	0.000	0.009	0.003	1.930	0.027	0.000	0.000	0.005	0.000	0.004	0.000	0.003	0.000	0.001	0.003	0.002	36.038	0.715	0.001	0.001

Sample ID	Nb	Nb Error	Zr	Zr Error	Sr	Sr Error	Rb	Rb Error	Bi	Bi Error	As	As Error	Se	Se Error	Au	Au Error	Pb	Pb Error	W	W Error	Zn	Zn Error	Cu	Cu Error	Ni	Ni Error	Co	Co Error	Fe	Fe Error	Mn	Mn Error	Cr	Cr Error	V	V Error	Ti	Ti Error	Al	Al Error	P	P Error	Si	Si Error	Ca	Ca Error	K	K Error	Cl	Cl Error	S	S Error	Mg	Mg Error
690	0.000	0.001	0.000	0.001	0.005	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.002	0.001	0.001	0.007	0.006	0.002	0.001	0.001	0.002	0.001	0.004	0.001	0.003	0.115	0.009	0.012	0.006	0.003	0.009	0.000	0.015	0.031	0.023	0.996	0.137	0.000	0.028	2.161	0.050	6.485	0.078	0.000	0.037	50.939	0.323	5.722	0.047	1.476	0.579
691	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.002	0.002	0.000	0.001	0.002	0.006	0.001	0.001	0.001	0.002	0.000	0.004	0.001	0.002	0.029	0.006	0.003	0.005	0.003	0.009	0.000	0.015	0.006	0.021	0.440	0.157	0.010	0.031	0.648	0.049	0.987	0.027	0.000	0.037	66.355	0.404	0.143	0.029	0.000	0.705
692	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.003	0.002	0.000	0.001	0.001	0.007	0.000	0.001	0.003	0.002	0.000	0.004	0.000	0.003	0.092	0.009	0.002	0.006	0.000	0.009	0.004	0.017	0.025	0.024	0.246	0.132	0.000	0.029	0.757	0.048	1.505	0.031	0.000	0.038	57.298	0.389	1.551	0.033	0.212	0.595
693	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.000	0.001	0.001	0.006	0.001	0.001	0.000	0.002	0.000	0.004	0.000	0.003	0.144	0.010	0.005	0.006	0.003	0.009	0.004	0.016	0.028	0.023	1.134	0.147	0.000	0.027	2.497	0.052	2.145	0.040	5.735	0.086	56.465	0.331	0.709	0.027	1.557	0.616
694	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.000	0.001	0.006	0.006	0.001	0.001	0.003	0.002	0.000	0.004	0.000	0.003	0.071	0.008	0.003	0.006	0.010	0.010	0.000	0.015	0.002	0.022	0.510	0.140	0.000	0.029	1.316	0.050	2.082	0.038	0.343	0.047	59.574	0.387	0.537	0.028	0.563	0.616
695	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.000	0.001	0.003	0.006	0.001	0.001	0.002	0.002	0.000	0.004	0.000	0.004	0.235	0.013	0.004	0.006	0.000	0.009	0.008	0.016	0.041	0.023	1.136	0.139	0.000	0.028	2.654	0.055	3.167	0.047	0.587	0.044	55.466	0.347	0.916	0.029	1.134	0.580
697	0.000	0.001	0.000	0.001	0.002	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.000	0.001	0.001	0.006	0.002	0.001	0.001	0.002	0.000	0.004	0.000	0.004	0.326	0.015	0.004	0.006	0.009	0.010	0.000	0.016	0.056	0.025	1.289	0.136	0.000	0.028	3.266	0.058	4.408	0.059	1.328	0.049	49.459	0.318	1.413	0.030	1.791	0.555
698	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.001	0.001	0.008	0.006	0.000	0.001	0.000	0.002	0.000	0.004	0.000	0.003	0.102	0.009	0.002	0.005	0.007	0.009	0.010	0.016	0.027	0.022	1.029	0.154	0.016	0.030	2.102	0.053	2.314	0.040	0.000	0.038	62.171	0.384	0.698	0.029	1.624	0.654
699	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.002	0.000	0.001	0.000	0.006	0.004	0.001	0.002	0.002	0.000	0.004	0.000	0.003	0.135	0.010	0.004	0.006	0.010	0.010	0.001	0.016	0.025	0.023	0.923	0.164	0.000	0.032	2.263	0.050	3.029	0.051	0.193	0.049	59.355	0.373	1.018	0.034	1.180	0.700
700	0.000	0.001	0.000	0.001	0.002	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.002	0.000	0.001	0.001	0.007	0.009	0.002	0.000	0.002	0.001	0.004	0.000	0.004	0.231	0.013	0.010	0.007	0.010	0.010	0.004	0.017	0.036	0.024	1.313	0.128	0.000	0.027	3.978	0.061	4.776	0.063	3.612	0.066	43.987	0.284	2.253	0.033	1.106	0.518
701	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.000	0.001	0.003	0.006	0.002	0.001	0.002	0.002	0.000	0.003	0.000	0.003	0.107	0.009	0.000	0.005	0.005	0.009	0.009	0.016	0.027	0.023	0.582	0.137	0.000	0.028	1.547	0.049	2.668	0.043	0.245	0.042	58.086	0.366	1.654	0.032	0.723	0.599
702	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.001	0.001	0.003	0.006	0.001	0.001	0.001	0.002	0.000	0.004	0.000	0.003	0.104	0.009	0.007	0.006	0.002	0.009	0.018	0.017	0.003	0.021	0.622	0.134	0.000	0.027	1.490	0.048	2.023	0.040	8.051	0.105	53.455	0.313	0.710	0.027	0.197	0.592
703	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.003	0.002	0.000	0.001	0.000	0.006	0.002	0.001	0.001	0.002	0.000	0.004	0.000	0.004	0.210	0.012	0.007	0.006	0.002	0.009	0.015	0.017	0.016	0.022	1.340	0.135	0.000	0.028	3.248	0.057	2.802	0.044	2.549	0.058	52.410	0.326	0.644	0.027	0.707	0.552

Appendix 5
Historic Core XRF Results

Sample ID	Well	Sample Depth (m)	Located on Alberta Potash Project	Description	Unit	Carnallite[1] (%)	KCl in Carnallite[1] (%)
940	Pectal Dina 10-32-45-1W4	1072.34	Provost	Halite	%	25.355	6.805
941	Pectal Dina 10-32-45-1W4	1072.66	Provost	PE Salt and minor Potash	%	2.400	0.644
942	Pectal Dina 10-32-45-1W4	1072.92	Provost	PE Salt and trace Potash	%	19.653	5.275
943	Pectal Dina 10-32-45-1W4	1073.29	Provost	Halite	%	20.442	5.487
944	Pectal Dina 10-32-45-1W4	Duplicate of 942	Provost	Duplicate of 943	%	16.659	4.471
945	Pectal Dina 10-32-45-1W4	1073.58	Provost	PE Salt and minor Potash	%	7.267	1.950
946	Pectal Dina 10-32-45-1W4	1073.9	Provost	PE Salt and minor Potash	%	20.567	5.520
947	Pectal Dina 10-32-45-1W4	1074.22	Provost	PE Salt and minor Potash	%	14.888	3.996
948	Pectal Dina 10-32-45-1W4	1074.63	Provost	PE Salt and minor Potash	%	26.349	7.072
949	Pectal Dina 10-32-45-1W4	1075.18	Provost	PE Salt and minor Potash	%	14.317	3.843
950	Pectal Dina 10-32-45-1W4	1075.79	Provost	PE Salt and minor Potash	%	12.729	3.416
951	Pectal Dina 10-32-45-1W4	1076.4	Provost	PE Salt and trace Potash	%	17.402	4.671
952	Pectal Dina 10-32-45-1W4	1077.06	Provost	PE Salt and minor Potash	%	19.082	5.122
953	Pectal Dina 10-32-45-1W4	1077.6	Provost	Salt	%	16.728	4.490
954	Pectal Dina 10-32-45-1W4	1078.22	Provost	PE Salt and Potash	%	6.627	1.779
955	Pectal Dina 10-32-45-1W4	1078.84	Provost	PE Salt and Potash	%	38.084	10.222
956	Pectal Dina 10-32-45-1W4	1079.45	Provost	PE Salt and trace Potash	%	13.232	3.551
957	Pectal Dina 10-32-45-1W4	1080.07	Provost	PE Salt and Potash	%	18.990	5.097
958	Pectal Dina 10-32-45-1W4	1080.57	Provost	Salt	%	11.860	3.183
959	Pectal Dina 10-32-45-1W4	1081.23	Provost	PE Salt and trace Potash	%	17.059	4.579
960	Pectal Dina 10-32-45-1W4	1081.83	Provost	PE Salt and minor Potash	%	13.517	3.628
961	Pectal Dina 10-32-45-1W4	1082.44	Provost	PE Salt and minor Potash	%	21.573	5.790
962	Pectal Dina 10-32-45-1W4	1083.06	Provost	PE Salt and minor Potash	%	8.353	2.242
963	Pectal Dina 10-32-45-1W4	Duplicate of 961	Provost	Duplicate of 962	%	2.114	0.567
964	Pectal Dina 10-32-45-1W4	1083.62	Provost	PE Salt and minor Potash	%	24.578	6.597
965	Pectal Dina 10-32-45-1W4	1084.25	Provost	PE Salt and trace Potash	%	15.768	4.232
966	Pectal Dina 10-32-45-1W4	1084.76	Provost	PE Salt and minor Potash	%	14.808	3.975
967	Pectal Dina 10-32-45-1W4	1085.37	Provost	Salt	%	8.981	2.411
968	Pectal Dina 10-32-45-1W4	1086	Provost	PE Salt and minor Potash	%	20.007	5.370
969	Pectal Dina 10-32-45-1W4	1086.54	Provost	Salt	%	14.466	3.883
999	CDN Land MedHat 14-36-20-1W4	1667.24	No	Coarse-grained salt	%	12.032	3.229
1000	CDN Land MedHat 14-36-20-1W4	1667.9	No	Coarse-grained salt	%	10.364	2.782
1001	CDN Land MedHat 14-36-20-1W4	1668.5	No	Coarse-grained salt	%	5.028	1.349
1002	CDN Land MedHat 14-36-20-1W4	1669.1	No	Coarse-grained salt	%	12.272	3.294
1003	CDN Land MedHat 14-36-20-1W4	1669.72	No	Coarse-grained salt	%	8.135	2.184
1004	CDN Land MedHat 14-36-20-1W4	1670.34	No	Coarse-grained salt	%	0.468	0.126
1005	CDN Land MedHat 14-36-20-1W4	Duplicate of 1003	No	Duplicate of 1004	%	12.809	3.438
1006	CDN Land MedHat 14-36-20-1W4	1670.8	No	Coarse-grained salt and minor potash	%	12.432	3.337
1007	CDN Land MedHat 14-36-20-1W4	1671.28	No	Coarse-grained salt and minor potash	%	8.901	2.389
1008	CDN Land MedHat 14-36-20-1W4	1671.55	No	Coarse-grained salt	%	5.210	1.398
1009	CDN Land MedHat 14-36-20-1W4	1671.94	No	Coarse-grained salt	%	14.237	3.821
1010	CDN Land MedHat 14-36-20-1W4	1672.7	No	Coarse-grained salt and minor potash	%	13.666	3.668
1011	CDN Land MedHat 14-36-20-1W4	1673.2	No	Coarse-grained salt and trace potash	%	19.916	5.345
1012	CDN Land MedHat 14-36-20-1W4	1673.45	No	Coarse-grained salt and minor potash	%	10.455	2.806
1013	CDN Land MedHat 14-36-20-1W4	1673.77	No	Coarse-grained salt and minor potash	%	13.677	3.671
1014	CDN Land MedHat 14-36-20-1W4	1673.98	No	Coarse-grained salt and minor potash	%	10.192	2.736
1015	CDN Land MedHat 14-36-20-1W4	Duplicate of 1013	No	Duplicate of 1014	%	11.243	3.018
971	CDN Land MedHat 14-36-20-1W4	1674.2	No	Coarse-grained salt and minor potash	%	7.564	2.030
972	CDN Land MedHat 14-36-20-1W4	1674.91	No	Coarse-grained salt and trace potash	%	17.585	4.720
973	CDN Land MedHat 14-36-20-1W4	1675.68	No	Coarse-grained salt and trace potash	%	7.953	2.134
974	CDN Land MedHat 14-36-20-1W4	1676.3	No	Coarse-grained salt	%	15.837	4.251
975	CDN Land MedHat 14-36-20-1W4	1676.92	No	Coarse-grained salt	%	16.671	4.474
976	CDN Land MedHat 14-36-20-1W4	1677.54	No	Coarse-grained salt	%	0.000	0.000
977	CDN Land MedHat 14-36-20-1W4	1678.09	No	Coarse-grained salt and minor potash	%	3.999	1.073
978	CDN Land MedHat 14-36-20-1W4	1678.76	No	Coarse-grained salt	%	6.604	1.773
979	CDN Land MedHat 14-36-20-1W4	Duplicate of 977	No	Duplicate of 978	%	15.265	4.097
980	CDN Land MedHat 14-36-20-1W4	1679.34	No	Coarse-grained salt	%	7.187	1.929
981	CDN Land MedHat 14-36-20-1W4	1679.86	No	Coarse-grained salt	%	7.633	2.049
982	CDN Land MedHat 14-36-20-1W4	1680.49	No	Coarse-grained salt and minor potash	%	16.317	4.379
983	CDN Land MedHat 14-36-20-1W4	1681.1	No	Coarse-grained salt	%	2.251	0.604
984	CDN Land MedHat 14-36-20-1W4	1681.72	No	Coarse-grained salt	%	5.496	1.475
985	CDN Land MedHat 14-36-20-1W4	1682.28	No	Coarse-grained salt	%	13.597	3.649
986	CDN Land MedHat 14-36-20-1W4	1682.9	No	Coarse-grained salt	%	6.810	1.828
987	CDN Land MedHat 14-36-20-1W4	1684.12	No	Coarse-grained salt	%	8.021	2.153
988	CDN Land MedHat 14-36-20-1W4	1685.3	No	Coarse-grained salt	%	10.352	2.779
989	CDN Land MedHat 14-36-20-1W4	1686.5	No	Coarse-grained salt	%	0.000	0.000
990	CDN Land MedHat 14-36-20-1W4	1687.75	No	Coarse-grained salt	%	0.000	0.000
991	CDN Land MedHat 14-36-20-1W4	1688.98	No	Coarse-grained salt	%	12.615	3.386
992	CDN Land MedHat 14-36-20-1W4	1690.17	No	Coarse-grained salt	%	7.804	2.095
993	CDN Land MedHat 14-36-20-1W4	1691.31	No	Intebedded salt and carbonates; At 24.23 into intebedded carbonates and salt	%	33.285	8.934
994	CDN Land MedHat 14-36-20-1W4	Duplicate of 992	No	Duplicate of 993	%	32.451	8.710
1042	Husky DH Wildmere 10-3-49-6W4	1111.93	North Block	Contact (altered mudstone)	%	24.658	6.618
1043	Husky DH Wildmere 10-3-49-6W4	1112.23	North Block	Contact (salt with potash)	%	4.570	1.227
1044	Husky DH Wildmere 10-3-49-6W4	1112.45	North Block	Coarse dark grey salt	%	14.854	3.987
1045	Husky DH Wildmere 10-3-49-6W4	1113.4	North Block	Salt/anhydrite	%	10.535	2.828
1046	Husky DH Wildmere 10-3-49-6W4	1114.22	North Block	Salt/anhydrite	%	2.342	0.629
1047	Husky DH Wildmere 10-3-49-6W4	1114.91	North Block	Salt/anhydrite	%	10.946	2.938
1048	Husky DH Wildmere 10-3-49-6W4	1116.52	North Block	Salt/anhydrite	%	6.890	1.849
1049	Husky DH Wildmere 10-3-49-6W4	1116.98	North Block	Salt/anhydrite	%	3.588	0.963
1050	Husky DH Wildmere 10-3-49-6W4	1117.78	North Block	Salt (start of pinkish) with trace potash	%	19.882	5.336
1051	Husky DH Wildmere 10-3-49-6W4	1119.21	North Block	Dark brown salt	%	6.856	1.840
1052	Husky DH Wildmere 10-3-49-6W4	1120.69	North Block	Reddish salt	%	12.660	3.398
1053	Husky DH Wildmere 10-3-49-6W4	1122.18	North Block	Brown-red salt	%	14.923	4.005
1054	Husky DH Wildmere 10-3-49-6W4	Duplicate of 1052	North Block	Duplicate of 1053	%	13.334	3.579
1055	Husky DH Wildmere 10-3-49-6W4	1123.9	North Block	Red salt (sample prev.) with trace potash	%	11.255	3.021
1056	Husky DH Wildmere 10-3-49-6W4	1125.3	North Block	Brown salt with trace potash	%	15.951	4.281
1057	Husky DH Wildmere 10-3-49-6W4	1126.7	North Block	Red salt with trace potash	%	5.576	1.497
1058	Husky DH Wildmere 10-3-49-6W4	1128.4	North Block	Red salt with trace potash	%	5.622	1.509
1059	Husky DH Wildmere 10-3-49-6W4	1130.21	North Block	Dark grey salt	%	9.678	2.598
1060	Husky DH Wildmere 10-3-49-6W4	1131.62	North Block	Dark grey salt	%	2.937	0.788
1061	Husky DH Wildmere 10-3-49-6W4	1133.14	North Block	Pinkish-red salt	%	13.871	3.723
1062	Husky DH Wildmere 10-3-49-6W4	1134.56	North Block	Clear to pinkish salt	%	10.135	2.720
1063	Husky DH Wildmere 10-3-49-6W4	Duplicate of 1061	North Block	Duplicate of 1062	%	10.512	2.821
1064	Husky DH Wildmere 10-3-49-6W4	1145.13	North Block	Pinkish-clear salt	%	4.399	1.181

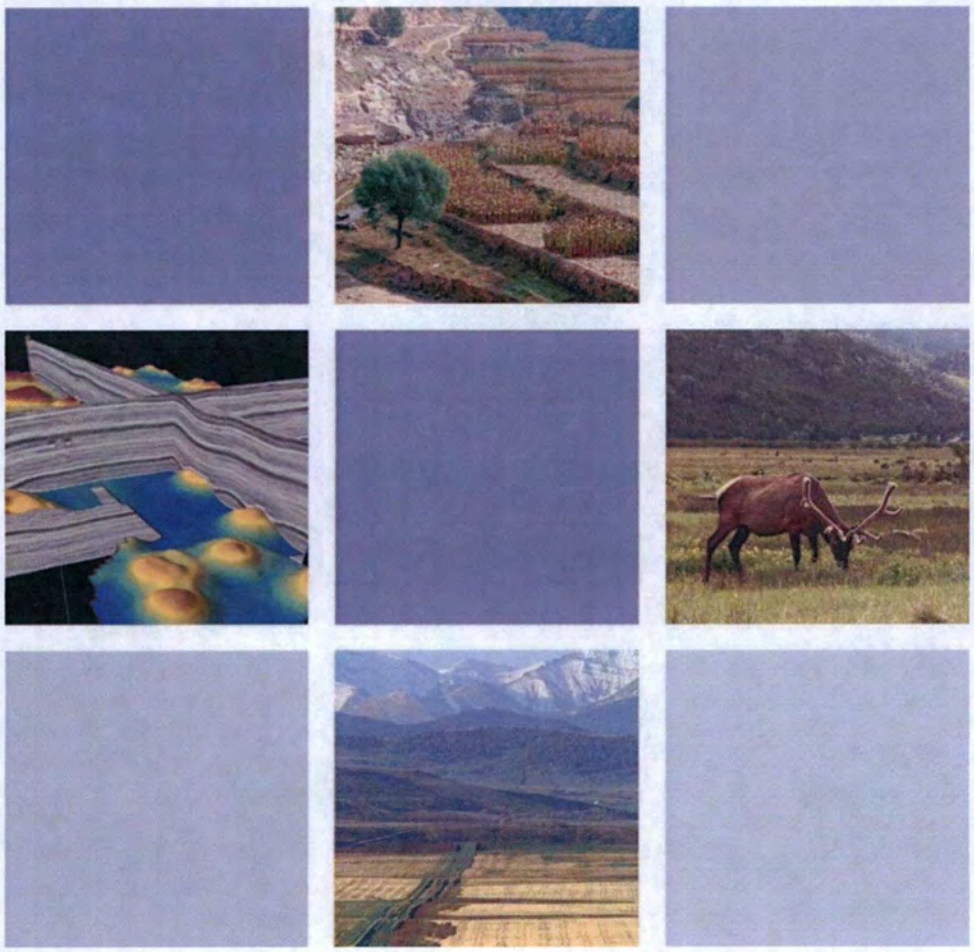
1 - Calculations provided by Bernard Gartner (SRC); note no references provided
2 - General determination of calnallite (Mg>K) versus sylvite (K>Mg); from Sinha and Raymahashay (2004)
3 - Halabura and Hardy (2007)

Appendix 6

Suffield Seismic Interpretation Report (South Claim Block)

RPS Boyd PetroSearch

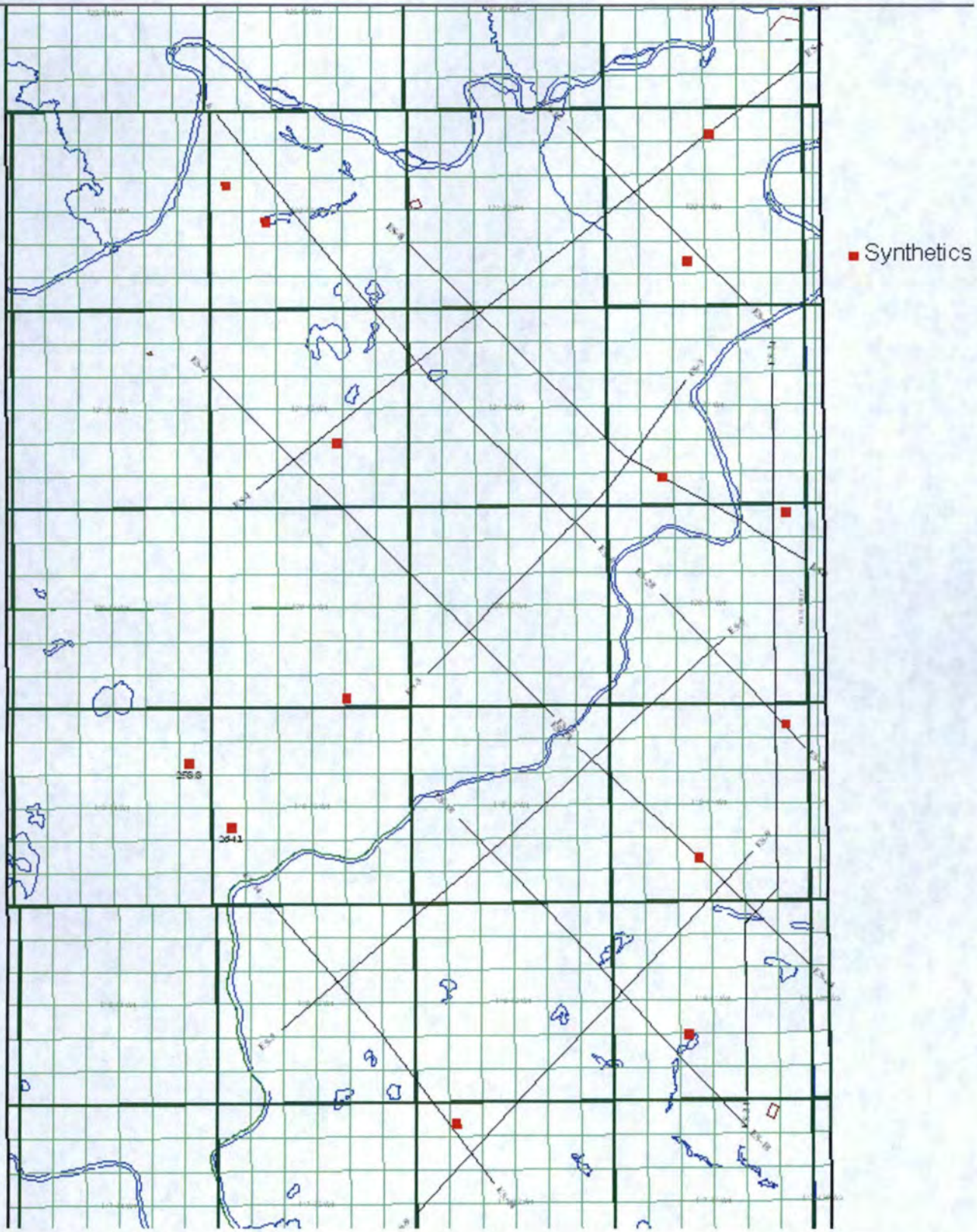
2011 SUFFIELD 2D
INITIAL INTERPRETATION



September 26, 2011

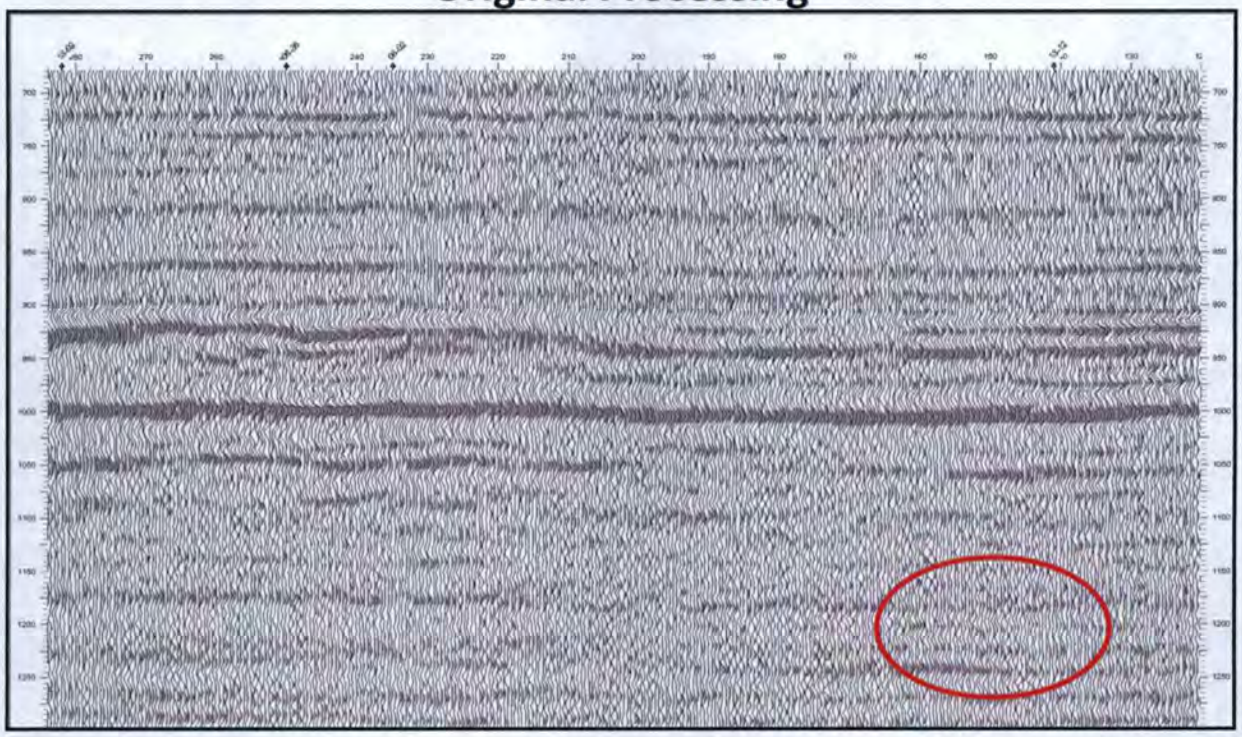
boydpetro.com | rpsgroup.com/Canada

LOCATION MAP

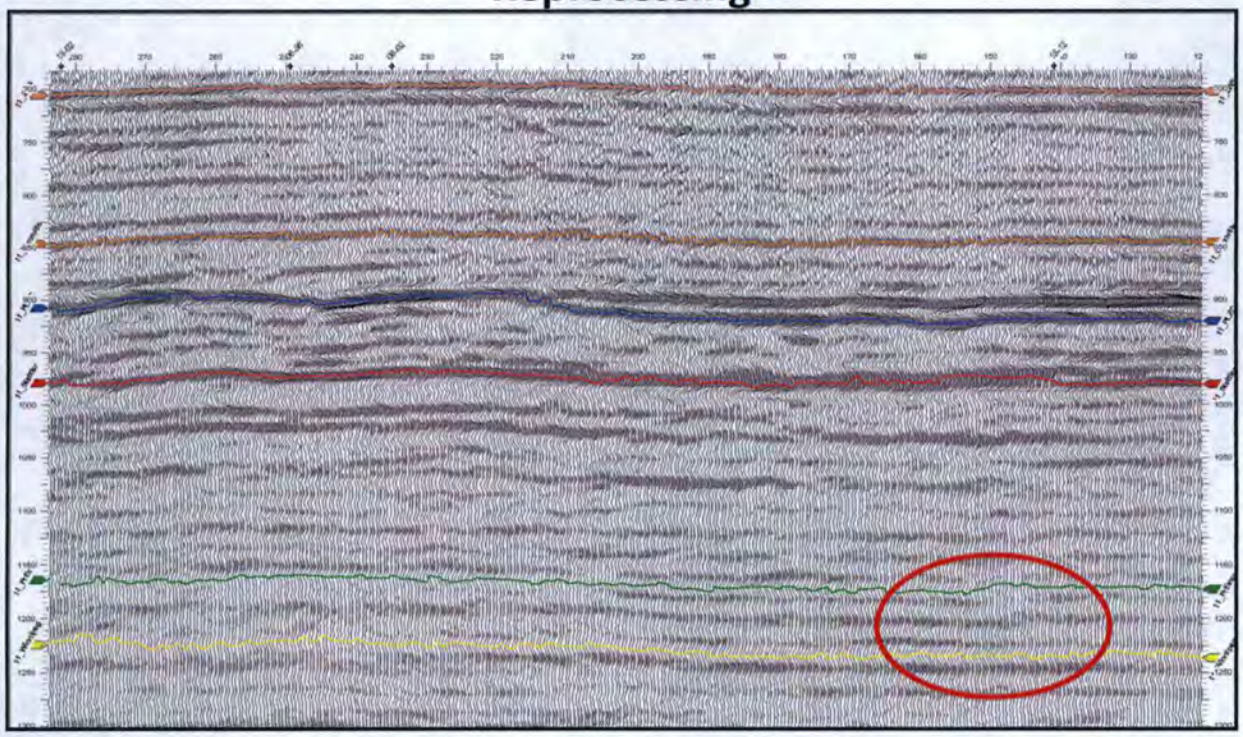


ES-1 REPROCESSING IMPROVEMENT IN A POOR DATA AREA

Original Processing

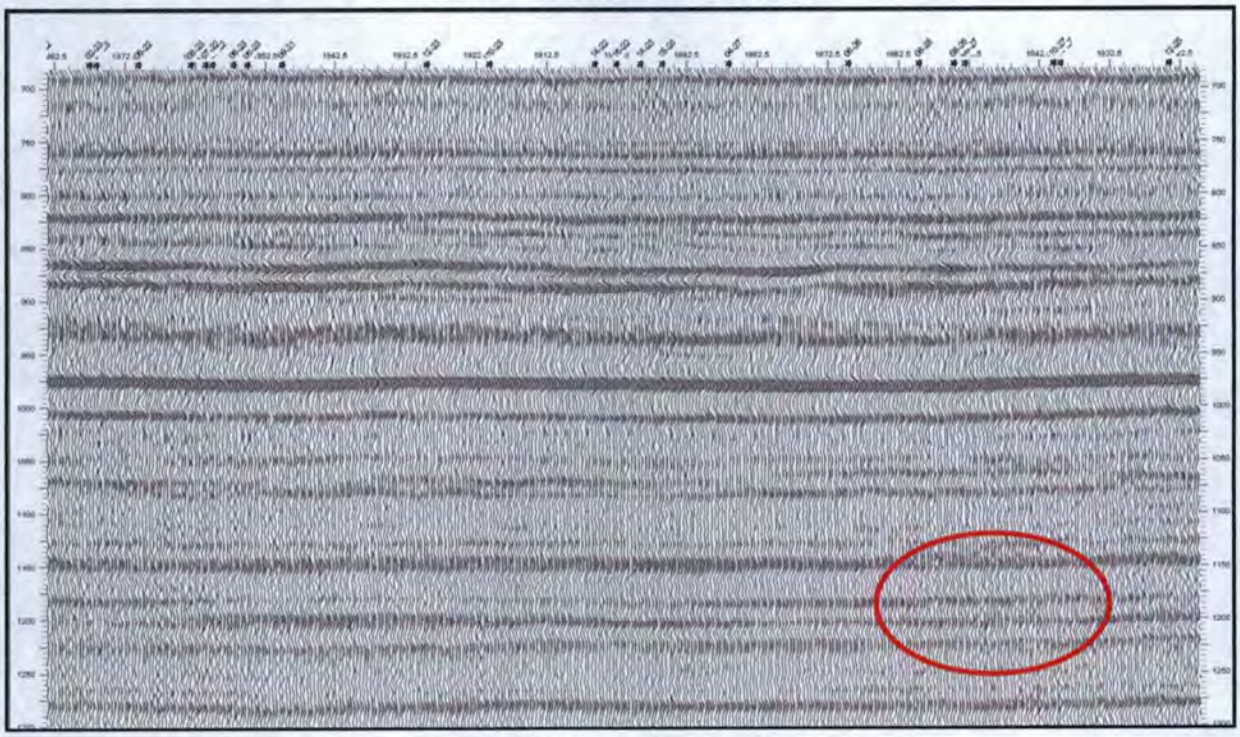


Reprocessing

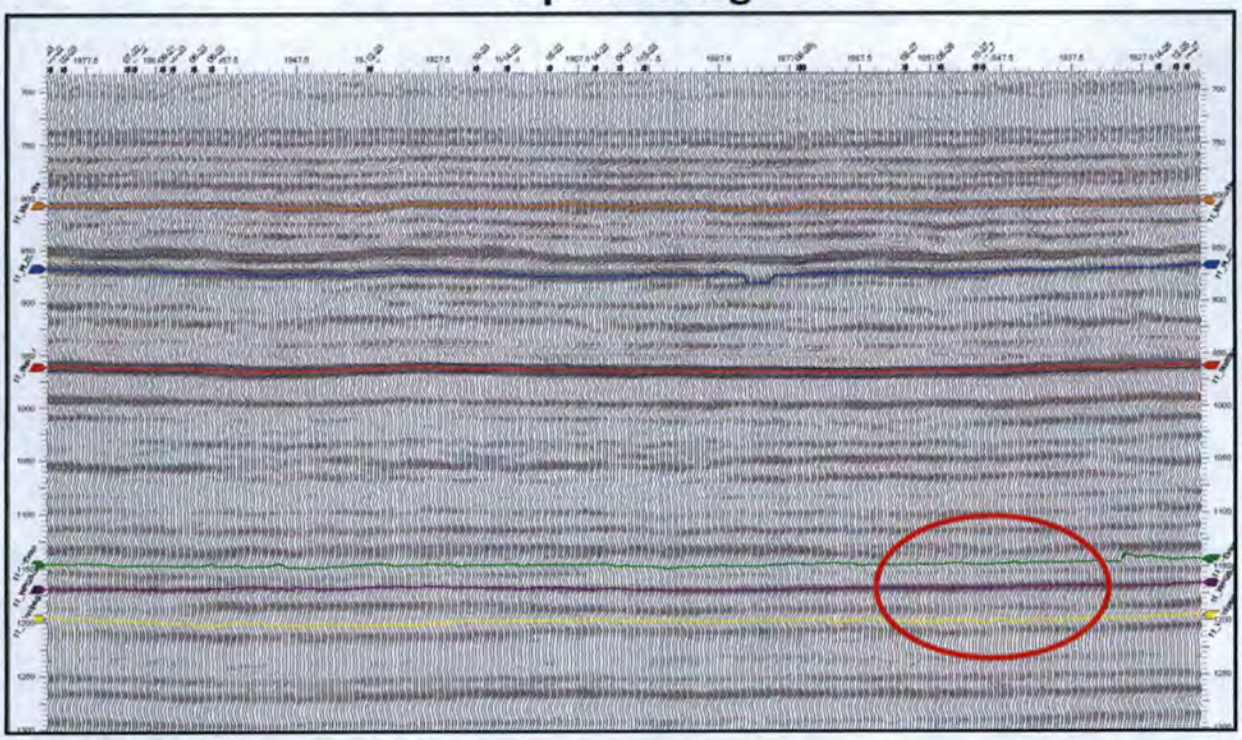


ES-34 REPROCESSING IMPROVEMENT IN A GOOD DATA AREA

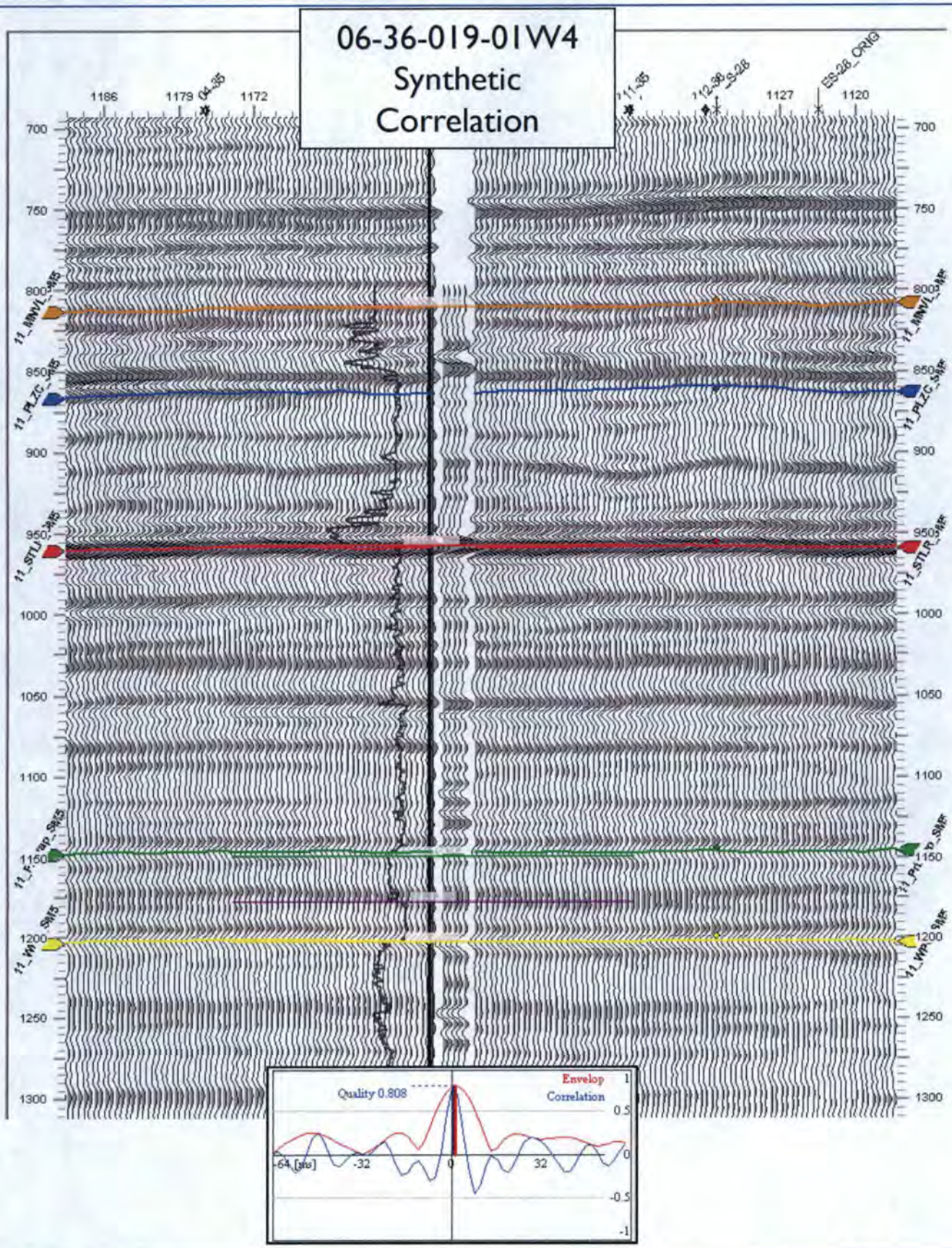
Original Processing



Reprocessing

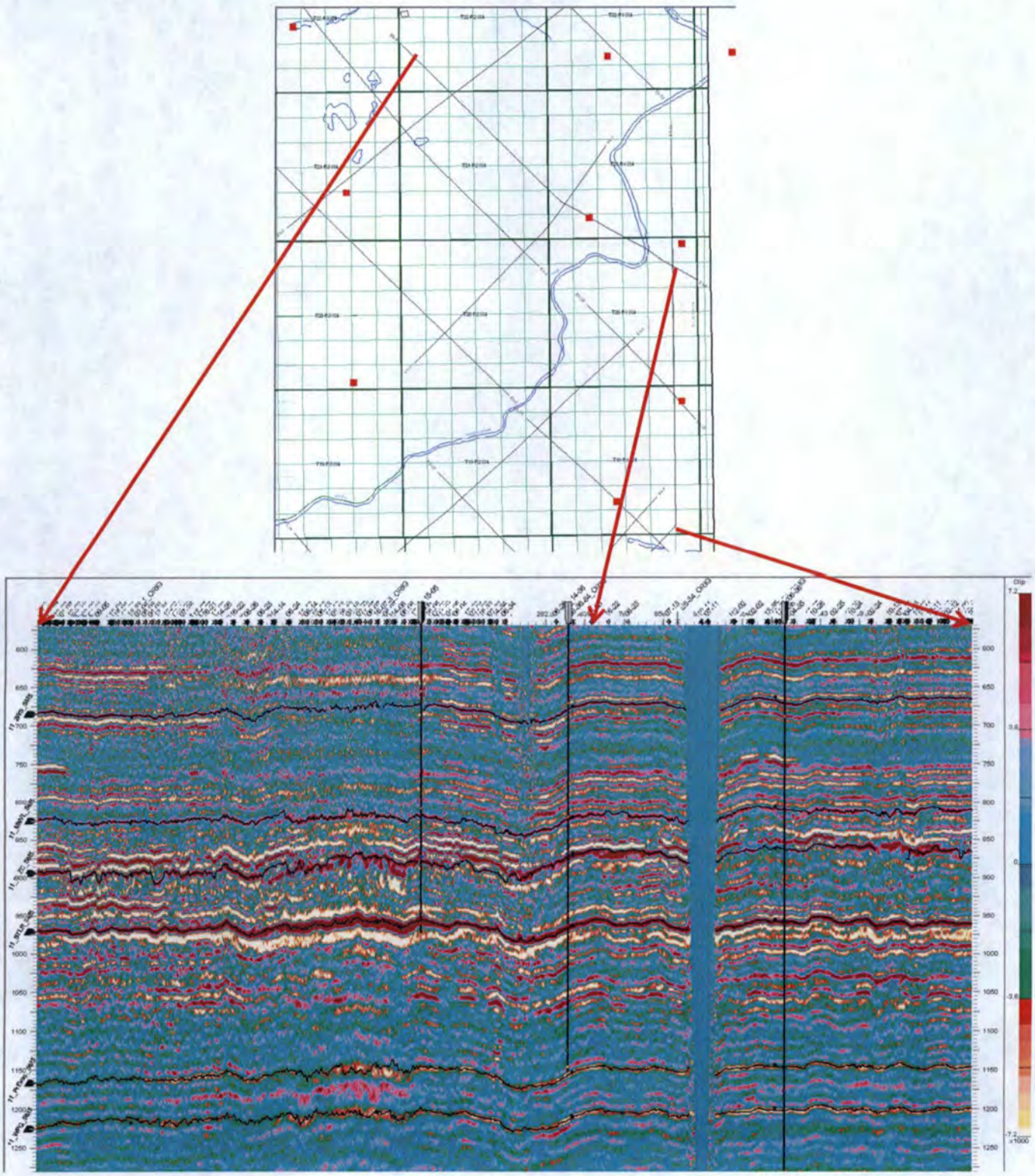


06-36-019-01W4 Synthetic Correlation

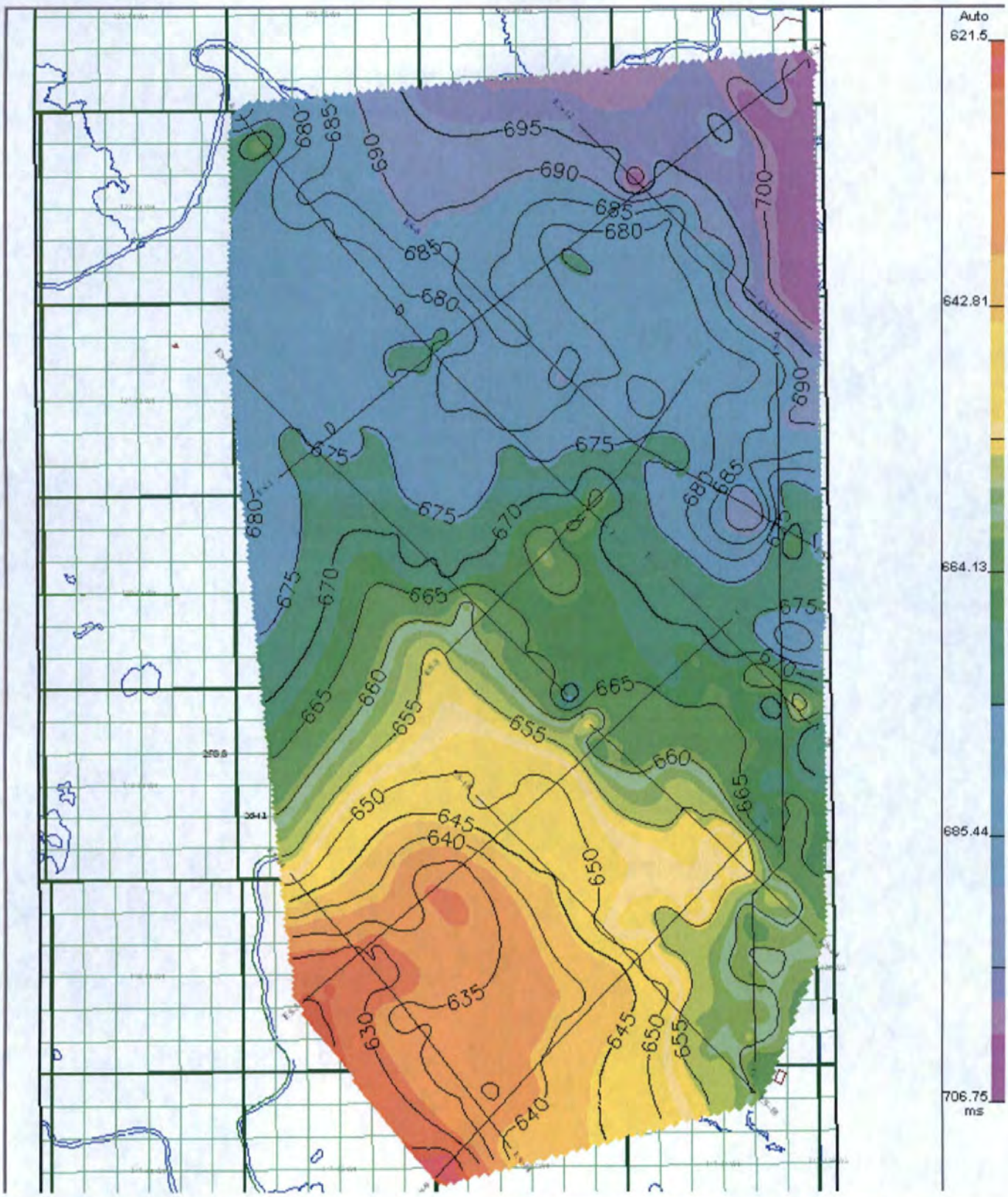


SEISMIC DATA & HORIZONS

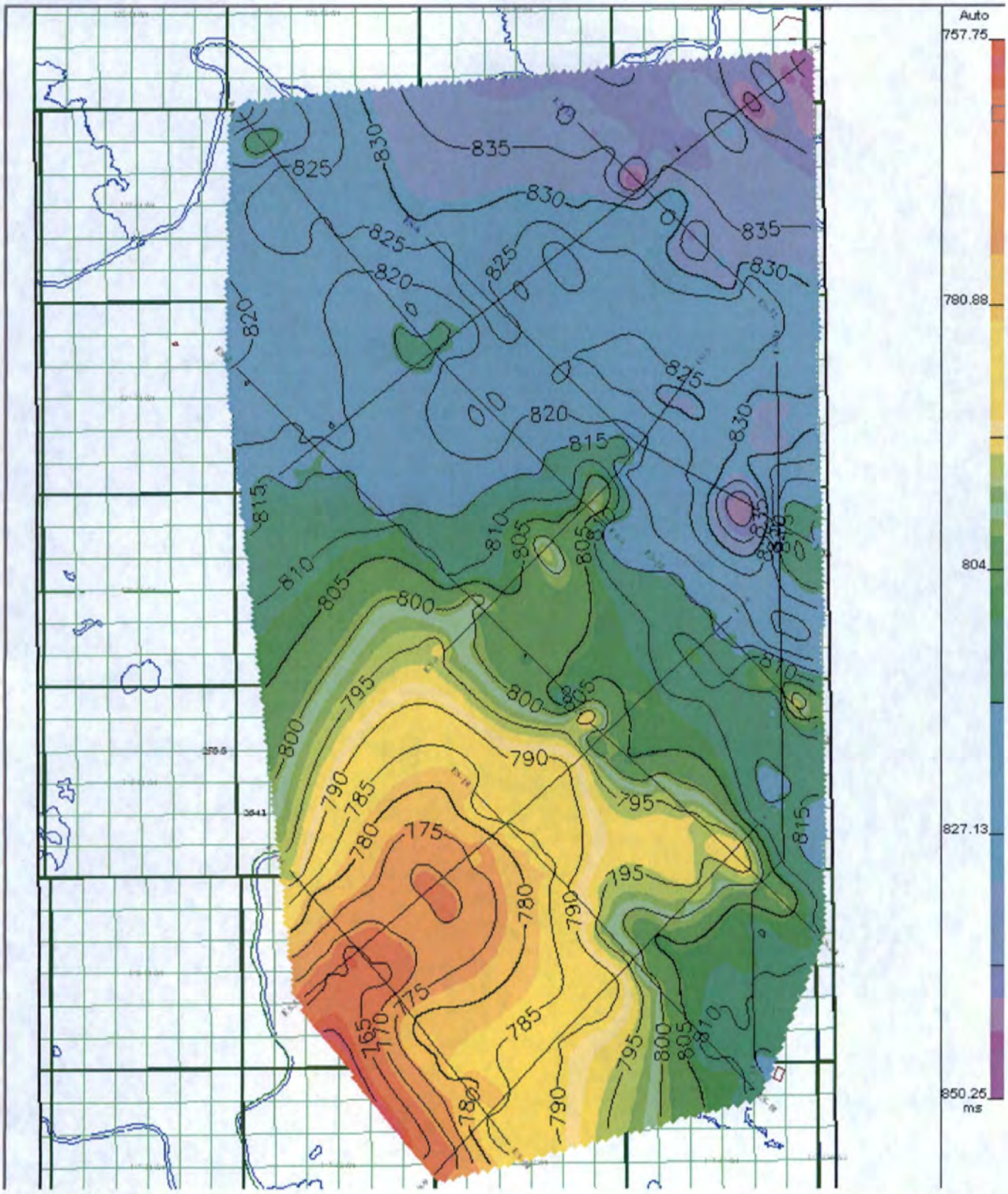
Fenceline showing poor data in the north to good data in the south.



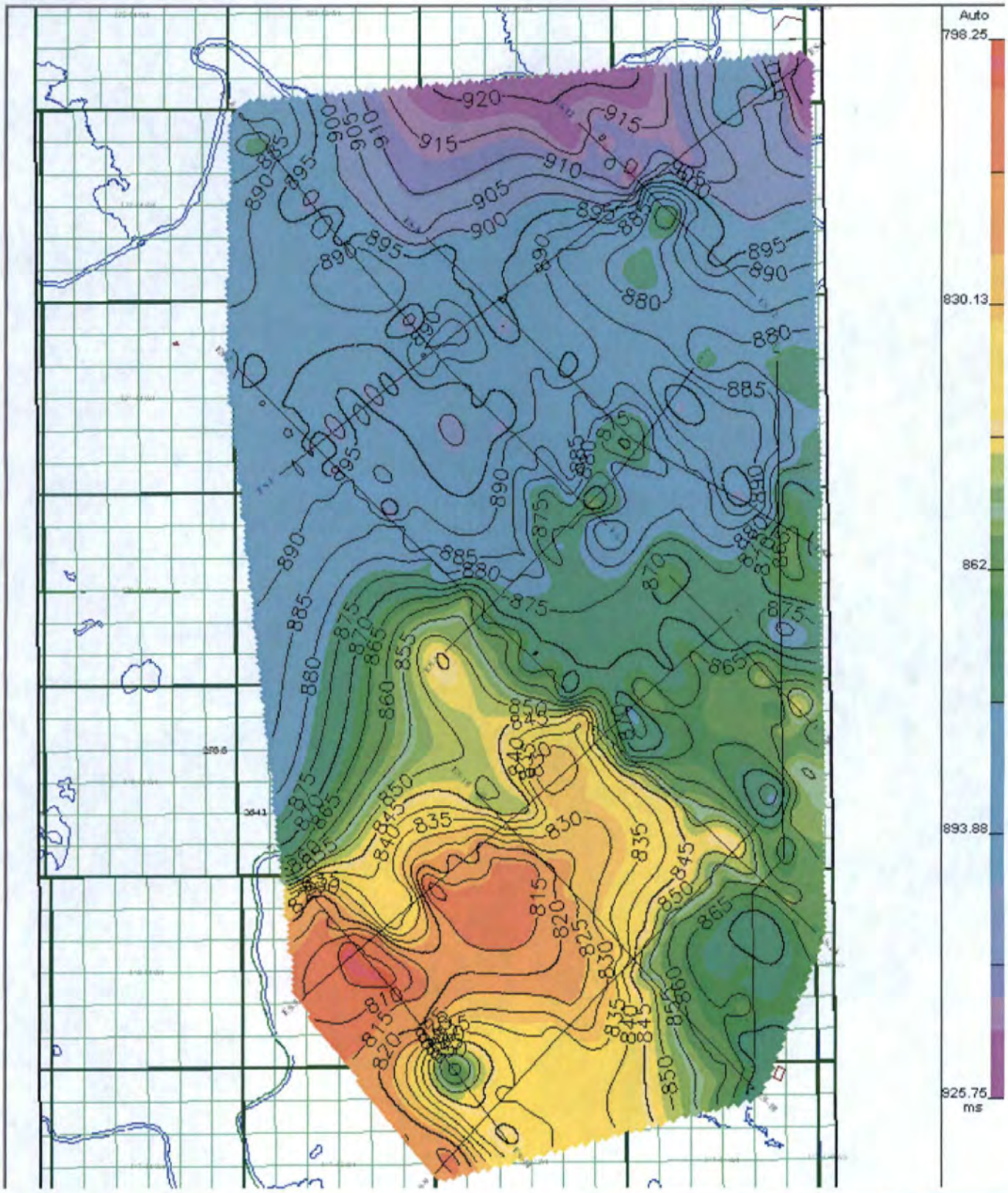
2WS Time Structure



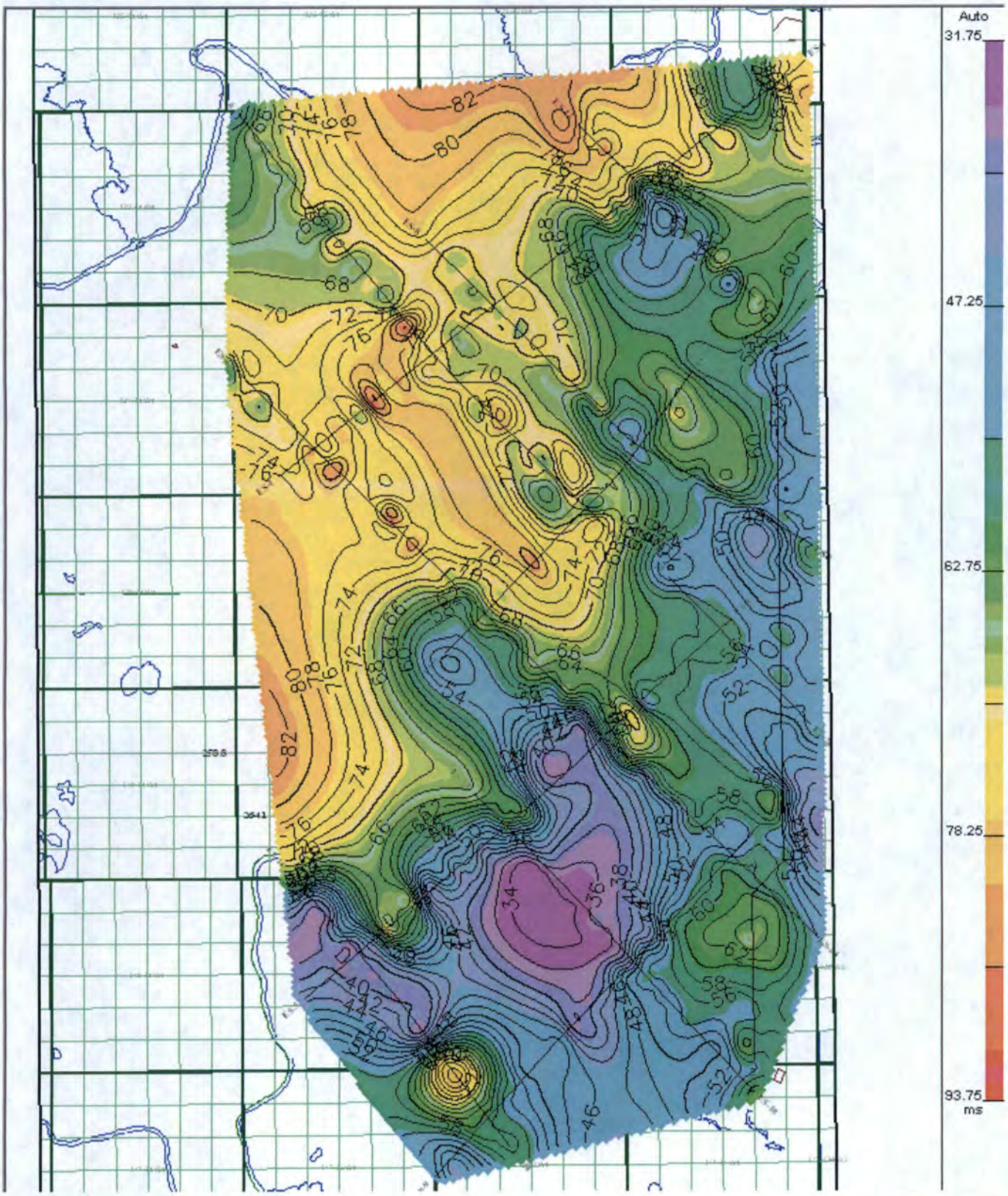
MANNVILLE TIME STRUCTURE



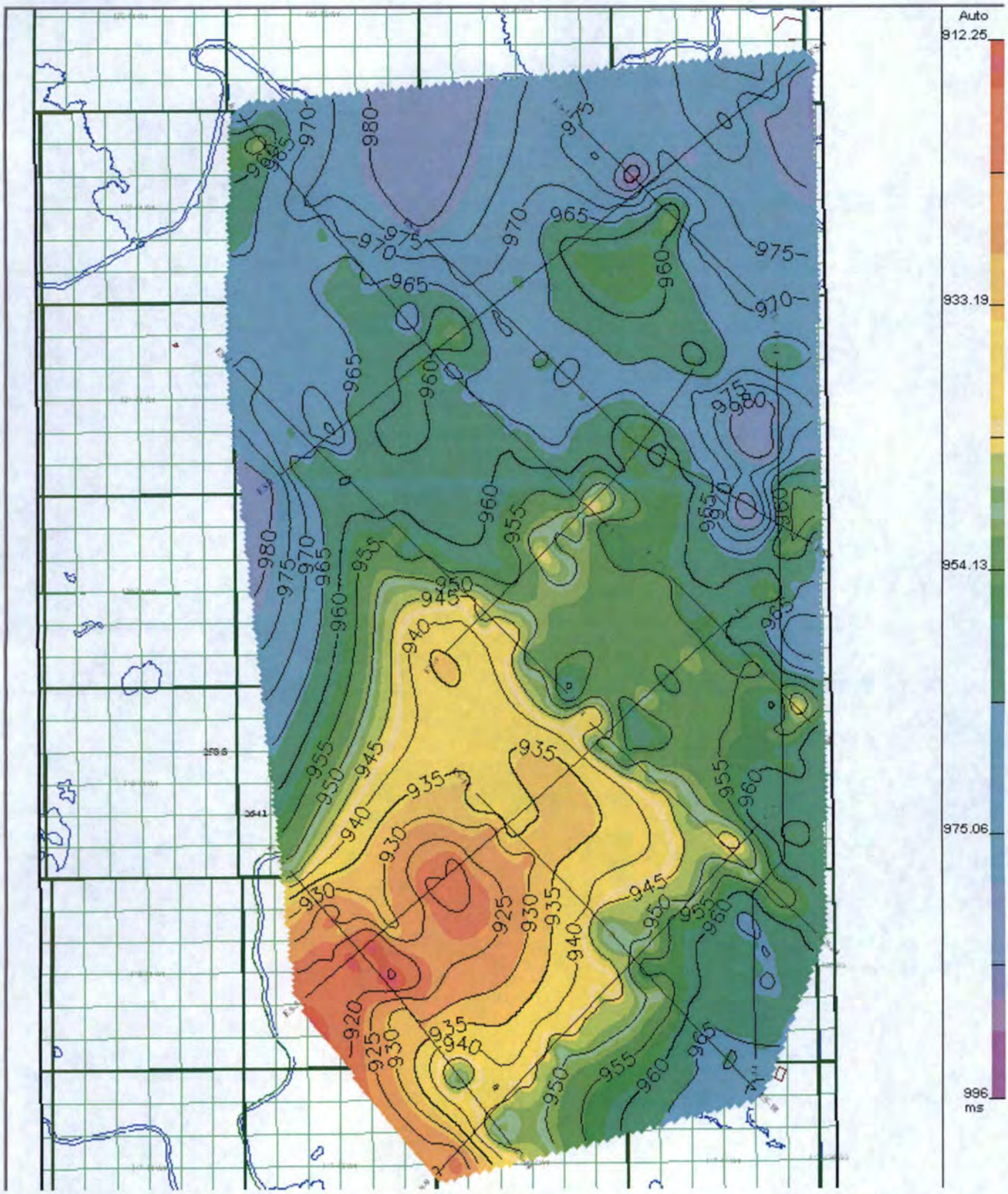
PALEOZOIC TIME STRUCTURE



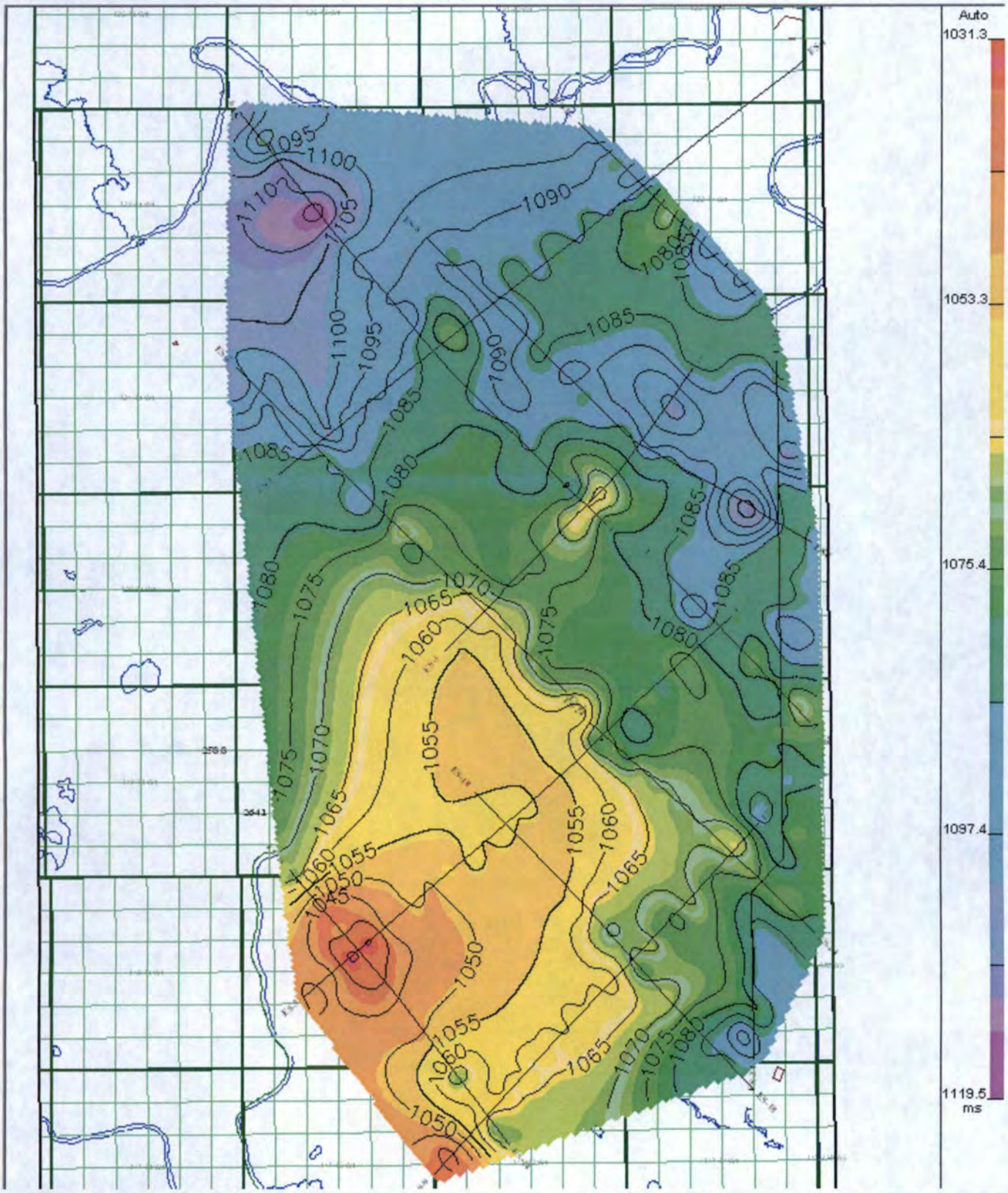
MANNVILLE – PALEOZOIC ISOCHRON



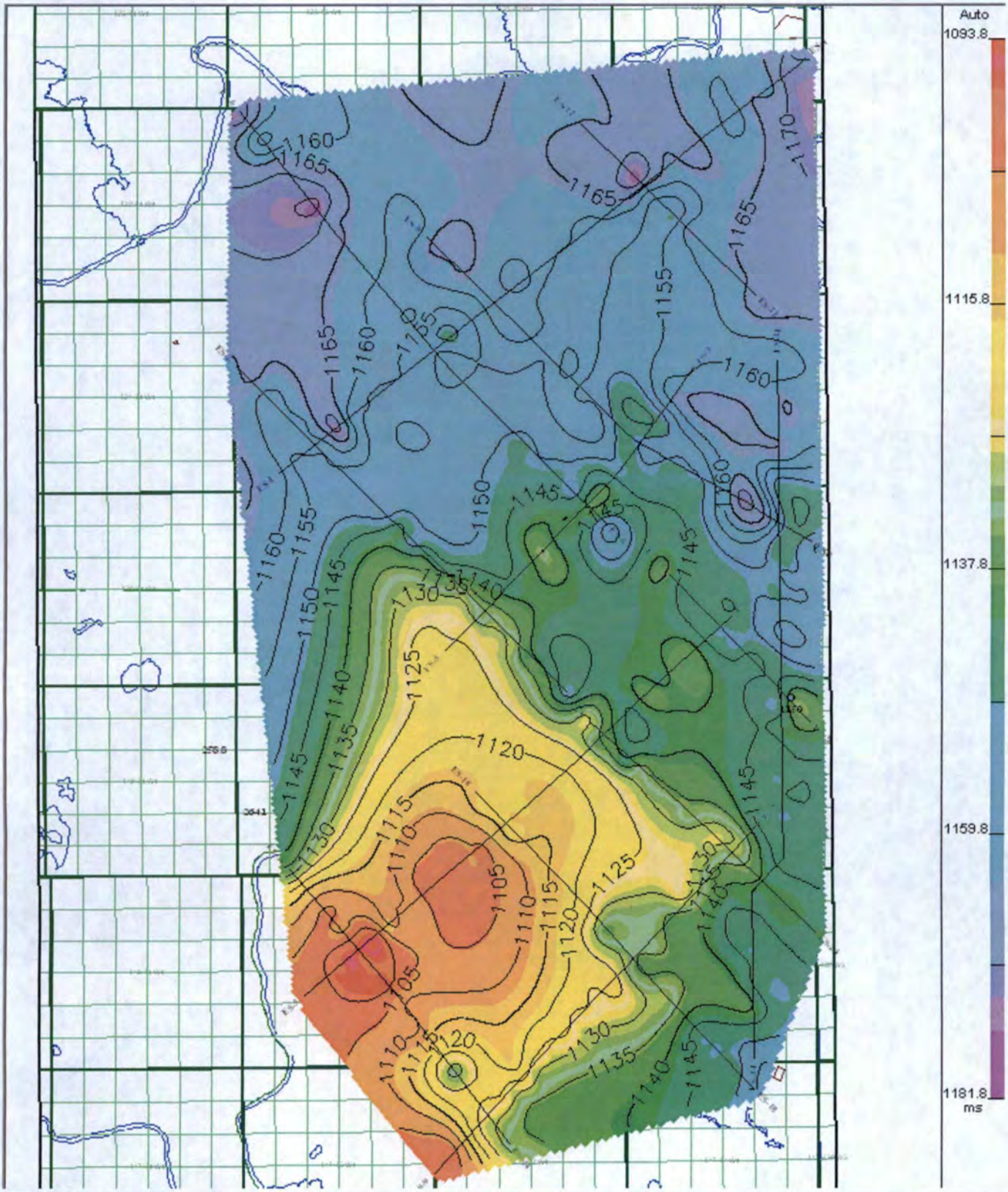
STETTLER TIME STRUCTURE



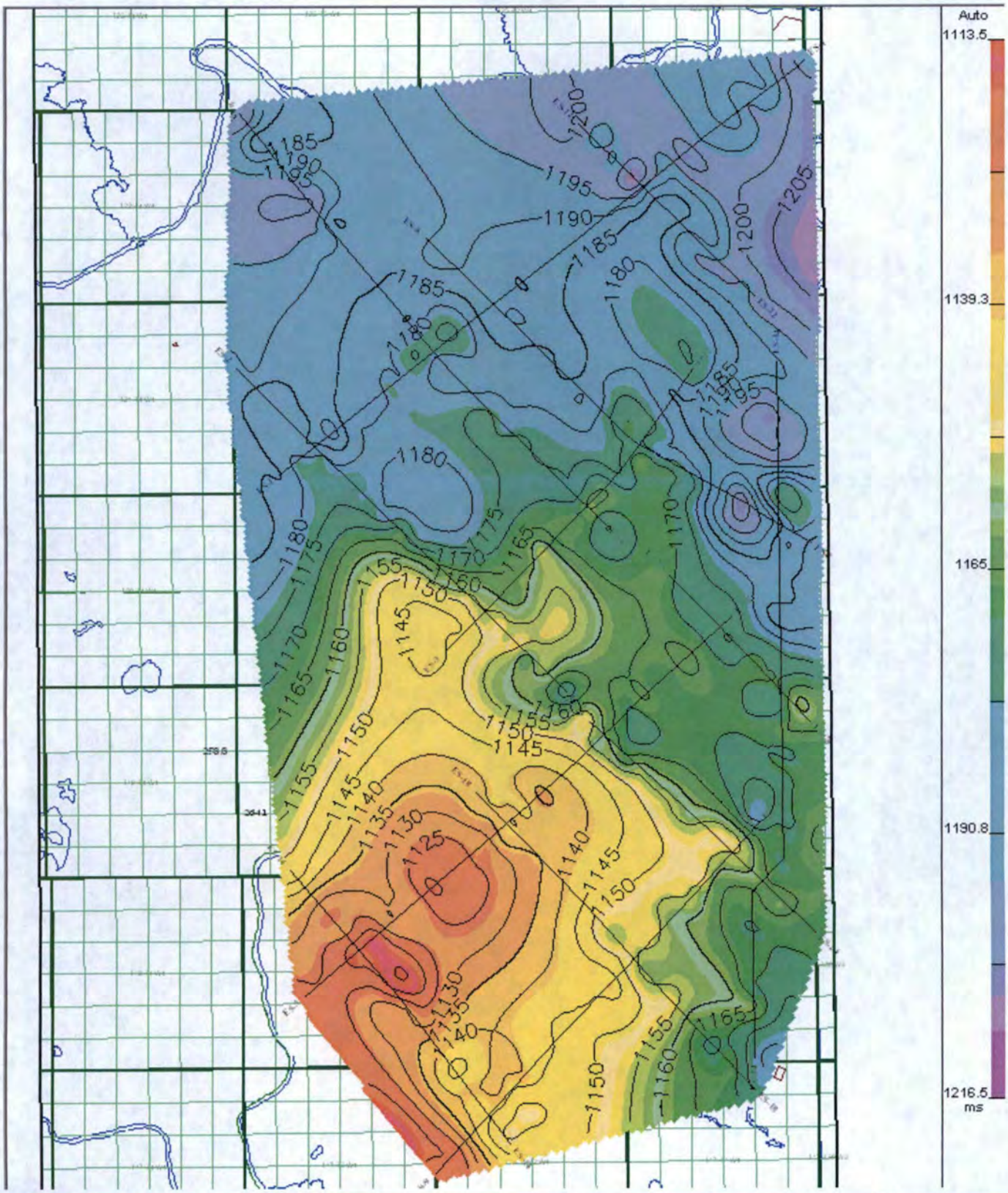
BEAVERHILL LAKE TIME STRUCTURE



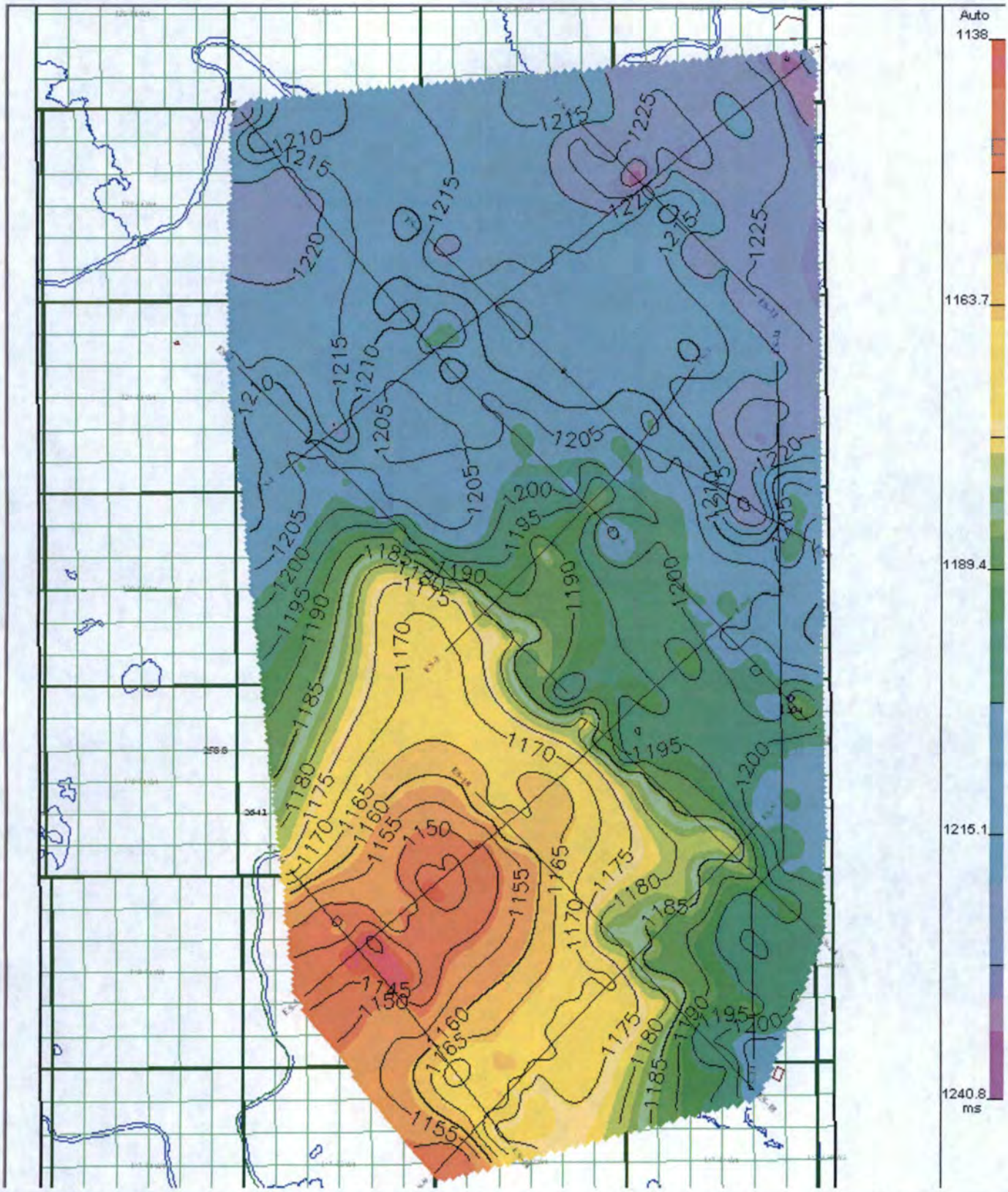
PRAIRIE EVAPORITE TIME STRUCTURE



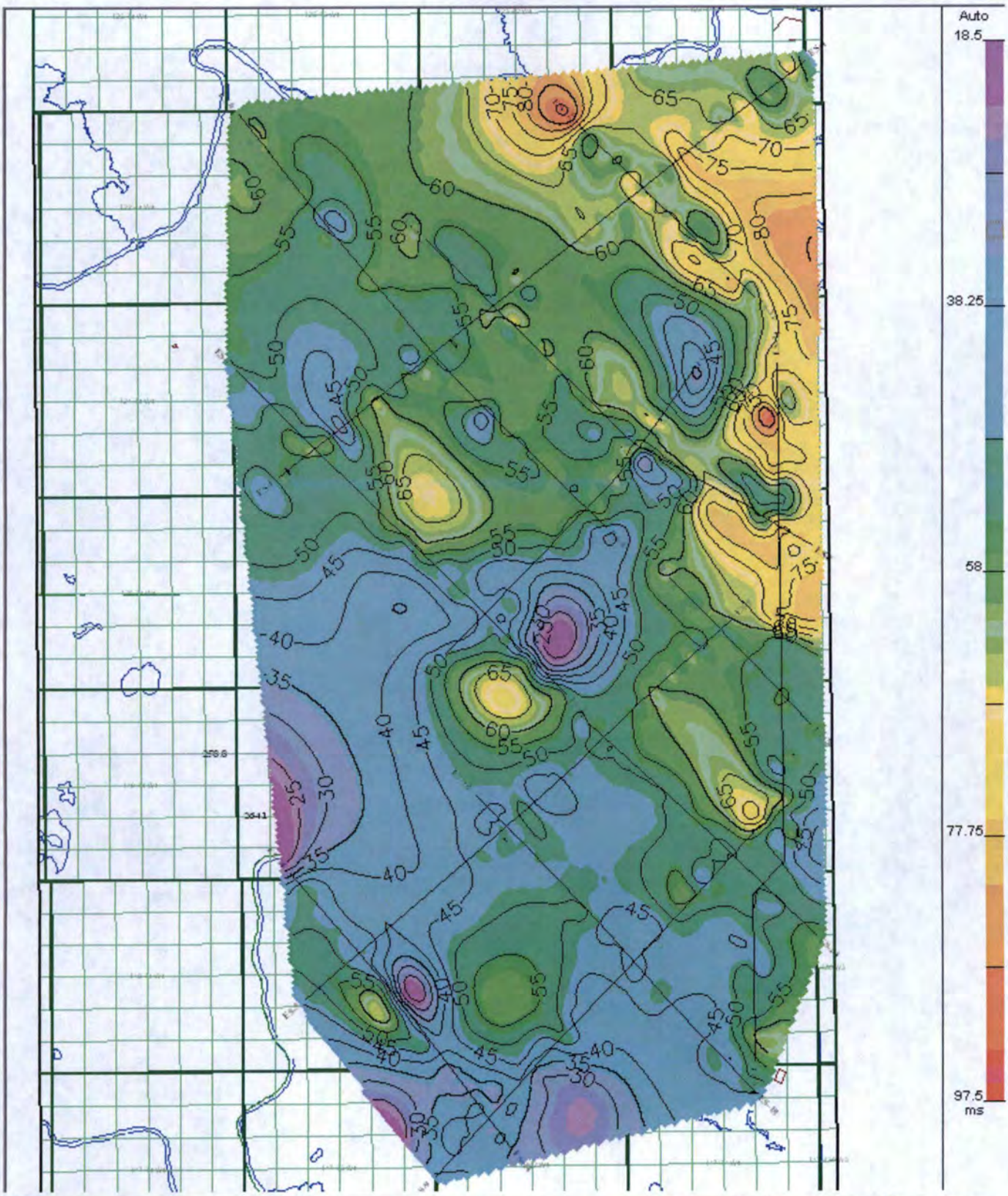
WINNIPEGOSIS TIME STRUCTURE



WINNIPEG TIME STRUCTURE



PRAIRIE EVAPORITE – WINNIPEGOSIS ISOPACH



Appendix 7

2011Drillhole GZD100 MEDHAT 8-36-19-1W4 Logs & Core Sample List

NORWEST
CORPORATION

Project: Grizzly Potash

Well Name: GZD100

UWI: 08-36-019-01W4

Geologist:	Paul Brown			
Date Described:	Jan. 10, 2012			
Ground Elevation	732.70m		Well Licence Number	439272
K.B. Elevation	736.65m		Spud Date	Dec. 10/2011
Hole Orientation	Vertical		Drilling Contractor	
Casing Depth	340.00m	From geophysical logs	Rig Number	
Core Point	1639.65m	From depth correction	Logging Contractor	Norwest
Core End	1675.20m	From depth correction		
			Geophysical Contractor	Baker Hughes
			Geophysical Logs Used:	Gamma, Neutron Density

Comments:

Disclaimer: The core description shown here reflects the data available at the time of core description. Subsequent analyses may result in minor modifications.

NORWEST
CORPORATION

Project: Pacific Potash
Well Name: GZD100
UWID: 08-36-19-01W4

Core Recovery					
Core		From	To	Length Drilled	Lost Core
Run	Box				
1	1	1639.95	1640.90	0.95	
1	2	1640.90	1641.95	1.05	
1	3	1641.95	1642.80	0.85	
1	4	1642.80	1643.80	1.00	
1	5	1643.80	1644.65	0.85	
1	6	1644.65	1645.55	0.90	
1	7	1645.55	1646.50	0.95	
1	8	1646.50	1647.55	1.05	
1	9	1647.55	1648.65	1.10	
1	10	1648.65	1649.70	1.05	
1	11	1649.70	1650.80	1.10	
1	12	1650.80	1651.85	1.05	
1	13	1651.85	1652.90	1.05	
1	14	1652.90	1653.95	1.05	
1	15	1653.95	1655.05	1.10	
1	16	1655.05	1656.20	1.15	
1	17	1656.20	1657.20	1.00	
2	1	1657.20	1658.30	1.10	
2	2	1658.30	1659.30	1.00	
2	3	1659.30	1660.25	0.95	
2	4	1660.25	1661.25	1.00	
2	5	1661.25	1662.30	1.05	
2	6	1662.30	1663.35	1.05	
2	7	1663.35	1664.55	1.20	
2	8	1664.55	1665.45	0.90	
2	9	1665.45	1666.55	1.10	
2	10	1666.55	1667.70	1.15	
2	11	1667.70	1668.75	1.05	
2	12	1668.75	1669.85	1.10	
2	13	1669.85	1670.85	1.00	
2	14	1670.85	1671.85	1.00	
2	15	1671.85	1672.95	1.10	
2	16	1672.95	1674.05	1.10	
2	17	1674.05	1675.20	1.15	
				35.25	**0**

Geologist: Paul Brown
Date: Jan. 10/2011
Recovery: 100%

NORWEST
CORPORATION

Project: Grizzly Potash

Well Name: GZD100

UWID: 08-36-019-01W4

Depth (m) From	Depth (m) To	Thickness	Sample Number	Lost Core	Fm	Mbr	Lithol	Texture	Basal Contact	Colour	Sedimentary Structures				Constituents				Fossils				Geotech Features			Est Insol	Est Halite	Est Sylvite	Est Carn	Description	Rock Strength Rating	Sum of core pieces >10cm	RQD %	RQD Rating	Spacing of Discontinuities Rating	Condition of Discontinuities Rating	RMR Rating	RMR Description
1639.95	**1641.55**	1.60		N	DWBAY	BURR	DOL	MIC	SH	10YR5/4	MA	WAV			DOL	BIT	AN	FOS	STR	SF			FRAC			100	0	0	0	DOLOSTONE, moderate yellowish brown to dark yellowish brown, micritic dolostone. Dominantly massive bedding with occasional intervals of black, bituminous wavy laminae. Occasional anhydrite lenses. Trace shell fragments and possible stromatoporoids at bottom contact.	12	125	78%	17	8	25	77	Good Rock
1641.55	**1643.80**	2.25		N	DWBAY	2RDBD	MUD	MIC	SH	N5	MA				RED	DOL	AN						JOT	FRAC		100	0	0	0	MUDSTONE, medium grey to medium bluish grey, dolomitized mudstone. Massive bedding with vertical and high angle joints and fractures throughout. Trace mm scale anhydrite inclusions. Occasional cm scale pink sparry dolomite inclusions.	4	210	93%	20	10	20	69	Good Rock
1643.80	**1644.45**	0.65		N	DWBAY	2RDBD	MUD	MIC	SH	10YR6/2	MA				RED	DOL							JOT	FRAC		100	0	0	0	MUDSTONE, pale olive to greyish olive dolomitized mudstone. Massive bedding with vertical, saddle, and high angle jointing and fractures throughout.	4	20	31%	8	8	20	55	Fair Rock
1644.45	**1644.65**	0.20		N	DWBAY	2RDBD	MUD	MIC	GR	10R4/2	MA				RED	DOL							FRAC			100	0	0	0	MUDSTONE, greyish red dolomitized mudstone. Massive bedding with angled fracture in the middle. High angle basal contact.	7	12	60%	13	8	10	53	Fair Rock
1644.65	**1645.25**	0.60		N	DWBAY	2RDBD	MUD	MIC	GR	10R4/2	MA				RED	DOL							FRAC			100	0	0	0	MUDSTONE, alternating dm scale intervals of greyish red and pale olive to greyish olive, dolomitized mudstone. Fractured throughout. Massive bedding.	7	49	82%	17	10	20	69	Good Rock
1645.25	**1647.05**	1.80		N	DWBAY	2RDBD	MUD	MIC	GR	10R4/2	MA	LAM			RED	DOL							FRAC			100	0	0	0	MUDSTONE, alternating cm scale interbeds of greyish red and pale olive, dolomitized mudstone. Dominantly massive bedding with occasional sparry dolomite laminae on fractured surfaces.	7	148	82%	17	10	20	69	Good Rock
1647.05	**1648.50**	1.45		N	DWBAY	2RDBD	MUD	MIC	SH	10YR6/2	VB	MA			RED	DOL	AN						FRAC			100	0	0	0	MUDSTONE, vague bedding associated with interbedded pale olive to greenish grey and greyish red, dolomitized mudstone. Occasional anhydrite inclusions and fractures throughout.	7	87	60%	13	10	10	55	Fair Rock
1648.50	**1648.85**	0.35	GZD100-001	N	PREVP		HAL	PHA	GR	5YR5/2	MA	VUG			HAL	SYL	HEM	CLI								TR	100	TR	0	HALITE, pale brown to greyish orange pink, subhedral, cloudy halite. Trace sylvite with hematite rims and trace clay inclusions. Occasional mm scale vugs. Average crystal size 1.0cm.								
1648.85	**1649.40**	0.55	GZD100-002	N	PREVP		HMS	PHA	GR	5R6/2	MA	VUG			HAL	SYL	HEM	CLI								TR	90	10	0	HALITE WITH MINOR SYLVITE, pale red to pale brown, subhedral, cloudy to clear halite and occasional cloudy sylvite with hematite rims. Trace clay inclusions. Massive with occasional mm scale vugs. Average crystal size 1.0cm.								
1649.40	**1649.70**	0.30	GZD100-003	N	PREVP		HMS	PHA	GR	5YR5/2	MA	VUG			HAL	SYL	HEM	CLI								TR	95	5	0	HALITE WITH MINOR SYLVITE, pale brown to greyish brown, subhedral to euhedral, cloudy to clear halite and occasional cloudy sylvite with hematite rims. Trace clay inclusions. Massive with occasional mm scale vugs. Average crystal size 1.0cm.								
1649.70	**1649.85**	0.15	GZD100-004	N	PREVP		HMS	PHA	GR	5R6/2	MA				HAL	SYL	HEM	CLI								5	75	20	0	HALITE WITH MINOR SYLVITE, pale red to moderate red, euhedral to subhedral, cloudy halite and moderate cloudy, subhedral sylvite with hematite rims. Occasional greenish grey clay inclusions. Average crystal size 1.0cm.								
1649.85	**1650.20**	0.35	GZD100-005	N	PREVP		HAL	PHA	GR	5YR7/2	MA	VUG			HAL	SYL	HEM									0	100	TR	0	HALITE, greyish orange pink to greyish pink, euhedral to subhedral, cloudy halite with trace sylvite. Massive bedding with occasional mm scale. Average crystal size 0.5cm.								
1650.20	**1650.75**	0.55	GZD100-006	N	PREVP		HAL	PHA	GR	5YR7/2	MA	VUG			HAL	SYL	HEM									0	100	TR	0	HALITE, greyish orange pink to greyish pink, euhedral to subhedral, cloudy halite with trace sylvite. Massive bedding with occasional mm scale. Average crystal size 0.5cm.								
1650.75	**1651.20**	0.45	GZD100-007	N	PREVP		HAL	PHA	GR	5R5/4	MA				HAL	SYL	HEM	CLI								TR	95	5	0	HALITE, moderate red to pale red, cloudy, subhedral halite. Occasional moderate reddish orange, cloudy, subhedral sylvite with hematite rims. Trace clay inclusions. Average crystal size 1.0cm.								
1651.20	**1651.70**	0.50	GZD100-008	N	PREVP		HWCL	PEG	SH	10R6/6	MA	VB	LAM		HAL	CLI	CLL	SYL								20	80	TR	0	HALITE WITH MINOR CLAY, moderate reddish orange to greyish orange pink, cloudy, anhedral halite with pale brown to moderate brown clay inclusions and laminae. Clay decreases downward. Vague bedding associated with clay interbeds at upper contact. Trace sylvite with hematite rims. Average crystal size 1.5cm.								
1651.70	**1652.00**	0.30	GZD100-009	N	PREVP	UPTLK	SYLN	PPH	GR	10R4/6	MA				SYL	HAL	HEM	CLI								5	45	50	0	SYLVINITE, moderate reddish brown, cloudy, subhedral sylvite with hematite rims. Occasional cm scale, euhedral, clear halite crystals and greenish grey clay inclusions. Average crystal size 0.5cm.								
1652.00	**1652.35**	0.35	GZD100-010	N	PREVP	UPTLK	SWCL	PHA	GR	10R3/4	MA				SYL	CLI	HAL	HEM								30	20	50	0	SYLVINITE WITH CLAY, dark reddish brown to moderate reddish brown, euhedral, cloudy sylvite with hematite rims. Olive grey clay inclusions throughout. Occasional subhedral halite crystals. Average crystal size 0.25cm.								
1652.35	**1652.60**	0.25	GZD100-011	N	PREVP	UPTLK	HMS	PEG	GR	5R4/2	MA				HAL	SYL	HEM	CLI								TR	90	10	0	HALITE WITH MINOR SYLVITE, greyish red to pale brown, subhedral, cloudy to clear halite and occasional cloudy sylvite crystals with hematite rims. Trace clay inclusions. Average crystal size 1.5cm.								
1652.60	**1652.90**	0.30	GZD100-012	N	PREVP	UPTLK	HMS	PEG	GR	5R4/2	MA				HAL	SYL	HEM	CLI								TR	80	20	0	HALITE WITH MINOR SYLVITE, greyish red to pale brown, euhedral, cloudy to clear halite and moderate, cloudy sylvite crystals with hematite rims. Trace clay inclusions. Average crystal size 1.25cm.								
1652.90	**1653.10**	0.20	GZD100-013	N	PREVP		HWMSCL	PHA	SH	5YR7/2	MA				HAL	SYL	HEM	CLI								15	80	5	0	HALITE WITH MINOR SYLVITE AND CLAY, greyish orange pink to pale red, subhedral, clear to cloudy halite. Occasional subhedral, cloudy sylvite with hematite rims. Moderate greenish grey to light olive grey clay inclusions. Average crystal size 0.75cm.								
1653.10	**1653.40**	0.30	GZD100-014	N	PREVP		HAL	PHA	GR	5YR7/2	MA				HAL	CLI	SYL	HEM								TR	100	TR	0	HALITE, greyish orange pink to light brown, subhedral, cloudy halite. Trace light olive grey clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1653.40	**1653.95**	0.55	GZD100-015	N	PREVP		HAL	PHA	GR	5YR7/2	MA	VB			HAL	CLI	SYL	HEM								TR	100	TR	0	HALITE, greyish orange pink to light brown, subhedral, cloudy halite. Trace light olive grey clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm. Vague bedding associated with occasional clay laminae.								
1653.95	**1654.50**	0.55	GZD100-016	N	PREVP		HAL	PHA	SH	5YR7/2	MA	LAM			HAL	CLI	SYL	HEM								TR	95	5	0	HALITE, greyish orange pink to light brown, subhedral, cloudy halite. Trace light olive grey clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm. Greyish orange to light brown clay interbed at bottom.								
1654.50	**1655.00**	0.50	GZD100-017	N	PREVP		HWCL	PHA	SH	5YR5/2	VB	MA			HAL	CLL	CLI	SYL								40	60	TR	0	HALITE WITH CLAY, pale brown to greyish brown, subhedral clear to cloudy halite with clay inclusions throughout. Vague bedding associated with light brown clay laminae. Trace sylvite with hematite rims. Average crystal size 0.25cm.								
1655.00	**1655.55**	0.55	GZD100-018	N	PREVP		HAL	PHA	GR	5YR7/2	MA	LAM			HAL	CLI	SYL	HEM								TR	100	TR	0	HALITE, greyish orange pink to light brown, subhedral, cloudy halite. Trace light olive grey clay inclusions and sylvite with hematite rims. Clay and sylvite decrease downward. Average crystal size 0.5cm.								
1655.55	**1656.20**	0.65	GZD100-019	N	PREVP		HAL	PEG	GR	10YR7/4	MA				HAL	CLI	SYL	HEM								TR	100	TR	0	HALITE, greyish orange to greyish orange pink, anhedral to subhedral, cloudy halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 1.25cm.								
1656.20	**1656.65**	0.45	GZD100-020	N	PREVP		HAL	PEG	SH	10YR7/4	MA				HAL	CLI	SYL	HEM								TR	95	5	0	HALITE, greyish orange to greyish orange pink, anhedral to subhedral, cloudy halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 1.25cm.								
1656.65	**1657.20**	0.55	GZD100-021	N	PREVP		HWCL	PHA	GR	5YR5/2	VB	MA			HAL	CLI	CLL	SYL								50	50	TR	0	HALITE WITH CLAY, pale brown, subhedral, cloudy halite with greyish brown to light brown clay inclusions and laminae throughout. Vague bedding associated with clay laminae. Trace sylvite with hematite rims. Average crystal size 0.25cm.								
1657.20	**1657.75**	0.55	GZD100-022	N	PREVP		HWCL	PHA	GR	5YR5/2	VB	MA			HAL	CLI	CLL	SYL								40	60	TR	0	HALITE WITH CLAY, pale brown, subhedral, cloudy halite with greyish brown to light brown clay inclusions and laminae throughout. Vague bedding associated with clay laminae. Trace sylvite with hematite rims. Average crystal size 0.25cm.								
1657.75	**1658.30**	0.55	GZD100-023	N	PREVP		HWCL	PHA	GR	5YR5/2	VB	MA			HAL	CLI	CLL	SYL								20	80	TR	0	HALITE WITH CLAY, pale brown, subhedral, cloudy halite with greyish brown to light brown clay inclusions and laminae throughout. Vague bedding associated with clay laminae. Trace sylvite with hematite rims. Average crystal size 0.25cm.								
1658.30	**1658.75**	0.45	GZD100-024	N	PREVP		HWCL	PHA	GR	5YR5/2	VB	MA			HAL	CLI	CLL	SYL								30	70	TR	0	HALITE WITH CLAY, pale brown, subhedral, cloudy halite with greyish brown to light brown clay inclusions and laminae throughout. Vague bedding associated with clay laminae. Trace sylvite with hematite rims. Average crystal size 0.5cm.								
1658.75	**1659.30**	0.55	GZD100-025	N	PREVP		HWCL	PHA	GR	5YR5/2	VB	MA			HAL	CLI	CLL	SYL								30	70	TR	0	HALITE WITH CLAY, pale brown, subhedral, cloudy halite with greyish brown to light brown clay inclusions and laminae throughout. Vague bedding associated with clay laminae. Trace sylvite with hematite rims. Average crystal size 0.5cm.								
1659.30	**1659.75**	0.45	GZD100-026	N	PREVP		HWCL	PHA	GR	5YR5/2	VB	MA			HAL	CLI	CLL	SYL								20	80	TR	0	HALITE WITH CLAY, pale brown, subhedral, cloudy halite with greyish brown to light brown clay inclusions and laminae throughout. Vague bedding associated with clay laminae. Trace sylvite with hematite rims. Average crystal size 0.5cm.								
1659.75	**1660.25**	0.50	GZD100-027	N	PREVP		HAL	PHA	GR	5YR6/4	MA				HAL	SYL	HEM	CLI								TR	100	TR	0	HALITE, light brown to pale brown, anhedral, cloudy halite. Occasional moderate reddish brown sylvite with hematite rims. Trace clay inclusions. Massive bedding. Average crystal size 0.25cm.								
1660.25	**1660.75**	0.50	GZD100-028	N	PREVP		HAL	PHA	GR	10YR6/2	MA				HAL	SYL	HEM	CLI								TR	>95	<5	0	HALITE, pale yellowish brown to pale brown, anhedral, cloudy to clear halite. Occasional sylvite with hematite rims. Trace clay inclusions. Average crystal size 0.5cm.								
1660.75	**1661.25**	0.50	GZD100-029	N	PREVP		HAL	PHA	GR	10YR6/2	MA				HAL	SYL	HEM	CLI								TR	>95	<5	0	HALITE, pale yellowish brown to pale brown, anhedral, cloudy to clear halite. Occasional sylvite with hematite rims. Trace clay inclusions. Average crystal size 0.5cm.								
1661.25	**1661.70**	0.45	GZD100-030	N	PREVP		HMS	PHA	GR	5YR5/2	MA	LAM			HAL	SYL	HEM	CLL								TR	95	5	0	HALITE WITH MINOR SYLVITE, pale brown to light brown, cloudy, subhedral halite. Minor sylvite with hematite rims and trace medium dark grey clay laminae. Average crystal size 0.5cm.								
1661.70	**1662.30**	0.60	GZD100-031	N	PREVP		HMS	PEG	SH	10R7/4	MA	LAM			HAL	SYL	HEM	CLL								TR	90	10	0	HALITE WITH MINOR SYLVITE, moderate orange pink to greyish orange pink, anhedral to subhedral, cloudy halite. Occasional moderate reddish orange, cloudy sylvite with hematite rims. Several medium dark grey clay laminae. Average crystal size 1.5cm.								
1662.30	**1662.75**	0.45	GZD100-032	N	PREVP		HAL	PEG	GR	10YR8/2	MA		VUG		HAL	HEM										0	100	0	0	HALITE, very pale orange to very light grey, anhedral to subhedral, cloudy to clear halite. Trace hematite. Occasional mm scale vugs. Average crystal size 1.5cm.								
1662.75	**1663.35**	0.60	GZD100-033	N	PREVP		HAL	PEG	GR	10YR8/2	MA	WAV	VUG		HAL	AN										5	95	0	0	HALITE, very pale orange to very light grey, anhedral to subhedral, cloudy to clear halite with occasional very light grey, wavy, anhydrite interbeds. Occasional mm scale vugs. Average crystal size 1.25cm.								
1663.35	**1663.95**	0.60	GZD100-034	N	PREVP		HAL	PEG	GR	10YR8/2	MA	WAV	VUG		HAL	AN										5	95	0	0	HALITE, very pale orange to very light grey, anhedral to subhedral, cloudy to clear halite with occasional very light grey, wavy, anhydrite interbeds. Occasional mm scale vugs. Average crystal size 1.25cm.								
1663.95	**1664.55**	0.60	GZD100-035	N	PREVP		HAL	PHA	GR	10YR8/2	MA	WAV	VUG		HAL	AN										10	95	0	0	HALITE, very pale orange to very light grey, anhedral to subhedral, cloudy to clear halite with occasional very light grey, wavy, anhydrite interbeds. Occasional mm scale vugs. Average crystal size 1.0cm.								
1664.55	**1665.00**	0.45	GZD100-036	N	PREVP		HAL	PHA	GR	10YR8/2	MA		VUG		HAL											0	100	0	0	HALITE, very pale orange to very light grey, anhedral to subhedral, cloudy to clear halite with occasional very light grey, wavy, anhydrite interbeds. Occasional mm scale vugs. Average crystal size 1.0cm.								
1665.00	**1665.45**	0.45	GZD100-037	N	PREVP		HAL	PHA	GR	10YR8/2	MA	WAV	VUG		HAL	AN										10	90	0	0	HALITE, very pale orange to very light grey, anhedral to subhedral, cloudy to clear halite with occasional very light grey, wavy, anhydrite interbeds. Occasional mm scale vugs. Average crystal size 1.0cm.								
1665.45	**1666.00**	0.55	GZD100-038	N	PREVP		HAL	PHA	GR	10YR8/2	MA				HAL	AN										TR	100	0	0	HALITE, very pale orange to light olive grey, subhedral, cloudy halite with trace anhydrite laminae. Average crystal size 1.0cm.								
1666.00	**1666.55**	0.55	GZD100-039	N	PREVP		HAL	PHA	GR	10YR8/2	WAV	MA			HAL	AN	HEM									10	90	0	0	HALITE, very pale orange to very light grey, subhedral, cloudy halite with occasional very light grey wavy anhydrite interbeds. Trace hematite. Average crystal size 0.5cm.								
1666.55	**1667.10**	0.55	GZD100-040	N	PREVP		HAL	PHA	GR	10YR8/2	WAV	MA			HAL	AN	HEM									20	80	0	0	HALITE, very pale orange to very light grey, subhedral, cloudy halite with very light grey wavy anhydrite interbeds throughout. Trace hematite. Average crystal size 0.5cm.								
1667.10	**1667.70**	0.60	GZD100-041	N	PREVP		HAL	PHA	GR	10YR8/2	WAV	MA	LAM		HAL	AN	HEM									25	75	0	0	HALITE, very pale orange to very light grey, subhedral, cloudy halite with very light grey wavy anhydrite interbeds and laminae throughout. Occasional hematite. Average crystal size 0.5cm.								
1667.70	**1668.30**	0.60	GZD100-042	N	PREVP		HAL	PHA	SH	10YR8/2	WAV	MA			HAL	AN	HEM									10	90	0	0	HALITE, very pale orange to very light grey, subhedral, cloudy halite with occasional very light grey wavy anhydrite interbeds. Anhydrite decreases downward. Occasional hematite. Average crystal size 0.25cm.								
1668.30	**1669.00**	0.70	GZD100-043	N	PREVP		ANHY	APH	SH	N7	PB	WAV			AN	HAL	HEM									90	10	0	0	ANHYDRITE, very light grey to light grey, anhydrite with occasional very pale orange halite interbeds. Dominantly parallel bedding with occasional wavy beds.								
1669.00	**1669.60**	0.60	GZD100-044	N	PREVP		HAL	PHA	GR	10YR6/2	MA				HAL	CLI	AN									TR	100	0	0	HALITE, pale yellowish brown to light brownish grey, subhedral, cloudy halite. Trace clay inclusions and possible anhydrite inclusions. Average crystal size 0.25cm.								
1669.60	**1670.00**	0.40	GZD100-045	N	PREVP		HMS	PHA	SH	10YR6/2	MA				HAL	SYL	HEM	CLI								TR	80	20	0	HALITE WITH MINOR SYLVITE, pale yellowish brown to pale red, subhedral to euhedral, cloudy to clear halite. Minor, cloudy sylvite with hematite rims. Sylvite increases downward. Average crystal size 1.0cm. Trace clay inclusions.								
1670.00	**1670.30**	0.30	GZD100-046	N	PREVP		HSCL	VFCL	GR	10YR7/4	VB	MA			CLL	CLI	HAL	SYL								80	20	TR	0	CLAY WITH MINOR HALITE, light brown to very pale orange clay with pale brown, cloudy, halite throughout. Trace sylvite with hematite rims. Dominantly vague bedding with occasional massive intervals. Clay decreases downward.								
1670.30	**1670.85**	0.55	GZD100-047	N	PREVP		HMS	PHA	GR	5R6/2	MA				HAL	SYL	HEM	CLI								TR	85	15	0	HALITE WITH MINOR SYLVITE, pale red to pale brown, subhedral to euhedral, cloudy halite with moderate, euhedral, cloudy sylvite. Hematite rims associated with sylvite and trace clay inclusions. Average crystal size 0.75cm.								
1670.85	**1671.30**	0.45	GZD100-048	N	PREVP		HWCL	PHA	GR	5YR5/2	MA	VB			HAL	CLL	CLI	SYL								10	90	TR	0	HALITE WITH MINOR CLAY, pale brown, subhedral, cloudy halite with occasional light brown clay laminae and inclusions throughout. Vague bedding associated with clay laminae. Average crystal size 0.25cm.								
1671.30	**1671.85**	0.55	GZD100-049	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	>85	<5	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1671.85	**1672.35**	0.50	GZD100-050	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	90	TR	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1672.35	**1672.95**	0.60	GZD100-051	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	90	TR	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1672.95	**1673.55**	0.60	GZD100-052	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	90	TR	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1673.55	**1674.05**	0.50	GZD100-053	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	90	TR	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1674.05	**1674.65**	0.60	GZD100-054	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	90	TR	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 0.5cm.								
1674.65	**1675.20**	0.55	GZD100-055	N	PREVP		HAL	PHA	GR	5YR5/2	MA				HAL	CLI	SYL	HEM								10	90	TR	0	HALITE, pale brown to greyish orange, subhedral to euhedral, cloudy/dirty halite. Occasional clay inclusions and sylvite with hematite rims. Average crystal size 1.0cm.								

NORWEST
CORPORATION

TERMINOLOGY AND ABBREVIATIONS FOR POTASH CORE LOGGING:

Formation:

Fm	
SOURIV	Souris River
DWBAY	Dawson Bay
PREVP	Prairie Evaporite

Member:

Mbr	
DAVID	Davidson
1RDBD	First Red Beds
2RDBD	Second Red Beds
HUBD	Hubbard
NEELY	Neely
BURR	Burr
UPTLK	Upper Patience Lake
LPTLK	Lower Patience Lake
BLPL	Belle Plaine
ESTR	Esterhazy
WBR	White Bear

Lithology:

Lithol	
ANHY	Anhydrite
CMUD	Calcareous mudstone
CARN	Carnallatite - carnallite mixed with sylvite & halite
CWCL	Carnallatite With Clay - carnallitite with minor clay inclusions scattered throughout
CSCL	Carnallatitic Salt Clay - mostly clay, but mixed with carnallatite
CLAY	Clay
DOL	Dolostone
GYPS	Gypsum
HAL	Halite
HWCL	Halite With Clay - halite with minor clay inclusions scattered throughout
HSCL	Halitic Salt Clay - mostly clay, but mixed with halite xtals
HMS	Halite With Minor Sylvite
HMC	Halite With Minor Carnallite
LS	Limestone
MUD	Mudstone
SAND	Sand
SHAL	Shale
SILT	Silt
SYLN	Sylvinite - sylvite mixed with halite
SWCL	Sylvinite With Clay - sylvinite with minor clay inclusions scattered throughout
SSCL	Sylvinitic Salt Clay - mostly clay, but mixed with sylvinite
HWMSCL	Halite With Minor Sylvite and Clay
SWCR	Sylvinite with Carnallite

Textures:

Textur	
PEG	Pegmatitic - very coarse grained, xtals mostly >1cm
PHA	Phaneritic - more or less equigranular, xtals mostly >0.5mm
APH	Aphanitic - more or less equigranular, xtals mosty <0.5mm
PPH	Porphyritic - scattered large xtals in finer grained groundmass
CRYP	Cryptocrystalline
MIC	Micrite - very fine lime mud
SPAR	Sparry - coarser calcite
VFCL	Very Fine Clastic - for red beds, mudstones, etc.
FRAG	Fragmental - brecciated by dissolution & recrystallization
VUG	Vuggy - vesicular, contains significant macroscopic pores, vugs or cavities
PPH	Porphyritic - scattered large xtals in finer grained groundmass
FCL	Fine Clastic - for siltstones
MCL	Medium Clastic - for sandstones
CCL	Coarse Clastic - for conglomerates

Basal Contact:

Basal	
SH	Sharp
GR	Gradational
ER	Erosional
SC	Scoured
BIO	Bioturbated
DIS	Disturbed (other than bioturbated)
UN	Uncertain

Sedimentary Structures:

Sedimentary	
BB	Bifurcated Bedding
BIO	Bioturbated
CB	Core broken or crushed
CV	Convoluted - soft-sediment deformation
DBD	Disturbed by drilling
XBL	Cross-Bedding - large scale
XBS	Cross-Bedding - small scale
XBT	Cross-Bedding - truncated
FL	Flame Structure
FB	Flaser Bedding
GR	Graded Bedding
HO	Homogeneous
IND	Indurated or Cemented
MA	Massive
PB	Parallel Bedding
RPL	Ripples, all types
SC	Scour & Fill
VB	Vague Bedding
VUG	Vug
WAV	Wavy Bedding
LAM	Laminations
SWS	Shattered while slabbing

Constituents:

Constituents	
AN	Anhydrite
BIT	Bitumen
BA	Barite
BE	Bentonite
BR	Breccia
BU	Burrow
CAL	Calcite
CAR	Carnallite
CD	Carbonaceous Debris
CG	Coated Grain
CH	Chert
CLI	Clay Inclusions
CLL	Clay Laminae
CN	Calcareous nodule
CON	Concretion
COL	Coal Laminae
DOL	Dolomite
FOS	Fossil
GLA	Glauconite
GYP	Gypsum
HAL	Halite
IOX	Iron Oxides, undifferentiated
LIM	Limonitic
MAR	Marcasite
MC	Mud or clay clasts
MUL	Mud Laminae
MIC	Mica
NOD	Nodule
ORL	Organic Laminae
PEB	Pebbles
PHO	Phosphorite
PIS	Pisolite
PYR	Pyrite
QTZ	Quartz Granules
RED	Red Beds
RIM	Sylvite rims on halite
ROT	Rootlet or Root Cast
ROK	Rock
SDL	Sand Laminae
SID	Siderite
SIL	Silt Laminae
S	Sulphur
SYL	Sylvite
SUD	Sulphides, undifferentiated
WD	Wood
ARG	Argillaceous

Geotech Features:

Geotech	
BCA	Bedding-to-Core-Axis angle; i.e., horizontal = 90, vertical = 0.
BKN	Broken
FLT	Fault, large scale
FRAC	Fracture
MFT	Microfault
JOT	Joint
SHR	Sheared Zone
SLK	Slickensided
SOF	Soft
SWS	Shattered while slabbing
DBD	Disturbed by Drilling

Colour:

Colour	
5R8/2	Grayish pink
5R7/4	Moderate pink
5R6/2	Pale red
5R6/6	Light red
5R5/4	Moderate red
5R4/2	Grayish red
5R4/6	Moderate red
5R3/4	Dusky red
5R2/2	Blackish red
5R2/6	Very dark red
10R8/2	Grayish orange pink
10R7/4	Moderate orange pink
10R6/2	Pale red
10R6/6	Moderate reddish orange
10R5/4	Pale reddish brown
10R4/2	Grayish red
10R4/6	Moderate reddish brown
10R3/4	Dark reddish brown
10R/2/2	Very dusky red
5YR8/4	Moderate orange pink
5YR7/2	Grayish orange pink
5YR5/2	Pale brown
5YR5/6	Light brown
5YR4/4	Moderate brown
5YR3/2	Grayish brown
5YR3/4	Moderate brown
5YR2/2	Dusky brown
10YR8/2	Very pale orange
10YR8/6	Pale yellowish orange
10YR7/4	Grayish orange
10YR6/2	Pale yellowish brown
10YR6/6	Dark yellowish orange
10YR5/4	Moderate yellowish brown
10YR4/2	Dark yellowish brown
10YR2/2	Dusky yellowish brown
5Y8/4	Grayish yellow
5Y7/2	Yellowish gray
5Y7/6	Moderate yellow
5Y6/4	Dusky yellow
5Y5/2	Light olive gray
5Y5/6	Light olive brown
5Y4/4	Moderate olive brown
5Y3/2	Olive gray
10Y8/2	Pale greenish yellow
10Y7/4	Moderate greenish yellow
10Y6/2	Pale olive
10Y6/6	Dark greenish yellow
10Y5/4	Light olive
10Y4/2	Grayish olive
5GY7/2	Grayish yellow green
5GY7/4	Moderate yellow greeen
5GY5/2	Dusky yellow green
5GY3/2	Grayish olive green
10GY7/2	Pale yellowish green
10GY6/4	Moderate yellowish green
10GY5/2	Grayish green
10GY4/4	Dark yellowish green
10GY3/2	Dusky yellowish green
5G7/2	Pale green
5G7/4	Light green
5G6/6	Brilliant green
5G5/2	Grayish green
5G5/6	Moderate green
5G3/2	Dusky green
10G8/2	Very pale green
10G6/2	Pale green
10G4/2	Grayish green
5BG7/2	Pale blue green
5BG6/6	Light blue green
5BG5/2	Grayish blue green
5BG4/6	Moderate blue green
5BG3/2	Dusky blue green
5B8/2	Very pale blue
5B7/6	Light blue
5B6/2	Pale blue
5B5/6	Moderate blue
5PB7/2	Pale blue
5PB5/2	Grayish blue
5PB3/2	Dusky blue
5P6/2	Pale purple
5P4/2	Grayish purple
5P2/2	Very dusky purple
5RP8/2	Pale pink
5RP6/2	Pale red purple
5RP4/2	Grayish red purple
5RP2/2	Very dusky red purple
5YR8/1	Pinkish gray
5YR6/1	Light brownish gray
5YR4/1	Brownish gray
5YR2/1	Brownish black
5Y8/1	Yellowish gray
5Y6/1	Light olive gray
5Y4/1	Olive gray
5Y2/1	Olive black
5GY8/1	Light greenish gray
5GY6/1	Greenish gray
5GY4/1	Dark greenish gray
5GY2/1	Greenish black
5G8/1	Light greenish gray
5G6/1	Greenish gray
5G4/1	Dark greenish gray
5G2/1	Greenish black
5B9/1	Bluish white
5B7/1	Light bluish gray
5B5/1	Medium bluish gray
N9	White
N8	Very light gray
N7	Light gray
N6	Medium light gray
N5	Medium gray
N4	Medium dark grey
N3	Dark grey
N2	Grayish black
N1	Black
5R5/6	Moderate red
10Y4/6	
5B7/2	
5B7/3	
5B5/2	
5YR5/4	
10R7/5	

Fossils:

Fossils	
AC	Algal Cyst
AM	Algal Mat
AMP	Amphipora
BRA	Brachiopod
BRY	Bryozoa
BU	Burrow
CCC	Coccolith
COR	Coral
CRI	Crinoid
FIS	Fish Remains
FOR	Foraminifera
GAS	Gastropod
ONC	Oncolite
PCY	Pelecypod
SF	Shell Fragments
SPI	Spicules
SPO	Sponge
SPR	Spore
STR	Stromatolite
STP	Stromatoporoid
UN	Uncertain
THAM	Thamnopora
PEL	Unknown

Estimations:

Est	
VH	Very High
HI	High
MOD	Moderate
LO	Low
TR	Trace
NO	None

SAMPLE LIST

HOLE ID	UWI	SAMPLE ID	TO	FROM
GZD100	08-36-019-01W4	GZD100-001	1648.5	1648.85
GZD100	08-36-019-01W4	GZD100-002	1648.85	1649.4
GZD100	08-36-019-01W4	GZD100-003	1649.4	1649.7
GZD100	08-36-019-01W4	GZD100-004	1649.7	1649.85
GZD100	08-36-019-01W4	GZD100-005	1649.85	1650.2
GZD100	08-36-019-01W4	GZD100-006	1650.2	1650.75
GZD100	08-36-019-01W4	GZD100-007	1650.75	1651.2
GZD100	08-36-019-01W4	GZD100-008	1651.2	1651.7
GZD100	08-36-019-01W4	GZD100-009	1651.7	1652
GZD100	08-36-019-01W4	GZD100-010	1652	1652.35
GZD100	08-36-019-01W4	GZD100-011	1652.35	1652.6
GZD100	08-36-019-01W4	GZD100-012	1652.6	1652.9
GZD100	08-36-019-01W4	GZD100-013	1652.9	1653.1
GZD100	08-36-019-01W4	GZD100-014	1653.1	1653.4
GZD100	08-36-019-01W4	GZD100-015	1653.4	1653.95
GZD100	08-36-019-01W4	GZD100-016	1653.95	1654.5
GZD100	08-36-019-01W4	GZD100-017	1654.5	1655
GZD100	08-36-019-01W4	GZD100-018	1655	1655.55
GZD100	08-36-019-01W4	GZD100-019	1655.55	1656.2
GZD100	08-36-019-01W4	GZD100-020	1656.2	1656.65
GZD100	08-36-019-01W4	GZD100-021	1656.65	1657.2
GZD100	08-36-019-01W4	GZD100-022	1657.2	1657.75
GZD100	08-36-019-01W4	GZD100-023	1657.75	1658.3
GZD100	08-36-019-01W4	GZD100-024	1658.3	1658.75
GZD100	08-36-019-01W4	GZD100-025	1658.75	1659.3
GZD100	08-36-019-01W4	GZD100-026	1659.3	1659.75
GZD100	08-36-019-01W4	GZD100-027	1659.75	1660.25
GZD100	08-36-019-01W4	GZD100-028	1660.25	1660.75
GZD100	08-36-019-01W4	GZD100-029	1660.75	1661.25
GZD100	08-36-019-01W4	GZD100-030	1661.25	1661.7
GZD100	08-36-019-01W4	GZD100-031	1661.7	1662.3
GZD100	08-36-019-01W4	GZD100-032	1662.3	1662.75
GZD100	08-36-019-01W4	GZD100-033	1662.75	1663.35
GZD100	08-36-019-01W4	GZD100-034	1663.35	1663.95
GZD100	08-36-019-01W4	GZD100-035	1663.95	1664.55
GZD100	08-36-019-01W4	GZD100-036	1664.55	1665
GZD100	08-36-019-01W4	GZD100-037	1665	1665.45
GZD100	08-36-019-01W4	GZD100-038	1665.45	1666
GZD100	08-36-019-01W4	GZD100-039	1666	1666.55
GZD100	08-36-019-01W4	GZD100-040	1666.55	1667.1
GZD100	08-36-019-01W4	GZD100-041	1667.1	1667.7
GZD100	08-36-019-01W4	GZD100-042	1667.7	1668.3
GZD100	08-36-019-01W4	GZD100-043	1668.3	1669
GZD100	08-36-019-01W4	GZD100-044	1669	1669.6
GZD100	08-36-019-01W4	GZD100-045	1669.6	1670
GZD100	08-36-019-01W4	GZD100-046	1670	1670.3
GZD100	08-36-019-01W4	GZD100-047	1670.3	1670.85
GZD100	08-36-019-01W4	GZD100-048	1670.85	1671.3
GZD100	08-36-019-01W4	GZD100-049	1671.3	1671.85
GZD100	08-36-019-01W4	GZD100-050	1671.85	1672.35
GZD100	08-36-019-01W4	GZD100-051	1672.35	1672.95
GZD100	08-36-019-01W4	GZD100-052	1672.95	1673.55
GZD100	08-36-019-01W4	GZD100-053	1673.55	1674.05
GZD100	08-36-019-01W4	GZD100-054	1674.05	1674.65
GZD100	08-36-019-01W4	GZD100-055	1674.65	1675.2

BAKER HUGHES

HIGH DEFINITION INDUCTION LOG SM
X-MULTIPOLE ARRAY ACOUSTILOG SM
COMPENSATED Z-DENSILOG SM
COMPENSATED NEUTRON LOG
GAMMA RAY LOG
CALIPER LOG

ILE NO:	COMPANY	GRIZZLY DISCOVERIES INC
	WELL	GZD100 MEDHAT 8-36-19-1
PI NO:	FIELD	MEDICINE HAT
	PROVINCE	ALBERTA

er. 3.87

WI: 00083601901W400

ICENCE: 439272

LOCATION:
SURFACE LOC LSD: 8-36-19-1
BH LSD: 8
SEC 036 TWP 019 RGE 01W4

OTHER SERVICES
CN-XMAC-ZDL
ORIT
CVL

ERMANENT DATUM	G.L.	ELEVATION	732.7 M
OG MEASURED FROM	K.B.	3.95 M	ABOVE P.D.
RILL. MEAS. FROM	KELLY BUSHING		

ELEVATIONS:
KB 736.65 M
DF
GL 732.7 M

ATE		10-DEC-2011			
UN	TRIP	1	1		
ERVICE ORDER		CA207471			
EPTH DRILLER		1745.0 M			
EPTH LOGGER		1739.1 M			
OTTOM LOGGED INTERVAL		1735.7 M			
OP LOGGED INTERVAL		340.0 M			
ASING DRILLER		244.5 MM	@340.0 M	@	
ASING LOGGER		340.0 M			
T SIZE		222.0 MM			
YPE OF FLUID IN HOLE		INVERT			
ENSITY	VISCOSITY	1180.0 G/L	103.0 S		
H	FLUID LOSS	NA	NA		
OURCE OF SAMPLE		NO SAMPLE			
M AT MEAS. TEMP.		NA	@NA	@	
MF AT MEAS. TEMP.		NA	@NA	@	
MC AT MEAS. TEMP.		NA	@NA	@	
OURCE OF RMF	RMC	NA	NA		
M AT BHT		NA	@NA	@	
ME SINCE CIRCULATION		9.5 HRS			
AX. RECORDED TEMP.		27.1 DEGC			
QUIP. NO.	LOCATION	E6548	NISKU		
ECORDED BY		R. NORD/ K. NADZAR			

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

CASING RECORD

SIZE	WEIGHT	GRADE	FROM	TO
244.5 MM	48.07 KG/M	H-40	0.0 M	340.0 M

BOREHOLE RECORD

BIT SIZE	FROM	TO
349.0 MM	0.0 M	340.0 M
222.0 MM	340.0 M	1745.0 M

REMARKS

UN 1 TRIP 1 : TIME STOPPED CIRCULATION: 10-DEC-2011 @ 07:00.

CNC IS ZDL CALIPER CORRECTED FROM TD TO SC
CNC AND PORZ RECORDED AND PRESENTED IN LIMESTONE MATRIX FROM TD-820 M
CNC AND PORZ RECORDED AND PRESENTED IN SANDSTONE MATRIX FROM 820M - SC

HDIL CORRECTED BY 38.1 MM STANDOFF
BOREHOLE AND TEMPERATURE CORRECTIONS HAVE BEEN APPLIED TO HDIL DATA
CALIPER PRESENTED WITH HDIL TO ASSIST IN THE QC OF THE DATA

INTEGRATED TRANSIT TIME TICS EVERY; 1.0, 10.0 AND 100.0 MICROSECONDS

INTEGRATED BOREHOLE VOLUME TICS EVERY: 0.1, 1.0 AND 10.0 M3

CREW: R. NORD, K. NADZAR, M. BAHAR, S. TRINK, D. ROMIJN

RIG: CHAMPION 15.

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	SWIVEL	3944XD	Z052872	FREE
1	1	DHPA	4430XB	10390592	FREE
1	1	TTRM SUB	3981XB	11748299	FREE
1	1	COMM	3514XB	Z117396	FREE
1	1	WTS DGR/SLI	1329XB	11756181	FREE
1	1	WTS DBL KNJ	3939XA	Z168295	KNUCKLE JOINT
1	1	CN	2446XA	Z153106	DECENTRALIZED
1	1	ZDEN	2234XA	Z167962	PAD DEVICE
1	1	WTS DBL KNJ	3939XA	Z180332	KNUCKLE JOINT
1	1	ORIT	4401XB	10118896	FREE
1	1	ACOUSTIC EL	1677EA	10096275	CENTRALIZED
1	1	XMAC RX MDR	1678MA	Z188711	CENTRALIZED
1	1	XMAC ISO	1678PB	10120073	FREE
1	1	XMAC TX ELC	1678BA	10168828	CENTRALIZED
1	1	XMAC TX ELC	1678FA	369275	CENTRALIZED
1	1	HDIL ELEC	1515EA	Z179487	ECCENTERED
1	1	HDIL MAND	1515MA	Z167570	ECCENTERED

INSTRUMENT CONFIGURATION

urce File: /dat1a/pass/gzd100medhat_8_36_19_1/m771l~grizzly-tdg

CABLEHEAD
Diameter : 8.6 cm
Length : 167.6 cm
Weight : 10.9 kg
Measure Point: 83.8 cm: CABLEHEAD TOP

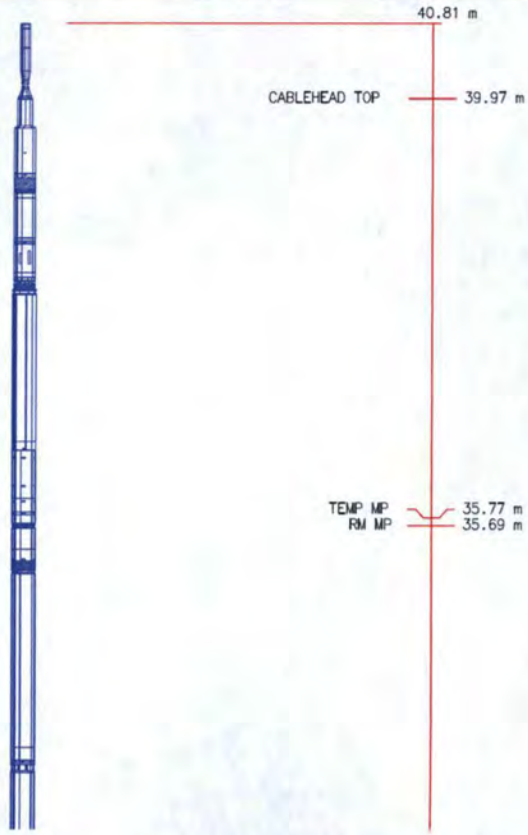
SWIVEL
Diameter : 8.6 cm
Length : 101.6 cm
Weight : 30.0 kg
Tensile Str. : 8545 kg
Compressive : 52727 kg

DOWNHOLE POWER ADAPTER
Diameter : 9.2 cm
Length : 160.7 cm
Weight : 39.1 kg

TTRM SUB
Diameter : 9.2 cm
Length : 116.8 cm
Weight : 28.2 kg
Measure Point: 42.2 cm: TEMP MP
Measure Point: 34.5 cm: RM MP
Tensile Str. : 16818 kg

WTS COMMON REMOTE
Diameter : 9.2 cm
Length : 194.0 cm
Weight : 57.3 kg
Tensile Str. : 35455 kg
Compressive : 51818 kg

DIGITAL SPECTRALOG



Tensile Str. : 35455 kg
Compressive : 38636 kg

KNUCKLE JOINT (DOUBLE)
Diameter : 8.6 cm
Length : 141.8 cm
Weight : 40.9 kg
Tensile Str. : 14545 kg
Compressive : Borehole Size Dependent

COMPENSATED NEUTRON
Diameter : 9.2 cm
Length : 231.4 cm
Weight : 68.2 kg
Measure Point: 80.3 cm: LSN MP
Measure Point: 68.2 cm: SSN MP
Tensile Str. : 35455 kg
Compressive : 35455 kg

Z-DENSILOG
Diameter : 12.4 cm
Length : 341.9 cm
Weight : 163.6 kg
Measure Point: 97.3 cm: CAL MP
Measure Point: 75.4 cm: LSD MP
Measure Point: 63.2 cm: SSD MP
Tensile Str. : 35455 kg
Compressive : 33864 kg

KNUCKLE JOINT (DOUBLE)
Diameter : 8.6 cm
Length : 141.8 cm
Weight : 40.9 kg
Tensile Str. : 14545 kg
Compressive : Borehole Size Dependent

DIGITAL ORIENTATION
Diameter : 8.6 cm
Length : 329.4 cm
Weight : 50.0 kg
Measure Point: 0.0 cm: ORIENT MP
Tensile Str. : 35455 kg

ARRAY ACOUSTILOG ELECTRONICS, 8 CHANNEL
Diameter : 8.6 cm
Length : 238.3 cm
Weight : 46.4 kg
Tensile Str. : 23636 kg
Compressive : 32727 kg

CROSS MULTIPOLE ARRAY ACOUSTILOG
Diameter : 9.5 cm
Length : 332.4 cm
Weight : 101.8 kg
Measure Point: 167.6 cm: R8
Measure Point: 152.4 cm: R7
Measure Point: 137.2 cm: R6
Measure Point: 121.9 cm: R5
Measure Point: 106.7 cm: R4
Measure Point: 91.4 cm: R3
Measure Point: 76.2 cm: R2
Measure Point: 61.0 cm: R1

SHEAR WAVE ACOUSTILOG
Diameter : 9.2 cm
Length : 152.4 cm
Weight : 61.4 kg
Tensile Str. : 20455 kg
Compressive : 20455 kg

GR MP — 31.66 m
LSN MP — 28.25 m
SSN MP — 28.13 m
CAL MP — 25.00 m
LSD MP — 24.78 m
SSD MP — 24.66 m
ORIENT MP — 19.31 m
R8 — 15.28 m
R7 — 15.13 m
R6 — 14.98 m
R5 — 14.83 m
R4 — 14.67 m
R3 — 14.52 m
R2 — 14.37 m
R1 — 14.22 m
MONOPOLE T2
QUADRUPOLE T5 — 11.63 m

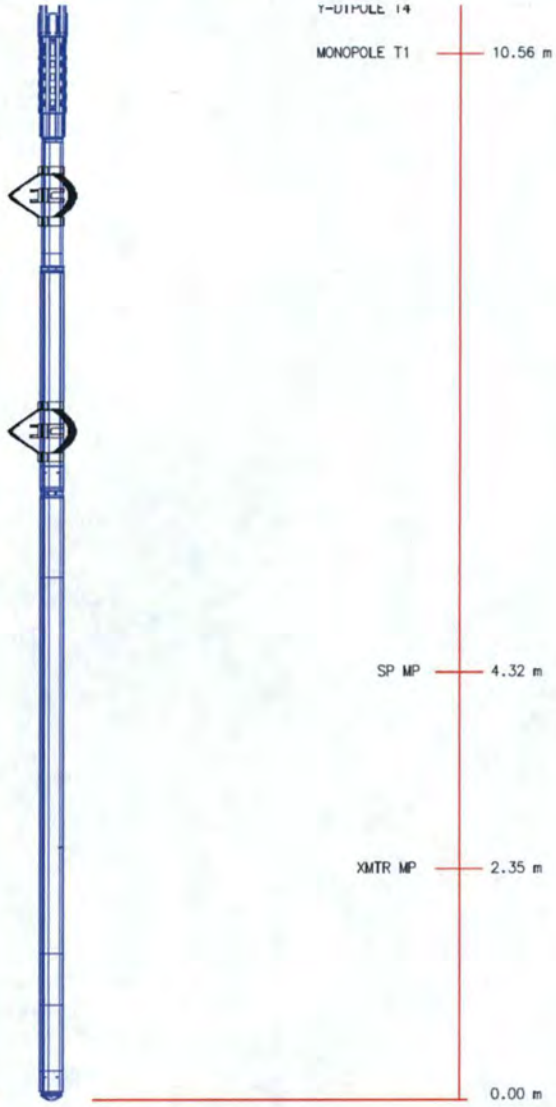
Weight : 77.3 kg
Measure Point: 195.6 cm: QUADRUPOLE T5
Measure Point: 195.6 cm: MONOPOLE T2
Measure Point: 142.2 cm: Y-DIPOLE T4
Measure Point: 142.2 cm: X-DIPOLE T3
Measure Point: 88.9 cm: MONOPOLE T1
Tensile Str. : 13636 kg
Compressive : 13636 kg

MULTI-POLE ARRAY ACOUSTIC
Diameter : 8.6 cm
Length : 131.6 cm
Weight : 26.4 kg
Tensile Str. : 35455 kg
Compressive : 32727 kg

HIGH DEFINITION INDUCTION TOOL
Diameter : 9.2 cm
Length : 827.0 cm
Weight : 188.6 kg
Measure Point: 423.9 cm: SP MP
Measure Point: 226.8 cm: XMTR MP
Tensile Str. : 16364 kg
Compressive : 864 kg

BULL PLUG 3 3/8

TOTAL LENGTH: 40.81 m
TOTAL WEIGHT: 1109.1 kg
MAX DIAMETER: 12.4 cm



MAIN LOG - LIMESTONE MATRIX

LIPS 6.1i Aug 06, 2010 Sat Dec 10 20:19:28 2011
ɔdates: 1 Patches: 1

rplt /main/62 Cplot Pdf_Cpp /main/16 Fileview 5.51

PARAMETER AND FILTER SUMMARY REPORT

ILE: /dat1a/pass/gzd100medhat_8_36_19_1/m771104.prm
OGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 306.105 m BOTTOM DEPTH: 1744.413 m

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
HT	FILTER ()	medium (1)		135	
AXIS CALIPER	FILTER ()	medium (1)		''	''

CN	FILTER ()	medium (1)	''	''
CALIPER	FILTER ()	medium (1)	''	''
	FILTER (.h)	medium (1)	''	''
	FILTER (.i)	medium (1)	''	''
ZDL MED RES	FILTER (hrd1*)	medium	''	''
	FILTER (hrd1s*)	medium	''	''
	FILTER (hrd2*)	medium	''	''
	FILTER (hrd2s*)	medium	''	''
	FILTER (soft*)	medium	''	''

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	0.000	mm	TOP	BOTTOM
	CASING THICKNESS	0.000	mm	''	''
BIT SIZE	BIT SIZE	222.000	mm	''	''
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		''	''
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		''	''
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	222.000	mm	''	''
	FIXED DIAMETER (mbh*)	222.000	mm	''	''
RH MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	OIL BASE MUD		''	''

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
CN SALINITY CORRECTION	SALINITY	0	ppm	TOP	BOTTOM
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		''	''
	BIT SIZE BEHIND CSNG	349.000	mm	''	''

ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
DENSITY POROSITY	RHOfluid	1.000	g/cm3	TOP	BOTTOM
	RHOmatrix (lime)	2.710	g/cm3	''	''
ZDL	DENX TRACKING	ON		''	''

ACOUSTIC AVAN CORRELATON

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
MONOPOLE COMPRESSIONAL	FORMATION TYPE	GENERIC (MEDIUM)		TOP	BOTTOM
	CORRELATION METHOD	NTH ROOT		''	''
	RESET TAPERS			''	''
	TAPER - LEFT END	200	us/m	TOP	494.309
		0	us/m	494.309	498.804
		200	us/m	498.804	592.836
		250	us/m	592.836	625.373
		200	us/m	625.373	639.775
		250	us/m	639.775	671.855
		200	us/m	671.855	800.329
		100	us/m	800.329	BOTTOM
	TAPER - RIGHT END	550	us/m	TOP	633.146
		500	us/m	633.146	643.280
		50	us/m	643.280	644.147
		550	us/m	644.147	673.608
		500	us/m	673.608	737.159
		550	us/m	737.159	740.893
		450	us/m	740.893	770.458
		400	us/m	770.458	777.227
		550	us/m	777.227	806.272
		425	us/m	806.272	869.290
		400	us/m	869.290	894.664
		255	us/m	894.664	1002.640
		400	us/m	1002.640	1106.653
		250	us/m	1106.653	BOTTOM
	FLOOR (UNIV. OPTION)	0.050		TOP	BOTTOM

ACOUSTIC WAVEFORM FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
WAVEFORM FILTER - FULLWAVE	SURFACE WAVE FILTER	ON		TOP	BOTTOM
	LOW FREQ CUTOFF	2000	Hz	''	''
	HIGH FREQ CUTOFF	20000	Hz	''	''

ACOUSTIC TCC CONTROL PARAMETERS

	SUBCYCLE LENGTH	50		''	''
	SUBSET	9		''	''
ENERAL MONOPOLE TCC PARAMETERS	STACK LEVEL	2		''	''
	DSP FILTER	ON		''	''
ULL WAVE MONOPOLE TCC PARAMETERS	ACG WINDOW	8064	us	''	''
	SAMPLE PERIOD	24		''	''
	RX DELAY	0	us	''	''

HDIL PROCESSING

EASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
DIL TEMPERATURE CORRECTION	TEMP CORR SOURCE	USE RXTEMP			
DAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		''	''
	ABC to CALCULATE	STANDOFF		''	''
	STANDOFF	38.10	mm	''	''
	TOOL POSITION	ECCENTERED		''	''
	Rmud MULTIPLIER	1.000		''	''

CURVE DESCRIPTION REPORT

RVE NAME	CREATION DATE	CURVE DESCRIPTION
:BIT	Dec 10 16:17:44 2011	BIT SIZE
:CALX	Dec 10 16:17:44 2011	CALIPER FROM X-AXIS OF XY CALIPER(S)
:CHT	Dec 10 16:17:44 2011	CABLE HEAD TENSION
1:CNCLS	Dec 10 16:17:44 2011	BOREHOLE SIZE CORRECTED LIMESTONE COMPENSATED NEU POROSITY
:DTCQI	Dec 10 16:17:44 2011	COMPRESSIONAL WAVE SLOWNESS
:GR	Dec 10 16:17:44 2011	GAMMA RAY
:M2R1	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
1:M2R2	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
:M2R3	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI
:M2R6	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
:M2R9	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
1:M2RX	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 120-INCH DOI
:PE	Dec 10 16:17:44 2011	PHOTO ELECTRIC CROSS-SECTION
:PZLS	Dec 10 16:17:44 2011	POROSITY FOR LIMESTONE MATRIX
:TEN	Dec 10 16:17:44 2011	DIFFERENTIAL TENSION
1:ZCOR	Dec 10 16:17:44 2011	DENSITY CORRECTION

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
BIT	0.00	DTCQI	14.63	M2R3	2.44	PE	24.69
CALX	24.92	GR	31.55	M2R6	2.44	PZLS	24.69
CHT	0.00	M2R1	2.44	M2R9	2.44	TEN	0.00
CNCLS	28.04	M2R2	2.44	M2RX	2.44	ZCOR	24.69

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t Interval : 325 - 1748 Meters

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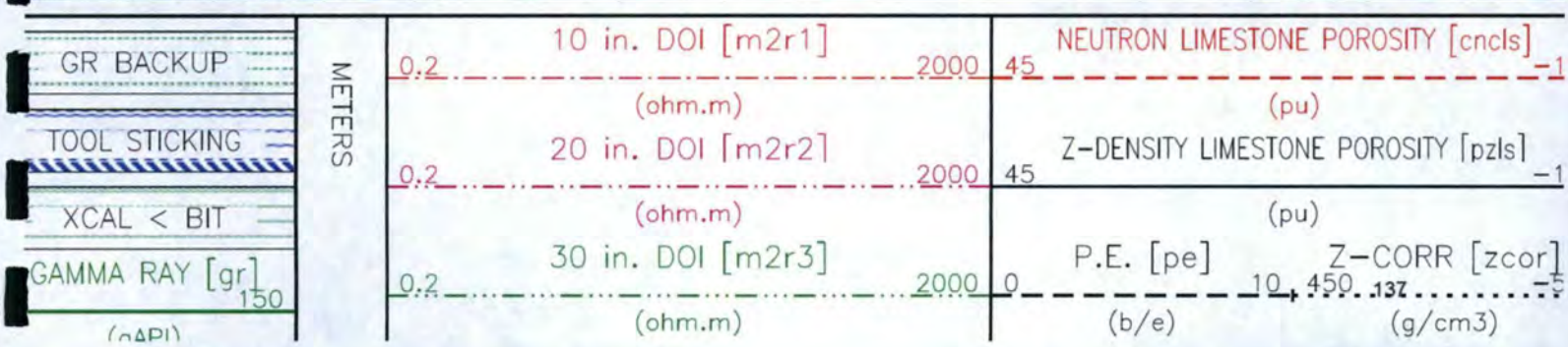
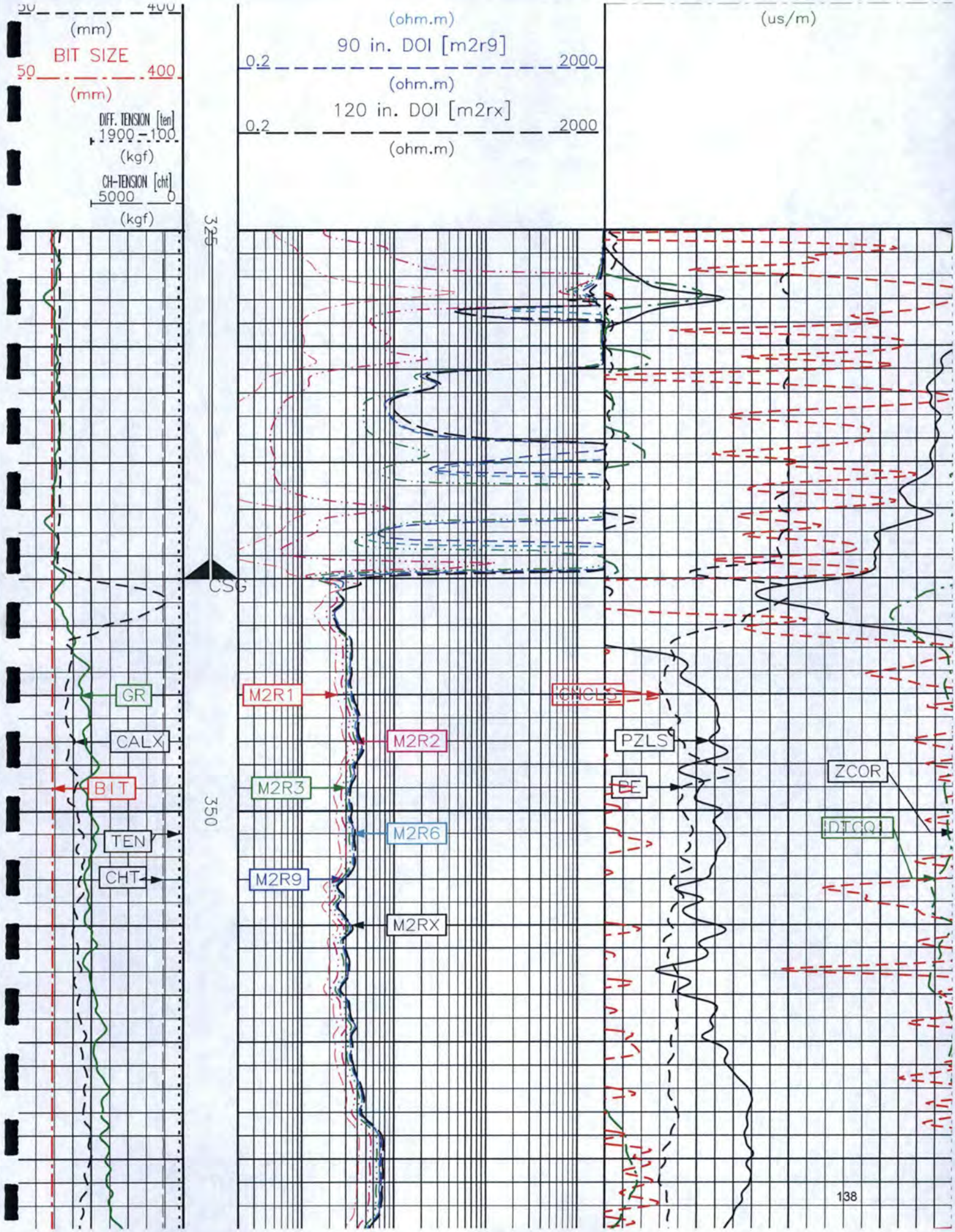
Created On : Dec 10 16:17:44 2011
Company : GRIZZLY DISCOVERIES INC
Well : GZD100 MEDHAT 8-36-19-1
Field : MEDICINE HAT
File Interval : 270.586 - 1744.41 Meters
Oct : m771I

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(mm)
BIT SIZE
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400
(mm)
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(kgf)
CH-TENSION [cht]
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0
(kgf)
(ohm.m)
90 in. DOI [m2r9]
0.2
2000
(ohm.m)
120 in. DOI [m2rx]
0.2
2000
(ohm.m)
(us/m)
325
CSG
350
GR
CALX
BIT
TEN
CHT
M2R1
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M2R3
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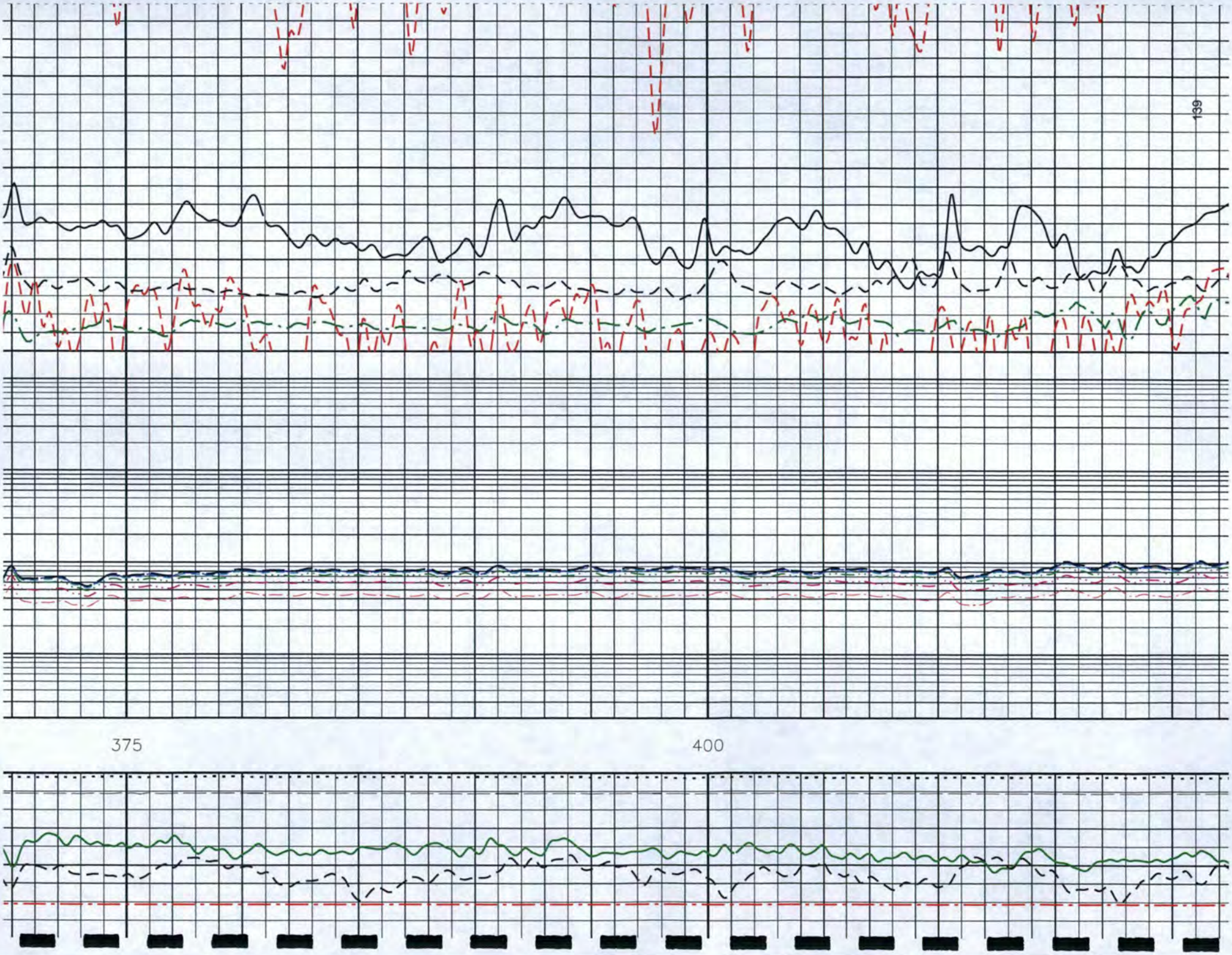
PZLS
PE
ZCOR
DTCO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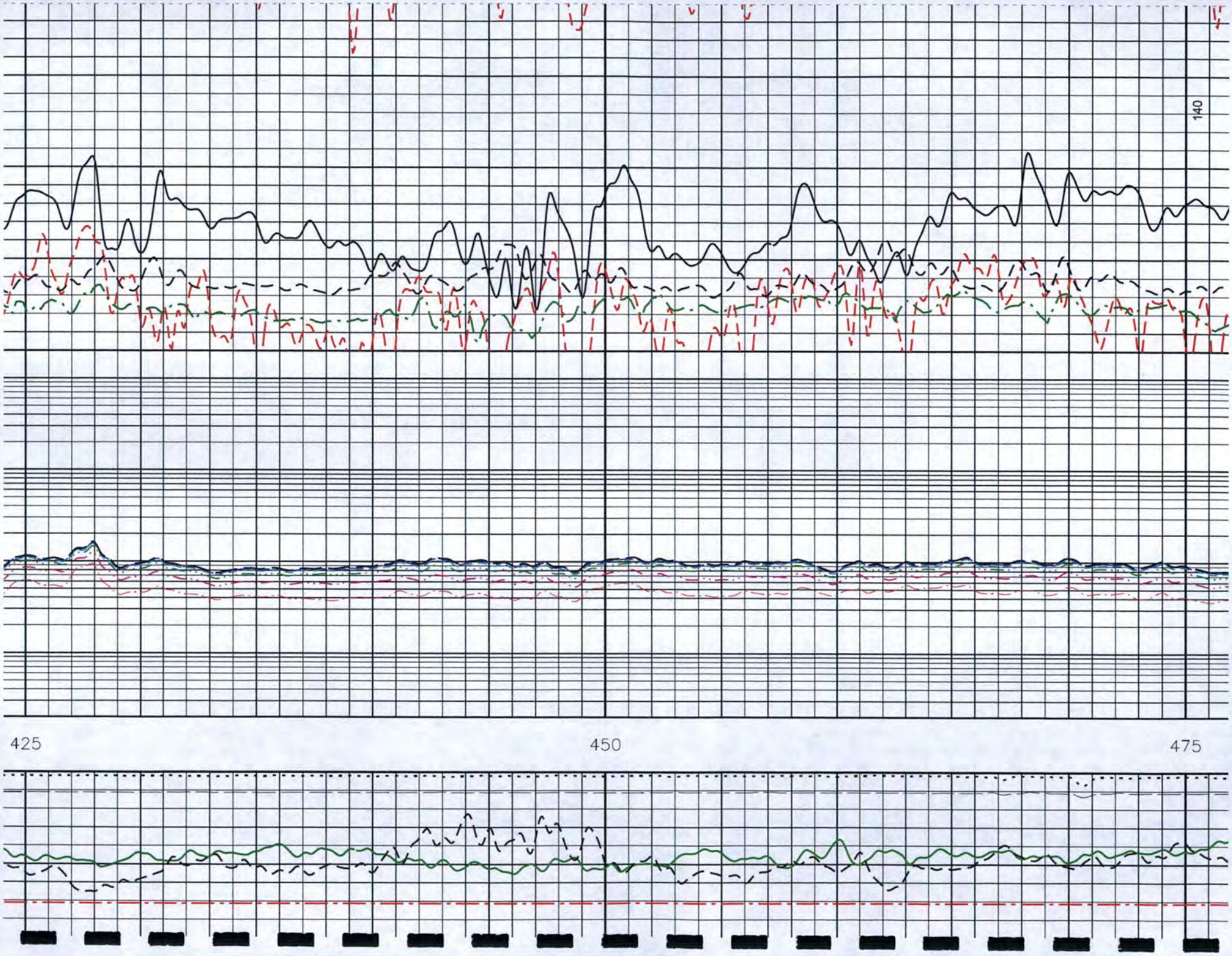
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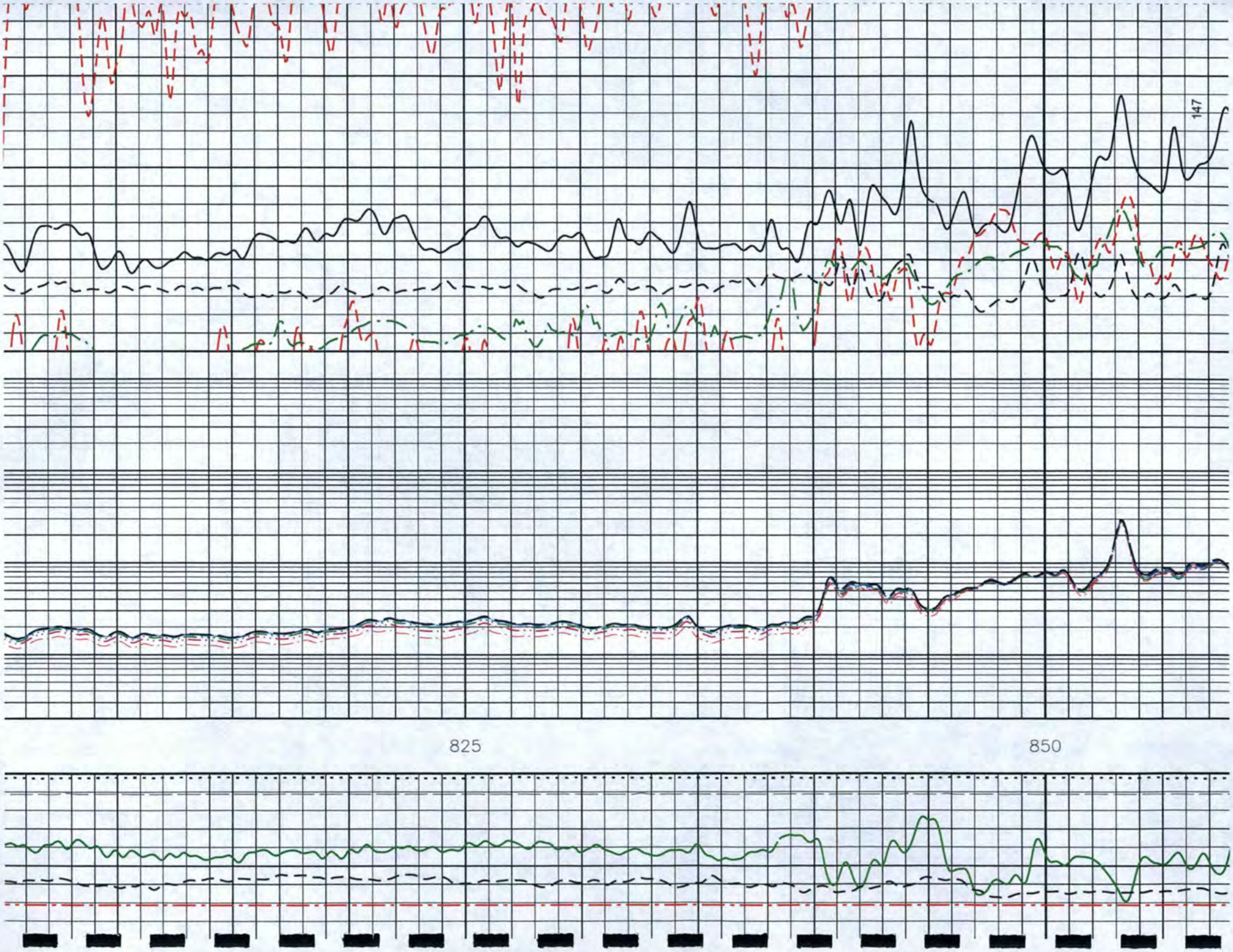
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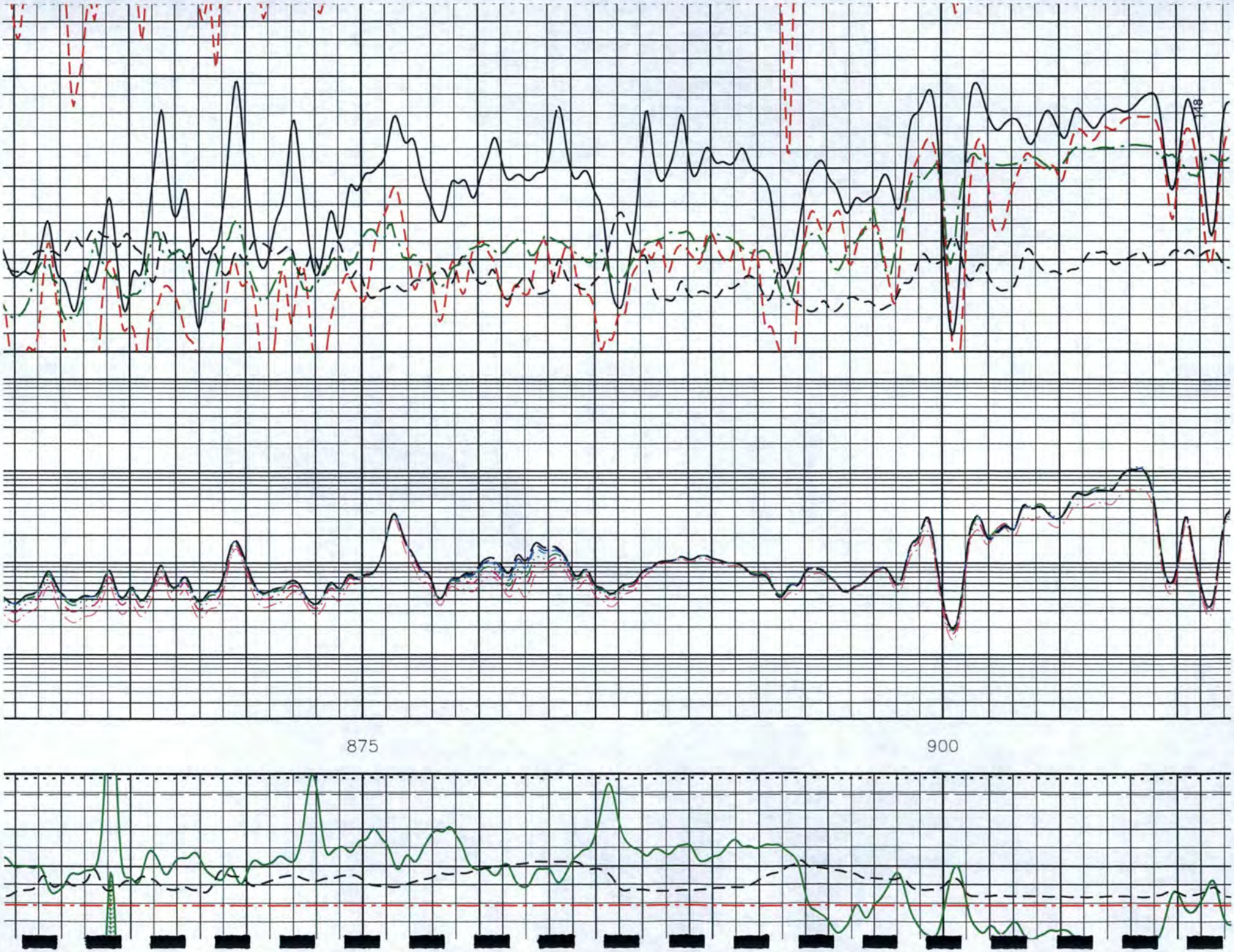
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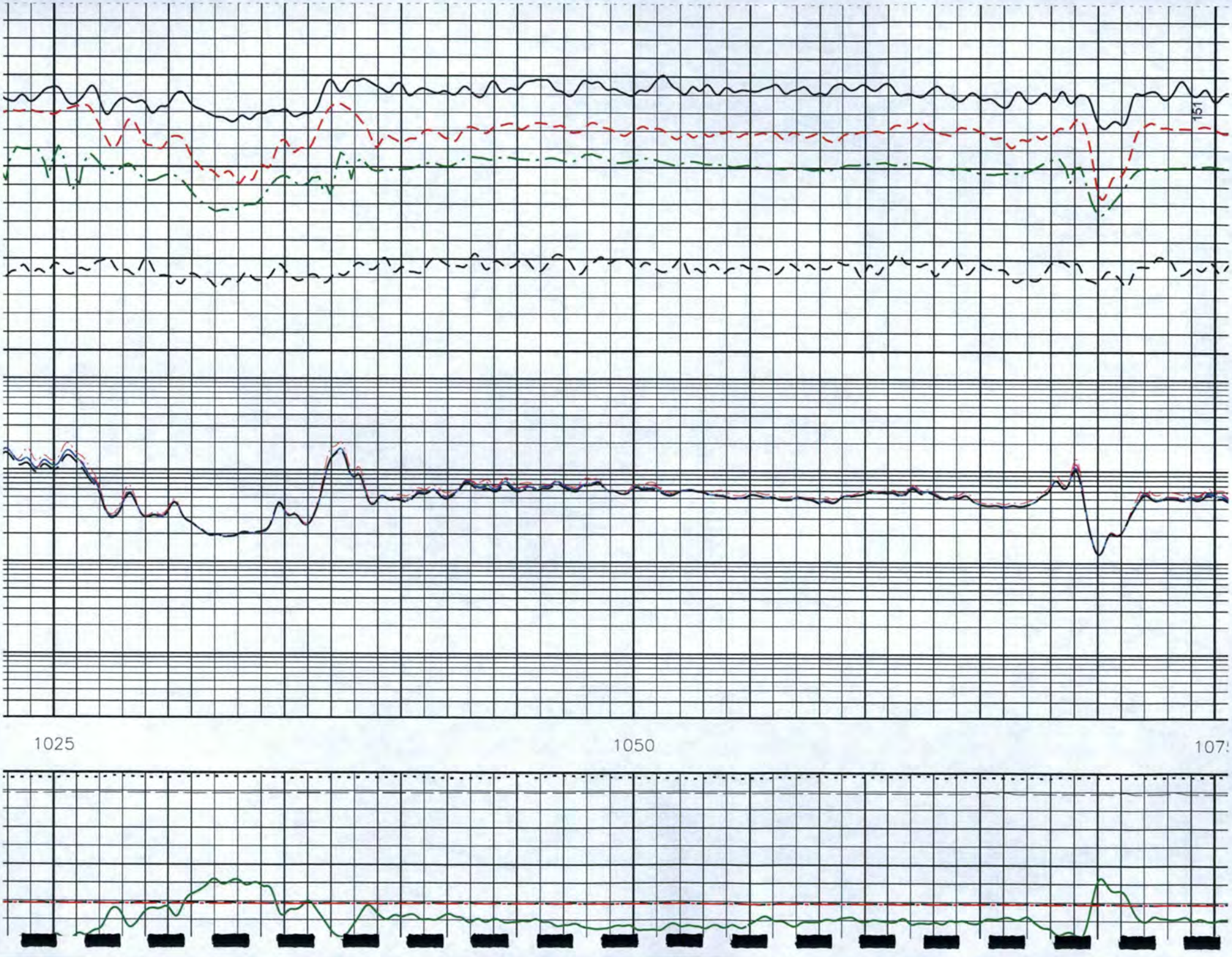
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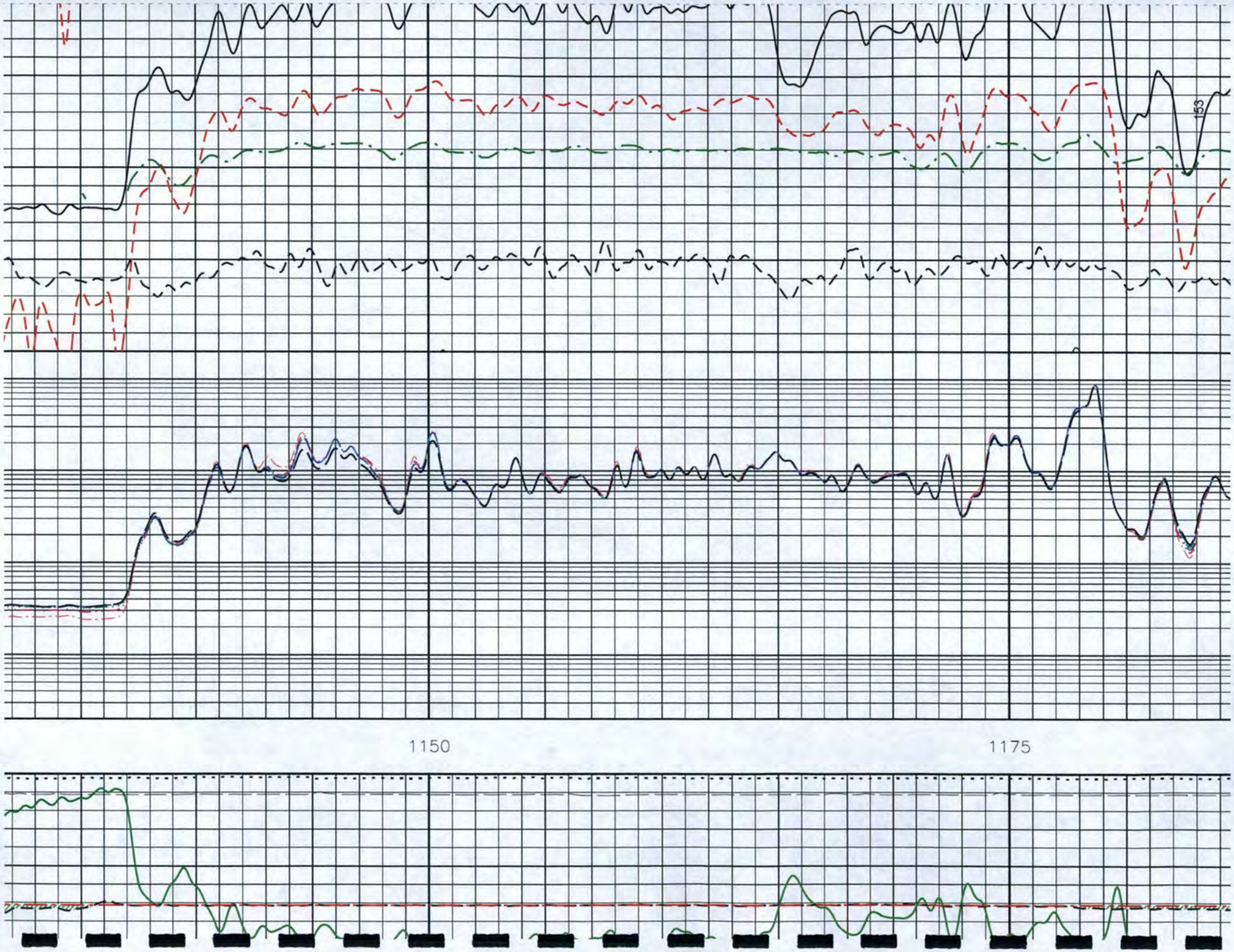
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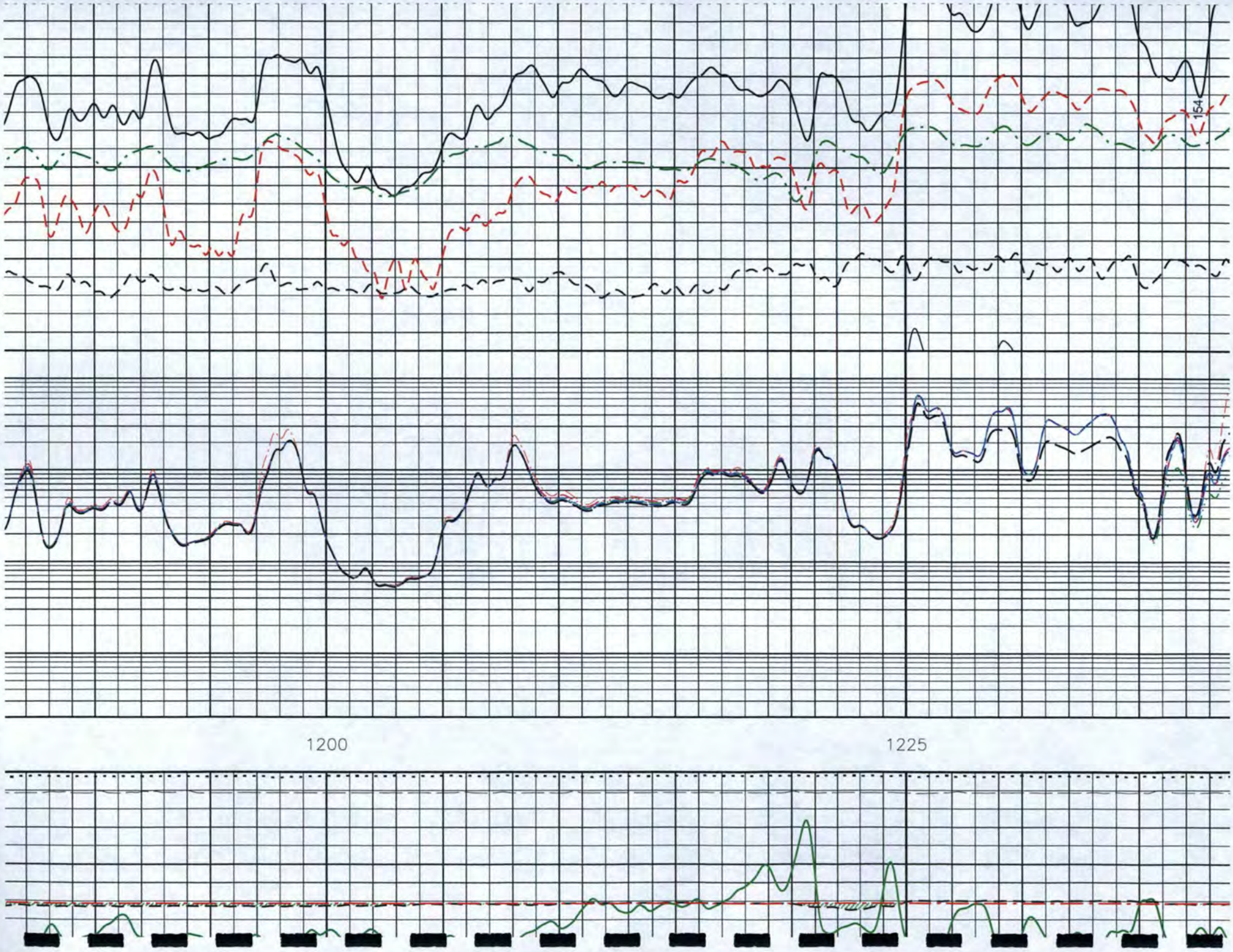
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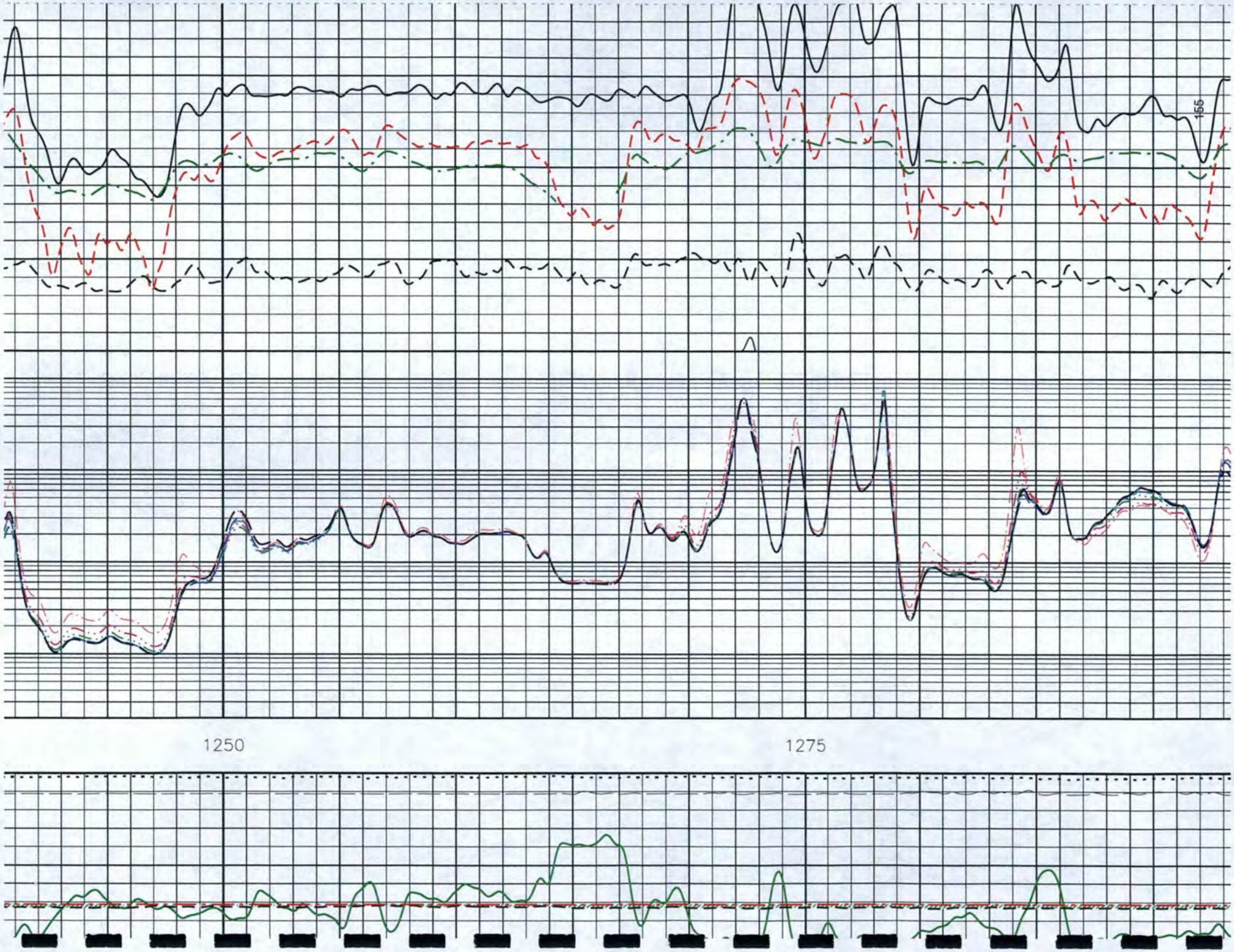
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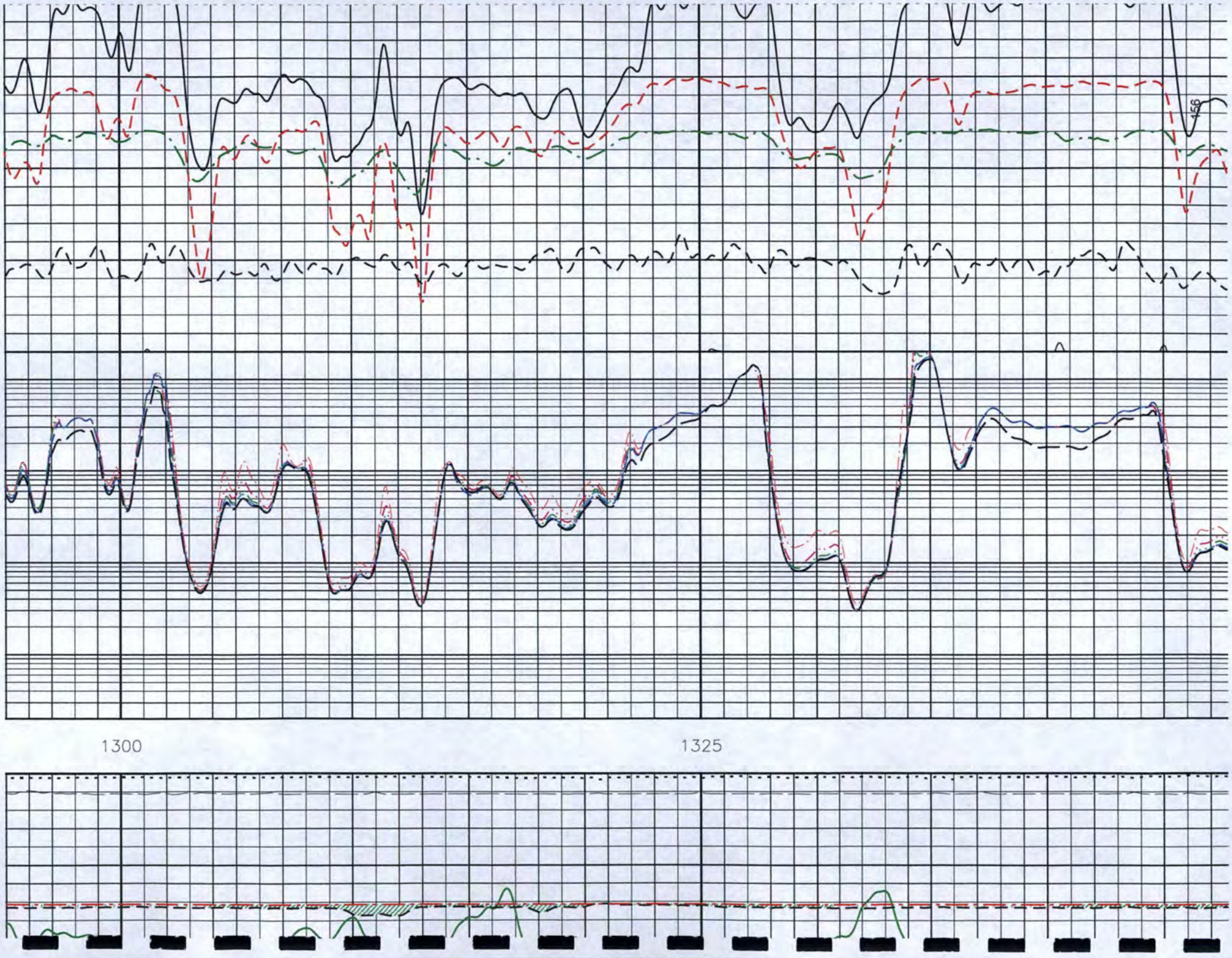
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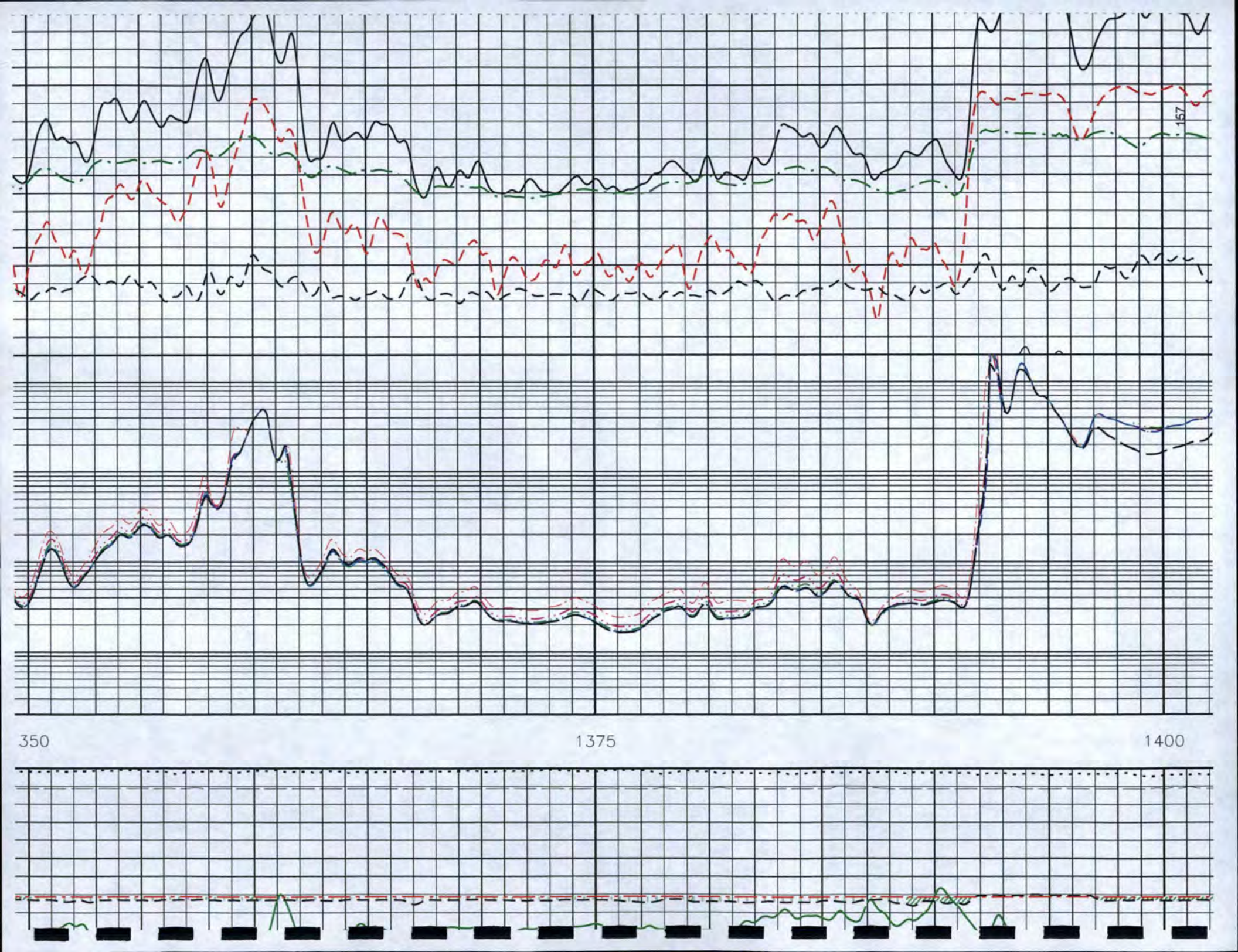
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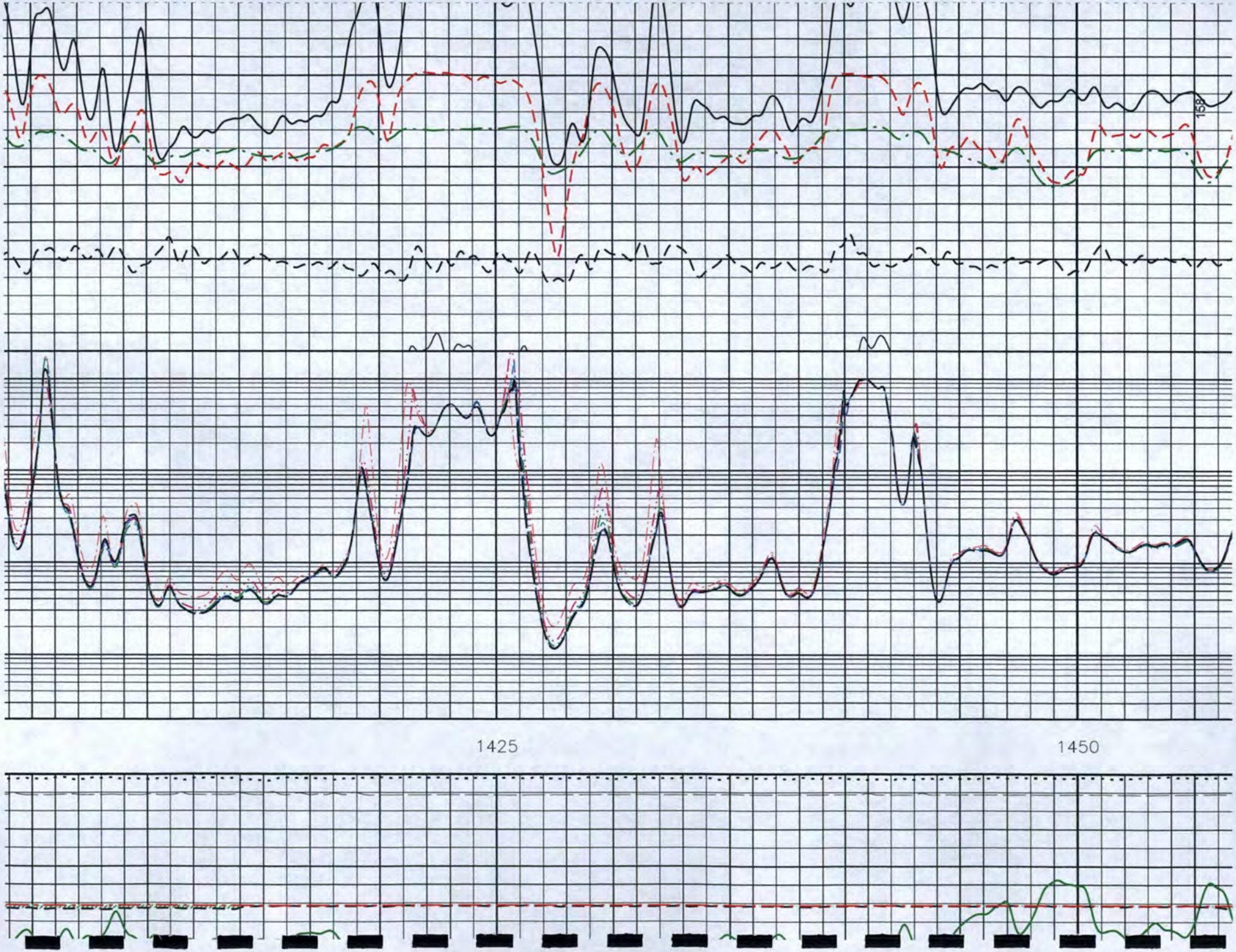
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1475
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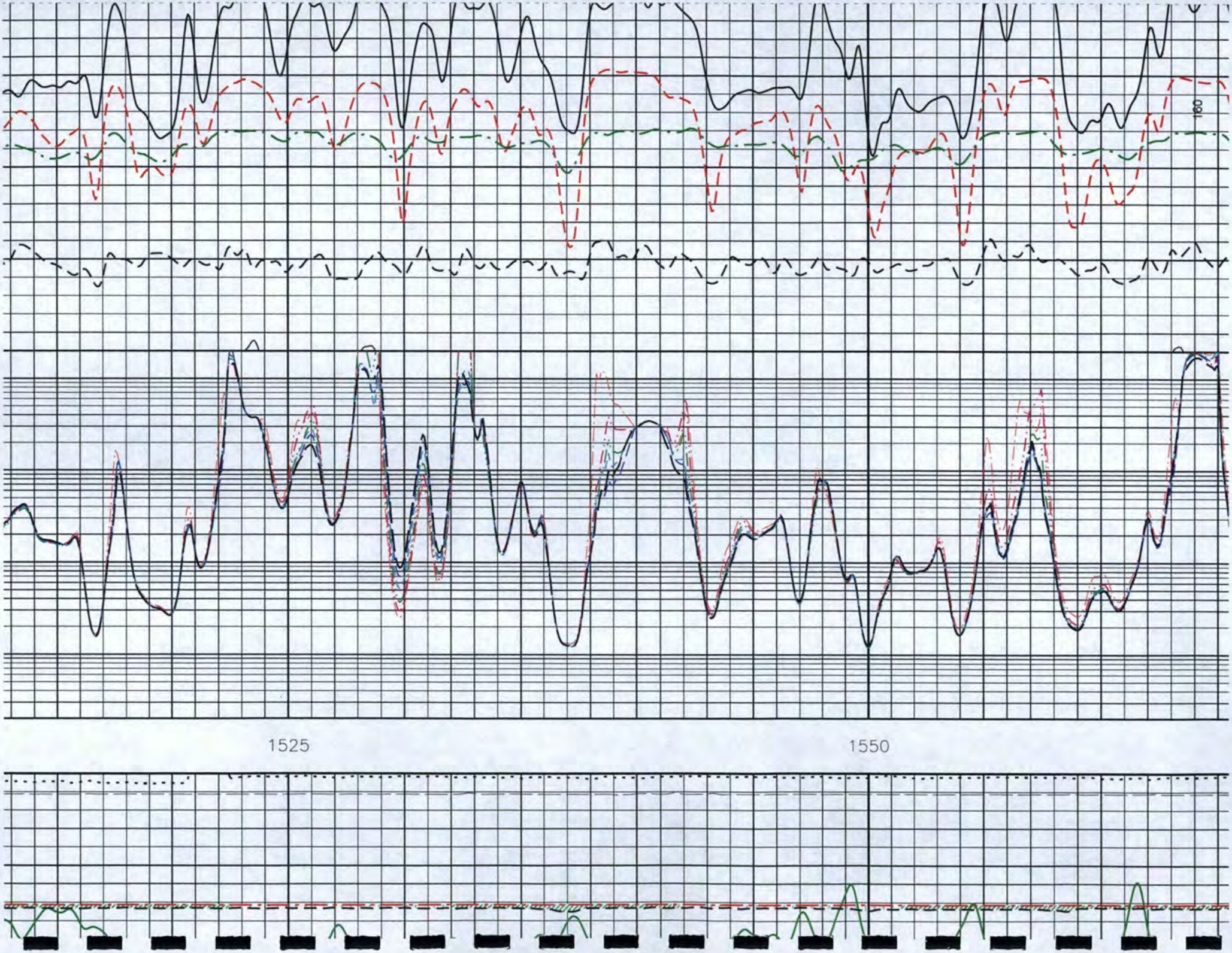
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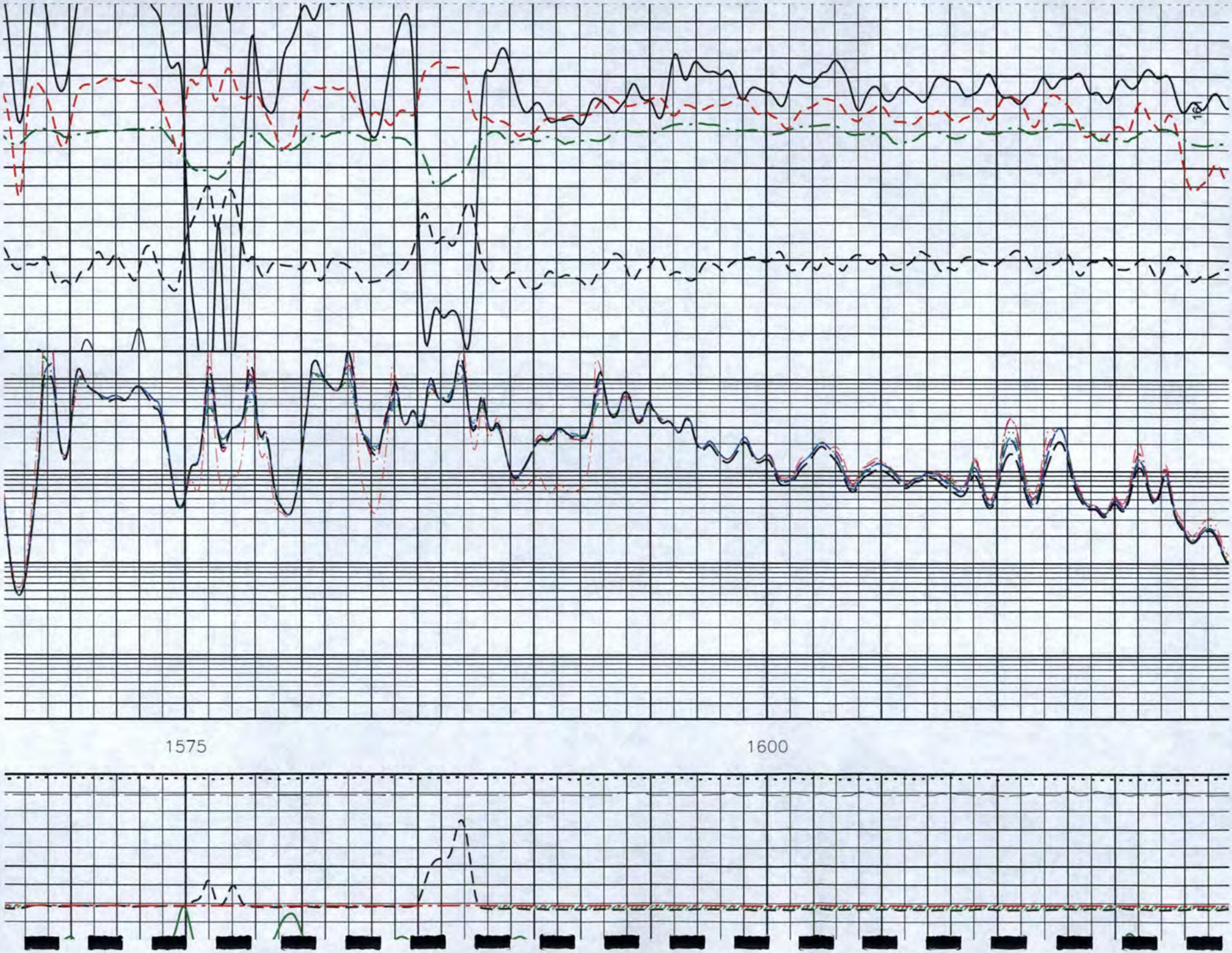
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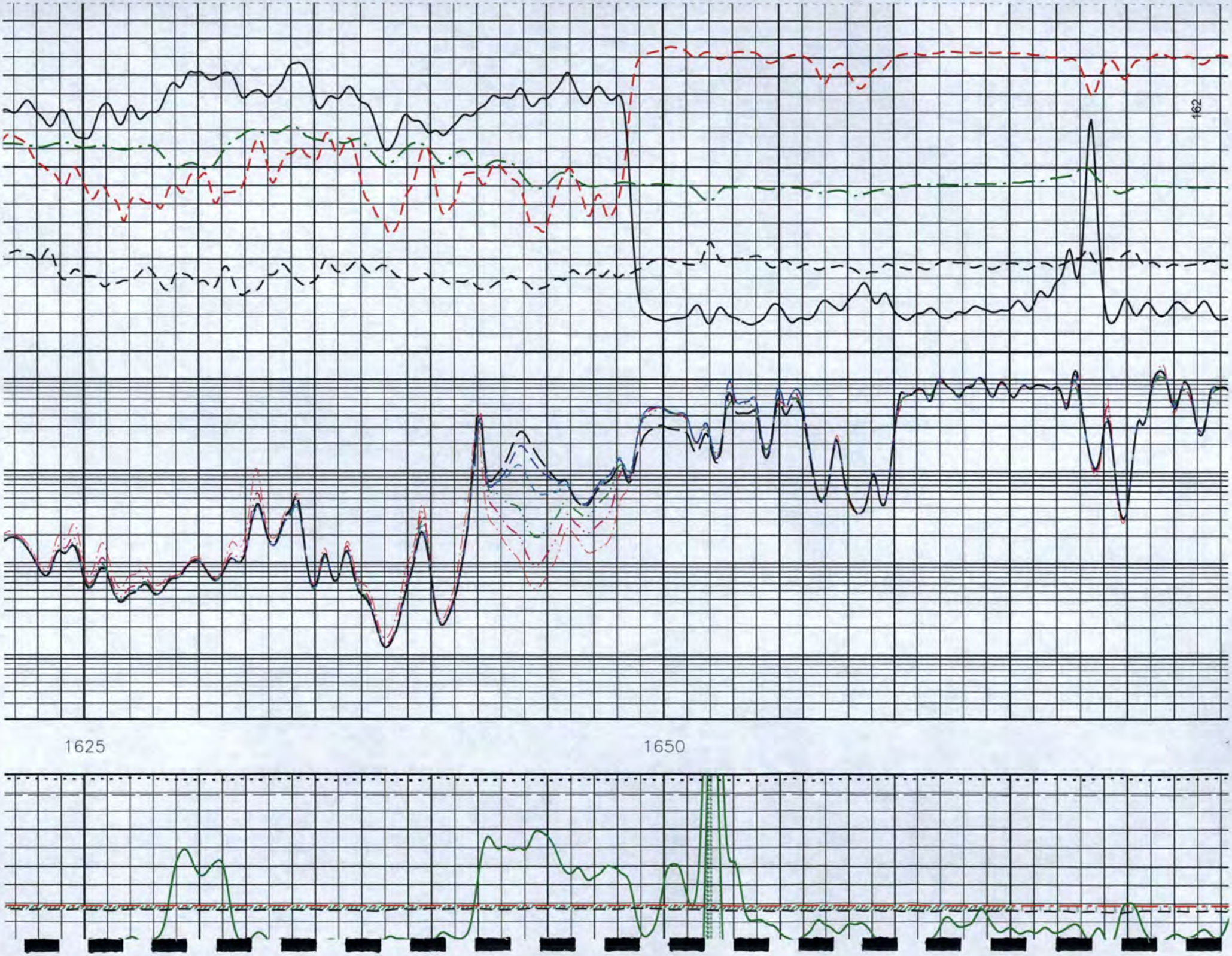
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FR GR
FR CALX
FR BIT
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FR CNCLS
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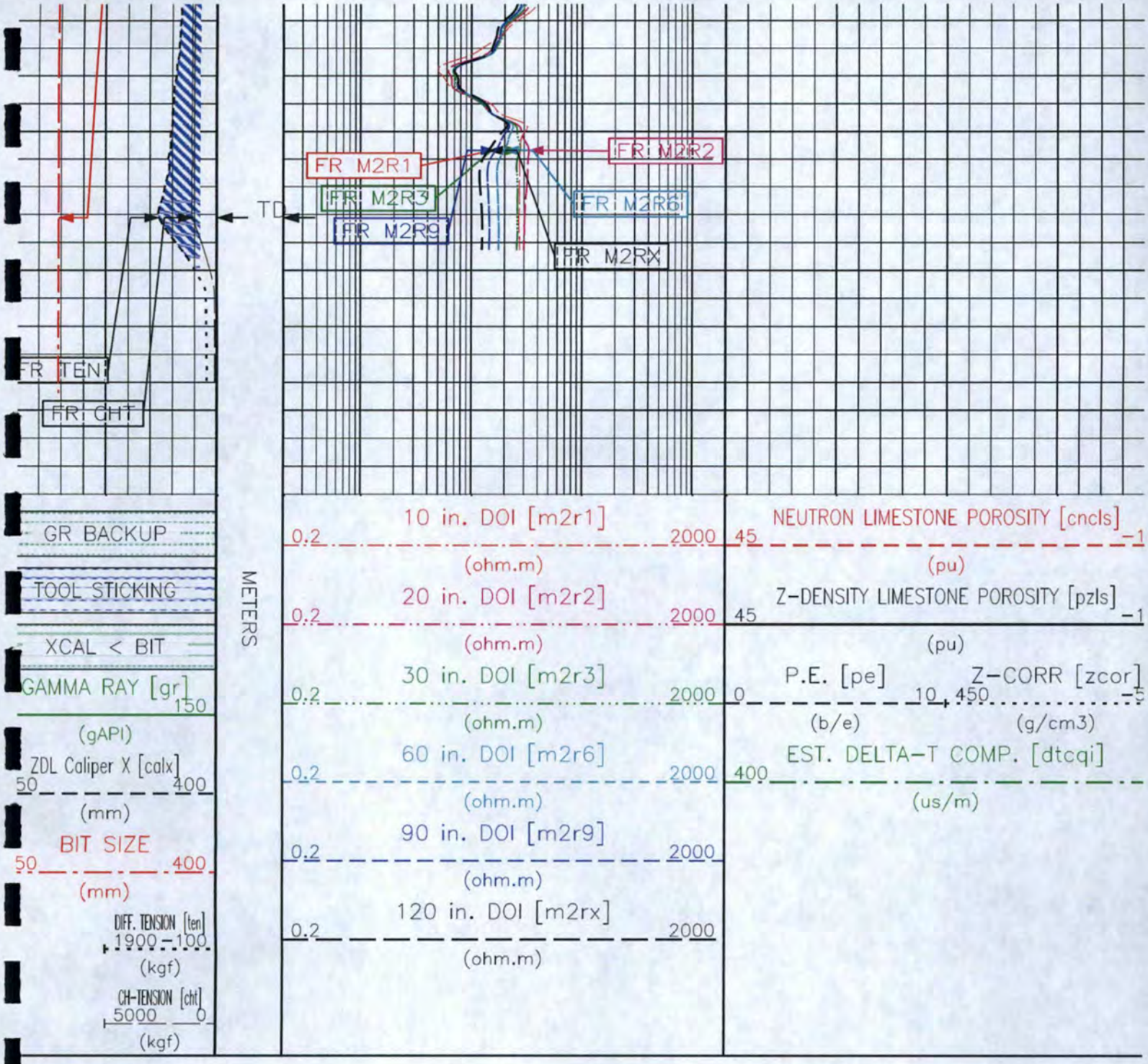
FR PZLS
FR ZCOR
FR DTCQ



MAIN LOG - SANDSTONE MATRIX

TOP DEPTH: 300.105 m BOTTOM DEPTH: 1744.415 m

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
HT	FILTER ()	medium (1)		TOP	BOTTOM
AXIS CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
R	FILTER ()	medium (1)		"	"
N	FILTER ()	medium (1)		"	"
ALIPER	FILTER ()	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
DL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"

BOREHOLE & CEMENT

EASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	0.000	mm	TOP	BOTTOM
	CASING THICKNESS	0.000	mm	"	"
IT SIZE	BIT SIZE	222.000	mm	"	"
OREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		"	"
OREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	222.000	mm	"	"
	FIXED DIAMETER (mbh*)	222.000	mm	"	"
H MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	OIL BASE MUD		"	"

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
N SALINITY CORRECTION	SALINITY	0	ppm	TOP	BOTTOM
N CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	349.000	mm	"	"

ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ENSITY POROSITY	RHOfluid	1.000	g/cm3	TOP	BOTTOM
	RHOmatrix (sand)	2.650	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"

ACOUSTIC AVAN CORRELATON

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ONOPOLE COMPRESSIONAL	FORMATION TYPE	GENERIC (MEDIUM)		TOP	BOTTOM
	CORRELATION METHOD	NTH ROOT		"	"
	RESET TAPERS			"	"
	TAPER - LEFT END	200	us/m	TOP	494.309
		0	us/m	494.309	498.804
		200	us/m	498.804	592.836
		250	us/m	592.836	625.373
		200	us/m	625.373	639.775
		250	us/m	639.775	671.855
		200	us/m	671.855	800.329
		100	us/m	800.329	BOTTOM
	TAPER - RIGHT END	550	us/m	TOP	633.146
		500	us/m	633.146	643.280
		50	us/m	643.280	644.147
		550	us/m	644.147	673.608
		500	us/m	673.608	737.159
		550	us/m	737.159	740.893
		450	us/m	740.893	770.458
		400	us/m	770.458	777.227
		550	us/m	777.227	806.272
		425	us/m	806.272	869.290
		400	us/m	869.290	894.664
		255	us/m	894.664	1002.640
		400	us/m	1002.640	1106.653
		250	us/m	1106.6[illegible]	BOTTOM
	FLOOR (UNIV. OPTION)	0.050		TOP	BOTTOM

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
WAVEFORM FILTER - FULLWAVE	SURFACE WAVE FILTER	ON		TOP	BOTTOM
	LOW FREQ CUTOFF	2000	Hz	''	''
	HIGH FREQ CUTOFF	20000	Hz	''	''

ACOUSTIC TCC CONTROL PARAMETERS

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
GENERAL TCC PARAMETERS	AGC	ON		TOP	BOTTOM
	SUBCYCLE LENGTH	50		''	''
	SUBSET	9		''	''
GENERAL MONOPOLE TCC PARAMETERS	STACK LEVEL	2		''	''
	DSP FILTER	ON		''	''
FULL WAVE MONOPOLE TCC PARAMETERS	ACG WINDOW	8064	us	''	''
	SAMPLE PERIOD	24		''	''
	RX DELAY	0	us	''	''

HDIL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
HDIL TEMPERATURE CORRECTION	TEMP CORR SOURCE	USE RXTEMP		TOP	BOTTOM
ADAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		''	''
	ABC to CALCULATE	STANDOFF		''	''
	STANDOFF	38.10	mm	''	''
	TOOL POSITION	ECCENTERED		''	''
	Rmud MULTIPLIER	1.000		''	''

CURVE DESCRIPTION REPORT

CURVE NAME	CREATION DATE	CURVE DESCRIPTION
1:BIT	Dec 10 16:17:44 2011	BIT SIZE
1:CALX	Dec 10 16:17:44 2011	CALIPER FROM X-AXIS OF XY CALIPER(S)
1:CHT	Dec 10 16:17:44 2011	CABLE HEAD TENSION
1:CNCSS	Dec 10 16:17:44 2011	BOREHOLE SIZE CORRECTED SANDSTONE COMPENSATED NEU POROSITY
1:DTCQI	Dec 10 16:17:44 2011	COMPRESSIONAL WAVE SLOWNESS
1:GR	Dec 10 16:17:44 2011	GAMMA RAY
1:M2R1	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
1:M2R2	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
1:M2R3	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI
1:M2R6	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
1:M2R9	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
1:M2RX	Dec 10 16:17:44 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 120-INCH DOI
1:PE	Dec 10 16:17:44 2011	PHOTO ELECTRIC CROSS-SECTION
1:PZSS	Dec 10 16:17:44 2011	POROSITY FOR SANDSTONE MATRIX
1:TEN	Dec 10 16:17:44 2011	DIFFERENTIAL TENSION
1:ZCOR	Dec 10 16:17:44 2011	DENSITY CORRECTION

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
BIT	0.00	DTCQI	14.63	M2R3	2.44	PE	24.69
CALX	24.92	GR	31.55	M2R6	2.44	PZSS	24.69
CHT	0.00	M2R1	2.44	M2R9	2.44	TEN	0.00
CNCSS	28.04	M2R2	2.44	M2RX	2.44	ZCOR	24.69

esentation : cpu1:/dat1a/pass/gzd100medhat_8_36_19_1/comp_main_ss.pdf [1:240 Scale]
ot Interval : 325 - 1748 Meters

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Created On : Dec 10 16:17:44 2011
Company : GRIZZLY DISCOVERIES INC
Well : GZD100 MEDHAT 8-36-19-1
Field : MEDICINE HAT
File Interval : 270.586 - 1744.41 Meters
Oct : m771I

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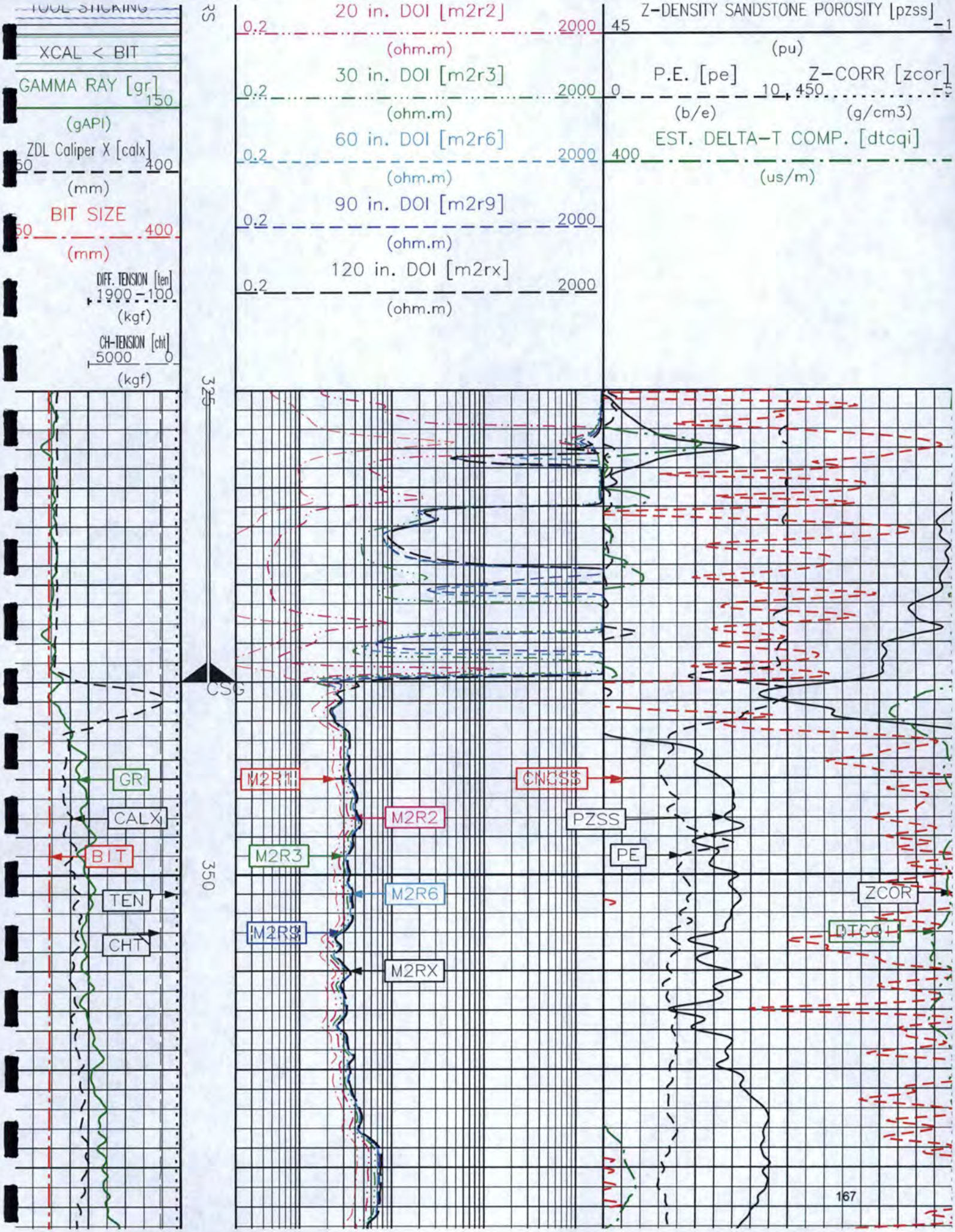
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400
(mm)
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(mm)
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(kgf)
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(kgf)
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30 in. DOI [m2r3]
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(ohm.m)
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(b/e)
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-45
(g/cm3)
EST. DELTA-T COMP. [dtcqi]
400
(us/m)
325
CSG
350
GR
CALX
BIT
TEN
CHT
M2R1
M2R2
M2R3
M2R6
M2R9
M2RX
CNSSS
PZSS
PE
ZCOR
DTCQI

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650
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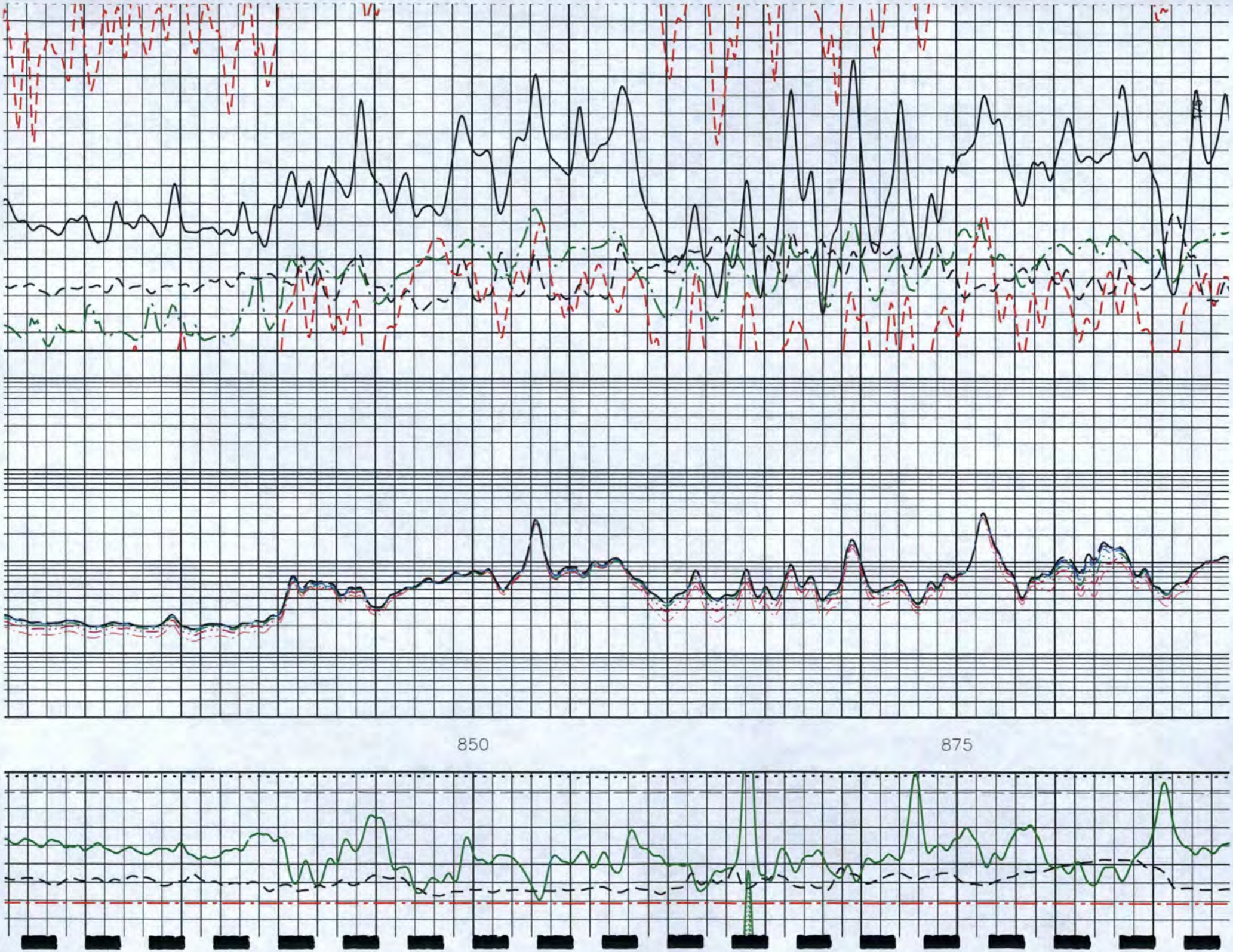
750

775
800
1/4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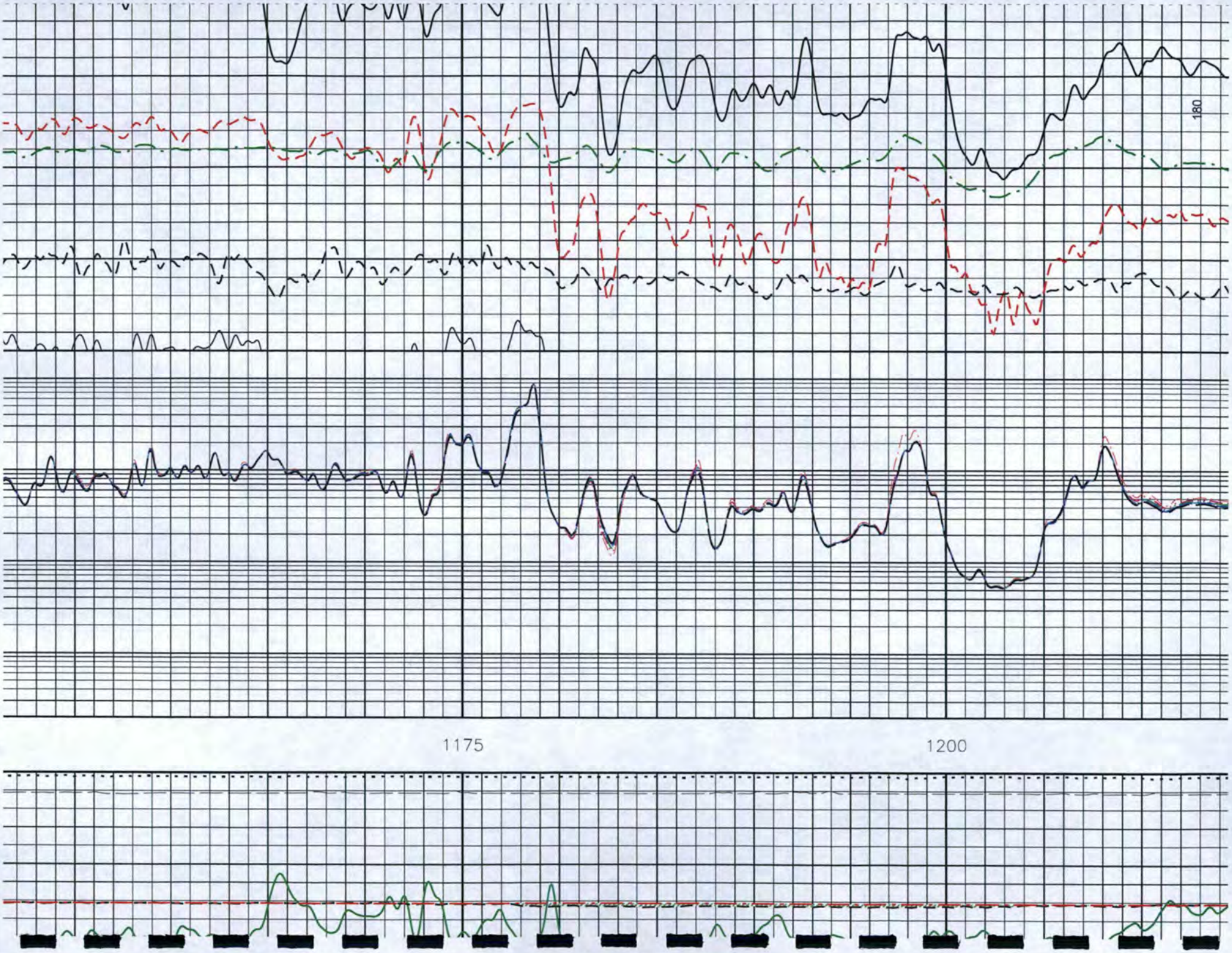
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1275

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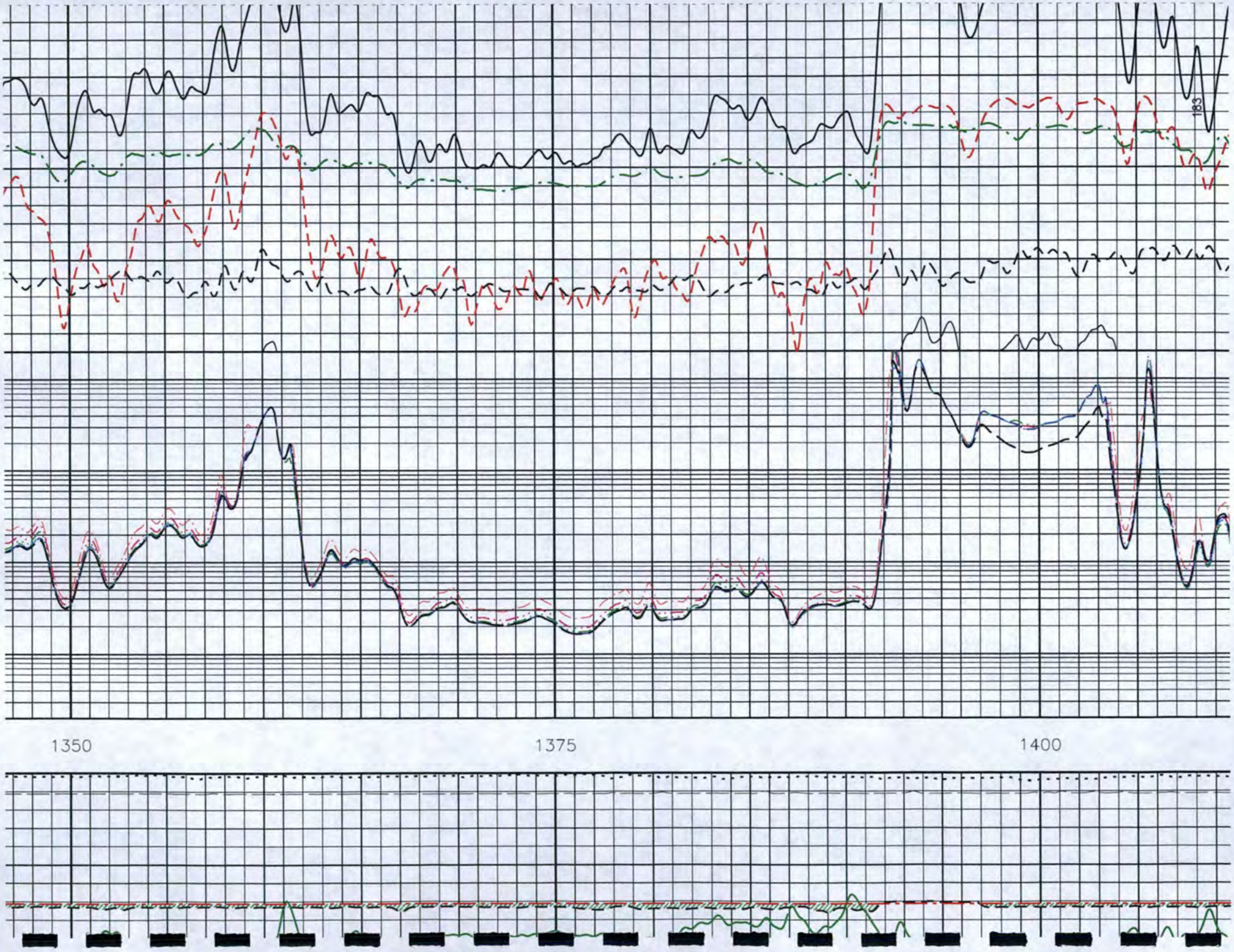
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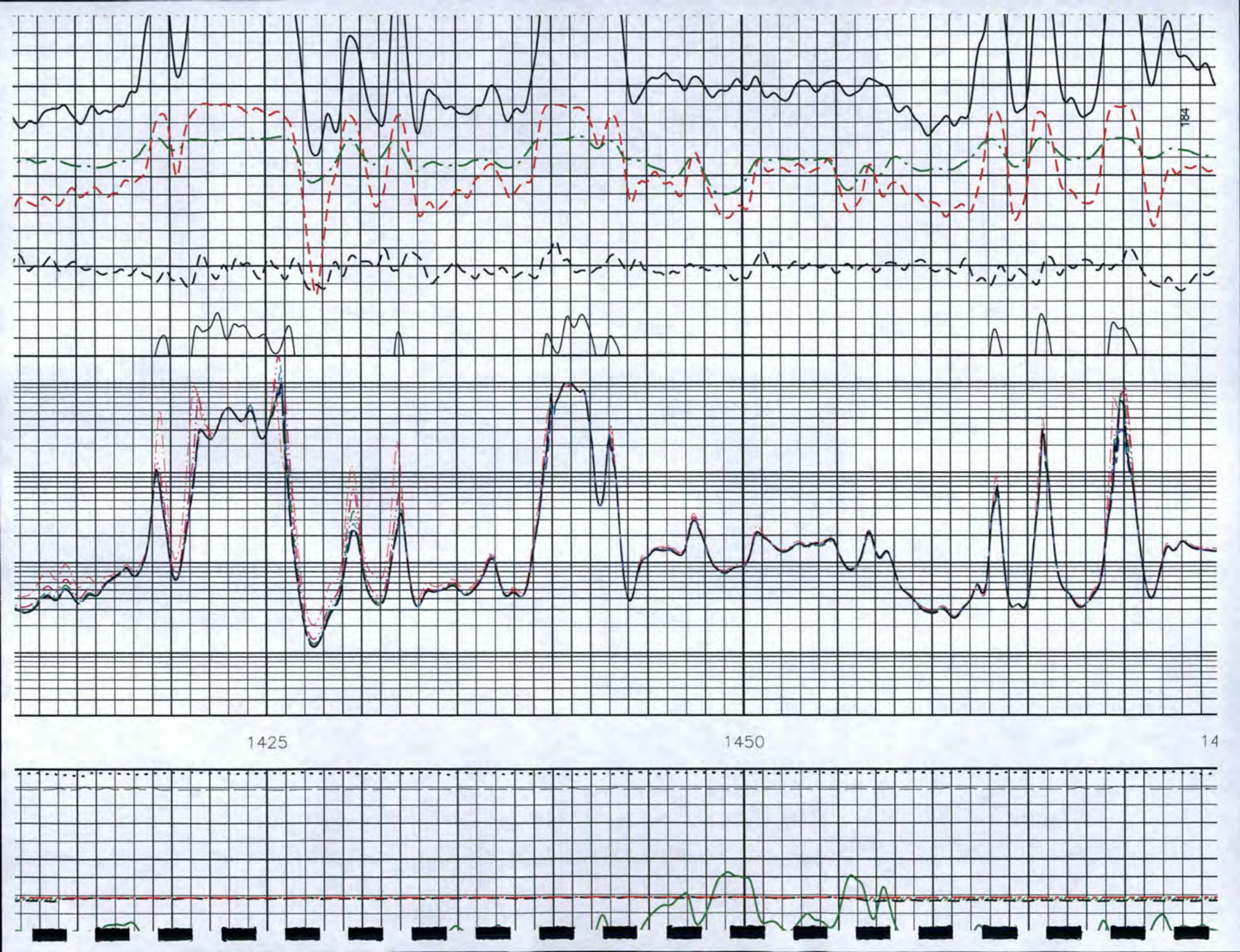
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14

1500
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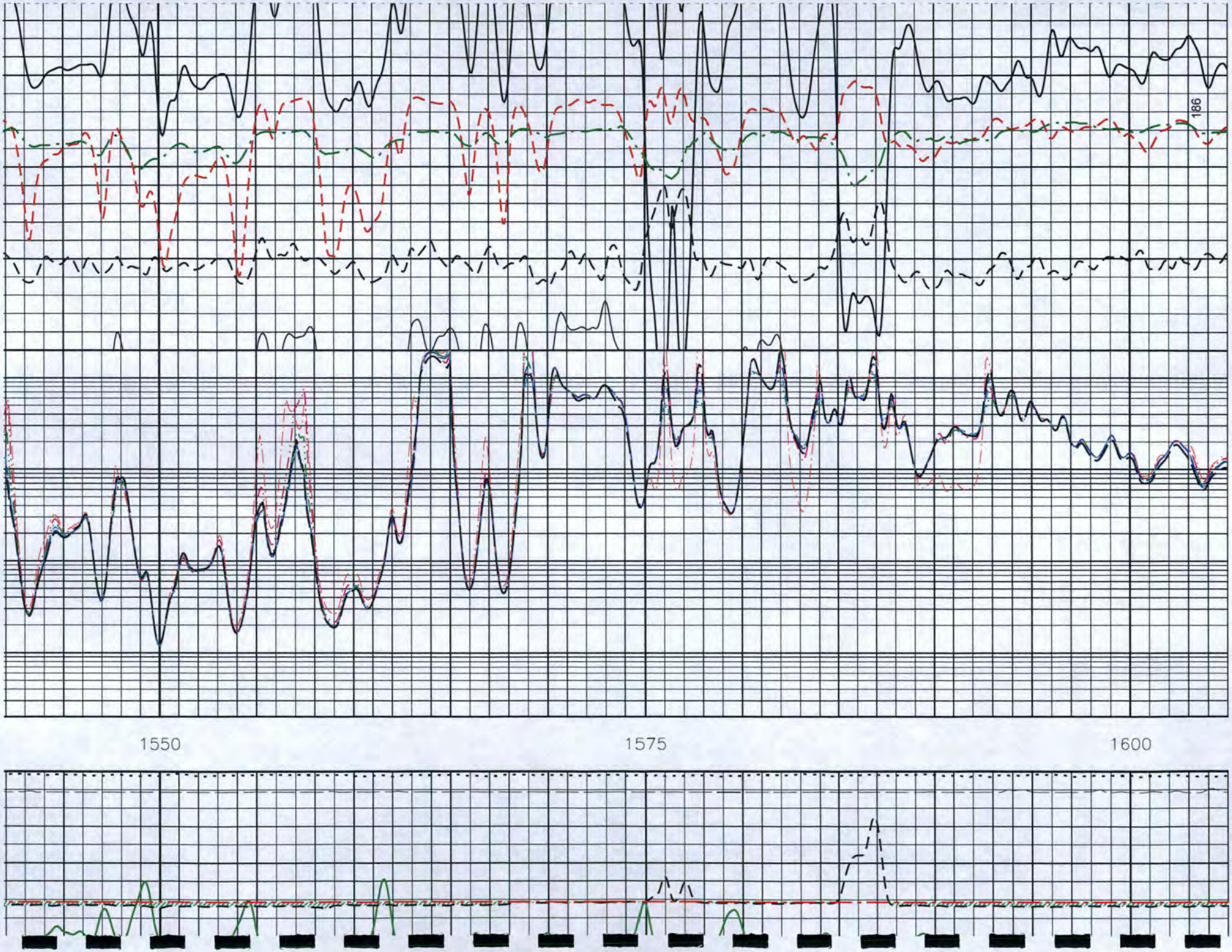
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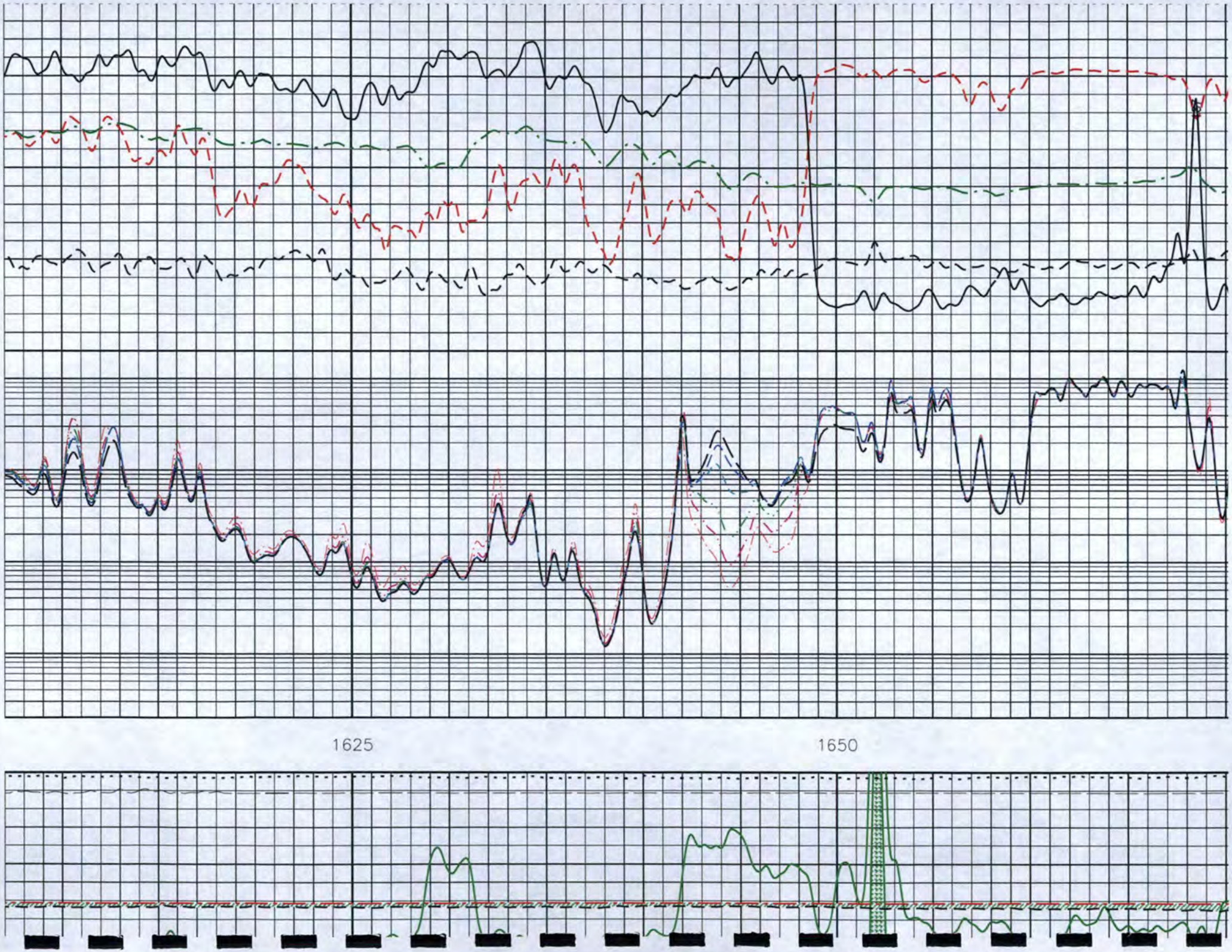
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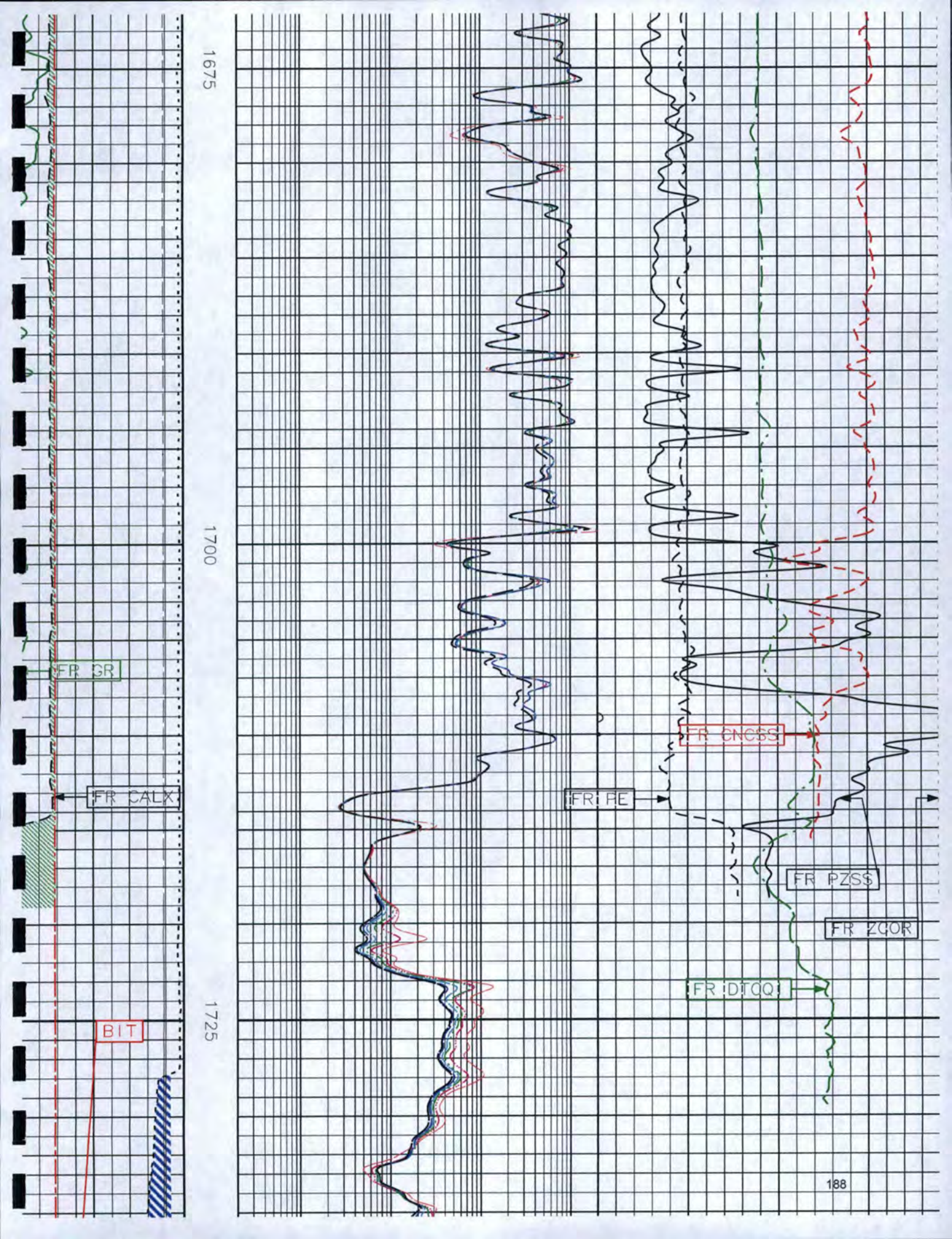
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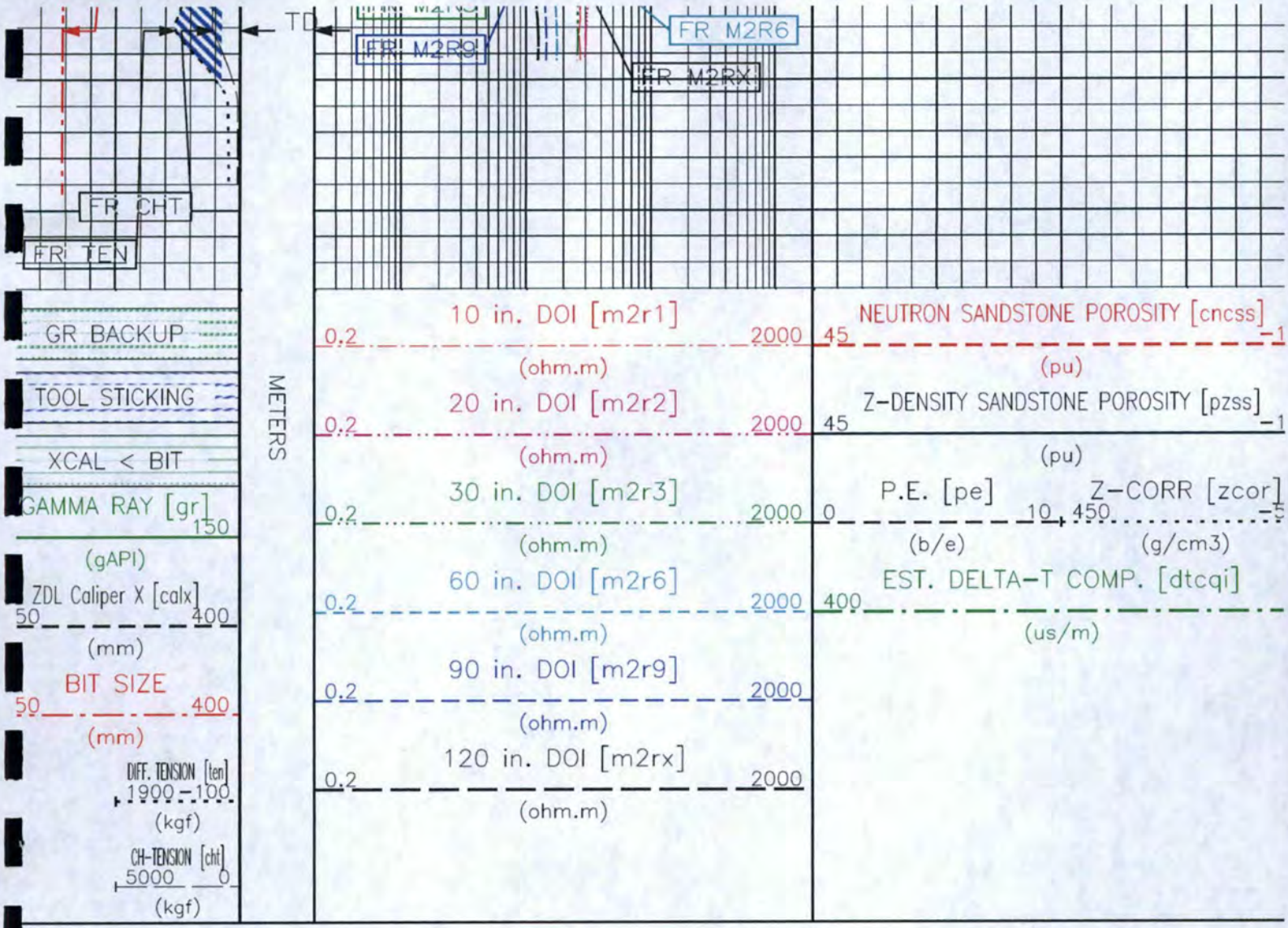

REPEAT LOG - LIMESTONE MATRIX

CLIPS 6.1i Aug 06, 2010
Updates: 1 Patches: 1

Sat Dec 10 16:55:04 2011

Crplt /main/62 Cplot Pdf_Cpp /main/16 Fileview 5.51

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/pass/gzd100medhat_8_36_19_1/m771103.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1611.897 m BOTTOM DEPTH: 1744.218 m

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m) TOP	BOTTOM
CHT	FILTER ()	medium (1)		TOP	BOTTOM
Z AXIS CALIPER	FILTER ()	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"
ER	FILTER ()	medium (1)		"	"

	FILTER (.h)	medium (1)		''	''
	FILTER (.i)	medium (1)		''	''
DL MED RES	FILTER (hrd1*)	medium		''	''
	FILTER (hrd1s*)	medium		''	''
	FILTER (hrd2*)	medium		''	''
	FILTER (hrd2s*)	medium		''	''
	FILTER (soft*)	medium		''	''
SP-SPDH	FILTER ()	medium (1)		''	''

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	0.000	mm	TOP	BOTTOM
	CASING THICKNESS	0.000	mm	''	''
IT SIZE	BIT SIZE	222.000	mm	''	''
OREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		''	''
	CALIPER/FIXED DIA. (mbh*)	USE CALIPER		''	''
OREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	222.000	mm	''	''
	FIXED DIAMETER (mbh*)	222.000	mm	''	''
H MUD RESISTIVITY SOURCE	RMUD SOURCE (HDIL)	OIL BASE MUD		''	''

CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
N SALINITY CORRECTION	SALINITY	0	ppm	TOP	BOTTOM
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		''	''
	BIT SIZE BEHIND CSNG	349.000	mm	''	''

ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ENSITY POROSITY	RHOfluid	1.000	g/cm3	TOP	BOTTOM
	RHOmatrix (lime)	2.710	g/cm3	''	''
ZDL	DENX TRACKING	ON		''	''

ACOUSTIC AVAN CORRELATON

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ONOPOLE COMPRESSIONAL	FORMATION TYPE	GENERIC (MEDIUM)		TOP	BOTTOM
	CORRELATION METHOD	NTH ROOT		''	''
	RESET TAPERS			''	''
	TAPER - LEFT END	100	us/m	''	''
	TAPER - RIGHT END	250	us/m	''	''
	FLOOR (UNIV. OPTION)	0.050		''	''

ACOUSTIC WAVEFORM FILTER

EASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
VAVEFORM FILTER - FULLWAVE	SURFACE WAVE FILTER	ON		TOP	BOTTOM
	LOW FREQ CUTOFF	2000	Hz	''	''
	HIGH FREQ CUTOFF	20000	Hz	''	''

ACOUSTIC TCC CONTROL PARAMETERS

EASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
ENERAL TCC PARAMETERS	AGC	ON		TOP	BOTTOM
	SUBCYCLE LENGTH	50		''	''
	SUBSET	9		''	''
ENERAL MONOPOLE TCC PARAMETERS	STACK LEVEL	2		''	''
	DSP FILTER	ON		''	''
ULL WAVE MONOPOLE TCC PARAMETERS	ACG WINDOW	8064	us	''	''
	SAMPLE PERIOD	24		''	''
	RX DELAY	0	us	''	''

HDIL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
DIL TEMPERATURE CORRECTION	TEMP CORR SOURCE	USE RXTEMP		TOP	BOTTOM
DAPTIVE BOREHOLE CORRECTION	ABC PROCESSING	ON		''	''
	ABC to CALCULATE	STANDOFF		''	''

CURVE DESCRIPTION REPORT

URVE NAME	CREATION DATE	CURVE DESCRIPTION
1:BIT	Dec 10 15:56:46 2011	BIT SIZE
1:CALX	Dec 10 15:56:46 2011	CALIPER FROM X-AXIS OF XY CALIPER(S)
1:CHT	Dec 10 15:56:46 2011	CABLE HEAD TENSION
1:CNCLS	Dec 10 15:56:46 2011	BOREHOLE SIZE CORRECTED LIMESTONE COMPENSATED NEU POROSITY
1:DTCQI	Dec 10 15:56:46 2011	COMPRESSIONAL WAVE SLOWNESS
1:GR	Dec 10 15:56:46 2011	GAMMA RAY
1:M2R1	Dec 10 15:56:46 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 10-INCH DOI
1:M2R2	Dec 10 15:56:46 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 20-INCH DOI
1:M2R3	Dec 10 15:56:46 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 30-INCH DOI
1:M2R6	Dec 10 15:56:46 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 60-INCH DOI
1:M2R9	Dec 10 15:56:46 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 90-INCH DOI
1:M2RX	Dec 10 15:56:46 2011	VERTICAL 2-FOOT RESOLUTION MATCHED RESISTIVITY, 120-INCH DOI
1:PE	Dec 10 15:56:46 2011	PHOTO ELECTRIC CROSS-SECTION
1:PZLS	Dec 10 15:56:46 2011	POROSITY FOR LIMESTONE MATRIX
1:SP	Dec 10 15:56:46 2011	SPONTANEOUS POTENTIAL
1:SPDH	Dec 10 15:56:46 2011	SPONTANEOUS POTENTIAL PROCESSED IN COMMON REMOTE
1:TEN	Dec 10 15:56:46 2011	DIFFERENTIAL TENSION
1:ZCOR	Dec 10 15:56:46 2011	DENSITY CORRECTION

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
BIT	0.00	GR	31.55	M2R9	2.44	SPDH	4.27
CALX	24.92	M2R1	2.44	M2RX	2.44	TEN	0.00
CHT	0.00	M2R2	2.44	PE	24.69	ZCOR	24.69
CNCLS	28.04	M2R3	2.44	PZLS	24.69		
DTCQI	14.63	M2R6	2.44	SP	4.27		

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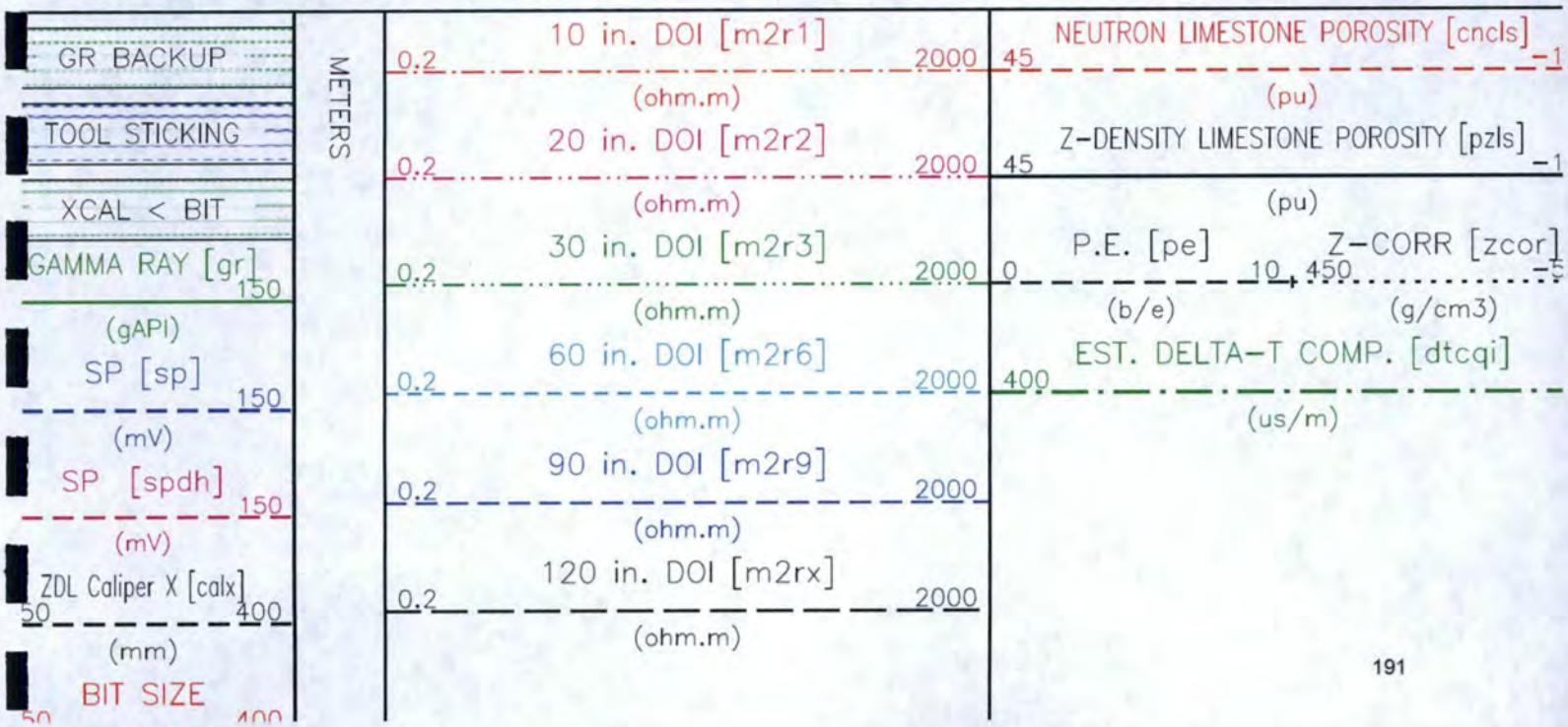
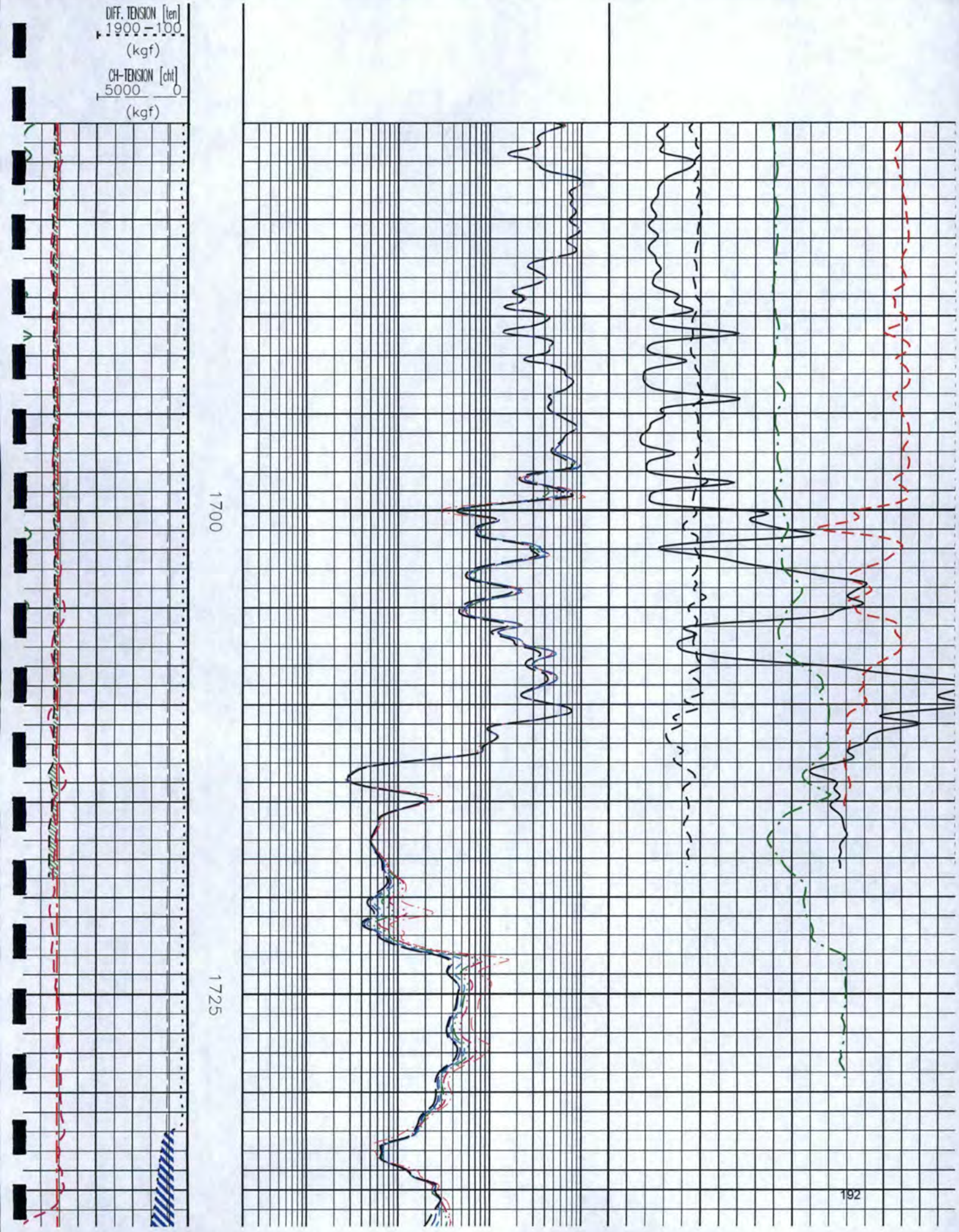
pt Interval : 1680 - 1744.22 Meters

Data File 1 : F1 : cpu1:/dat1a/pass/gzd100medhat_8_36_19_1/1repeat.xtf
Created On : Dec 10 15:56:46 2011
Company : GRIZZLY DISCOVERIES INC
Well : GZD100 MEDHAT 8-36-19-1
Field : MEDICINE HAT
File Interval : 1576.43 - 1744.22 Meters
Oct : m771l

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(kgf)
CH-TENSION [cht]
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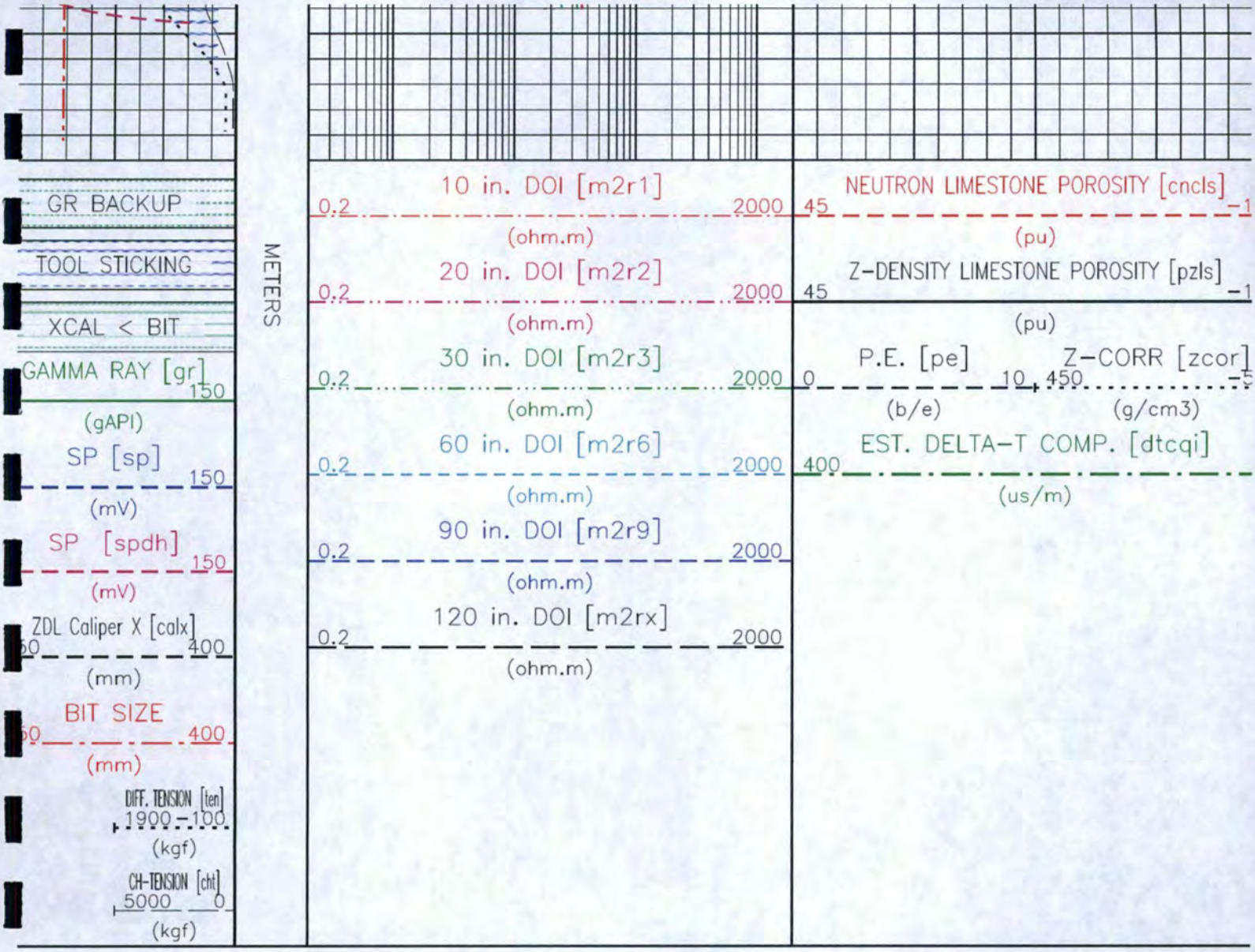
1725



CALIBRATION / VERIFICATION SUMMARY

urce File: /dat1a/pass/gzd100medhat_8_36_19_1/m771l.tp1

CHT PRIMARY CALIBRATION SUMMARY

TOOL #: 3981XA 11748299

DATE/TIME PERFORMED: Sat Dec 10 13:55:50 2011

UNIT #: 3880TB Z006548

	Signal Low (raw)	Signal High (raw)	Scale Mult	Scale Add	Engr Low (kgf)	Engr High (kgf)
CHT	-41.20	570.73	1.64	175.59	108.20	1109.10

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 11756181 DATE/TIME PERFORMED: Fri Dec 2 16:16:12 2011

UNIT #: 3880TB Z006548 CALB JIG #: 4702NK DA-522

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	158.04	1070.27	912.2 (830.0 960.0)	0.164	25.99	175.99	150

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 11756181 DATE/TIME PERFORMED: Fri Dec 2 16:21:18 2011

UNIT #: 3880TB Z006548 VERI JIG #: 4702NK DA-522

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	158.47	1072.89	0.164	26.06	176.42	150.36 (140.00 160.00)

GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1329XA 11756181 DATE/TIME PERFORMED: Sat Dec 10 14:04:23 2011 DAYS SINCE CAL: 7

UNIT #: 3880TB Z006548 VERI JIG #: 4702NK DA-522

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	232.16	1129.09	0.164	38.17	185.66	147.49 (140.36 160.36)

GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 1329XA 11756181 DATE/TIME PERFORMED: Sat Dec 10 19:20:24 2011 DAYS SINCE CAL: 8

UNIT #: 3880TB Z006548 VERI JIG #: 4702NK DA-522

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	264.91	1171.84	0.164	43.56	192.69	149.13 (137.49 157.49)

CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2446XA 153106 DATE/TIME PERFORMED: Sat Nov 12 18:02:11 2011

UNIT #: 5753XB 10143390 CALIBRATOR #: 2437XB 112675 SOURCE #: 4717XS 370248

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	NOMINAL SSN/LSN	CORRECTION FACTOR	POROSITY (pu)
LSN	770.21	784.71				
SSN	1962.87	2043.08				
RATIO			2.60361	2.75100	1.05661 0.97000 1.07000	
CN						21.358

CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 153106 DATE/TIME PERFORMED: Sat Nov 12 18:09:49 2011

UNIT #: 5753XB 10143390 ICE BLOCK #: 4717ND D--435

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	2325.10	2462.57				
SSN	4537.28	4990.21				
RATIO			2.02642	1.05661	2.14195	
CN						13.223

CN BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2446XA 153106 DATE/TIME PERFORMED: Sat Dec 10 14:11:31 2011 DAYS SINCE CAL: 27

UNIT #: 3880TB Z006548 ICE BLOCK #: 4717ND D--435

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	2291.82	2425.27				
SSN	4527.86	4978.82				
RATIO			2.05290	1.05661	2.16999	
CN						13.573 11.223 15.223

CN AFTER LOG VERIFICATION SUMMARY

TOOL #: 2446XA 153106 DATE/TIME PERFORMED: Sat Dec 10 19:15:24 2011 DAYS SINCE CAL: 28

UNIT #: 3880TB Z006548 ICE BLOCK #: 4717ND D--435

	MEASURED CPS	DEADTM CORR CPS	DTC SSN/LSN	CORRECTION FACTOR	DTC CORR SSN/LSN	POROSITY (pu)
LSN	2280.64	2412.79				
SSN	4538.86	4992.13				
RATIO			2.06903	1.05661	2.18751	
CN						13.794 (11.573 – 15.573)

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 167962 DATE/TIME PERFORMED: Sun Dec 4 19:55:25 2011

UNIT #: 3880TB Z006548

	SMALL RING	LARGE RING	MULT	ADD	SMALL RING (mm)	LARGE RING (mm)
CALIPER	2012.0	2895.2	0.20131	-227.24257	177.800	355.600

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 167962 DATE/TIME PERFORMED: Sat Dec 10 14:48:13 2011 DAYS SINCE CAL: 5

UNIT #: 3880TB Z006548

	I.D.	MULT	ADD	I.D. (mm)
CALIPER	2262.0	0.20131	-226.77094	228.600

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 167962 DATE/TIME PERFORMED: Sat Dec 10 18:19:16 2011 DAYS SINCE CAL: 5

UNIT #: 3880TB Z006548

	I.D.	MULT	ADD	I.D.

AFTER:	[illegible]	[illegible]	[illegible]	[illegible]
				215.900 241.300

ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2234XA 167962 DATE/TIME PERFORMED: Sat Nov 12 16:54:43 2011

UNIT: 5753XB 10143390 CALB BLKS: 2225XA 094290 CS SRC: 4703NT 16050B

SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)
224.6 (220.0 – 230.0)	224.3 (220.0 – 230.0)	1712.9	1736.3

	SS (cps)	LS (cps)	SHR	DEN (kg/m3)	CORR (kg/m3)	PE (b/e)
MG (LO PE)	21165.2	11852.1	0.664 (0.565 – 0.665)	1697.000	2.000	2.140
AL	12324.2	1187.7		2700.000	-4.000	
AL + SHIM	17035.9	2097.9		2614.000	157.000	
MG + SHIM (HI PE)	10227.9	5585.1	0.268 (0.210 – 0.270)			8.550
RATIO AL + SHIM/AL	1.38 (1.32 – 1.42)	1.77 (1.64 – 1.84)				
RATIO MG/AL	1.72 (1.65 – 1.78)	9.98 (9.40 – 10.20)				

ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 167962 DATE/TIME PERFORMED: Sat Dec 10 14:00:10 2011 DAYS SINCE CAL: 27

UNIT #: 3880TB Z006548

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	1728.9 (1636.3 – 1836.3)	227.6 (220.0 – 230.0)	1278.0 (1100.0 – 1550.0)
SS	1733.2 (1612.9 – 1812.9)	225.3 (220.0 – 230.0)	1284.0 (1100.0 – 1550.0)

LV (V)	PAD CURRENT (mA)
5.0 (4.8 – 5.2)	66.9 (50.0 – 120.0)

ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 167962 DATE/TIME PERFORMED: Sat Dec 10 19:22:01 2011 DAYS SINCE CAL: 28

UNIT #: 3880TB Z006548

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	1717.5 (1636.3 – 1836.3)	223.8 (220.0 – 230.0)	1272.0 (1100.0 – 1550.0)
SS	1725.4 (1612.9 – 1812.9)	224.0 (220.0 – 230.0)	1276.2 (1100.0 – 1550.0)

LV (V)	PAD CURRENT (mA)
5.0 (4.8 – 5.2)	65.5 (50.0 – 120.0)

HDIL PRIMARY CALIBRATION SUMMARY

TOOL #: 1515MA 167570 DATE/TIME PERFORMED: Fri Nov 25 16:45:20 2011

UNIT #: 5753XB 10108816 GRCOND ID & DATE: Nisku 0802111

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-0.003 (-0.200 – 0.200)	-0.003 (-0.100 – 0.100)	-0.007 (-0.100 – 0.100)	-0.002 (-0.100 – 0.100)	-0.002 (-0.100 – 0.100)	-0.001 (-0.100 – 0.100)	0.000 (-0.100 – 0.100)	0.001 (-0.100 – 0.100)
Coil 0 Q	0.043 (-1.000 – 1.000)	0.017 (-0.200 – 0.200)	0.007 (-0.100 – 0.100)	0.002 (-0.100 – 0.100)	0.002 (-0.100 – 0.100)	-0.000 (-0.100 – 0.100)	-0.003 (-0.100 – 0.100)	-0.002 (-0.100 – 0.100)
Coil 1 R	-0.004 (-0.200 – 0.200)	-0.001 (-0.100 – 0.100)	-0.004 (-0.100 – 0.100)	0.000 (-0.100 – 0.100)	-0.000 (-0.100 – 0.100)	0.001 (-0.100 – 0.100)	0.001 (-0.100 – 0.100)	0.000 (-0.100 – 0.100)
Coil 1 Q	0.032 (-1.000 – 1.000)	0.011 (-0.200 – 0.200)	0.006 (-0.100 – 0.100)	0.002 (-0.100 – 0.100)	0.002 (-0.100 – 0.100)	0.002 (-0.100 – 0.100)	-0.001 (-0.100 – 0.100)	-0.001 (-0.100 – 0.100)
Coil 2 R	0.009 (-0.200 – 0.200)	-0.002 (-0.100 – 0.100)	-0.013 (-0.100 – 0.100)	-0.008 (-0.100 – 0.100)	-0.003 (-0.100 – 0.100)	0.009 (-0.100 – 0.100)	0.019 (-0.100 – 0.100)	0.026 (-0.100 – 0.100)
Coil 2 Q	0.033 (-1.000 – 1.000)	0.010 (-0.200 – 0.200)	0.004 (-0.100 – 0.100)	-0.007 (-0.100 – 0.100)	-0.015 (-0.100 – 0.100)	-0.021 (-0.100 – 0.100)	-0.016 (-0.100 – 0.100)	-0.005 (-0.100 – 0.100)
Coil 3 R	-0.004 (-0.100 – 0.100)	-0.004 (-0.100 – 0.100)	-0.008 (-0.100 – 0.100)	0.001 (-0.100 – 0.100)	0.002 (-0.100 – 0.100)	0.005 (-0.100 – 0.100)	-0.001 (-0.100 – 0.100)	0.005 (-0.100 – 0.100)
Coil 3 Q	0.040 (-0.500 – 0.500)	0.003 (-0.200 – 0.200)	0.002 (-0.100 – 0.100)	-0.002 (-0.100 – 0.100)	-0.003 (-0.100 – 0.100)	-0.001 (-0.100 – 0.100)	-0.003 (-0.100 – 0.100)	-0.002 (-0.100 – 0.100)
Coil 4 R	-0.007 (-0.200 – 0.200)	-0.012 (-0.200 – 0.200)	-0.013 (-0.200 – 0.200)	-0.007 (-0.200 – 0.200)	0.001 (-0.200 – 0.200)	0.005 (-0.200 – 0.200)	0.009 (-0.200 – 0.200)	0.011 (-0.200 – 0.200)
Coil 4 Q	0.084 (-1.000 – 1.000)	0.024 (-0.400 – 0.400)	0.008 (-0.200 – 0.200)	0.002 (-0.200 – 0.200)	-0.003 (-0.200 – 0.200)	-0.012 (-0.200 – 0.200)	-0.005 (-0.200 – 0.200)	-0.000 (-0.200 – 0.200)
Coil 5 R	-0.007 (-0.400 – 0.400)	-0.008 (-0.400 – 0.400)	-0.023 (-0.400 – 0.400)	-0.011 (-0.400 – 0.400)	-0.014 (-0.400 – 0.400)	-0.015 (-0.400 – 0.400)	-0.008 (-0.400 – 0.400)	0.003 (-0.400 – 0.400)
Coil 5 Q	0.153 (-2.000 – 2.000)	0.049 (-0.800 – 0.800)	0.030 (-0.400 – 0.400)	0.012 (-0.400 – 0.400)	0.003 (-0.400 – 0.400)	-0.012 (-0.400 – 0.400)	-0.005 (-0.400 – 0.400)	-0.016 (-0.400 – 0.400)
Coil 6 R	-0.020 (-1.000 – 1.000)	-0.024 (-1.000 – 1.000)	-0.061 (-1.000 – 1.000)	-0.053 (-1.000 – 1.000)	-0.034 (-1.000 – 1.000)	-0.012 (-1.000 – 1.000)	0.012 (-1.000 – 1.000)	0.030 (-1.000 – 1.000)

	-5.000 5.000	-2.000 2.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	127.77 100.00 150.00	126.55 100.00 150.00	124.24 98.00 150.00	120.84 96.00 140.00	116.29 92.00 140.00	110.70 87.00 130.00	103.72 82.00 120.00	95.85 76.00 110.00
Coil 0 P	7.289 6.000 9.000	23.118 19.000 28.000	38.680 32.000 47.000	54.286 44.000 66.000	69.899 57.000 85.000	85.663 70.000 100.000	101.464 82.000 120.000	117.292 95.000 140.000
Coil 1 M	222.44 180.00 270.00	220.19 180.00 270.00	215.89 170.00 260.00	209.57 170.00 250.00	200.97 160.00 250.00	190.44 160.00 230.00	177.46 150.00 220.00	163.02 140.00 200.00
Coil 1 P	7.531 6.000 9.000	23.781 19.000 28.000	39.752 32.000 48.000	55.791 45.000 67.000	71.801 57.000 86.000	87.992 70.000 110.000	104.138 83.000 120.000	120.237 96.000 140.000
Coil 2 M	453.18 360.00 540.00	448.21 360.00 540.00	438.76 350.00 530.00	425.02 340.00 510.00	406.77 330.00 500.00	384.69 310.00 470.00	358.46 300.00 440.00	329.00 270.00 410.00
Coil 2 P	7.621 6.000 9.000	24.201 19.000 29.000	40.446 32.000 48.000	56.697 45.000 67.000	72.912 58.000 87.000	89.194 71.000 110.000	105.373 84.000 130.000	121.573 96.000 140.000
Coil 3 M	745.46 590.00 880.00	738.52 580.00 870.00	725.19 570.00 850.00	705.63 550.00 830.00	678.95 530.00 800.00	645.17 500.00 760.00	602.92 470.00 710.00	555.54 440.00 650.00
Coil 3 P	7.636 6.000 10.000	24.044 20.000 29.000	40.228 33.000 49.000	56.499 46.000 69.000	72.818 59.000 89.000	89.330 72.000 110.000	105.817 85.000 130.000	122.387 98.000 150.000
Coil 4 M	1124.9 900.0 1400.0	1113.3 900.0 1300.0	1091.1 900.0 1300.0	1059.0 850.0 1300.0	1015.7 800.0 1200.0	963.1 800.0 1200.0	898.7 750.0 1100.0	827.2 700.0 1000.0
Coil 4 P	7.727 6.000 10.000	24.380 20.000 30.000	40.768 33.000 50.000	57.169 46.000 70.000	73.574 60.000 90.000	90.068 73.000 110.000	106.554 86.000 130.000	123.046 99.000 150.000
Coil 5 M	2301.3 1900.0 2800.0	2278.5 1800.0 2800.0	2234.5 1800.0 2700.0	2170.2 1800.0 2600.0	2083.5 1700.0 2500.0	1976.9 1600.0 2400.0	1846.0 1500.0 2200.0	1698.7 1400.0 2100.0
Coil 5 P	8.060 6.000 10.000	25.314 20.000 31.000	42.324 34.000 51.000	59.378 48.000 72.000	76.459 62.000 93.000	93.695 76.000 110.000	110.915 89.000 130.000	128.215 100.000 150.000
Coil 6 M	5890.9 4700.0 7100.0	5824.5 4700.0 7000.0	5698.5 4600.0 6900.0	5516.3 4400.0 6600.0	5274.9 4200.0 6400.0	4982.0 4000.0 6000.0	4629.3 3700.0 5600.0	4240.2 3400.0 5100.0
Coil 6 P	8.429 7.000 10.000	26.411 22.000 32.000	44.117 36.000 54.000	61.834 51.000 76.000	79.543 65.000 98.000	97.341 80.000 120.000	115.085 94.000 140.000	132.867 110.000 160.000

AM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	521 -200 800	-55 -500 200	-124 -600 100	-147 -600 50	-157 -500 20	-162 -500 20	-165 -500 20	-166 -500 20
Coil 0 Q	3192 -3000 6000	1136 -1000 2000	665 -1000 1200	447 -500 900	315 -400 700	222 -400 600	151 -400 500	94 -400 400
Coil 1 R	589 450 650	84 20 130	21 -30 60	-1 -50 40	-10 -55 30	-16 -60 20	-20 -60 10	-22 -60 10
Coil 1 Q	1186 0 2500	478 0 900	297 0 600	213 0 450	163 0 350	130 0 300	106 0 250	87 0 250
Coil 2 R	189.0 140.0 230.0	24.8 0.0 51.0	5.4 -10.0 25.0	-0.3 -15.0 15.0	-3.1 -16.0 10.0	-4.3 -16.0 7.0	-5.4 -16.0 5.0	-5.9 -16.0 3.0
Coil 2 Q	626.2 -200.0 1000.0	235.8 0.0 350.0	146.5 0.0 220.0	107.2 0.0 160.0	85.7 0.0 130.0	72.2 0.0 110.0	62.9 0.0 100.0	56.5 0.0 90.0
Coil 3 R	51.5 37.0 62.0	7.3 0.0 12.0	1.9 -3.0 6.0	0.0 -4.0 4.0	-1.0 -5.0 2.0	-1.5 -5.0 1.0	-2.4 -6.0 1.0	-2.5 -6.0 1.0
Coil 3 Q	143.4 -140.0 280.0	57.2 -40.0 100.0	38.7 -20.0 70.0	32.0 -10.0 60.0	28.9 -10.0 50.0	27.6 -10.0 50.0	27.4 -10.0 50.0	26.8 -10.0 50.0
Coil 4 R	11.76 2.00 18.00	0.27 -3.00 6.00	-1.05 -3.50 3.00	-1.34 -3.90 2.00	-1.30 -4.20 2.00	-1.54 -4.50 2.00	-1.63 -4.70 2.00	-1.58 -5.00 2.00

Coil 5 R	3.39	0.02	-0.63	-0.83	-0.92	-1.13	-1.00	-1.10
	-2.00 5.80	-3.20 2.40	-4.50 3.10	-4.70 3.20	-4.80 3.20	-5.00 3.30	-5.20 3.40	-5.40 3.50
Coil 5 Q	0.14	2.65	4.91	7.29	9.69	11.94	14.52	16.82
	-60.00 70.00	-20.00 30.00	-20.00 30.00	-20.00 35.00	-20.00 45.00	-20.00 50.00	-20.00 60.00	-30.00 70.00
Coil 6 R	0.05	-0.22	-0.25	-0.43	-0.44	-0.47	-0.55	-0.61
	-4.80 1.00	-5.70 3.80	-6.50 4.90	-6.90 5.40	-7.30 5.80	-7.50 6.00	-7.70 6.10	-7.90 6.30
Coil 6 Q	-13.34	-3.11	0.94	4.18	6.98	9.72	12.42	14.96
	-30.00 30.00	-20.00 25.00	-20.00 35.00	-30.00 50.00	-35.00 60.00	-40.00 70.00	-50.00 80.00	-60.00 100.00

MM Factor	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	0.970	0.970	0.966	0.966	0.963	0.962	0.959	0.959
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 0 P	-0.086	0.026	0.092	0.085	0.060	-0.042	-0.044	-0.120
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 1 M	0.957	0.957	0.954	0.954	0.950	0.949	0.945	0.946
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 1 P	-0.020	0.064	0.113	0.157	0.117	0.048	0.001	-0.134
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 2 M	0.974	0.971	0.970	0.969	0.967	0.966	0.963	0.963
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 2 P	-0.003	-0.022	-0.043	-0.027	-0.025	-0.101	-0.102	-0.121
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 3 M	0.970	0.969	0.969	0.969	0.966	0.966	0.964	0.966
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 3 P	0.015	-0.038	-0.046	-0.042	-0.067	-0.144	-0.212	-0.177
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 4 M	0.975	0.974	0.974	0.973	0.971	0.971	0.967	0.967
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 4 P	0.002	-0.027	-0.061	-0.047	-0.069	-0.131	-0.141	-0.254
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 5 M	0.973	0.973	0.974	0.972	0.970	0.971	0.967	0.967
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 5 P	-0.059	-0.122	-0.093	-0.087	-0.129	-0.205	-0.166	-0.230
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000
Coil 6 M	0.963	0.966	0.966	0.965	0.964	0.969	0.966	0.966
	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100	0.900 1.100
Coil 6 P	-0.039	-0.079	-0.211	-0.181	-0.287	-0.438	-0.394	-0.539
	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000	-2.000 2.000

PARMS	TCID 0	TCID 1	Cal Temp (degC)	T Factor
IDs	1.839	0.990	17.9	1.04

HDIL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1515MA 167570 DATE/TIME PERFORMED: Sat Dec 10 14:37:56 2011 DAYS SINCE CAL: 14

UNIT #: 3880TB Z006548

Coil 0 R	-0.005	-0.005	-0.006	-0.007	-0.006	-0.006	-0.005	-0.004
	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 0 Q	0.042	0.019	0.008	0.004	0.004	-0.000	-0.002	-0.002
	-1.000 1.000	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 1 R	0.002	-0.001	-0.004	-0.005	-0.005	-0.005	-0.004	-0.003
	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 1 Q	0.031	0.014	0.010	0.005	0.002	0.000	-0.002	-0.002
	-1.000 1.000	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 2 R	0.013	-0.004	-0.015	-0.017	-0.009	-0.003	0.010	0.019
	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 2 Q	0.029	0.011	0.008	-0.003	-0.014	-0.020	-0.017	-0.008
	-1.000 1.000	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 3 R	-0.013	-0.008	-0.005	-0.007	-0.003	-0.003	-0.002	-0.001
	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 3 Q	0.039	0.007	0.010	0.003	-0.000	0.001	-0.004	-0.004
	-0.500 0.500	-0.200 0.200	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100	-0.100 0.100
Coil 4 R	-0.005	-0.010	-0.013	-0.015	-0.009	-0.004	-0.004	0.006
	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200
Coil 4 Q	0.084	0.037	0.012	0.003	0.004	-0.009	-0.007	-0.006
	-1.000 1.000	-0.400 0.400	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200	-0.200 0.200
Coil 5 R	-0.016	-0.016	-0.022	-0.019	-0.012	-0.019	-0.013	-0.007
	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400
Coil 5 Q	0.153	0.044	0.018	-0.003	0.005	0.003	-0.013	-0.007
	-2.000 2.000	-0.800 0.800	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400	-0.400 0.400
Coil 6 R	-0.008	-0.032	-0.052	-0.064	-0.044	-0.008	-0.001	0.030
	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000
Coil 6 Q	0.212	0.075	0.040	0.017	-0.011	-0.048	-0.042	-0.033
	-5.000 5.000	-2.000 2.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000	-1.000 1.000

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	127.52	126.32	123.95	120.54	115.96	110.28	103.36	95.43
	100.00 150.00	100.00 150.00	98.00 150.00	96.00 140.00	92.00 140.00	87.00 130.00	82.00 120.00	76.00 110.00
Coil 0 P	7.363	23.313	38.994	54.709	70.438	86.292	102.135	118.085
	6.000 9.000	19.000 28.000	32.000 47.000	44.000 66.000	57.000 85.000	70.000 100.000	82.000 120.000	95.000 140.000
Coil 1 M	225.76	223.44	219.00	212.54	203.81	192.96	179.81	165.16
	180.00 270.00	180.00 270.00	170.00 260.00	170.00 250.00	160.00 250.00	160.00 230.00	150.00 220.00	140.00 200.00
Coil 1 P	7.600	23.946	40.031	56.149	72.305	88.563	104.754	120.997
	6.000 9.000	19.000 28.000	32.000 48.000	45.000 67.000	57.000 86.000	70.000 110.000	83.000 120.000	96.000 140.000
Coil 2 M	454.28	450.37	440.73	426.92	408.64	386.24	359.67	330.19
	360.00 540.00	360.00 540.00	350.00 530.00	340.00 510.00	330.00 500.00	310.00 470.00	300.00 440.00	270.00 410.00
Coil 2 P	4.286	23.255	40.117	56.702	73.154	89.622	105.950	122.309
	6.000 9.000	19.000 29.000	32.000 48.000	45.000 67.000	58.000 87.000	71.000 110.000	84.000 130.000	96.000 140.000
Coil 3 M	741.99	735.04	721.62	701.93	675.11	641.10	599.48	551.49
	590.00 880.00	580.00 870.00	570.00 850.00	550.00 830.00	530.00 800.00	500.00 760.00	470.00 710.00	440.00 650.00
Coil 3 P	7.700	24.209	40.535	56.879	73.322	89.904	106.472	123.171
	6.000 10.000	20.000 29.000	33.000 49.000	46.000 69.000	59.000 89.000	72.000 110.000	85.000 130.000	98.000 150.000
Coil 4 M	1135.1	1123.3	1100.4	1067.6	1024.1	970.2	905.8	832.9
	900.0 1400.0	900.0 1300.0	900.0 1300.0	850.0 1300.0	800.0 1200.0	800.0 1200.0	750.0 1100.0	700.0 1000.0
Coil 4 P	7.777	24.498	40.962	57.429	73.909	90.456	106.959	123.523
	6.000 10.000	20.000 30.000	33.000 50.000	46.000 70.000	60.000 90.000	73.000 110.000	86.000 130.000	99.000 150.000
Coil 5 M	2294.5	2271.3	2226.8	2162.3	2075.7	1968.3	1837.4	1689.9
	1900.0 2800.0	1800.0 2800.0	1800.0 2700.0	1800.0 2600.0	1700.0 2500.0	1600.0 2400.0	1500.0 2200.0	1400.0 2100.0

Coil 6 M	5905.0	5838.6	5710.3	5526.4	5282.9	4986.8	4632.4	4238.0
	4700.0 7100.0	4700.0 7000.0	4600.0 6900.0	4400.0 6600.0	4200.0 6400.0	4000.0 6000.0	3700.0 5600.0	3400.0 5100.0
Coil 6 P	8.484	26.552	44.353	62.159	79.959	97.818	115.621	133.487
	7.000 10.000	22.000 32.000	36.000 54.000	51.000 76.000	65.000 98.000	80.000 120.000	94.000 140.000	110.000 160.000

HDIL AFTER LOG VERIFICATION SUMMARY

TOOL #: 1515MA 167570 DATE/TIME PERFORMED: Sat Dec 10 18:25:11 2011 DAYS SINCE CAL: 15

UNIT #: 3880TB Z006548

ZERO DATA(mv)	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 R	-0.002	-0.006	-0.005	-0.005	-0.007	-0.006	-0.005	-0.005
	-0.085 0.075	-0.065 0.055	-0.036 0.024	-0.037 0.023	-0.036 0.024	-0.036 0.024	-0.035 0.025	-0.034 0.026
Coil 0 Q	0.042	0.019	0.008	0.004	0.003	0.000	-0.002	-0.002
	0.002 0.082	-0.101 0.139	-0.022 0.038	-0.026 0.034	-0.026 0.034	-0.030 0.030	-0.032 0.028	-0.032 0.028
Coil 1 R	0.003	-0.000	-0.004	-0.005	-0.006	-0.006	-0.004	-0.003
	-0.078 0.082	-0.051 0.049	-0.034 0.026	-0.035 0.025	-0.035 0.025	-0.035 0.025	-0.034 0.026	-0.033 0.027
Coil 1 Q	0.031	0.013	0.009	0.005	0.003	0.001	-0.003	-0.003
	-0.369 0.431	-0.086 0.114	-0.020 0.040	-0.025 0.035	-0.028 0.032	-0.030 0.030	-0.032 0.028	-0.032 0.028
Coil 2 R	0.008	-0.006	-0.016	-0.015	-0.009	-0.001	0.008	0.018
	-0.057 0.083	-0.034 0.026	-0.045 0.015	-0.047 0.013	-0.039 0.021	-0.033 0.027	-0.020 0.040	-0.011 0.049
Coil 2 Q	0.032	0.011	0.007	-0.002	-0.015	-0.019	-0.016	-0.009
	-0.321 0.379	-0.089 0.111	-0.022 0.038	-0.033 0.027	-0.044 0.016	-0.050 0.010	-0.047 0.013	-0.038 0.022
Coil 3 R	-0.011	-0.008	-0.005	-0.004	-0.005	-0.005	-0.001	0.000
	-0.053 0.027	-0.048 0.032	-0.045 0.035	-0.047 0.033	-0.043 0.037	-0.043 0.037	-0.042 0.038	-0.041 0.039
Coil 3 Q	0.042	0.012	0.008	0.004	-0.002	-0.001	0.000	-0.003
	-0.161 0.239	-0.073 0.087	-0.030 0.050	-0.037 0.043	-0.040 0.040	-0.039 0.041	-0.044 0.036	-0.044 0.036
Coil 4 R	-0.002	-0.008	-0.015	-0.018	-0.007	-0.010	-0.003	0.005
	-0.065 0.055	-0.070 0.050	-0.073 0.047	-0.075 0.045	-0.069 0.051	-0.064 0.056	-0.064 0.056	-0.054 0.066
Coil 4 Q	0.082	0.032	0.014	0.004	-0.001	-0.010	-0.009	-0.006
	-0.216 0.384	-0.063 0.137	-0.048 0.072	-0.057 0.063	-0.056 0.064	-0.069 0.051	-0.067 0.053	-0.066 0.054
Coil 5 R	-0.014	-0.023	-0.023	-0.024	-0.023	-0.012	-0.004	-0.016
	-0.136 0.104	-0.136 0.104	-0.142 0.098	-0.139 0.101	-0.132 0.108	-0.139 0.101	-0.133 0.107	-0.127 0.113
Coil 5 Q	0.151	0.054	0.021	-0.004	0.002	-0.009	-0.004	-0.010
	-0.447 0.753	-0.206 0.294	-0.102 0.138	-0.123 0.117	-0.115 0.125	-0.117 0.123	-0.133 0.107	-0.127 0.113
Coil 6 R	-0.027	-0.042	-0.040	-0.060	-0.038	-0.033	0.014	0.018
	-0.308 0.292	-0.332 0.268	-0.352 0.248	-0.364 0.236	-0.344 0.256	-0.308 0.292	-0.301 0.299	-0.270 0.330
Coil 6 Q	0.202	0.069	0.049	0.005	-0.035	-0.035	-0.055	-0.030
	-1.288 1.712	-0.525 0.676	-0.260 0.340	-0.283 0.317	-0.311 0.289	-0.348 0.252	-0.342 0.258	-0.333 0.267

ELEC. GAINS	10 KHz	30 KHz	50 KHz	70 KHz	90 KHz	110 KHz	130 KHz	150 KHz
Coil 0 M	127.59	126.39	124.02	120.58	115.96	110.31	103.37	95.40
	124.97 130.07	123.79 128.85	121.47 126.43	118.13 122.96	113.64 118.28	108.07 112.48	101.29 105.42	93.52 97.34
Coil 0 P	7.348	23.308	39.001	54.714	70.465	86.294	102.150	118.139
	4.363 10.363	20.313 26.313	35.994 41.994	51.709 57.709	67.438 73.438	83.292 89.292	99.135 105.135	115.085 121.085
Coil 1 M	225.61	223.32	218.86	212.35	203.65	192.76	179.64	164.81
	221.25 230.28	218.97 227.91	214.62 223.38	208.29 216.79	199.74 207.89	189.10 196.82	176.21 183.40	161.85 168.46
Coil 1 P	7.600	23.955	40.032	56.165	72.333	88.557	104.750	121.025

	445.19 463.36	441.37 459.38	431.91 449.54	418.38 435.45	400.47 416.82	378.51 393.96	352.48 366.87	323.58 336.79
Coil 2 P	4.297	23.265	40.137	56.696	73.181	89.639	105.973	122.324
	1.286 7.286	20.255 26.255	37.117 43.117	53.702 59.702	70.154 76.154	86.622 92.622	102.950 108.950	119.309 125.309
Coil 3 M	742.49	735.55	722.11	702.25	675.34	641.26	599.51	551.59
	727.15 756.83	720.33 749.74	707.19 736.05	687.89 715.97	661.61 688.61	628.28 653.93	587.49 611.47	540.46 562.52
Coil 3 P	7.702	24.222	40.552	56.894	73.351	89.926	106.488	123.185
	4.700 10.700	21.209 27.209	37.535 43.535	53.879 59.879	70.322 76.322	86.904 92.904	103.472 109.472	120.171 126.171
Coil 4 M	1136.2	1124.4	1101.3	1068.6	1024.6	970.7	905.9	832.9
	1112.4 1157.8	1100.8 1145.8	1078.3 1122.4	1046.3 1089.0	1003.6 1044.6	950.8 989.6	887.7 923.9	816.2 849.6
Coil 4 P	7.777	24.504	40.969	57.434	73.931	90.474	106.979	123.545
	4.777 10.777	21.498 27.498	37.962 43.962	54.429 60.429	70.909 76.909	87.456 93.456	103.959 109.959	120.523 126.523
Coil 5 M	2297.2	2273.9	2229.3	2164.4	2077.1	1969.4	1838.8	1690.6
	2248.7 2340.4	2225.9 2316.7	2182.3 2271.4	2119.1 2205.6	2034.2 2117.2	1928.9 2007.6	1800.7 1874.2	1656.1 1723.7
Coil 5 P	8.107	25.453	42.546	59.671	76.859	94.129	111.391	128.787
	5.107 11.107	22.446 28.446	39.540 45.540	56.665 62.665	73.841 79.841	91.132 97.132	108.394 114.394	125.768 131.768
Coil 6 M	5913.9	5847.2	5718.8	5533.0	5288.1	4991.7	4635.6	4239.1
	5786.9 6023.1	5721.8 5955.3	5596.1 5824.5	5415.8 5636.9	5177.3 5388.6	4887.1 5086.6	4539.8 4725.1	4153.3 4322.8
Coil 6 P	8.485	26.562	44.370	62.185	79.985	97.853	115.652	133.533
	5.484 11.484	23.552 29.552	41.353 47.353	59.159 65.159	76.959 82.959	94.818 100.818	112.621 118.621	130.487 136.487

BAKER HUGHES

ECLIPS

COMPANY	GRIZZLY DISCOVERIES INC	FILE NO:
WELL	GZD100 MEDHAT 8-36-19-1	
FIELD	MEDICINE HAT	API NO:
PROVINCE	ALBERTA	

LOCATION:

SURFACE LOC LSD: 8-36-19-1

BH LSD: 8

SEC 036 TWP 019 RGE 01W4

ELEVATIONS:

KB 736.65 M

DF

GL 732.7 M

UWI: 100083601901W400

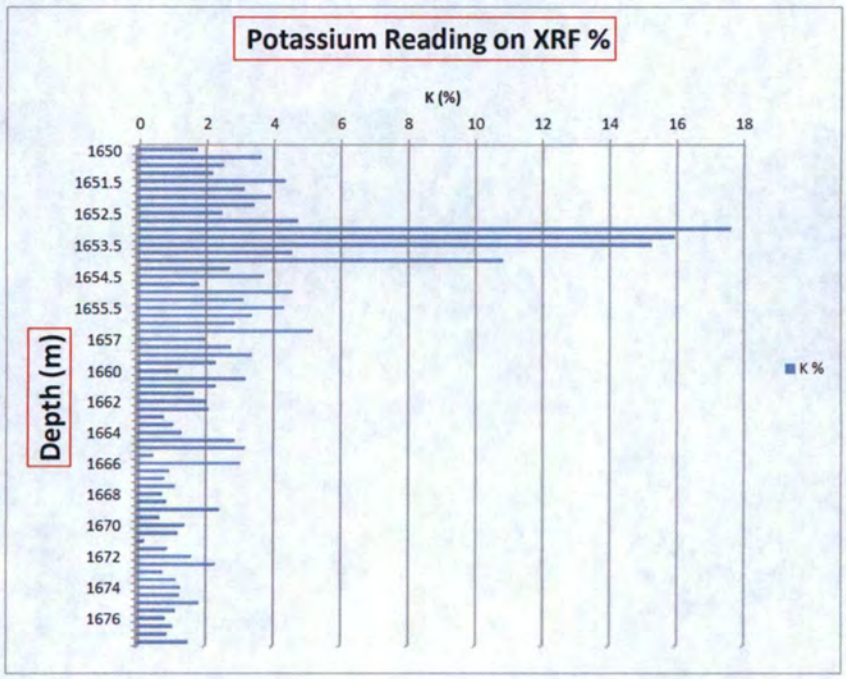
LICENCE: 0439272

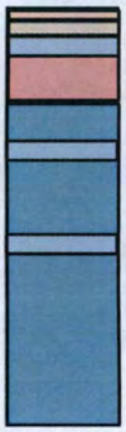
DATE 10-DEC-2011

Appendix 8

2011 Drillhole GZD100 MEDHAT 8-36-19-1W4 Sample Results

Depth	K % (XRF)
1650	1.76
1650.5	3.66
1651	2.53
1651.25	2.21
1651.5	4.37
1651.75	3.15
1652	3.95
1652.25	3.44
1652.5	2.49
1652.75	4.74
1653	17.64
1653.25	15.96
1653.5	15.28
1653.75	4.57
1654	10.85
1654.25	2.71
1654.5	3.74
1654.75	1.81
1655	4.58
1655.25	3.12
1655.5	4.32
1655.75	3.36
1656	2.85
1656.5	5.19
1657	1.98
1657.5	2.74
1658	3.37
1658.5	2.31
1660	1.19
1660.5	3.18
1661	2.3
1661.5	1.66
1662	2.05
1662.5	2.1
1663	0.77
1663.5	1.05
1664	1.3
1664.5	2.88
1665	3.19
1665.5	0.45
1666	3.04
1666.5	0.925
1667	0.781
1667.5	1.1
1668	0.727
1668.5	0.844
1669	2.42
1669.5	0.637
1670	1.39
1670.5	1.19
1671	0.194
1671.5	0.866
1672	1.59
1672.5	2.29
1673	0.743
1673.5	1.12
1674	1.26
1674.5	1.23
1675	1.81
1675.5	1.11
1676	0.814
1676.5	1.04
1677	0.864
1677.5	1.49





not depth corrected
see Exova logs for depth correction info

SRC Geoanalytical Laboratories
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Report No: G-12-137

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Date of Report: February 10, 2012

Moisture and Insoluble Determination

Column Header Details

Insoluble Determination of Potash in % (Insols)
Moisture at 105C in wt % (Moisture)

Sample Number	Insols %	Moisture wt %
POT003	N/R	N/R
GZD 100 8-36-19-1 19-01 78501	0.4	0.1
GZD 100 8-36-19-1 19-02 78502	0.4	0.1
GZD 100 8-36-19-1 19-03 78503	3.1	0.1
GZD 100 8-36-19-1 19-04 78504	2.6	<0.1
GZD 100 8-36-19-1 19-05 78505	0.3	<0.1
GZD 100 8-36-19-1 19-06 78506	0.3	<0.1
GZD 100 8-36-19-1 19-07 78507	0.3	<0.1
GZD 100 8-36-19-1 19-08 78508	6.2	0.1
GZD 100 8-36-19-1 19-09 78509	4.4	<0.1
GZD 100 8-36-19-1 19-10 78510	18.4	0.4
GZD 100 8-36-19-1 19-11 78511	5.3	0.1
GZD 100 8-36-19-1 19-12 78512	4.4	<0.1
GZD 100 8-36-19-1 19-13 78513	5.7	<0.1
GZD 100 8-36-19-1 19-14 78514	0.6	0.1
GZD 100 8-36-19-1 19-15 78515	0.5	0.1
GZD 100 8-36-19-1 19-16 78516	0.6	<0.1
GZD 100 8-36-19-1 19-17 78517	10.0	0.2
GZD 100 8-36-19-1 19-18 78518	1.3	<0.1
GZD 100 8-36-19-1 19-19 78519	0.4	<0.1
POT004	N/R	N/R
GZD 100 8-36-19-1 19-20 78520	1.4	0.1
GZD 100 8-36-19-1 19-21 78521	14.1	0.4
GZD 100 8-36-19-1 19-22 78522	6.6	0.1
GZD 100 8-36-19-1 19-23 78523	7.6	0.1
GZD 100 8-36-19-1 19-24 78524	21.6	0.4
GZD 100 8-36-19-1 19-25 78525	8.4	0.2
GZD 100 8-36-19-1 19-26 78576	8.5	0.1
GZD 100 8-36-19-1 19-27 78577	1.4	<0.1
GZD 100 8-36-19-1 19-28 78578	0.4	<0.1
GZD 100 8-36-19-1 19-29 78579	0.4	<0.1
GZD 100 8-36-19-1 19-30 78580	0.4	<0.1
GZD 100 8-36-19-1 19-31 78581	0.5	<0.1
GZD 100 8-36-19-1 19-32 78582	0.1	<0.1
GZD 100 8-36-19-1 19-33 78583	1.0	<0.1

SRC Geoanalytical Laboratories
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Report No: G-12-137

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Date of Report: February 10, 2012

Moisture and Insoluble Determination

Sample Number	Insols %	Moisture wt %
GZD 100 8-36-19-1 19-34 78584	0.7	<0.1
GZD 100 8-36-19-1 19-35 78585	0.5	<0.1
GZD 100 8-36-19-1 19-36 78586	0.4	<0.1
GZD 100 8-36-19-1 19-37 78587	2.2	<0.1
GZD 100 8-36-19-1 19-33 78583	1.2	<0.1
POT003	N/R	N/R
GZD 100 8-36-19-1 19-38 78588	0.4	<0.1
GZD 100 8-36-19-1 19-39 78589	1.9	<0.1
GZD 100 8-36-19-1 19-40 78590	1.8	<0.1
GZD 100 8-36-19-1 19-41 78591	0.6	<0.1
GZD 100 8-36-19-1 19-42 78592	0.2	<0.1
GZD 100 8-36-19-1 19-43 78593	50.5	0.1
GZD 100 8-36-19-1 19-44 78594	0.5	<0.1
GZD 100 8-36-19-1 19-45 78595	0.7	<0.1
GZD 100 8-36-19-1 19-46 78596	19.8	0.2
GZD 100 8-36-19-1 19-47 78597	0.4	<0.1
GZD 100 8-36-19-1 19-48 78598	7.7	<0.1
GZD 100 8-36-19-1 19-49 78599	2.0	<0.1
GZD 100 8-36-19-1 19-50 78600	3.5	<0.1
GZD 100 8-36-19-1 19-51 11556	2.5	<0.1
GZD 100 8-36-19-1 19-52 11557	5.9	0.1
GZD 100 8-36-19-1 19-53 11558	5.6	0.1
GZD 100 8-36-19-1 19-54 11559	1.4	0.1
GZD 100 8-36-19-1 19-55 11560	4.6	<0.1
GZD 100 8-36-19-1 19-52 11557	5.9	0.1

Insolubles: A 2.00 g pulp is dissolved in 15 ml of 30°C DI water then centrifuged for 2 minutes, decanted and repeated.
Moisture: A 1.00 gram pulp is heated at 105 C overnight and the weight loss determined.

SRC Geoanalytical Laboratories
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Report No: G-12-137

Date of Report: February 10, 2012

Potash ICP1 Soluble

Column Header Details

Silver in ppm (Ag)
Aluminum in wt % (Al_2O_3)
Barium in ppm (Ba)
Berylium in ppm (Be)
Calcium in wt % (CaO)

Cadmium in ppm (Cd)
Cerium in ppm (Ce)
Cobalt in ppm (Co)
Chromium in ppm (Cr)
Copper in ppm (Cu)

Dysprnnosium in ppm (Dy)
Erbium in ppm (Er)
Europium in ppm (Eu)
Iron in wt % (Fe_2O_3)
Gallium in ppm (Ga)

Gadolinium in ppm (Gd)
Hafnium in ppm (Hf)
Holmium in ppm (Ho)
Potassium in wt % (K_2O)
Lanthanum in ppm (La)

Lithium in ppm (Li)
Magnesium in wt % (MgO)
Manganese in wt % (MnO)
Molybdenum in ppm (Mo)
Sodium in wt % (Na_2O)

Niobium in ppm (Nb)
Neodymium in ppm (Nd)
Nickel in ppm (Ni)
Phosphorus in wt % (P_2O_5)
Lead in ppm (Pb)

Praseodymium in ppm (Pr)
Sulfur in ppm (S)
Scandium in ppm (Sc)
Samarium in ppm (Sm)
Tin in ppm (Sn)

Strontium in ppm (Sr)
Tantalum in ppm (Ta)
Terbium in ppm (Tb)
Thorium in ppm (Th)
Titanium in wt % (TiO_2)

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Potash ICP1 Soluble

Column Header Details

Uranium in ppm (U, ICP)
Vanadium in ppm (V)
Tungsten in ppm (W)
Yttrium in ppm (Y)
Ytterbium in ppm (Yb)

Zinc in ppm (Zn)
Zirconium in ppm (Zr)

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Attention: Mike Dufresne
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Samples: 60

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Potash ICP1 Soluble

Sample Number	Ag ppm	Al2O3 wt %	Ba ppm	Be ppm	CaO wt %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Dy ppm	Er ppm	Eu ppm	Fe2O3 wt %	Ga ppm
POT003	<0.2	0.03	<1	<0.2	0.15	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-01 78501	<0.2	0.03	22	<0.2	0.43	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-02 78502	<0.2	0.03	25	<0.2	0.33	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-03 78503	<0.2	0.03	26	<0.2	0.33	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-04 78504	<0.2	0.03	22	<0.2	0.15	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-05 78505	<0.2	0.03	22	<0.2	0.16	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-06 78506	<0.2	0.03	24	<0.2	0.14	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-07 78507	<0.2	0.03	30	<0.2	0.20	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-08 78508	<0.2	0.04	23	<0.2	0.33	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-09 78509	<0.2	0.04	34	<0.2	0.39	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.05	<1
GZD 100 8-36-19-1 19-10 78510	<0.2	0.05	13	<0.2	0.41	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.05	<1
GZD 100 8-36-19-1 19-11 78511	<0.2	0.05	21	<0.2	0.49	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-12 78512	<0.2	0.04	16	<0.2	0.57	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-13 78513	<0.2	0.04	14	<0.2	0.58	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-14 78514	<0.2	0.03	19	<0.2	0.48	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-15 78515	<0.2	0.04	21	<0.2	0.31	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-16 78516	<0.2	0.04	29	<0.2	0.35	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-17 78517	<0.2	0.05	17	<0.2	0.47	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-18 78518	<0.2	0.04	18	<0.2	0.46	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-19 78519	<0.2	0.03	28	<0.2	0.28	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
POT004	<0.2	0.03	<1	<0.2	0.07	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-20 78520	<0.2	0.04	17	<0.2	0.44	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-21 78521	<0.2	0.05	15	<0.2	0.48	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.05	<1
GZD 100 8-36-19-1 19-22 78522	<0.2	0.04	50	<0.2	0.56	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-23 78523	<0.2	0.05	30	<0.2	0.52	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-24 78524	<0.2	0.05	13	<0.2	0.41	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.05	<1
GZD 100 8-36-19-1 19-25 78525	<0.2	0.05	20	<0.2	0.59	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.05	<1
GZD 100 8-36-19-1 19-26 78576	<0.2	0.04	7	<0.2	2.19	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-27 78577	<0.2	0.05	17	<0.2	0.43	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-28 78578	<0.2	0.03	35	<0.2	0.29	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-29 78579	<0.2	0.03	22	<0.2	0.82	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-30 78580	<0.2	0.04	13	<0.2	1.18	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.04	<1
GZD 100 8-36-19-1 19-31 78581	<0.2	0.03	27	<0.2	0.52	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-32 78582	<0.2	0.03	21	<0.2	0.51	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-33 78583	<0.2	0.03	14	<0.2	1.55	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-34 78584	<0.2	0.03	10	<0.2	1.60	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-35 78585	<0.2	0.03	10	<0.2	1.48	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-36 78586	<0.2	0.03	10	<0.2	1.48	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-37 78587	<0.2	0.03	9	<0.2	2.40	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.03	<1
GZD 100 8-36-19-1 19-33 78583	<0.2	0.03	11	<0.2	1.59	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.03	<1

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Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

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Potash ICP1 Soluble

Sample Number	Ag ppm	Al2O3 wt %	Ba ppm	Be ppm	CaO wt %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Dy ppm	Er ppm	Eu ppm	Fe2O3 wt %	Ga ppm
POT003	<0.2	0.02	1	<0.2	0.15	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	0.01	<1
GZD 100 8-36-19-1 19-38 78588	<0.2	<0.01	10	<0.2	1.09	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-39 78589	<0.2	<0.01	6	<0.2	5.06	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-40 78590	<0.2	<0.01	6	<0.2	6.48	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-41 78591	<0.2	<0.01	4	<0.2	6.38	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-42 78592	<0.2	<0.01	10	<0.2	5.17	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-43 78593	<0.2	<0.01	2	<0.2	10.7	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-44 78594	<0.2	0.01	34	<0.2	0.62	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-45 78595	<0.2	0.01	37	<0.2	0.45	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-46 78596	<0.2	0.03	12	<0.2	0.71	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1
GZD 100 8-36-19-1 19-47 78597	<0.2	<0.01	28	<0.2	0.28	<1	<1	<1	1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-48 78598	<0.2	0.01	16	<0.2	0.48	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-49 78599	<0.2	<0.01	27	<0.2	0.42	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-50 78600	<0.2	0.01	35	<0.2	0.54	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-51 11556	<0.2	0.02	19	<0.2	0.65	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-52 11557	<0.2	0.03	17	<0.2	0.64	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.02	<1
GZD 100 8-36-19-1 19-53 11558	<0.2	0.02	18	<0.2	0.55	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-54 11559	<0.2	0.02	29	<0.2	0.28	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1
GZD 100 8-36-19-1 19-55 11560	<0.2	0.01	21	<0.2	0.53	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1
GZD 100 8-36-19-1 19-52 11557	<0.2	0.01	15	<0.2	0.62	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.01	<1

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Samples: 60

Report No: G-12-137

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Potash ICP1 Soluble

Sample Number	Gd ppm	Hf ppm	Ho ppm	K2O wt %	La ppm	Li ppm	MgO wt %	MnO wt %	Mo ppm	Na2O wt %	Nb ppm	Nd ppm	Ni ppm	P2O5 wt %	Pb ppm
POT003	<1	<1	<1	19.3	<1	<1	1.25	<0.01	<1	32.5	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-01 78501	<1	<1	<1	1.69	<1	<1	0.10	<0.01	<1	51.2	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-02 78502	<1	<1	<1	1.22	<1	<1	0.09	<0.01	<1	51.1	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-03 78503	<1	<1	<1	2.34	<1	<1	0.10	<0.01	<1	49.1	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-04 78504	<1	<1	<1	7.27	<1	<1	0.10	<0.01	<1	45.5	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-05 78505	<1	<1	<1	6.93	<1	<1	0.05	<0.01	<1	46.7	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-06 78506	<1	<1	<1	6.48	<1	<1	0.05	<0.01	<1	47.4	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-07 78507	<1	<1	<1	2.68	<1	<1	0.06	<0.01	<1	50.5	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-08 78508	<1	<1	<1	4.46	<1	<1	0.14	<0.01	<1	45.4	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-09 78509	<1	<1	<1	31.1	<1	<1	0.09	<0.01	<1	24.0	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-10 78510	<1	<1	<1	9.69	<1	1	0.18	<0.01	<1	33.4	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-11 78511	<1	<1	<1	2.83	<1	<1	0.12	<0.01	<1	46.9	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-12 78512	<1	<1	<1	5.41	<1	<1	0.11	<0.01	<1	44.8	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-13 78513	<1	<1	<1	5.00	<1	<1	0.11	<0.01	<1	44.6	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-14 78514	<1	<1	<1	2.50	<1	<1	0.08	<0.01	<1	50.7	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-15 78515	<1	<1	<1	2.02	<1	<1	0.08	<0.01	<1	50.6	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-16 78516	<1	<1	<1	1.93	<1	<1	0.08	<0.01	<1	50.3	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-17 78517	<1	<1	<1	1.72	<1	<1	0.15	<0.01	<1	45.9	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-18 78518	<1	<1	<1	1.21	<1	<1	0.09	<0.01	<1	50.2	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-19 78519	<1	<1	<1	1.53	<1	<1	0.09	<0.01	<1	51.3	<1	<1	<1	0.03	<1
POT004	<1	<1	<1	60.3	<1	<1	0.13	<0.01	<1	1.76	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-20 78520	<1	<1	<1	3.05	<1	<1	0.09	<0.01	<1	49.6	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-21 78521	<1	<1	<1	1.38	<1	1	0.19	<0.01	<1	43.6	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-22 78522	<1	<1	<1	1.26	<1	<1	0.13	<0.01	<1	48.2	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-23 78523	<1	<1	<1	1.14	<1	<1	0.13	<0.01	1	47.2	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-24 78524	<1	<1	<1	1.58	<1	1	0.21	<0.01	<1	38.8	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-25 78525	<1	<1	<1	0.87	<1	<1	0.15	<0.01	<1	46.6	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-26 78576	<1	<1	<1	1.12	<1	<1	0.15	<0.01	<1	43.9	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-27 78577	<1	<1	<1	1.29	<1	<1	0.13	<0.01	<1	50.8	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-28 78578	<1	<1	<1	1.25	<1	<1	0.10	<0.01	<1	51.3	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-29 78579	<1	<1	<1	0.84	<1	<1	0.08	<0.01	<1	51.1	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-30 78580	<1	<1	<1	1.51	<1	<1	0.10	<0.01	1	50.3	<1	<1	<1	0.02	<1
GZD 100 8-36-19-1 19-31 78581	<1	<1	<1	2.85	<1	<1	0.08	<0.01	<1	49.3	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-32 78582	<1	<1	<1	2.02	<1	<1	0.06	<0.01	<1	50.4	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-33 78583	<1	<1	<1	1.89	<1	<1	0.05	<0.01	<1	49.1	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-34 78584	<1	<1	<1	3.32	<1	<1	0.06	<0.01	<1	48.5	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-35 78585	<1	<1	<1	2.04	<1	<1	0.06	<0.01	<1	49.4	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-36 78586	<1	<1	<1	2.48	<1	<1	0.06	<0.01	<1	48.6	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-37 78587	<1	<1	<1	1.41	<1	<1	0.06	<0.01	<1	47.8	<1	<1	<1	0.03	<1
GZD 100 8-36-19-1 19-33 78583	<1	<1	<1	1.82	<1	<1	0.06	<0.01	1	49.0	<1	<1	<1	0.03	<1

SRC Geoanalytical Laboratories
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Report No: G-12-137

Date of Report: February 10, 2012

Potash ICP1 Soluble

Sample Number	Gd ppm	Hf ppm	Ho ppm	K2O wt %	La ppm	Li ppm	MgO wt %	MnO wt %	Mo ppm	Na2O wt %	Nb ppm	Nd ppm	Ni ppm	P2O5 wt %	Pb ppm
POT003	<1	<1	<1	19.5	<1	<1	1.25	<0.01	<1	32.0	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-38 78588	<1	<1	<1	1.96	<1	<1	0.04	<0.01	<1	49.4	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-39 78589	<1	<1	<1	1.45	<1	<1	0.04	<0.01	<1	44.6	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-40 78590	<1	<1	<1	1.23	<1	<1	0.04	<0.01	1	42.8	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-41 78591	<1	<1	<1	1.69	<1	<1	0.04	<0.01	<1	43.1	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-42 78592	<1	<1	<1	1.66	<1	<1	0.04	<0.01	<1	45.3	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-43 78593	<1	<1	<1	1.01	<1	<1	0.09	<0.01	<1	11.2	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-44 78594	<1	<1	<1	0.26	<1	<1	0.09	<0.01	<1	51.7	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-45 78595	<1	<1	<1	1.77	<1	<1	0.09	<0.01	<1	50.4	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-46 78596	<1	<1	<1	0.80	<1	1	0.16	<0.01	<1	40.9	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-47 78597	<1	<1	<1	3.39	1	<1	0.05	<0.01	<1	49.9	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-48 78598	<1	<1	<1	0.74	<1	<1	0.10	<0.01	<1	48.2	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-49 78599	<1	<1	<1	0.86	<1	<1	0.05	<0.01	<1	50.8	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-50 78600	<1	<1	<1	0.51	<1	<1	0.06	<0.01	<1	50.1	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-51 11556	<1	<1	<1	0.61	<1	<1	0.07	<0.01	<1	49.6	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-52 11557	<1	<1	<1	0.89	<1	<1	0.11	<0.01	<1	48.4	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-53 11558	<1	<1	<1	1.03	<1	<1	0.10	<0.01	<1	48.3	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-54 11559	<1	<1	<1	0.85	1	<1	0.09	<0.01	<1	51.7	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-55 11560	<1	<1	<1	1.97	1	<1	0.08	<0.01	<1	48.7	<1	<1	<1	<0.01	<1
GZD 100 8-36-19-1 19-52 11557	<1	<1	<1	0.99	<1	<1	0.09	<0.01	<1	48.8	<1	<1	<1	<0.01	<1

SRC Geoanalytical Laboratories
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Report No: G-12-137

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Date of Report: February 10, 2012

Potash ICP1 Soluble

Sample Number	Pr ppm	S ppm	Sc ppm	Sm ppm	Sn ppm	Sr ppm	Ta ppm	Tb ppm	Th ppm	TiO2 wt %	U, ICP ppm	V ppm	W ppm	Y ppm	Yb ppm
POT003	<1	877	<1	<1	<1	9	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-01 78501	<1	3110	<1	<1	<1	20	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-02 78502	<1	2220	<1	<1	<1	18	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-03 78503	<1	1990	<1	<1	<1	17	1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-04 78504	<1	618	<1	<1	<1	10	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-05 78505	<1	1010	<1	<1	<1	6	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-06 78506	<1	875	<1	<1	<1	5	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-07 78507	<1	1330	<1	<1	<1	9	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-08 78508	<1	1970	<1	<1	<1	17	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-09 78509	<1	2760	<1	<1	<1	17	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-10 78510	<1	2600	<1	<1	<1	22	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-11 78511	<1	3470	<1	<1	<1	21	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-12 78512	<1	4140	<1	<1	<1	25	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-13 78513	<1	4460	<1	<1	<1	20	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-14 78514	<1	3550	<1	<1	<1	15	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-15 78515	<1	2160	<1	<1	<1	11	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-16 78516	<1	2520	<1	<1	<1	13	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-17 78517	<1	3120	<1	<1	<1	20	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-18 78518	<1	3380	<1	<1	<1	18	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-19 78519	<1	1780	<1	<1	<1	14	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
POT004	<1	279	<1	<1	<1	2	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-20 78520	<1	3200	<1	<1	<1	20	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-21 78521	<1	3100	<1	<1	<1	25	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-22 78522	<1	3940	<1	<1	<1	26	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-23 78523	<1	3650	<1	<1	<1	24	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-24 78524	<1	2440	<1	<1	<1	25	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-25 78525	<1	4350	<1	<1	<1	24	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-26 78576	<1	14200	<1	<1	<1	82	<1	<1	1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-27 78577	<1	2670	<1	<1	<1	15	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-28 78578	<1	1800	<1	<1	<1	13	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-29 78579	<1	6580	<1	<1	<1	27	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-30 78580	<1	9650	<1	<1	<1	37	1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-31 78581	<1	3860	<1	<1	<1	18	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-32 78582	<1	4070	<1	<1	<1	17	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-33 78583	<1	9080	<1	<1	<1	41	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-34 78584	<1	9150	<1	<1	<1	43	1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-35 78585	<1	8660	<1	<1	<1	40	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-36 78586	<1	8590	<1	<1	<1	42	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-37 78587	<1	14300	<1	<1	<1	65	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-33 78583	<1	9090	<1	<1	<1	45	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1

SRC Geoanalytical Laboratories
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Report No: G-12-137

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Date of Report: February 10, 2012

Potash ICP1 Soluble

Sample Number	Pr ppm	S ppm	Sc ppm	Sm ppm	Sn ppm	Sr ppm	Ta ppm	Tb ppm	Th ppm	TiO2 wt %	U, ICP ppm	V ppm	W ppm	Y ppm	Yb ppm
POT003	<1	922	<1	<1	<1	7	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-38 78588	<1	6850	<1	<1	<1	28	<1	<1	<1	<0.01	<2	<1	<1	<1	0.2
GZD 100 8-36-19-1 19-39 78589	<1	32200	<1	<1	<1	121	<1	<1	1	<0.01	<2	<1	<1	<1	0.2
GZD 100 8-36-19-1 19-40 78590	<1	35000	<1	1	<1	163	<1	<1	1	<0.01	<2	<1	<1	<1	0.2
GZD 100 8-36-19-1 19-41 78591	<1	34000	<1	1	<1	167	<1	<1	1	<0.01	<2	<1	<1	<1	0.2
GZD 100 8-36-19-1 19-42 78592	<1	32500	<1	<1	<1	134	<1	<1	1	<0.01	<2	<1	<1	<1	0.2
GZD 100 8-36-19-1 19-43 78593	<1	56700	<1	5	<1	285	<1	<1	2	<0.01	<2	<1	<1	<1	0.2
GZD 100 8-36-19-1 19-44 78594	<1	2940	<1	<1	<1	24	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-45 78595	<1	2380	<1	<1	<1	24	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-46 78596	<1	3740	<1	<1	<1	35	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-47 78597	<1	1470	<1	<1	<1	13	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-48 78598	<1	2500	<1	<1	<1	23	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-49 78599	<1	2340	<1	<1	<1	17	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-50 78600	<1	3050	<1	<1	<1	18	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-51 11556	<1	3730	<1	<1	<1	21	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-52 11557	<1	3510	<1	<1	<1	26	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-53 11558	<1	2890	<1	<1	<1	27	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1
GZD 100 8-36-19-1 19-54 11559	<1	1230	<1	<1	<1	16	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-55 11560	<1	2930	<1	<1	<1	25	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1
GZD 100 8-36-19-1 19-52 11557	<1	3490	<1	<1	<1	26	<1	<1	<1	<0.01	<2	<1	<1	<1	0.1

SRC Geoanalytical Laboratories
125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Norwest Corporation
Attention: Mike Dufresne
PO #/Project: 2011-5592 (393-1)
Samples: 60

Report No: G-12-137

Date of Report: February 10, 2012

Potash ICP1 Soluble

Sample Number	Zn ppm	Zr ppm
POT003	<1	<1
GZD 100 8-36-19-1 19-01 78501	<1	<1
GZD 100 8-36-19-1 19-02 78502	<1	<1
GZD 100 8-36-19-1 19-03 78503	<1	<1
GZD 100 8-36-19-1 19-04 78504	<1	<1
GZD 100 8-36-19-1 19-05 78505	<1	<1
GZD 100 8-36-19-1 19-06 78506	<1	<1
GZD 100 8-36-19-1 19-07 78507	<1	<1
GZD 100 8-36-19-1 19-08 78508	<1	<1
GZD 100 8-36-19-1 19-09 78509	<1	<1
GZD 100 8-36-19-1 19-10 78510	<1	<1
GZD 100 8-36-19-1 19-11 78511	<1	<1
GZD 100 8-36-19-1 19-12 78512	<1	<1
GZD 100 8-36-19-1 19-13 78513	<1	<1
GZD 100 8-36-19-1 19-14 78514	<1	<1
GZD 100 8-36-19-1 19-15 78515	<1	<1
GZD 100 8-36-19-1 19-16 78516	<1	<1
GZD 100 8-36-19-1 19-17 78517	<1	<1
GZD 100 8-36-19-1 19-18 78518	<1	<1
GZD 100 8-36-19-1 19-19 78519	<1	<1
POT004	<1	<1
GZD 100 8-36-19-1 19-20 78520	<1	<1
GZD 100 8-36-19-1 19-21 78521	<1	<1
GZD 100 8-36-19-1 19-22 78522	<1	<1
GZD 100 8-36-19-1 19-23 78523	<1	<1
GZD 100 8-36-19-1 19-24 78524	<1	<1
GZD 100 8-36-19-1 19-25 78525	<1	<1
GZD 100 8-36-19-1 19-26 78576	<1	<1
GZD 100 8-36-19-1 19-27 78577	<1	<1
GZD 100 8-36-19-1 19-28 78578	<1	<1
GZD 100 8-36-19-1 19-29 78579	<1	<1
GZD 100 8-36-19-1 19-30 78580	<1	<1
GZD 100 8-36-19-1 19-31 78581	<1	<1
GZD 100 8-36-19-1 19-32 78582	<1	<1
GZD 100 8-36-19-1 19-33 78583	<1	<1
GZD 100 8-36-19-1 19-34 78584	<1	<1
GZD 100 8-36-19-1 19-35 78585	<1	<1
GZD 100 8-36-19-1 19-36 78586	<1	<1
GZD 100 8-36-19-1 19-37 78587	<1	<1
GZD 100 8-36-19-1 19-33 78583	<1	<1

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Samples: 60

Report No: G-12-137

Date of Report: February 10, 2012

Potash ICP1 Soluble

Sample Number	Zn ppm	Zr ppm
POT003	<1	<1
GZD 100 8-36-19-1 19-38 78588	<1	<1
GZD 100 8-36-19-1 19-39 78589	<1	<1
GZD 100 8-36-19-1 19-40 78590	<1	<1
GZD 100 8-36-19-1 19-41 78591	<1	<1
GZD 100 8-36-19-1 19-42 78592	<1	<1
GZD 100 8-36-19-1 19-43 78593	<1	<1
GZD 100 8-36-19-1 19-44 78594	<1	<1
GZD 100 8-36-19-1 19-45 78595	<1	<1
GZD 100 8-36-19-1 19-46 78596	<1	<1
GZD 100 8-36-19-1 19-47 78597	<1	<1
GZD 100 8-36-19-1 19-48 78598	<1	<1
GZD 100 8-36-19-1 19-49 78599	<1	<1
GZD 100 8-36-19-1 19-50 78600	<1	<1
GZD 100 8-36-19-1 19-51 11556	<1	<1
GZD 100 8-36-19-1 19-52 11557	<1	<1
GZD 100 8-36-19-1 19-53 11558	<1	<1
GZD 100 8-36-19-1 19-54 11559	<1	<1
GZD 100 8-36-19-1 19-55 11560	<1	<1
GZD 100 8-36-19-1 19-52 11557	<1	<1

Soluble Digestion: A 0.125g pulp is dissolved with 15 ml of D.I. H20 at 30°C temperature for 1 hour . Samples are initially vortexed then shaken at half an hour and one hour intervals.
The standard is POT003.

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125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8
Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geolab@src.sk.ca

Apex Geoscience Ltd
Attention: Michael Dufresne
PO #/Project:
Samples: 13

Report No: G-12-200

Date of Report: February 27, 2012

Moisture and Insoluble Determination

Column Header Details

Insoluble Determination of Potash in % (Insols)
Moisture at 105C in wt % (Moisture)

Sample Number	Insols %	Moisture wt %
POT003	N/R	N/R
GZD100 8-36-19-1 19-03 78503	3.6	0.1
GZD100 8-36-19-1 19-04 78504	3.2	<0.1
GZD100 8-36-19-1 19-05 78505	0.6	<0.1
GZD100 8-36-19-1 19-06 78506	0.7	<0.1
GZD100 8-36-19-1 19-07 78507	0.6	<0.1
GZD100 8-36-19-1 19-08 78508	5.6	0.1
GZD100 8-36-19-1 19-09 78509	4.8	<0.1
GZD100 8-36-19-1 19-10 78510	17.2	0.3
GZD100 8-36-19-1 19-11 78511	5.4	<0.1
GZD100 8-36-19-1 19-12 78512	4.8	<0.1
GZD100 8-36-19-1 19-13 78513	5.6	<0.1
GZD100 8-36-19-1 19-12 78512 R	4.7	<0.1

Insolubles: A 2.00 g pulp is dissolved in 15 ml of 30°C DI water then centrifuged for 2 minutes, decanted and repeated.
Moisture: A 1.00 gram pulp is heated at 105 C overnight and the weight loss determined.

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Potash ICP1 Soluble

Column Header Details

Silver in ppm (Ag)
Aluminum in wt % (Al2O3)
Barium in ppm (Ba)
Berylium in ppm (Be)
Calcium in wt % (CaO)

Cadmium in ppm (Cd)
Cerium in ppm (Ce)
Cobalt in ppm (Co)
Chromium in ppm (Cr)
Copper in ppm (Cu)

Dysprnnosium in ppm (Dy)
Erbium in ppm (Er)
Europium in ppm (Eu)
Iron in wt % (Fe2O3)
Gallium in ppm (Ga)

Gadolinium in ppm (Gd)
Hafnium in ppm (Hf)
Holmium in ppm (Ho)
Potassium in wt % (K2O)
Lanthanum in ppm (La)

Lithium in ppm (Li)
Magnesium in wt % (MgO)
Manganese in wt % (MnO)
Molybdenum in ppm (Mo)
Sodium in wt % (Na2O)

Niobium in ppm (Nb)
Neodymium in ppm (Nd)
Nickel in ppm (Ni)
Phosphorus in wt % (P2O5)
Lead in ppm (Pb)

Praseodymium in ppm (Pr)
Sulfur in ppm (S)
Scandium in ppm (Sc)
Samarium in ppm (Sm)
Tin in ppm (Sn)

Strontium in ppm (Sr)
Tantalum in ppm (Ta)
Terbium in ppm (Tb)
Thorium in ppm (Th)
Titanium in wt % (TiO2)

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Potash ICP1 Soluble

Column Header Details

Uranium in ppm (U, ICP)
Vanadium in ppm (V)
Tungsten in ppm (W)
Yttrium in ppm (Y)
Ytterbium in ppm (Yb)

Zinc in ppm (Zn)
Zirconium in ppm (Zr)

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Potash ICP1 Soluble

Sample Number	Ag ppm	Al2O3 wt %	Ba ppm	Be ppm	CaO wt %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Dy ppm	Er ppm	Eu ppm	Fe2O3 wt %	Ga ppm	Gd ppm	Hf ppm
POT003	<0.2	0.01	2	<0.2	0.17	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	1	<1	<1
GZD100 8-36-19-1 19-03 78503	<0.2	0.01	14	<0.2	0.37	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-04 78504	<0.2	<0.01	15	<0.2	0.15	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-05 78505	<0.2	<0.01	12	<0.2	0.19	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-06 78506	<0.2	<0.01	15	<0.2	0.16	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-07 78507	<0.2	0.01	17	<0.2	0.23	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-08 78508	<0.2	<0.01	13	<0.2	0.36	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-09 78509	<0.2	<0.01	13	<0.2	0.45	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-10 78510	<0.2	<0.01	8	<0.2	0.45	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-11 78511	<0.2	<0.01	10	<0.2	0.57	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-12 78512	<0.2	0.01	10	<0.2	0.70	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-13 78513	<0.2	0.02	10	<0.2	0.69	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1
GZD100 8-36-19-1 19-12 78512 R	<0.2	0.02	10	<0.2	0.70	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	0.01	<1	<1	<1

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Potash ICP1 Soluble

Sample Number	Ho ppm	K2O wt %	La ppm	Li ppm	MgO wt %	MnO wt %	Mo ppm	Na2O wt %	Nb ppm	Nd ppm	Ni ppm	P2O5 wt %	Pb ppm	Pr ppm	S ppm	Sc ppm	Sm ppm
POT003	<1	19.7	<1	<1	1.26	<0.01	<1	32.1	<1	<1	<1	<0.01	<1	<1	901	<1	<1
GZD100 8-36-19-1 19-03 78503	<1	2.15	<1	<1	0.08	<0.01	<1	48.9	<1	<1	<1	<0.01	<1	<1	1940	<1	<1
GZD100 8-36-19-1 19-04 78504	<1	7.16	<1	<1	0.06	<0.01	<1	45.9	<1	<1	<1	<0.01	<1	<1	578	<1	<1
GZD100 8-36-19-1 19-05 78505	<1	7.13	<1	<1	0.04	<0.01	<1	47.4	<1	<1	<1	<0.01	<1	<1	973	<1	<1
GZD100 8-36-19-1 19-06 78506	<1	6.08	<1	<1	0.03	<0.01	<1	47.5	<1	<1	<1	<0.01	<1	<1	831	<1	<1
GZD100 8-36-19-1 19-07 78507	<1	2.38	<1	<1	0.05	<0.01	<1	50.2	<1	<1	<1	<0.01	<1	<1	1200	<1	<1
GZD100 8-36-19-1 19-08 78508	<1	4.33	<1	<1	0.09	<0.01	<1	45.8	<1	<1	<1	<0.01	<1	<1	1820	<1	<1
GZD100 8-36-19-1 19-09 78509	<1	29.9	<1	<1	0.06	<0.01	<1	25.1	<1	<1	<1	<0.01	<1	<1	2540	<1	<1
GZD100 8-36-19-1 19-10 78510	<1	9.43	1	<1	0.12	<0.01	<1	34.1	<1	<1	<1	<0.01	<1	<1	2300	<1	<1
GZD100 8-36-19-1 19-11 78511	<1	2.44	<1	<1	0.08	<0.01	<1	46.3	<1	<1	<1	<0.01	<1	<1	3160	<1	<1
GZD100 8-36-19-1 19-12 78512	<1	5.02	<1	<1	0.07	<0.01	<1	45.8	<1	<1	<1	<0.01	<1	<1	4010	<1	<1
GZD100 8-36-19-1 19-13 78513	<1	4.80	<1	<1	0.07	<0.01	<1	45.6	<1	<1	<1	<0.01	<1	<1	4000	<1	<1
GZD100 8-36-19-1 19-12 78512 R	<1	4.97	<1	<1	0.07	<0.01	<1	45.4	<1	<1	<1	<0.01	<1	<1	4040	<1	<1

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Potash ICP1 Soluble

Sample Number	Sn ppm	Sr ppm	Ta ppm	Tb ppm	Th ppm	TiO2 wt %	U, ICP ppm	V ppm	W ppm	Y ppm	Yb ppm	Zn ppm	Zr ppm
POT003	<1	7	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-03 78503	<1	17	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-04 78504	<1	4	1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-05 78505	<1	7	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-06 78506	<1	1	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-07 78507	<1	7	1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-08 78508	<1	12	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-09 78509	<1	14	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-10 78510	<1	21	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-11 78511	<1	20	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-12 78512	<1	18	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-13 78513	<1	17	1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1
GZD100 8-36-19-1 19-12 78512 R	<1	18	<1	<1	<1	<0.01	<2	<1	<1	<1	<0.1	<1	<1

Soluble Digestion: A 0.125g pulp is dissolved with 15 ml of D.I. H20 at 30°C temperature for 1 hour . Samples are initially vortexed then shaken at half an hour and one hour intervals.
The standard is POT003.

Appendix 9

Expenditures

	Data Compilation, historical data verification and resampling 2008-2012	Seismic Study Summer 2011	Drilling Winter 2011	Subtotals
APEX Geoscience Expenses				
APEX Trucks, Computers & Miscellaneous Equipment Rentals, Fees	$1,967.17		$3,089.26	$5,056.43
APEX Geologists Fieldwork			$7,475.00	$7,475.00
APEX Geologists Office	$12,187.56	$1,463.31	$11,328.31	$24,979.19
APEX Principals Directly Involved	$16,297.69	$2,406.94	$2,292.06	$20,996.69
Total APEX Geoscience Costs June 2008 to August 2012	**$30,452.42**	**$3,870.25**	**$24,184.64**	**$58,507.31**
APEX Third Party Expenses				
Accommodation	$442.66			$442.66
Analytical costs	$5,500.00		$7,905.61	$13,405.61
Miscellaneous field supplies	$39.83		$3,424.04	$3,463.87
Food; field and travel	$106.73		$260.93	$367.65
Fuel; field and travel	$114.14		$486.28	$600.42
Travel costs (Bus, Taxi)	$749.48		$87.80	$837.28
Communications	$51.09		$47.57	$98.66
Courier	$5.38			$5.38
Training			$72.50	$72.50
Parallax Resources and Norwest rentals			$2,150.00	$2,150.00
Parallax Resources and Norwest consulting			$21,886.88	$21,886.88
Integrated Geomatics surveyor services			$5,084.00	$5,084.00
Total APEX Third Party Expenses June 2008 to August 2012	$7,009.30		$41,405.61	$48,414.91
		Total APEX Paid Costs June 2008 to August 2012		**$106,922.21**
Grizzly Direct Paid Expenses				
RPS Boyd Petro Search Seismic Survey Costs		$225,534.53		$225,534.53
Grizzly Principal Directly Involved	20,000.00	$20,000.00	$80,000.00	$120,000.00
Trucking (including Mob and demob, waste hauling and disposal of fluids), Equipment rentals			$510,693.14	$510,693.14
Construction			$36,053.44	$36,053.44
Drilling - direct drilling costs			$249,127.32	$249,127.32
Drill Crew and Supervision			$339,431.22	$339,431.22
Communications			$3,771.00	$3,771.00
Enironmental			$86,375.97	$86,375.97
Supplies			$203.85	$203.85
Land access fees			$29,013.25	$29,013.25
Total Grizzly Incurred Costs June 2008 to August 2012		$225,534.53	$1,334,669.19	**$1,600,203.72**
SUBTOTAL PROJECT COSTS JUNE 2008 to AUGUST 2012	**$37,461.72**	**$229,404.78**	**$1,400,259.43**	
		TOTAL PROJECT COSTS JUNE 2008 to AUGUST 2012		**$1,707,125.93**