

Crow Butte Resources, Inc.

Petition for Aquifer Exemption

North Trend Expansion Area

August 2008



Table of Contents

1. Introduction	1
1.1 Proposed Activities	1
1.2 Ore/Site Amenability to the ISL Mining Method	1
2. Summary of Regulatory Requirements	4
3. Description of Proposed Exemption	7
3.1 Background	7
3.2 Geology of North Trend Expansion Area	9
3.2.1 Borehole Geophysical Logs	10
3.3 Stratigraphy	12
3.3.1 Alluvium	13
3.3.2 White River Group	13
3.3.2.1 Brule Formation	13
3.3.2.2 The Chadron Formation	15
3.3.2.3 Upper Chadron and Upper/Middle Chadron (Big Cottonwood Creek Member)	15
3.3.2.4 Middle Chadron (Peanut Peak Member)	17
3.3.2.5 Basal Chadron Sandstone (Chamberlain Pass Formation)	18
3.3.3 Montana Group	19
3.3.3.1 Interior Paleosol (Upper Interior Paleosol and Yellow Mounds Paleosol)	19
3.3.3.2 Pierre Shale	20
3.3.4 Pre-Pierre Shale Stratigraphy	21
3.4 Structural Geology	21
3.4.1 3D Geologic Modeling	24
3.4.2 Timing of Fold Development	24
4. Hydrology of the North Trend Expansion Area	29
4.1 Surface Water	29



Table of Contents

4.2	Groundwater	30
4.2.1	Groundwater Occurrence and Flow Direction	30
4.2.2	Groundwater Quality Data	32
4.3	Aquifer Testing and Hydraulic Parameter Identification Information	36
4.4	Hydrologic Conceptual Model for the North Trend Expansion Area	38
4.4.1	Confining Layers	39
4.4.2	Hydrologic Conditions	40
4.4.3	Hydrological Affects of Folding	43
4.5	Description of the Proposed Mining Operation and Relationship to Site Geology and Hydrology	45
4.6	Lateral and Vertical Extent of the Exempt Aquifer	46
4.7	Local Water Supply	47
5.	Regulatory Criteria for Aquifer Exemption Demonstration	51
5.1	The Basal Chadron Sandstone is not a Source of Drinking Water (Title 122; Chapter 5, Section 004.01)	51
5.2	The Basal Chadron Sandstone Cannot/Will Not Serve as Future Source of Drinking Water (Title 122, Chapter 5)	52
5.2.1	The Basal Chadron Sandstone is Mineral Bearing with Production Capability (Title 122, Chapter 5, 004.2A)	53
5.2.2	The Basal Chadron Sandstone Groundwater Cannot Technically/Economically be Rendered Fit for Consumption (Title 122, Chapter 005.02C)	53
6.	Conclusions	56
	References	58



Table of Contents

Tables

1	General Stratigraphic Chart for Northwest Nebraska
2	Description of Proposed Aquifer Exemption Location – North Trend
3	Representative Stratigraphic Section – North Trend
4	Comparison of Mean Monthly Precipitation with Normal Mean Monthly Discharge of the White River at Crawford, Nebraska
5	Normal Mean Monthly Discharge of the White River at Crawford, Nebraska, 1992-1995, part of 2003 and 2004
6	Water Levels – Brule Formation and Basal Chadron Sandstone (Spring 2008)
7	Water Quality Summary for the Alluvium, Brule Formation, and Basal Formation – CSA
8	List of Active, Inactive and Abandoned Water Wells within the North Trend Expansion Area
9	Water Quality Summary – Basal Chadron Sandstone Well W-007 (Well 81A)
10	Water Quality Summary – Brule Formation Well W-008 (Well 78)
11	Water Quality Summary – Quarterly Monitoring in Brule Formation and Basal Chadron Sandstone (1996-1997 and 2004-2005)
12	Water Quality Summary – Brule Formation and Basal Chadron Sandstone (March 2008)
13	Summary of 2006 North Trend Pump Test Results vs. Existing Permit Area
14	Summary of 2006 North Trend Pump Test Well Information
15	Summary of 2006 North Trend Pump Test Results
16	Summary of the Town of Crawford Water System

Figures

1	Location Map, North Trend Expansion Area and Original Crow Butte Project Area
2	Location of the North Trend Expansion Ore Body and Proposed Aquifer Exemption Area
3	North Trend Wellfield Land Use and Proposed Mine Units



Table of Contents

4	North Trend Cross-Section Location Map
5a	North Trend Structural Cross-Section: A-A'
5b	North Trend Structural Cross-Section: B-B'
5c	North Trend Structural Cross-Section: C-C'
5d	North Trend Structural Cross-Section: D-D'
6	Bedrock Geology of the North Trend Expansion Area
7	North Trend Expansion Area Type Log (SO-9)
8	North Trend Isopach Map of Upper Chadron
9	North Trend Isopach Map Upper/Middle Chadron
10	North Trend Isopach Map Basal Chadron Sandstone
11	North Trend Structure Map Top of the Pierre Shale
12a	Basal Chadron Sandstone (Chamberlain Pass Fm)
12b	Basal Chadron Sandstone (Chamberlain Pass FM) and Upper/Middle Chadron (Big Cottonwood Creek Mbr)
12c	Basal Chadron Sandstone (Chamberlain Pass Fm) and Brule Fm
12d	Top of Pierre Shale
13	Regional Structural Feature Map, Northern Nebraska
14	Regional Structure Contour Map, Top of Basal Chadron Sandstone
15	Regional Structure Contour Map, Top of Pierre Shale
16	Regional Isopach Map, Basal Chadron Sandstone
17	Regional Water Level Map in the Brule Formation 1982-1983
18	Regional Water Level Map in the Basal Chadron Sandstone 1982- 1983
19	Location of Groundwater Wells in the North Trend Expansion Area
19a	Location of Groundwater Wells in the North Trend Expansion Area and a 2.25-Mile Radius of the Expansion Area
19b	Location of Groundwater Wells Within the Town of Crawford
20	Location of North Trend Pump Test Monitoring Wells

**Table of Contents**

21	North Trend Expansion Area Water Level Map – Brule Formation (2/7/07)
22	North Trend Expansion Area Potentiometric Surface Basal Chadron Sandstone (4/16/08)
23	Drawdown at COW-2 During Pump Test #6
24	Drawdown at RC-2 During Pump Test #6

Appendices

A	Geophysical Boring Logs
B	Mineralogical and Particle Size Distribution Analyses
C	Well Completion Report for COW-2004-6
D	Groundwater Analytical Lab Reports
E	Water user survey Information for Water Supply Wells in 2.25-Mile Area of Review



Petition for Aquifer Exemption

North Trend Expansion Area

1. Introduction

Crow Butte Resources, Inc. (CBR) currently operates a uranium in-situ leach (ISL) extraction mine in Dawes County, Nebraska. This operation, called the Crow Butte Project, is located in portions of Sections 11, 12, 13, and 24 of Township 31 North, Range 52 West and Sections 18, 19, 20, 29, and 30 of Township 31 North, Range 51 West. Uranium oxide is extracted from the Chamberlain Pass Formation (herein referred to as the Basal Chadron Sandstone for continuity with historical permitting) via Class III mineral extraction wells, and has been permitted and operated since 1991.

1.1 Proposed Activities

CBR seeks to expand mining activities northwest of the current production area. The proposed North Trend Expansion Area (NTEA) is located in Sections 21, 22, 27, 28, 33 and 34 of Township 32 North, Range 52 West, and is about 0.5 mile north of the city of Crawford, Nebraska. The NTEA encompasses about 2,200 acres, and 100 percent of the minerals leased in the NTEA are on private lands. As in the current Class III production area, the Basal Chadron Sandstone contains the uranium to be extracted.

1.2 Ore/Site Amenability to the ISL Mining Method

Amenability of the uranium deposits in the Basal Chadron Sandstone in the Crow Butte Project to ISL mining was demonstrated initially through core studies at the original Crow Butte Study Area (CSA) where mining is currently being conducted. Results of core studies were confirmed in the Research and Development (R&D) phase of the project at the Crow Butte site using bicarbonate/carbonate leaching solutions with oxygen. Reports concerning the results of the R&D activities, including restoration of affected groundwater, have been submitted to the Nuclear Regulatory Commission (NRC) and the Nebraska Department of Environmental Quality (NDEQ). Similar to the CSA currently being mined by ISL, the NTEA exhibits the following conditions:

- For containment of solution, the Basal Chadron Sandstone ore body is relatively horizontal (within the permit boundary) and is underlain and overlain by very low permeability strata.
- The Basal Chadron Sandstone ore body is below the static water table and has sufficient permeability to achieve solution flow.



Petition for Aquifer Exemption

North Trend Expansion Area

- The permeability, porosity, and hydrology of the Basal Chadron Sandstone is favorable to the ISL process.
- A pump test has verified the favorable hydrologic conditions in the Basal Chadron Sandstone at the site.
- The uranium ore is similar to that of the current Crow Butte ISL operation and, therefore, is mineralogically suitable for solution mining.

The information and experience gained during past R&D programs formed the basis for the existing commercial uranium ISL mining operations. CBR believes that the current commercial project, including the successful restoration of groundwater in Mine Unit 1, demonstrates that such a program can be implemented with minimal short-term environmental impacts and with no significant risk to the public health or safety.

Assuming favorable regulatory action by the NRC and State of Nebraska regulatory agencies, CBR anticipates initial construction of the North Trend Satellite Plant and associated facilities in 2009. Production is scheduled to begin in late 2009 and is projected to last for approximately 11 years. Groundwater restoration activities at NTEA are expected to begin in late 2012 with Mine Unit NT-1. As shown in the following table, groundwater restoration will extend for 8 years with final site decommissioning completed by mid-2023.

North Trend Construction, Mining, and Restoration Schedule		
Planned Activity	Start Date	End Date
Production and Restoration	January 2009	May 2024
Facility Construction	January 2009	December 2009
Production	December 2009	August 2020
Mine Unit NT-1	December 2009	November 2012
Mine Unit NT-2	March 2010	March 2013
Mine Unit NT-3	August 2011	July 2014
Mine Unit NT-4	August 2012	August 2015
Mine Unit NT-5	August 2013	August 2016
Mine Unit NT-6	August 2014	August 2017
Mine Unit NT-7	August 2015	August 2018



**Petition for Aquifer
Exemption**

North Trend Expansion Area

North Trend Construction, Mining, and Restoration Schedule		
Mine Unit NT-8	August 2016	August 2019
Mine Unit NT-9	August 2017	August 2020
Groundwater Restoration	November 2012	May 2023
Mine Unit NT-1	November 2012	August 2015
Mine Unit NT-2	May 2013	May 2016
Mine Unit NT-3	July 2014	May 2017
Mine Unit NT-4	August 2015	May 2018
Mine Unit NT-5	August 2016	May 2019
Mine Unit NT-6	August 2017	May 2020
Mine Unit NT-7	August 2018	May 2021
Mine Unit NT-8	August 2019	May 2022
Mine Unit NT-9	August 2020	May 2023
Final Site Reclamation	May 2023	May 2024



Petition for Aquifer Exemption

North Trend Expansion Area

2. Summary of Regulatory Requirements

Water quality information indicates that the Basal Chadron Sandstone groundwater exhibits a Total Dissolved Solids (TDS) concentration of less than 10,000 milligrams per liter (mg/L), and therefore can be considered an underground source of drinking water (USDW) as defined in Nebraska Administrative Code Title 122, Chapter 1. Title 122, Chapter 5 prohibits the movement of fluids during in-situ mining operations into a USDW, but an aquifer exemption may be granted if appropriate regulatory demonstrations are made (see Section 5 of this report for additional discussion regarding the regulatory basis of an aquifer exemption). The original operators of the Crow Butte Project Area, Wyoming Fuel Company, received an aquifer exemption in 1990 to allow in-situ extraction of uranium from the Basal Chadron Sandstone (Federal Register, Vol. 55, No. 100, May 23, 1990). Mining began in 1991 and continues to date. CBR seeks to expand this successful operation to the NTEA. Hence, an aquifer exemption for the NTEA is requested.

The Nebraska Administrative Code Title 122 presents rules and regulations for underground injection and mineral production wells. Chapter 4, Section 001 of the Code states: *“No owner or operator shall construct, operate, maintain, convert, plug or abandon any injection well or mineral production well or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water if the presence of that contaminant may cause a violation of any primary drinking water regulation...”*.

However, Chapter 5 of Title 122, Section 002 states, *“Upon petition by permit applicant and after public notice and opportunity for a public hearing, the Director may designate an aquifer or a portion thereof as an exempted aquifer”*. To facilitate this designation, Section 003 states that:

003 The petitioner must identify (by narrative description, illustrations, maps, or other means) and describe, in geographic and/or geometric terms (such as vertical and lateral limits and gradient) which is clear and definite, an aquifer or parts thereof which he or she proposes the Director designate an exempted aquifer and effects of the exemption of the aquifer from Nebraska Title 118 – Ground Water Standards and Use Classification....

Chapter 5, Section 004 specifies the criteria for making the aquifer exemption:



Petition for Aquifer Exemption

North Trend Expansion Area

- 004 An Aquifer or a portion of an aquifer which meets the criteria for an underground source of drinking water may be designated as an exempted aquifer if the following criteria are met:
- 004.01 It does not currently serve as a source of drinking water; and
- 004.02 It cannot now and will not in the future serve as a source of drinking water because:
 - 004.02A It is mineral, hydrocarbon, or geothermal energy bearing with production capability;
 - 004.02B It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;
 - 004.02C It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or
 - 004.02D It is located above a Class III well mining area subject to subsidence or catastrophic collapse

As indicated above, the petitioner must provide specific information pertinent to the aquifer or parts thereof which are proposed for the Director to designate as an exempted aquifer. The remaining sections of this Aquifer Exemption Petition provide the required information; Sections 3 and 4 of this application present the required Chapter 5 Title 122 Section 003 narrative description about the portion of the aquifer for which an exemption is sought, including general hydrologic information about the aquifer, location, and related facility operations that impact the hydrologic setting. Section 5 of this application shows how the required aquifer exemption criteria presented in Chapter 5 Title 122 Section 004 are met, specifically that:

- The aquifer or a portion of the aquifer does not currently serve as a source of drinking water (004.01).
- It cannot and will not in the future serve as a source of drinking water because:
 - 1) it is mineral-, hydrocarbon- or geothermal energy-bearing with production capability (004.2A) and 2) it is so contaminated that it would be economically or technically impractical to render that water fit for human consumption (004.02C).

**Petition for Aquifer
Exemption**

North Trend Expansion Area

Note that regulation does not mandate that all four aquifer exemption criteria specified under Section 004.02 be met; rather, only one of the four criteria need be demonstrated to successfully meet the regulatory requirement. Criteria under both 004.02A and 004.02C are met by the proposed exemption.



Petition for Aquifer Exemption

North Trend Expansion Area

3. Description of Proposed Exemption

3.1 Background

Figure 1 presents the geographic location of the proposed exemption area. As shown on Figure 1, the proposed NTEA occurs about 0.5 mile north of Crawford, Nebraska in Sections 21, 22, 27, 28, 33 and 34 of Township 32 North, Range 52 West. Table 1 presents the regional stratigraphic section that includes the White River Group (Brule Formation through Basal Chadron Sandstone).

The Basal Chadron Sandstone contains both the aquifer for which an exemption is sought and the mining interval (ore bearing zone) in the NTEA. The lateral extent of the exemption area requested includes all of the proposed NRC permit area as shown on Figure 2. This figure shows the location of the commercially producible ore based on drilling conducted to date. However, because additional drilling will be conducted in the future, and uranium prices continue to increase, CBR requests that the entire NTEA be included in the aquifer exemption to allow for full development of the resource within the NTEA. Table 2 presents the legal description of the proposed exempted aquifer in the NTEA. Detailed information pertaining to the geologic and hydrologic characteristics of this aquifer is presented in Sections 3 and 4, respectively. The vertical extent of the exemption is discussed in Section 4.6.

Historically, land in the NTEA has been used for grazing of livestock and dry-land farming (principally winter wheat). Current land use and proposed Mine Units within the NTEA are shown on Figure 3.

Based on a site reconnaissance (conducted in June 2004 and recently updated) and a Nebraska Department of Natural Resources (NDNR) aerial photo of the NTEA, there is only one occupied housing unit in the NTEA. Within a 2.25-mile area of review (AOR) of the NTEA boundary, the major population center is the Town of Crawford, which is south of the NTEA. Crawford contains 537 housing units, of which 473 are occupied. Within the 2.25-mile AOR, outside the NTEA boundary, an estimated 44 occupied rural housing units are located outside of the Town of Crawford and the NTEA (US Census, 2000). There are 526 occupied housing units within the 2.25-mile review area.

There are no dwelling units within 0.62 mile of the center point of the proposed NTEA. Four dwelling units are within 1.24 miles of the center point. The depth to the ore body within the Basal Chadron Sandstone in the NTEA ranges from approximately 400 to about 700 feet below ground surface (bgs; Table 3). The width of the ore body varies



Petition for Aquifer Exemption

North Trend Expansion Area

from approximately 100 feet to 1,000 feet. The ore body ranges in grade from less than 0.05 percent to greater than 0.5 percent U_3O_8 , with an average grade estimated at 0.20 percent equivalent U_3O_8 and 0.31 percent chemical U_3O_8 . Initial estimates pertaining to the CSA Class III Permit area indicated 22.8 million pounds of U_3O_8 in that area, and that this uranium was present in a mineralogical form amenable to solution mining. This area has been successfully mined for more than 12 years.

Total reserves for the NTEA have not been developed at this time. However, CBR has estimated recoverable resources at the NTEA to be approximately 5,000,000 pounds U_3O_8 . An annual production rate of 500,000 to 600,000 pounds of U_3O_8 is expected in the NTEA, and it will operate at a total flow rate of 4,500 gallons per minute (gpm). To maintain hydraulic control, a net bleed of approximately 0.5 to 1.0 percent of the total mining flow is anticipated.

Hansley, et al. (1989) conducted detailed geochemical analysis of the Crow Butte uranium ore to assess both ore genesis and composition. The Crow Butte deposits, including those at the NTEA, are roll-type deposits with coffinite being the predominant uranium mineral species present. The origin of the uranium is in-situ rhyolitic ash material within the Basal Chadron Sandstone. Coffinite is associated with pyrite, and high silica activity due to dissolution of the rhyolitic ash favored formation of coffinite over uraninite in most parts of this sandstone. In addition, smectite is present in the samples examined, with the most common minerals in the sandstone being quartz, plagioclase, K-feldspar, coffinite, pyrite, marcasite, calcite, illite/spectrite smectite, and tyuyamunite. The heavy mineral portion of the samples contained several minerals including those above as well as garnet, magnetite, marcasite, and illmenite. Vanadium was detected in the samples primarily as an amorphous species presumed to have originated from the in-situ ash. Hansley, et al. state that at least some uranium and vanadium remain bound to amorphous volcanic material and/or smectite rather than as discrete mineral phases.

Petrographic data obtained and examined by Hansley et al. (1989) suggest that uranium mineralization occurred before lithification of the Basal Chadron Sandstone. Hansley states: *“Dissolution of abundant rhyolitic volcanic ash produced U- and Si- rich ground waters that were channeled through permeable sandstone as at the base of the Chadron by relatively impermeable overlying and underlying beds. The precipitation of early authigenic pyrite created a reducing environment favorable for precipitation and accumulation of U in the basal sandstone. The U has remained in a reduced state, as evidenced by the fact that the unoxidized minerals, coffinite and uraninite, comprise the bulk of the ore.”*



Petition for Aquifer Exemption

North Trend Expansion Area

Based on similar regional deposition, the NTEA ore body is expected to be similar mineralogically and geochemically to that of the CSA. The ore bodies in the two areas are within the same geologic unit (the Basal Chadron Sandstone) and have the same mineralization source. The sites are separated by only a few miles, and the cause of mineral deposition in the two areas appears to be similar. Neither site is anticipated to be significantly affected by recharge or other processes. The groundwater characteristics of the NTEA mineralized zone are discussed in detail in Section 4.0.

3.2 Geology of North Trend Expansion Area

Table 1 summarizes the regional stratigraphic section for northwest Nebraska. A geologic map of bedrock in northwest Nebraska is shown on Figure 6. The bedrock map depicts the occurrence in northwest Nebraska of the Miocene Ogallala Group, Miocene Arikaree Group, the Eocene-Oligocene White River Group, and Upper Cretaceous strata belonging to the Montana Group and Colorado Group. The Upper Cretaceous Pierre Shale, the unconformably overlying White River Group (i.e., Brule Formation, Chadron Formation, and Chamberlain Pass Formation), and the Arikaree Group outcrop in the vicinity of the Town of Crawford and NTEA (Figure 6, see inset).

The Crow Butte area is located near the northern limits of the High Plains section of the Great Plains physiographic province. Topography of the Crow Butte area includes gently sloping, rolling hills with outlying, broad ridges which are dissected by intermittent and perennial streams. The most prominent physiographic feature in the region is the Pine Ridge Escarpment, which rises roughly 300 to 900 feet above the basal plain. The escarpment bounds three sides of the Crawford Basin. Colluvial and alluvial deposits originating from this escarpment cover the permit area. The elevation of the Crow Butte Project area ranges from 3,600 to 4,400 feet above mean sea level (amsl).

The local stratigraphy present within the NTEA consists of the following geological units in descending order: alluvial sediments, Brule Formation, Chadron Formation, Chamberlain Pass Formation and Pierre Shale. The channel sandstone facies of the Chamberlain Pass Formation, informally referred to herein as the Basal Chadron Sandstone, represents the production zone and target of solution mining in the NTEA. The general stratigraphic section for the NTEA is summarized in Table 3. Revised nomenclature for stratigraphic units within the White River Group is discussed in detail in Section 3.3. Figure 4 illustrates the locations of four north-south and east-west cross-sections through the NTEA depicted on Figures 5a through 5d.



Petition for Aquifer Exemption

North Trend Expansion Area

Though a thick (approx. 1,200 to 1,500 feet), regionally extensive stratigraphic section of sedimentary units underlies the Pierre Shale, those units are not relevant to this petition. The absence of sandstone units for more than 1,000 feet below the top of the Pierre Shale precludes the need for monitoring zones below the surface of the Pierre Shale. Discussion in this report is limited to those formations immediately above and below the Basal Chadron Sandstone (Petrotek, 2004; Wyoming Fuel Company, 1983).

3.2.1 Borehole Geophysical Logs

As of April 2008, there have been 686 exploration/development holes drilled within the NTEA boundary. A sample portion of a borehole geophysical log (boring SO-9) is shown on Figure 7. Detailed analysis of a carefully chosen suite of borehole geophysics provides a method for interpreting lithology, stratigraphy, and depositional environment; and for deriving porosity values, permeability index, and water salinity. The log curves used for interpretation and parameter derivation measure: resistivity, electron density, interval travel time, spontaneous potential, natural radioactivity, and hydrogen content.

Log interpretation and parameter evaluation involves analysis of the measured log curve values and responses. The measured curve and resultant analysis are affected by drilling processes, properties of the formation, and limitations of the logging tools themselves. Common hydrogeologic objectives of borehole geophysical logging include: (1) definition and correlation of aquifer or other lithologic units; (2) estimation of aquifer properties such as porosity and permeability; and (3) assessment of physical properties of formation water including conductivity, total dissolved solids, and total hardness. These objectives must be considered in the design, selection, and implementation of an effective logging program.

There are three basic parameters derived or interpreted from borehole geophysical logs: lithology, resistivity, and porosity. From these basic parameters, there are numerous variations that can provide information regarding lithologic identification, correlation, facies evaluation, delineation of permeable and porous zones, and identification of pore fluids. The following types of measurements are used to determine this information:

- spontaneous potential
- natural gamma radiation (ray)



Petition for Aquifer Exemption

North Trend Expansion Area

- resistivity/induction
- acoustic velocity (Sonic)
- electron density (bulk density)
- induced radiation effects (neutron)
- caliper (hole size)

Approximately 130 geophysical logs were reviewed for interpretation and correlation in the NTEA (Appendix A). The following represent the general log suite at each borehole location.

- Gamma ray (GR) tools measure naturally occurring gamma ray radiation emitted spontaneously from the formation by uranium, thorium, and the potassium 40 isotope. Natural gamma logs are powerful tools in lithologic identification and correlation, identification of potential migration pathways, and evaluation of water quality with respect to radionuclides, such as uranium salts. GR logs usually show the clay content in sedimentary rocks because heavy radioactive elements (potassium, thorium and uranium-radium) tend to concentrate in clays. While clays and clayey sands are higher in radioactivity, clean sands (no clay content) and carbonates usually exhibit low levels of radioactivity. The GR curve can differentiate between sands, clays, and the gradation between the two. As radioactive elements tend to concentrate in shale and clays, high GR readings reflect high shale or clay content in sedimentary units. Very low levels of radioactive elements or isotopes are present in clean formations (sands, gypsum, and anhydrite); unless contaminants are present such as dissolved potassium or uranium salts, volcanic ash, or granite wash. The tool records counts per second which should be converted to API units. Natural gamma logs should always be calibrated in API units.
- The Spontaneous Potential (SP) log is a measurement of the electrical potential (voltage) that occurs in a boring when fluids of different salinities are in contact. The electrical potential is produced by the interaction of formation water, conductive drilling fluids, and certain ion-selective sediments (clay). Because clays have a very low permeability, and sands a high permeability, the SP can be a valuable lithology indicator. In general, clay-free permeable



Petition for Aquifer Exemption

North Trend Expansion Area

beds of moderate to low resistivity are sharply defined by the SP curve. High-resistivity beds distort the SP currents, creating a flattening of the slope of the SP curve at bed boundaries. This causes poor bed boundary definition. In addition, the SP curve is also distorted (depressed or elevated) by permeable zones that contain clay, hydrocarbons, gas or contaminants.

- Single point resistance tools measure the resistance to current flow between a tool electrode and a ground electrode (conventional single point resistance), or between an electrode in the tool and the shell of the tool (differential single point resistance). Response of the log curve is attributed to lithologic units of varying resistance. Resistance increases in freshwater-filled sands or gravels, and decreases in shales, clays, silts and brine-filled sands. Curve values are recorded in ohms. Point resistance tools have a relatively small radius of investigation and poor thin bed resolution in comparison to resistivity tools. These logs are mainly used for correlation of beds.
- The Neutron-Neutron (N-N) tools directly measure variations in the hydrogen content of the formation. N-N probes measure the variations in the hydrogen content profile. The N-N probe contains a source of high-energy neutrons (commonly americium-beryllium) with thermal neutron detectors at a fixed distance away from the source. The tool records counts per second which should be converted to API units. A high count indicated a low porosity, while a low count indicated a high porosity. Neutron logs are influenced by changes in the hole diameter.

3.3 Stratigraphy

The general stratigraphy for northwest Nebraska is shown in Table 1. The regional stratigraphy consists of pre-Cambrian basement rocks that are overlain by a thick Phanerozoic stratigraphic sequence. This section provides a detailed description of the stratigraphy of the NTEA based on an extensive review of existing site-specific drilling logs and published literature. Geological units are described from stratigraphically youngest to stratigraphically oldest. Revised nomenclature for these stratigraphic units is discussed, where applicable, and referred to throughout this application. To be consistent with historical permitting, the stratigraphic nomenclature used in previous submittals to the NRC and the NDEQ has been preserved.



Petition for Aquifer Exemption

North Trend Expansion Area

3.3.1 Alluvium

Alluvial deposits occur from the surface to the top of the Brule Formation, and vary in thickness depending upon topography from 0 to 60 feet (Figures 5a through 5d). In general, the alluvium consists of reworked Oligocene-Miocene age rock fragments, sand, gravel, and sandy soil horizons that originated from the Gering and Monroe Creek Formations that form the nearby Pine Ridge Escarpment. It may also include weathered portions of the underlying Brule Formation. It should be noted that the alluvium may be water-bearing at some locations.

A review of available geophysical logs revealed that the bottom of the alluvium was indicated by the transition from meandering or “chattering” of the geophysical curves to a consistent curve pattern. Portions of the log “chatter” represent the varying lithology, saturation, and porosity of the alluvial materials. For boring locations where distinct geophysical curve signatures were not observed between the alluvium and underlying Brule Formation, selection of the contact between the overlying and underlying units were based on existing information provided by CBR.

3.3.2 White River Group

The Eocene-Oligocene White River Group consists of the Chamberlain Pass Formation overlain by the Chadron Formation, which is, in turn, overlain by the Brule Formation (Table 3). Strata assigned to this group were deposited within fluvial, lacustrine, and eolian environments (Terry and LaGarry, 1998). In northwest Nebraska, it rests unconformably on pedogenically modified Pierre Shale. The bulk of the White River Group is composed of airfall and reworked volcanoclastics derived from sources in Nevada and Utah (Larson and Evanoff, 1998; Terry and LaGarry, 1998).

The history of stratigraphic nomenclature for the White River Group of Nebraska and South Dakota has had various interpretations as described by Harksen and Macdonald (1969). The following stratigraphic nomenclature represents a preservation of formal and informal members based on nomenclature by Schultz and Stout (1955) with representation of more recent nomenclature (Terry and LaGarry, 1998; Terry, 1998; LaGarry, 1998; Hoganson et al., 1998).

3.3.2.1 Brule Formation

The Oligocene Brule Formation represents the youngest unit within the White River Group which outcrops throughout most of the Crow Butte area. The unit conformably



Petition for Aquifer Exemption

North Trend Expansion Area

overlies the Chadron Formation and is unconformably overlain by sandstones of the Arikeree Group (Figure 6). The formation was originally subdivided by Swinehart (1985) and later revised by LaGarry (1998) into three members, from oldest to youngest: the “brown siltstone” member, the Whitney Member, and underlying Orella Member (Table 3). The “brown siltstone” member consists of pale brown and brown, nodular, cross-bedded eolian volcanoclastic siltstones and sandy siltstones. The contact with the underlying Whitney Member varies from gradational to a sharp unconformity where the brown siltstone fills valleys and depressions. The Whitney Member consists of pale brown, massive, and typically nodular eolian siltstones with occasional thin interbeds of brown and bluish-green sandstone, and volcanic ash. In contrast to the lowest 10 meters consist of white or green laminated fluvial siltstones, sheet sandstones, and channel sandstones. The contact between the Whitney Member and the underlying Orella Member is intertonguing. The Orella Member consists of pale brown, brown, and brownish-orange volcanoclastic overbank clayey siltstones and silty claystones, brown and bluish-green overbank sheet sandstones, and volcanic ash. Occasional thick, fine- to medium-grained, channelized sandstones occur throughout the Orella Member. These sandstones appear to have very limited lateral extent. The overall thickness of the Brule Formation within the NTEA is approximately 50 to 100 feet. The majority of the Brule Formation present at the NTEA consists of the Orella Member, as the entire “brown siltstone” member and most of the Whitney Member have been erosional removed.

The contact between the Brule Formation and underlying Chadron Formation is sometimes difficult to ascertain, as the contact between the two formations is intertonguing (LaGarry, 1998). The contact is recognized regionally as the lithologic change from thinly interbedded and less pedogenically modified brown, orange and tan volcanoclastic clayey siltstones and sheet sandstones of the Orella Member to pedogenically modified green, red, and pink volcanoclastic silty claystones of the Upper Chadron (Big Cottonwood Creek Member) (Terry and LaGarry, 1998). The contact cannot be consistently selected in drill cuttings or electric logs. Typical log responses for the Brule Formation exhibit relatively flat or straight curves representing the shale/clay log signature (Figure 7). The GR curve represents the shale/clay baseline. The bottom of the Brule Formation is noted where the curves coincide with the established shale/ clay baseline or where there is a slight shift in the shale/clay baseline. Where the contact for the base of the Brule Formation was indiscernible on electric logs, the location of the contact was based on picks provided by CBR. Figures 5a through 5d depict the occurrence of the Brule Formation within the NTEA and southward across the fold structure.



Petition for Aquifer Exemption

North Trend Expansion Area

3.3.2.2 *The Chadron Formation*

The Eocene-Oligocene Chadron Formation is the lowermost member of the White River Group (Table 3). The Chadron Formation conformably overlies the Chamberlain Pass Formation and is conformably overlain by the Brule Formation. From top to bottom, the Chadron Formation consists of the following stratigraphic units: Upper Chadron (Big Cottonwood Creek Member), Upper/Middle Chadron (Big Cottonwood Creek Member), Middle Chadron (Peanut Peak Member), and Basal Chadron Sandstone (Chamberlain Pass Formation). The Basal Chadron Sandstone represents the production zone and target of ISL mining within the NTEA. Figures 5a through 5d depict the subsurface geology of the Chadron Formation within the NTEA and southward across a fold structure.

3.3.2.3 *Upper Chadron and Upper/Middle Chadron (Big Cottonwood Creek Member)*

The Upper Chadron and Upper/Middle Chadron (collectively belonging to the Big Cottonwood Creek Member) are composed primarily of volcanoclastic overbank silty claystones interbedded with tabular and lenticular channel sandstones, lacustrine limestones, pedogenic calcretes, marls, volcanic ashes and gypsum (Terry and LaGarry, 1998). Tuffs in the Toadstool Park area that occur in the uppermost section of the Big Cottonwood Creek Member were dated by $^{40}\text{Ar}/^{39}\text{Ar}$ methods as late Eocene (~34 Ma) in age (Terry and LaGarry, 1998). The lower boundary of this member is an intertonguing contact with the underlying Middle Chadron (Peanut Peak Member) of the Chadron Formation, or it is a local unconformity where the Upper/Middle Chadron fills valleys and depressions (Terry and LaGarry, 1998) (Table 3). The upper boundary is recognized by a lithologic change from pedogenically modified green, red and pink volcanoclastic silty claystones of the Big Cottonwood Creek Member to thinly interbedded and less pedogenically modified brown, orange, and tan volcanoclastic clayey siltstones and sheet sandstones of the Orella Member of the Brule Formation (Terry and LaGarry, 1998) (Table 3).

The Upper Chadron is the youngest member of the White River Group (Table 3). The upper part of the Upper Chadron is light green-gray bentonitic clay grading downward to green and frequently red clay, though interbedded sandstones also occur. Based on the predominance of fine-grained lithologies that comprise the Upper Chadron, this unit represents a distinct and rapid facies change from the coarse-grained lithologies present in the underlying Upper/Middle and Basal Chadron Sandstone. Geophysical logs indicate a facies change within the unit toward the southeast (Appendix A). Based on available well control data, the Upper Chadron is continuous across the NTEA. An



Petition for Aquifer Exemption

North Trend Expansion Area

isopach map of the Upper Chadron is shown on Figure 8. The Upper Chadron ranges in stratigraphic thickness from about 100 to 250 feet in the NTEA (Figures 5a through 5d). X-ray diffraction analyses of the red clay from the CSA to the south indicate that it is primarily composed of montmorillonite and calcite in that vicinity.

Typical geophysical log responses for the Upper Chadron exhibit curves that are relatively flat or straight which represent the shale/clay log signature (Figure 7). The GR curve represents the shale/clay baseline. The top of the Upper Chadron is noted where the curves begin to deviate from the shale/clay baseline.

The Upper/Middle Chadron is directly overlain by the Upper Chadron (Table 3). At some locations, the Upper/Middle Chadron is similar in appearance to the Basal Chadron Sandstone (described later in this section) and is typically a very fine to fine grained, well-sorted, poorly cemented sandstone. Similar to the Upper Chadron, geophysical logs for the Upper/Middle Chadron indicate a facies change toward the southeast. Extensive review of available data from the NTEA and vicinity, strongly indicate that the sandstone is completely absent in the vicinity of the fold structure south of the NTEA. At other locations, particularly at the northern and western portions of the NTEA, occurrence of the sandstone unit is intermittent, but is generally present at most borehole locations (Figures 5a through 5d and 12b). The available data suggest that the Upper/Middle Chadron, where present, typically ranges in thickness from approximately 10 to 100 feet across the NTEA (Figure 9).

The GR curve distinctly marks the top and bottom of the Upper/Middle Chadron (Figure 7). The curve responses of the logs are not as nearly as large as seen in the Basal Chadron Sandstone (described below). The GR shifts distinctly to the right at the lower boundary, indicating a sandstone containing uranium. The GR curve can also shift to the left indicating sandstone without the presence of uranium. The top of the sandstone unit is marked by a return of the GR to the shale/clay baseline.

For unknown reasons, possibly the continued or renewed uplift of the Black Hills or Chadron Dome, reworked sediment and fluvial deposits of the Upper and Upper/Middle Chadron (Big Cottonwood Creek Member) were concentrated in northwestern Nebraska (Terry and LaGarry, 1998). At some locations, initial deposition of the Big Cottonwood Creek Member occurred within paleovalleys incised into the underlying Middle Chadron (Peanut Peak Member) (Terry and LaGarry, 1998). At other locations (e.g., Toadstool Park), the lower boundary is intertonguing (Terry and LaGarry, 1998).



Petition for Aquifer Exemption

North Trend Expansion Area

3.3.2.4 Middle Chadron (*Peanut Peak Member*)

The Middle Chadron is described as a clay-rich interval that grades from brick red to grey in color with interbedded bentonitic clay and sands. A light green-gray “sticky” clay within this unit serves as an excellent marker bed in drill cuttings and has been observed in virtually all regional test holes both within the NTEA and the CSA to the south. The Middle Chadron unconformably overlies the Basal Chadron Sandstone (Chamberlain Pass Formation) in South Dakota and Nebraska (Terry, 1998) (Table 3). As described above, the upper boundary is variable and is overlain either by the Upper/Middle Chadron, where present, or by the Upper Chadron (Table 3). The Middle Chadron differs from the overlying Upper/Middle and Upper Chadron in that the Middle Chadron is composed of bluish-green, smectite-rich mudstone and claystone, weathers into hummocky, “haystack-shaped” hills and slopes with a popcorn-like surface, is less variegated in color, and has less silt (Terry, 1998). The predominantly clay lithology of the Middle Chadron represents a distinct and rapid facies change from the underlying Basal Chadron Sandstone. The Middle Chadron is the thickest member of the White River Group. Within the NTEA, the unit ranges in stratigraphic thickness from about 200 to 300 feet.

Six core samples were collected by CBR at borehole T-775 in the NTEA from low permeability intervals that occur in the upper, middle, and lower portions of the Middle Chadron from approximately 380 to 600 feet bgs (Appendix B). X-ray diffraction analyses indicate all samples were composed primarily of smectite with minor varying amounts of feldspar, quartz, calcite, dolomite, and illite mica. Particle grain size analyses indicate all six samples were silty claystones or clayey siltstones with a relatively even mixture of silt- and clay-sized particles. Three samples (Samples 1, 7 and 11) were predominantly clay-sized particles ranging from 52 percent to 61percent clay. Three samples (Samples 3, 5, and 9) were predominantly silt-sized particles ranging from 54percent to 61percent silt.

Typical geophysical log responses for the Middle Chadron exhibit curves that are relatively flat or straight which represent the shale/clay log signature (Figure 7). The GR curve represents the shale/clay baseline. The top of the Middle Chadron is noted where the curves break either distinctly to the left or to the right, representing the sandstone of the Upper/Middle Chadron, where present.



Petition for Aquifer Exemption

North Trend Expansion Area

3.3.2.5 Basal Chadron Sandstone (*Chamberlain Pass Formation*)

The Basal Chadron Sandstone is the oldest unit in the White River Group. The lower section is a coarse-grained, arkosic sandstone with frequent interbedded thin silt and clay lenses of varying thickness and continuity that lies on a marked regional unconformity with the underlying Yellow Mounds Paleosol (Terry, 1998). The lower contact is easily recognized by a change in color and lithology from the underlying black or bright yellow, pedogenically modified surface of the Pierre Shale (i.e., the Yellow Mounds Paleosol) to white channel sandstone. Occasionally, the Basal Chadron Sandstone grades upward to fine-grained sandstone containing varying amounts of interstitial clay material and persistent clay interbeds. The Upper Interior Paleosol, occurring as a persistent clay horizon, typically brick red in color, generally marks the upper limit of the Basal Chadron Sandstone (Table 3). The Upper Interior Paleosol developed on top of the Basal Chadron Sandstone which in turn is unconformably overlain by the Middle Chadron (Peanut Peak Member) in South Dakota and Nebraska (Terry, 1998). Vertebrate fossils from the Basal Chadron Sandstone in northwestern Nebraska and South Dakota indicate a late Eocene age (Chadronian) (Clark et al., 1967; LaGarry, 1996; Lillegraven, 1970; Vondra, 1958).

An isopach map of the Basal Chadron Sandstone in the vicinity of the NTEA is presented on Figure 10. The Basal Chadron Sandstone occurs at depths ranging from about 300 to 700 feet bgs and was encountered at all exploration holes. Stratigraphic thickness of the unit within the NTEA ranges from approximately 20 to 170 feet. The thickest sections of the unit occur in southern portion of Section 27 within the NTEA and immediately west of the NTEA in the southern portion of Section 28 (Figure 10). Three distinct sandstone facies are present in the thickest portions of this unit. The unit thins significantly to the north-northwest and to the east of the basin trough where only two sandstone facies appear to be present on the outermost edges of the NTEA. Regionally, the unit ranges in thickness from 0 to 250 feet (Figures 10 and 16).

The greenish-white channel sandstones of the Basal Chadron Sandstone that overlie the Yellow Mounds Paleosol are the target of ISL mining activities in the NTEA. The channel sandstones typically occur in three distinct intervals within the NTEA, as compared to the occurrence of only two distinct channel sandstone intervals at the CSA to the south and at the Three Crow site southwest of the Town of Crawford. Regionally, deposition of the Basal Chadron Sandstone has been attributed to large, high-energy braided streams. In this regard, the Basal Chadron Sandstone is lenticular with numerous facies changes occurring within short distances. The interbedded thin



Petition for Aquifer Exemption

North Trend Expansion Area

silt and clay lenses most likely represent flood plain or low velocity deposits normally associated with fluvial sedimentation.

Thin section examination of Basal Chadron Sandstone samples collected by CBR in the CSA indicates a composition of 50 percent monocrystalline quartz and 30 to 40 percent undifferentiated feldspar, plagioclase feldspar and microcline feldspar. The remainder includes polycrystalline quartz, chert, chalcedonic quartz, various heavy minerals and pyrite. X-ray diffraction analyses indicate that the Basal Chadron Sandstone is 75percent quartz with the remaining composition composed of potassium feldspar and plagioclase.

The GR curve distinctly marks the top and bottom of the Basal Chadron Sandstone. The GR shifts distinctly to the right at the lower boundary of the sandstone unit when uranium is present (Figure 7). The resistivity curve generally shifts to the left, indicating a transmissive unit. The N-N log generally reads lower counts per second (cps); therefore, the sandstones appear to be more saturated with a higher porosity than the surrounding material. The top of the formation is marked by a gradual return of the GR to the shale/clay baseline.

3.3.3 Montana Group

3.3.3.1 Interior Paleosol (Upper Interior Paleosol and Yellow Mounds Paleosol)

The Interior Paleosol of Schultz and Stout (1955) was subsequently divided into the younger Eocene Upper Interior Paleosol (Chamberlain Pass Formation) and the Cretaceous Yellow Mounds Paleosol (Pierre Shale) (Terry, 1991; Evans and Terry, 1994; Terry and Evans, 1994; Terry, 1998) (Table 3). The Upper Interior Paleosol represents pedogenically modified distal overbank deposits of a distinct fluvial system developed on the surface of the Basal Chadron Sandstone (Chamberlain Pass Formation) which predates deposition of the Chadron Formation. The Yellow Mounds Paleosol developed on the Cretaceous Pierre Shale and altered the normally black marine shale to bright yellow, purple, lavender and orange.

X-ray diffraction analyses of a single core sample (Sample 14) collected from the Yellow Mounds Paleosol by CBR at borehole T-775 in the NTEA indicate a composition composed primarily of smectite with minor amounts of quartz, plagioclase and illite mica (Appendix B). Particle grain size distribution analyses indicate the sample was predominantly composed of approximately 68 percent clay-sized particles.



Petition for Aquifer Exemption

North Trend Expansion Area

Review of available data for the NTEA indicate that neither of the two paleosol units could be consistently interpreted based solely on geophysical logs. For simplicity, these units are not represented on the type log, cross-sections, or the 3D geologic model of the area (described in more detail in Section 3.4.1). However, a review of existing geophysical logs and driller's notes indicates that the red clay horizon (Upper Interior Paleosol) was often encountered during drilling activities, confirming its presence within the NTEA (Appendix A).

3.3.3.2 *Pierre Shale*

The Cretaceous Interior Seaway resulted in the offshore deposits of the late Cretaceous Pierre Shale (Table 3). The Pierre Shale is a thick, homogenous black marine shale with low permeability and represents one of the most laterally extensive formations of northwest Nebraska. Regional geologic data indicate that this formation can be up to 1,500 feet thick in the Dawes County area (Wyoming Fuel Company 1983; PetroTek, 2004). The southward retreat of the Cretaceous Interior Seaway resulted in the subaerial exposure and weathering of rock units from Early Cretaceous to Eocene age across the northern Great Plains (Lisenbee, 1988). This event resulted in the erosion and pedogenic modification of the surface of the Pierre Shale to form the brightly-colored Yellow Mounds Paleosol (Terry and LaGarry, 1998) (Table 3). Consequently, the pedogenically modified surface of the Pierre Shale marks a major unconformity with the overlying White River Group and exhibits a paleotopography with considerable relief (DeGraw, 1969). The Pierre Shale is underlain by organic-rich shale and marl with minor amounts of sandstone, siltstone, limestone and chalk of the Niobrara Formation (Table 1). Figure 11 depicts a structure contour map for the top of the Pierre Shale for the NTEA.

X-ray diffraction analyses of a single core sample (Sample 13) of the Pierre Shale collected by CBR at borehole T-775 in the NTEA indicate a composition composed primarily of smectite with minor amounts of quartz, plagioclase, potassium feldspar, and illite mica (Appendix B). Particle grain size distribution analyses indicate the sample was predominantly composed of approximately 58 percent clay particles. There are no significant sandstone units within the Pierre Shale underlying the NTEA.

Local logging data indicate that the Pierre Shale ranges in thickness from 1,327 to 1,565 feet in the NTEA. Typical log responses for the Pierre Shale have curves that are relatively flat or straight and represent the shale/clay log signature (Figure 7). The GR has established the shale/clay baseline. The top of the Pierre Shale is noted where the



Petition for Aquifer Exemption

North Trend Expansion Area

curves break either sharply to the left or to the right and represent the occurrence of the Basal Chadron Sandstone.

Seven deep oil and gas wells were drilled in the vicinity of the NTEA (Johnson, Ostermeyer, Pinney 1, Leeling 1, True-State, Soester-Wulfoil and Heckman No. 1) (see UIC Class III Permit Application for well locations) (Appendix A). The character of the entire Pierre Shale in the vicinity of the NTEA can best be observed in geophysical logs from three of the seven nearby abandoned oil and gas wells (Heckman No. 1, Soester-Wulfoil and Leeling 1), as these wells were completed through the entire thickness of the unit. The Heckman No.1 well is approximately 6 miles southeast of the NTEA in the vicinity of the central CSA (T31N, R52W, Section 24). The log from Heckman No. 1 is believed to be representative of the Pierre Shale within the Crow Butte area, including the NTEA (Appendix A). At Heckman No. 1, the Pierre Shale is 1,565 feet thick. The top of the Pierre Shale occurs at a depth of 525 feet and the base occurs at 2,090 feet where it rests on the Niobrara Formation. The spontaneous potential and resistivity curves for this borehole qualitatively indicate a lack of permeable, water-bearing zones within the Pierre Shale. The Soester-Wulfoil well is located within the NTEA, in T32N R52W, Section 34 (Figure 4). At this location, the Pierre Shale is 1,327 feet thick and also shows no indication of permeable (water bearing) zones. The top of the Pierre occurs at a depth of 627 feet, and the base is encountered 1,954 feet bgs (Appendix A). The Leeling 1 well is located approximately 2 miles northeast of the NTEA (T32N, R52W, Section 13). At Leeling 1, the Pierre Shale is 1,459 feet thick. The top of the Pierre Shale occurs at a depth of 333 feet and the base occurs at 1,792 feet (Appendix A).

3.3.4 Pre-Pierre Shale Stratigraphy

Underlying the Pierre Shale is a thick sequence of Mississippian through Cretaceous age strata that unconformably overlie pre-Cambrian granite (Table 1). Together with the Pierre Shale, the underlying Niobrara Formation, Carlile Shale, Greenhorn Limestone, and Graneros Shale compose a composite lower confining interval approximately 2,500 feet thick which immediately underlies the Basal Chadron Sandstone. There do not appear to be significant sandstone units within this thick sequence of low-permeability strata.

3.4 Structural Geology

Regional uplift during the Laramide Orogeny forced the southward retreat of the Cretaceous Interior Seaway, resulting in the subaerial exposure and weathering of rock



Petition for Aquifer Exemption

North Trend Expansion Area

units from Early Cretaceous to Eocene age across the northern Great Plains (including the Pierre Shale). The depositional basin associated with deformation of the Wyoming thrust belt and initial Laramide uplifts to the west of Nebraska, represented a structural foredeep. The greatest uplift occurred in the Black Hills, which lie north of Sioux and Dawes Counties in southwester South Dakota. Lisenbee (1988) provides a comprehensive summary of the tectonic history of the Black Hills uplift. The pre-Oligocene Black Hills uplift (<37 Ma) occurred prior to the deposition of the Eocene-Oligocene strata of the White River Group. Strata of the White River Group cover most of the eroded roots of the Black Hills uplift as well as the syntectonic sedimentary rocks in the Powder River and Williston basins. The Hartville, Laramie, and Black Hills uplifts supplied sediment for rivers that flowed east-southeast across the study area (Clark, 1975; Stanley and Benson, 1979; Swinehart et al., 1985).

The most prominent structural expression in northwest Nebraska is the Chadron Arch (Figure 13). Together with the Chadron Arch, the Black Hills Uplift produced many of the prominent structural features presently observed in the region today. The Chadron Arch represents an anticlinal feature that strikes roughly northwest-southeast along the northeastern boundary of Dawes County. Swinehart et al. (1985) suggested multiple phases of probable uplift in northwestern Nebraska near the Chadron Arch between c.a. 28 Ma and <5 Ma. The only known surficial expressions of the Chadron Arch are outcroppings of Cretaceous rocks that predate deposition of the Pierre Shale in the northeastern corner of Dawes County, as well as in small portions of Sheridan County, Nebraska and Shannon County, South Dakota. The general locations of faults in northwest Nebraska are depicted on the State Geologic Map shown on Figure 6.

The Crow Butte area, including the CSA and North Trend, lie in what has been named the Crawford Basin (DeGraw, 1969). DeGraw (1969) substantiated known structural features and proposed several previously unrecognized structures in western Nebraska based on detailed studies of primarily deep, oil test hole data collected from pre-Tertiary subsurface geology. The Crawford Basin was defined by DeGraw (1969) as a triangular asymmetrical basin about 50 miles long in an east-west direction and 25 to 30 miles wide. The basin is bounded by the Toadstool Park Fault on the northwest, the Chadron Arch and Bordeaux Fault to the east, and the Cochran Arch and Pine Ridge Fault to the south (Figure 13). The Crawford Basin is structurally folded into a westward-plunging syncline that trends roughly east-west. Note that the Bordeaux Fault, Pine Ridge Fault, and Toadstool Park Fault proposed by DeGraw (1969) are not presented on the State Geologic Map (Figure 6). The Toadstool Park Fault has been mapped at one location (T33N, R53W) and estimated to have had approximately 60



Petition for Aquifer Exemption

North Trend Expansion Area

feet of displacement (Singer and Picard, 1980). The Town of Crawford is located near the axis of the Crawford Basin.

As a result of regional deformation (Figure 13), stratigraphic units that underlie the NTEA generally dip gently to the south and southeast, with Tertiary deposits dipping slightly less than the older Mesozoic and Paleozoic Formations (Witzel, 1974). Cross-sections presented on Figures 5a through 5d illustrate local structural trends across the NTEA. Former drilling activities at the Crow Butte project identified a structural feature referred to as the White River Fault located between the current CSA Class III permit area and the proposed NTEA (Figure 13). The White River Fault generally follows the drainage of the White River north of Crawford (Figure 1). Evidence of a fault was identified during the exploration drilling phase of the Crow Butte project (Collings and Knode, 1984). The fault is manifested in the vicinity of the NTEA as a significant northeast-trending, subsurface monocline (Figures 5a through 5d and 12a through 12d). Structure contour maps of the top of the Pierre Shale and Basal Chadron Sandstone further support the existence of this fold structure (Figures 11, 14, and 15). It has been suggested that Tertiary displacement along the White River Fault is related to reactivation of bounding sutures in Proterozoic basement rocks associated with island arc terranes (Carlson, 2002). Deep data are limited, but confirm that the structural relief across the feature ranges from 300 to 500 vertical feet, depending on location, and is upthrown on the south-southeast side.

Detailed fault kinematics of the White River Fault have not been thoroughly investigated to date. In order to decipher whether geological units have been cut by the White River Fault at depth, consistent observations of structurally thinned, structurally thickened (e.g., repeated stratigraphic sections), missing stratigraphic sections or linear features associated with a fault rupture must be observed regardless of fault kinematics (e.g., reverse slip, oblique strike-slip, normal slip) in the vicinity of the fold structure. Based on an extensive review of geophysical logs in a 3D context, none of the above conditions were observed that could not be associated with other geological processes (e.g., erosional denudation or topographic highs associated with fold development). Instead, all of the stratigraphic units within the NTEA are well-correlated southward across the monoclinical structure with no apparent offsets or truncated units on the north limb of the fold, with the exception of the Upper/Middle Chadron. Therefore, available drilling and logging data in the NTEA suggest that, while this fault may occur at depth, it most likely does not continue upsection through the Pierre Shale into the Chamberlain Pass, Chadron, and Brule Formations. It is possible that the fault is manifested at the surface by a fault-propagation fold generated by a "blind" fault at depth (i.e., a fault that loses displacement or "tips out" prior to rupturing the surface or



Petition for Aquifer Exemption

North Trend Expansion Area

the highest stratigraphic unit) (Suppe, 1983). This scenario would be consistent with the compressive stresses required to generate the fold structure. Additional lines of evidence that the White River Fault does not cut upsection of the Pierre Shale are discussed in Section 4.4.

3.4.1 3D Geologic Modeling

In an effort to better characterize the spatial distribution and geologic relationships between the alluvium, Eocene-Oligocene strata of the NTEA, and the White River Fault, a 3D geologic model was developed using Mining Visualization Software (MVS) version 9.12 based on an extensive review of existing exploration hole data from the NTEA. Figures 12a through 12d present 3D visual perspectives focused on specific stratigraphic and structural relationships between the Brule Formation, Upper/Middle Chadron (Big Cottonwood Creek Member), Basal Chadron Sandstone (Chamberlain Pass Formation) and Pierre Shale. Descriptions provided below of the structure of the stratigraphic units beneath the NTEA and interpretations of the timing of fold development, are based in part on the 3D geologic model.

For the purposes of 3D visualization, it should be noted that for locations where the Upper/Middle Chadron was not present, the contact between the Upper Chadron Formation (Big Cottonwood Creek Member) and the Middle Chadron Formation (Peanut Peak Member) was inferred. Distinction of the specific contact between Upper and Middle Chadron was not discernable based on available data. Based on the average occurrence of the top and bottom of the Upper/Middle Chadron, a proportional value of 55 percent of the range of thickness between the top of the Upper Chadron and the base of the Middle Chadron was used to infer the contact between the two units. For example, at borehole D-69, the top of the Upper Chadron occurs at 90 feet bgs and the bottom of the Middle Chadron occurs at 388 feet bgs (a difference of 298 feet). The contact between the two units, therefore, was inferred at 254 feet bgs. Observations from drilling within the NTEA indicate the contact between the Upper and Middle Chadron is intertonguing. For simplicity of 3D visualization, the contact is inferred to be a planar contact.

3.4.2 Timing of Fold Development

The following discussion targets the timing of development of the subsurface monoclinical structure associated with the White River Fault and its relationship to stratigraphic units within the NTEA. Descriptions are provided in order of first geological occurrence based on review and interpretation of available data.



Petition for Aquifer Exemption

North Trend Expansion Area

Based on structural interpretation and the presence of lithologic marker beds, the timing of fold development clearly post-dates deposition of the Cretaceous Pierre Shale and formation of the overlying Yellow Mounds Paleosol. Structural relief of the Pierre Shale appears to be greater toward the southwest of the NTEA compared to the relief to the northeast of the NTEA (Figures 11 and 12d). This may, in part, be due to the westward-plunging synclinal axis of the Crawford Basin.

Based on observations from drilling and logging data in the White River Group, the Basal Chadron Sandstone (i.e., channel sandstone facies of the Chamberlain Pass Formation) is present at all exploration holes within the NTEA and CSA and can be correlated across the fold structure (Figures 5a through 5d, 12a, 14, and 16). Though localized thickening of this unit occurs within the NTEA (e.g., Sections 27 and 28), there is high spatial correlation between topographic lows on the eroded surface of the Pierre Shale and the thickest sections of the Basal Chadron Sandstone, suggesting that the paleotopography of the eroded Pierre Shale was partly responsible for the basin fill architecture (Figures 10 and 12d). As depicted in the lower left panel on Figure 12a, the observed eastward thinning (i.e., localized westward thickening) of this unit in the vicinity of the NTEA may be attributed to the following:

- reduced eastward sediment accommodation related to regional basin subsidence as indicated by regional westward thickening shown on Figure 16
- differential uplift associated with initial activity of the White River Fault
- elevated paleotopography east of the NTEA, or
- any combination of the above

Though some degree of structural thinning appears to have occurred on the limb of the fold, the Basal Chadron Sandstone maintains a relatively consistent range in stratigraphic thickness between the southernmost portion of the NTEA and the top of the fold structure indicating: (1) little, if any, elevated topography existed along the fold structure during deposition of the unit and (2) the absence of any significant erosional denudation on the northwest limb and axis of the fold structure (Figures 10 and 12a). The nature of the large, high-energy braided streams that deposited this unit also suggests little topography existed near the fold structure. A review of geophysical logs indicates that the character of the sandstone is different on the fold limb and uplifted side to the south compared to the sandstone in the central NTEA, which is likely related to the depositional environment. Following deposition, this unit was dramatically



Petition for Aquifer Exemption

North Trend Expansion Area

folded by deformation related to displacement on the White River Fault at depth. Up to 500 vertical feet of structural relief exists between the NTEA and the uplifted fold axis along the top surface of the Basal Chadron Sandstone. Based on these observations, it is possible that initial displacement on the White River Fault predated deposition of the Basal Chadron Sandstone. However, any uplift associated with fold development in the vicinity of the NTEA was minimal. Therefore, deposition of the Basal Chadron Sandstone is inferred to predate most, if not all, of the fold development.

The 3D geometry of the Middle Chadron (Peanut Peak Member) strongly suggests that growth of the monocline in the subsurface was synchronous with deposition. The Middle Chadron can be correlated throughout the NTEA and across the fold structure (Figures 5a through 5d). The most pronounced thickening occurs within the NTEA boundary (Figures 5a through 5d). Noticeable thinning of the unit towards the southeast is spatially coincident with the entire length of the fold axis, indicating reduced sediment accommodation in the vicinity of the fold structure. Given the coeval relationship between fold development and deposition, the interbedded sandstones in the Middle Chadron may indicate episodic uplift along the fold structure. The unit is also structurally folded by the monocline with up to 650 vertical feet of structural relief between the NTEA and the uplifted fold axis along the bottom surface of the Middle Chadron, clearly indicating that folding also post-dates deposition of this unit.

The Upper/ Middle Chadron (Big Cottonwood Creek Member) dips slightly to the southeast within the NTEA and appears to have been either erosionally denuded or not deposited along the entire length of the fold structure south of the NTEA (Figures 5a through 5d, 9, and 12b). Due to the limited spatial distribution, it is difficult to discern whether this unit was folded within the NTEA. Multiple scenarios could explain the absence of this unit to the south. One scenario involves isolated deposition of the Upper/Middle Chadron to the north of the fold structure. In this scenario, sufficient topographic relief was present to the south by the time the Upper/Middle Chadron was deposited as a result of uplift associated with the fold structure, effectively creating a localized, topographic barrier to fluvial sedimentation to the south. A second scenario would involve deposition of the Upper/Middle Chadron across the fold structure with a limited southward extent (as indicated by the absence of the Upper/Middle Chadron in the CSA), followed by uplift and erosional removal of the Upper/Middle Chadron along the fold axis prior to deposition of the overlying Upper Chadron. Both scenarios indicate the presence of an erosional unconformity to varying degrees between the Middle Chadron and Upper Chadron in the vicinity of the fold. Available data preclude a distinction between the suggested depositional environments. Based on indications that folding was coincident with the deposition of units stratigraphically above



Petition for Aquifer Exemption

North Trend Expansion Area

(discussed below) and below the Upper/Middle Chadron, it is inferred that folding was coincident with deposition of this unit.

Available data strongly suggest that growth of the monocline was coincident with deposition of the Upper Chadron (Big Cottonwood Creek Member). The Upper Chadron dips gently to the northeast and can be correlated throughout the NTEA and across the fold structure. Similar to the Middle Chadron, the Upper Chadron is noticeably thin along the entire length of the fold axis to the east and southeast of the NTEA, indicating a similar reduction in sediment accommodation in the vicinity of the fold (Figures 5a through 5d and 8). The unit exhibits less pronounced folding compared to stratigraphically lower and geologically older units (i.e., Middle Chadron, Basal Chadron Sandstone and Pierre Shale), nevertheless indicating that folding also post-dates deposition of this unit. This geometry can be explained by the cumulative effect of continued folding synchronous with deposition where underlying units are progressively more deformed with depth (Figure 5a). The most pronounced thickening occurs north of the fold structure and west of the NTEA (Figure 5a through 5d). Based on available data, localized northward thickening is likely the result of reduced sediment accommodated near the fold structure related to fold development. Based on regional studies, westward thickening of the Upper Chadron was likely the result of increased sediment accommodation from regional basin subsidence and/or synclinal folding of the Crawford Basin (DeGraw, 1969; Clark, 1975; Stanley and Benson, 1979; Swinehart et al., 1985).

In contrast to members of the underlying Chadron and Chamberlain Pass Formations, the Brule Formation does not appear to be significantly folded. An isolated section of the Brule Formation in the vicinity of borings A-698, A-299, and A-686 does appear to be mildly uplifted and broadly folded, though the unit generally maintains a consistent approximately 10° dip to the northeast across the area (Figures 5a, 5d and 12c). Though the stratigraphic thickness varies across the NTEA and to the south, no obvious thinning related to the original depositional environment was observed. Basin fill architecture was likely the predominate control on distribution of the Brule Formation. Thickness variations are mostly attributable to exposure and subsequent erosion of the unit prior to deposition of the overlying colluvial and alluvial cover materials. In addition, fracturing due to structural modification by the monocline is unlikely.

In summary, deposition of the Middle Chadron (Peanut Peak Member), Upper/Middle Chadron (Big Cottonwood Creek Member), and Upper Chadron (Big Cottonwood Creek Member) appear to be coincident with continued or episodic fold development in

**Petition for Aquifer
Exemption**

North Trend Expansion Area

the vicinity of Crawford. It is possible that fold development was coincident with the deposition of the Basal Chadron Sandstone; however, any topographic uplift associated with fold development pre-dating deposition of the Basal Chadron Sandstone was minimal. Available data suggest that the White River Fault was active during the late Eocene and possibly early Oligocene, and not entirely during the Oligocene as previously reported. The decreased sediment accommodation across the fold structure (i.e., southward thinning stratigraphic units) observed in some stratigraphic units (Middle Chadron, Upper/Middle Chadron, and Upper Chadron) is likely related to topographic uplift south of the NTEA along the fold structure and possible regional basin subsidence to the west. Viewed in this context, it is apparent that the depositional environments of selected members of the White River Group (exclusive of the Basal Chadron Sandstone and Brule Formation) were impacted by the growing fold structure southeast of the NTEA. Given the relationship between the protracted history of displacement on the White River Fault and proximal deposition of the White River Group, the Middle Chadron, Upper/Middle Chadron, and Upper Chadron should be considered synorogenic in nature in the vicinity of the CSA and NTEA. There does not appear to be clear temporal or structural relationships between folding associated with the White River Fault and faults that clearly offset the Peanut Peak and Big Cottonwood Creek Members in the Toadstool Park area (LaGarry, 1998; Terry and LaGarry, 1998).



Petition for Aquifer Exemption

North Trend Expansion Area

4. Hydrology of the North Trend Expansion Area

4.1 Surface Water

The NTEA is drained by the White River, which flows northeast along the southern boundary of the proposed NTEA (Figure 1). The White River is used to support agricultural production, wildlife habitat and both warm and cold-water fish. For the period of record from 1931 to 1991, United States Geological Survey (USGS) data indicate that the average monthly mean flow ranged from 6.3 to 122 cubic feet per second (cfs), with a mean value of 20.4 cfs (USGS, 2004). Based on data from the NDNR, the flow of the White River in 2001 ranged from 8.5 to 69 cfs, with an annual mean of 20.0 cfs (NDNR, 2008a). Historical precipitation and flow data for the White River are presented in Tables 4 and 5.

Spring Creek flows west to east through the northern portion of the NTEA (Figures 1 and 19). Little Cottonwood and Sand Creeks flow from west to east to the north of the NTEA where they join the White River. Squaw, English and White Clay Creeks flow into the White River south of the NTEA. Deadman's, Cherry and Bozle Creeks, all located outside the NTEA, flow northward to the White River.

Data from the United States Environmental Protection Agency (USEPA) STORET database for the White River at Crawford (60 sampling events from 1968 to 1980) indicate an average specific conductance of 380 microSiemens per centimeter ($\mu\text{S}/\text{cm}$). USEPA STORET data from the White River tributaries in the vicinity of the NTEA (Soldier Creek [west of Crawford]; Squaw Creek, White Clay Creek and English Creek [all east of Crawford]; and Deadman's Creek [south of Crawford]) indicated that the specific conductance for these tributaries ranged from 36 to 507 $\mu\text{S}/\text{cm}$ (8 sampling events from 1981 to 1995).

No surface-water impoundments are located within the NTEA. Several small impoundments are located on private ranches outside the NTEA, primarily along Squaw and White Clay Creeks (east of the NTEA) and Little Cottonwood Creek (north of the NTEA). Surface-water features are shown on Figures 1, 19, 19a and 20. Only one naturally occurring spring (8001) is documented within the 2.25-mile AOR (Figure 19a). Based on field inspections by CBR personnel, there currently is no irrigated farmland within the NTEA boundary.



Petition for Aquifer Exemption

North Trend Expansion Area

4.2 Groundwater

4.2.1 Groundwater Occurrence and Flow Direction

Within the Crawford Basin, the alluvium, Brule Formation and Basal Chadron Sandstone (Chamberlain Pass Formation) are considered water-bearing intervals. The alluvial deposits are not typically considered to be a reliable water source. Sandy siltstones, overbank sheet sandstones and occasional thick channelized sandstones that occur throughout the Orella Member of the Brule Formation may be locally water-bearing units. These sandstone and siltstone units are difficult to correlate over any large distance and are discontinuous lenses, rather than laterally continuous strata. Although the Brule Formation is a locally water-bearing unit, it does not always produce usable amounts of water. Despite this characteristic, the Brule Formation has historically been considered the shallowest aquifer above the Basal Chadron Sandstone aquifer and water supply wells have been completed in this unit.

Locations of all groundwater monitoring wells in the vicinity of the NTEA are shown on Figure 19. There is one active well screened in the alluvium (RA-1), two active monitoring wells screened in the Brule Formation (BOW-1 and BOW-2), four active monitoring wells screened in the Upper/Middle Chadron (MCOW-1, MCOW-2, MCOW-3 and MCOW-4) and nine active monitoring wells screened in the Basal Chadron Sandstone (COW-1, COW-2, COW-3, COW-4, COW-5, COW-6, CPW-2, RC-1 and RC-2 (Figure 19). Well completion reports for these monitoring wells are included in the North Trend Hydraulic Pump Test #6 submitted as an appendix to the Underground Injection Control (UIC) Class III Permit Application. Monitoring well COW-6 was installed from February 11 to 13, 2008 in Section 22 of the NTEA to establish a more spatially comprehensive network of monitoring wells screened in the Basal Chadron Sandstone (Appendix C). Several water supply wells are also screened in the Brule Formation and Basal Chadron Sandstone, though none of these wells are used for drinking water within the NTEA or the 2.25-mile AOR (Figure 19a, Table 8).

The static water level for wells screened in the Brule Formation in the vicinity of the NTEA typically range from 10 to 60 feet bgs (personal communication with CBR staff, March 2008). However, monitoring wells screened in the Brule Formation are often dry. Water-level measurement events were conducted at two monitoring wells screened in the Brule Formation (BOW-1 and BOW-2) during four water-level measurement events in March and April 2008. Consistent water levels of approximately 3,620 feet amsl were obtained at well BOW-1 during all four events (Table 6). In contrast, well BOW-2 was dry during each measurement event (Table 6). Following consistent precipitation in



Petition for Aquifer Exemption

North Trend Expansion Area

May and early June 2008, water levels were measured again from the Brule Formation in June 2008 (Table 6). During this event, BOW-2 had a measurable static water level. The resulting groundwater elevations are shown on Figure 21. Water levels ranged from approximately 3,588 to 3,676 feet amsl. Groundwater elevations for the June 9, 2008 event indicate groundwater flow is convergent with the White River. Groundwater flow is directed to the southeast in the northern portion of the NTEA and to the northeast (parallel with flow in the White River) in the southern portion of the NTEA (Figure 21). The average hydraulic gradient within the NTEA is 0.0081 ft/ft. South of the White River, historical water levels measured in the Brule Formation in the 1982-1983 timeframe indicate a regional hydraulic gradient to the north (Figure 17).

Despite the installation of monitoring wells screened in the Upper/Middle Chadron, the wells have not historically produced sufficient water such that they could be adequately developed. It is possible that the unit could contain recoverable water; however, a limited production capacity exists of <0.01 gpm based on a 2004 recovery test in wells located in the southern part of Section 27 (see Section 4.3). No domestic or livestock wells in the NTEA are completed in this interval. For these reasons, no attempts were made to collect water levels from wells screened in the Upper/Middle Chadron.

Monitoring wells screened in the Basal Chadron Sandstone are known to be artesian with flow at the surface at many locations within the NTEA. Water levels were determined based on pressure readings collected from the nine available monitoring wells and two water supply wells (wells 97 and 123) screened in the Basal Chadron Sandstone during five water-level measurement events in March and April 2008 (Table 6). Fluctuating water levels were observed at two monitoring wells (COW-2 and CPW-2) and the two water supply wells (wells 97 and 123) during events between March 4 and April 4, 2008. It was subsequently discovered that wells 97 and 123 had been turned on periodically by local land owners to allow artesian flow to fill livestock tanks. The two water supply wells were subsequently closed and allowed to equilibrate for a 12-hour period prior to collecting additional pressure readings on April 16, 2008. The resulting potentiometric surface on April 16, 2008 is shown on Figures 5a through 5d and Figure 22. The potentiometric surface ranged from 3,672 to 3,729 feet amsl and was above the ground surface at all locations within the NTEA. Data for the April 16, 2008 event indicate groundwater flow is predominantly to the southeast with an average hydraulic gradient of 0.0018 ft/ft within the NTEA and steepened gradient of 0.0058 ft/ft southeast of the NTEA within the north-dipping fold limb. Figure 18 shows historical regional water levels for the Basal Chadron Sandstone from 1982 to 1983 for two wells in the vicinity of the NTEA and additional wells from the CSA. Because a limited number of data points exist, an inferred potentiometric surface has not been



Petition for Aquifer Exemption

North Trend Expansion Area

presented for the 1982 to 1983 data. However, the limited historical water levels suggest similar southward flow from the NTEA converging with north and northeast flow from the CSA in that time period.

Prior to starting the 2006 pump test (described in Section 4.3), static water levels were collected in June 2006 from the Brule Formation, Upper/Middle Chadron and Basal Chadron Sandstone. Water levels ranged from 3,608 to 3,621 feet amsl in the Brule Formation, 3,605 to 3,609 feet amsl in the Upper/Middle Chadron and 3,693 to 3,711 feet amsl in the Basal Chadron Sandstone (see North Trend Hydrologic Testing Report - Test #6 (PetroTek, 2006)) submitted as an appendix to the UIC Class III Permit Application). Historically, potentiometric levels in the overlying Upper/Middle Chadron Sand and Brule Formation average approximately 90 feet and 80 feet below the potentiometric surface for the Basal Chadron Sandstone, respectively, indicating that an upward hydraulic gradient exists between the Basal Chadron Sandstone and the Brule Formation.

Available groundwater data for both the Brule Formation and Basal Chadron Sandstone at the NTEA do not indicate that there are any documented flow rate variations or recharge issues that would impact groundwater quality as a result of ISL mining operations in the Basal Chadron Sandstone. There are no surface-water ponds within the area and only limited stream flow. The Brule Formation, while considered an overlying aquifer, is not an extensive or exceptionally productive system. The available monitoring data do not indicate any seasonality or pumping effects by domestic wells within this zone. There are no domestic wells completed in the Basal Chadron Sandstone within the NTEA and there is no information to indicate that there are recharge or flow rate issues associated with the Basal Chadron Sandstone that would affect groundwater quality.

4.2.2 Groundwater Quality Data

Groundwater quality within the White River drainage generally is poor (Engberg and Spalding, 1978). Groundwater obtained from the Basal Chadron Sandstone aquifer contains a strong sulfur odor as a result of localized reducing conditions associated with the ore body (Figure 2). Groundwater quality data was collected from 1982 to 1987 within and near the CSA to establish background conditions in the vicinity of the Crow Butte Project. Water-quality information for the Alluvium, Brule Formation and Basal Chadron Sandstone is summarized in Table 7. Wells sampled from the Brule Formation include RA-1, RA-2, RB-1 and RB-3 (Ferret Exploration of Nebraska, 1987). Wells sampled from the Chadron Formation include RC-1, RC-2, RC-3, RC-4, RC-5,



Petition for Aquifer Exemption

North Trend Expansion Area

RC-6 and RC-7 (Ferret Exploration of Nebraska, 1987). Background and restoration values are discussed in the UIC Class III Permit Application for the NTEA.

In order to assess potential impacts on water supply users in the NTEA and associated 2.25-mile AOR, CBR has used the results of water user surveys conducted by CBR in 1996, with updates in 2004, 2007 and 2008. The surveys consisted of interviews of individual home/ property owners and local drillers, and in 2008, a review of the Nebraska Department of Natural Resources (NDNR) groundwater well data base (NDNR, 2008b) for registered wells in the AOR. The water user survey determined the location, depth, casing size, depth to water and flow rate of all wells within the area that were (or could) be used for domestic, agricultural or livestock uses. Under current Nebraska law, domestic or livestock wells completed prior to September 09, 1993, do not have to be registered (NRS 2008). Therefore, well completion records for wells prior to September 09, 1993, are limited. However, efforts were made by CBR to gather available information on existing water supply wells located within the AOR of the NTEA through interviews with home/property owners and local well drillers. This interview process significantly improved the completeness of CBR's well user survey information presented in Appendix 6. Active, inactive and abandoned water wells within the 2.25-mile AOR of the NTEA are summarized in Table 8 and Appendix E.

In 1984, Wyoming Fuel Company notified the NDEQ that during a 1984 water supply well survey, local residents reported that 18 private water supply wells located within the Town of Crawford had been abandoned (Collings, S.P. 1984). The locations of these wells were as follows:

1121 1 st Street	228 Ash Street
233 Reed Street	Old Creamery – 2 wells
311 Annin Street	5 th and Main Streets
320 Annin Street	410 Pine Street
702 Annin Street	5 th and Oak Streets
704 Annin Street	End of Fremont Street (south end)
708 Annin Street	235 Elm Street



Petition for Aquifer Exemption

North Trend Expansion Area

5th and Linn Streets

10118 3rd Street

Sam Schmidt Place

There was little information available for such wells other than being abandoned. Due to the lack of information, these wells have not been included in the water user survey data presented in Appendix E.

Based on the data collected during the 1996 water user survey, CBR selected a Basal Chadron Sandstone well (W-007 also identified as Well 81) and a Brule Formation well (W-008 also identified as Well 78) for water-quality analyses (Figure 19). It should be noted that well W-007 (Well 81) was subsequently abandoned. CBR collected groundwater samples from the two water supply wells during four monitoring periods, obtained from September 1996 through July 1997, to assess seasonable variability in water quality. Tables 9 and 10 summarize the water-quality results for these two well locations for a full suite of analyses including major ions, nonmetals, trace metals and select radionuclides. When uranium undergoes radioactive decay, highly radioactive elements are produced. Radionuclides of the uranium-238 decay series include uranium, thorium-230, radium-226, lead-210 and polonium-210. Water quality results indicate that the TDS for the Basal Chadron Sandstone ranged from 1,790 to 1,820 mg/L, while the TDS for the Brule Formation ranged from 423 to 479 mg/L. Major ion content in groundwater was slightly higher in the Basal Chadron Sandstone than the Brule Formation, as would be expected by the concentrations of TDS. Alkalinity and conductivity are higher in the Basal Chadron Sandstone than Brule Formation. Neither formation had significant measurable concentrations of most trace metals. Measurable uranium ranging in concentration from non-detect to 0.006 mg/L was detected in groundwater from Basal Chadron Sandstone. Concentrations of radium-226 ranged from 10.3 to 14.7 picocuries per liter (pCi/L) in groundwater from the Basal Chadron Sandstone, which is above the USEPA maximum contaminant level (MCL) and NDEQ standard of 5 pCi/L. Measurable uranium was also present in all four groundwater samples from the Brule Formation and ranged in concentration from non-detect to 0.016 mg/L. Radium-226 was only detected in two groundwater samples from the Brule Formation and ranged in concentration from non-detect to 0.5 pCi/L.

Additional quarterly groundwater sampling was conducted in the NTEA from September 1996 to June 1997 and July 2004 to September 2005. Groundwater samples were collected from one Basal Chadron Sandstone well (Well 81) and four Brule Formation wells (Well 77, Well 78, Well 83 and Well 107) (Figure 19). The sample locations were chosen based on proximity to the proposed mining operation,



Petition for Aquifer Exemption

North Trend Expansion Area

use and distribution throughout the NTEA. Groundwater samples were only analyzed for select radionuclides (natural uranium, thorium-230, radium-226, lead-210 and polonium-210), with the exception of First Quarter 2005 results when only natural uranium and radium-226 were analyzed as a result of an error on the chain-of-custody (Table 11). Analytical results for the Brule Formation indicate that natural uranium ranged from 6.1 to 31.1 pCi/L, radium-226 ranged from non-detect to 1.3 pCi/L, thorium-230 ranged from non-detect to 1.2 pCi/L, lead-210 ranged from non-detect to 13.5 pCi/L and polonium-210 ranged from non-detect to 8.6 pCi/L. Analytical results for the Basal Chadron Sandstone indicate that natural uranium ranged from non-detect to 8.8 pCi/L, radium-226 ranged from 9.2 to 13.5 pCi/L, thorium-230 ranged from non-detect to 10.8 pCi/L, lead-210 ranged from non-detect to 12.9 pCi/L and polonium-210 ranged from non-detect to 12.4 pCi/L. The 1996 and 1997 water quality data establish the initial water-quality conditions associated with Brule Formation and the mineralized Basal Chadron Sandstone (Tables 9, 10 and 11).

Additional water-quality samples were collected during three bi-weekly sampling events from wells in the NTEA in March 2008 to meet the current NRC permit requirements (SUA-1534, Section 10.3). Groundwater sample locations included one Brule Formation well (BOW-1), nine Basal Chadron monitoring wells (COW-1, COW-2, COW-3, COW-4, COW-5, COW-6, CPW-2, RC-1 and RC-2), and two Basal Chadron water supply wells (Wells 97 and 123) (Figure 19). Attempts were made to collect groundwater samples from a second Brule Formation well (BOW-2); however, this well was dry during each sampling event. All groundwater samples were analyzed for major ions, metals, physical properties and radionuclides (Table 12 and Appendix D). Groundwater samples collected in March 2008 from wells in the NTEA were analyzed for each of these daughter products.

Extensive water quality results for the March 2008 sampling event indicate that the Brule Formation and Basal Chadron Sandstone have different geochemical signatures. For the Brule Formation, TDS ranged from 429 to 474 mg/L, uranium concentrations ranged from 0.025 to 0.026 mg/L, polonium-210 ranged from non-detect to 0.9 pCi/L and radium-226, thorium-230 and lead-210 were non-detect for all three sampling events (Table 12). For the Basal Chadron Sandstone, TDS ranged from 1,200 to 2,550 mg/L, uranium concentrations ranged from non-detect to 0.0361 mg/L, radium-226 ranged from non-detect to 44.6 pCi/L, thorium-230 ranged from non-detect to 0.2 pCi/L, lead-210 ranged from non-detect to 39.2 pCi/L and polonium-210 ranged from non-detect to 7.6 mg/L (Table 12). Note that uranium concentrations were non-detect at all sampling locations outside of the NTEA (RC-1, Well 97 and Well 123) (Figure 19).



Petition for Aquifer Exemption

North Trend Expansion Area

Based on the March 2008 results, concentrations of TDS, major ions, uranium and all daughter products of uranium decay are elevated in the Basal Chadron Sandstone.

4.3 Aquifer Testing and Hydraulic Parameter Identification Information

During the initial permitting and development activities within the CSA, two pumping tests were conducted in the central portion of the CSA to: (1) assess the hydraulic characteristics of the Chadron Sandstone, and (2) demonstrate the confinement provided by the overlying and underlying aquicludes. Those tests, referred to as Test #1 and Test #2, were performed in 1982 and 1987, respectively (Wyoming Fuel Company, 1983; Resources Technologies Group, 1987). Test #3 was conducted in September 1996 (Harlan & Associates, Inc., 1996). Test #4 was conducted in August 2002 (Petrotek, 2002). Results from those tests are summarized in Table 13.

Pump tests on the Basal Chadron Sandstone aquifer were conducted in the NTEA between 2004 and 2006. The final report on pump test activities in the NTEA (North Trend Hydrologic Testing Report - Test #6 (PetroTek, 2006) was submitted as an appendix to the UIC Class III Permit Application. Testing activities and findings from pump test activities in the NTEA are summarized below.

Results from the initial testing activities conducted in 2004 to 2005 (Tests #1 through #5) were not definitive as a result of such problems including improperly abandoned old exploration holes, equipment problems, insufficient stress (drawdown) to provide usable data and infiltration of surface water into observation wells. Prior to testing activities, CBR installed seven new wells in the Basal Chadron Sandstone (CPW-1, CPW-2, COW-1, COW-2, COW-3, COW-4 and COW-5) (Figure 20). CPW-1 was installed specifically for use as a pumping well, but was subsequently abandoned due to casing problems and CPW-2 was installed as a replacement. The remaining wells were used as observation wells. A pre-existing well that was screened in the Basal Chadron Sandstone (RC-2) was also used as a monitoring location. To assess the hydrogeologic isolation of the Basal Chadron Sandstone aquifer during testing, CBR also installed monitoring wells in the overlying Upper/Middle Chadron (MCOW-1 and MCOW-2) and Brule Formation (BOW-1) (Figure 20). Because the Basal Chadron Sandstone is underlain by the thick and relatively impermeable Pierre Shale (as discussed in Sections 3.3 and 4.4), no underlying monitoring wells were installed.

A longer pump test was conducted in June and July 2006 (Test #6), which included installing new monitoring wells in the Upper/Middle Chadron (MCOW-3 and MCOW-4) and Brule Formation (BOW-2), and use of automated equipment. The pump test was



Petition for Aquifer Exemption

North Trend Expansion Area

conducted in accordance with a Test Plan submitted by CBR to the NDEQ in June 2006. Well information for wells used during the 2006 pump test is summarized in Table 14. Locations of wells used during the 2006 pump test are illustrated on Figure 20.

The 2006 pump test was designed to assess the following:

- degree of hydrologic communication between the Basal Chadron Sandstone pumping well and the surrounding Basal Chadron Sandstone monitoring wells
- presence or absence of hydrologic boundaries within the Basal Chadron Sandstone aquifer over the test area
- hydrologic characteristic of the Basal Chadron Sandstone aquifer within the test area
- degree of hydrologic isolation between the Basal Chadron Sandstone aquifer and the overlying aquifers

The 2006 pump test was conducted while pumping at COW-5 at 16.4 gpm for 357 hours (14.9 days). The radius of influence (ROI) was approximately 7,500 feet. More than 110 feet of drawdown was achieved during testing and all wells monitored during the test indicated adequate drawdown (e.g., greater than 1.3 feet), confirming hydrologic communication with the Basal Chadron Sandstone aquifer.

Results of the 2006 pump test indicate a mean hydraulic conductivity of 2.3 feet/day (8.1×10^{-4} centimeters per second [cm/sec]), a mean transmissivity of 60 square feet per day (ft^2/day ; ranging from 42 to 75 ft^2/day), and a mean permeability of approximately 1,100 millidarcies (md) based on an assumed water viscosity of 1.35 cp (at 50 degrees Fahrenheit) and a density of 1 (Table 13). The mean storativity was 5.3×10^{-5} (ranging from 2.3×10^{-5} to 8.4×10^{-5}) (Table 13). Estimated hydraulic parameters for individual well locations for the 2006 pump test are summarized in Table 15. No water-level changes of concern were observed in any of the overlying wells during testing. The pump test results demonstrate the following important conclusions:

- The Test #6 monitoring well network is in hydraulic communication with the Basal Chadron Sandstone aquifer throughout the NTEA.



Petition for Aquifer Exemption

North Trend Expansion Area

- The Basal Chadron Sandstone aquifer has been adequately characterized with respect to hydrogeologic conditions within the test area.
- Adequate confinement exists between the Basal Chadron Sandstone aquifer and the overlying Upper/Middle Chadron and Brule Formation throughout the majority of the NTEA.
- Transmissivity of the Basal Chadron Sandstone in the NTEA is relatively consistent, but the thickness and hydraulic conductivity vary with direction and location.

These conclusions indicate that though variance in thickness and hydraulic conductivity may impact mining operations (e.g., well spacing, completion interval and injection/production rates), it is not anticipated to impact regulatory issues. It should be noted that cross-sections presented in the North Trend Hydrologic Testing Report - Test #6 (PetroTek, 2006) differ from cross-sections presented in this application. Cross-sections presented in this application are revised interpretations based on a recent extensive review of available site-specific drilling logs and published literature.

Though initial review of Test #6 results reported no evidence of a hydraulic boundary at the location of the White River Fault and fold structure, further evaluation of drawdown data from two observation wells (COW-2 and RC-2) located between the pump well (COW-5) and the fold structure, indicate the presence of a barrier boundary (possible low-K boundary) likely associated with reduced transmissivity due to tectonic compressional stresses on the steep limb of the fold (Figures 23 and 24). The steepness of the drawdown curves is consistent with a barrier boundary condition south of COW-2 and RC-2 (Kruseman and de Ridder, 1994). Based on the structure of the monocline, the 7,500-foot ROI for the 2006 pump test was adequate to recognize a hydraulic boundary located between the fold axis and the pumping well.

4.4 Hydrologic Conceptual Model for the North Trend Expansion Area

Tables 1 and 3 present the regional and local stratigraphic columns within the NTEA. The water-bearing units within the stratigraphic section present at the NTEA include the Basal Chadron Sandstone, Upper/ Middle Chadron, permeable intervals in the Orella Member of the Brule Formation, and (rarely) alluvial deposits. Sections 4.4.1, 4.4.2 and 4.4.3 describe the confining layers present at the NTEA, hydrologic conditions for the water-bearing intervals and hydrological affects of tectonic folding.



Petition for Aquifer Exemption

North Trend Expansion Area

4.4.1 Confining Layers

Lower confinement for the Basal Chadron Sandstone is represented by approximately 1,200 to 1,500 feet of Pierre Shale in the NTEA, which hydraulically isolates the unit from underlying sandstone intervals. The Pierre Shale is not a water-bearing unit, exhibits very low permeability, and is considered a regional aquiclude. Regional estimates of hydraulic conductivity for the Pierre Shale range from 10^{-7} to 10^{-12} cm/sec (Neuzil and Bredehoeft, 1980; Neuzil et al., 1982; Neuzil et al. 1984; Neuzil, 1993). The Pierre Shale has a measured vertical hydraulic conductivity in the CSA of less than 1×10^{-10} cm/sec (Wyoming Fuel Company, 1983), which is consistent with other studies in the region. Particle grain size analysis of a sample collected from the Pierre Shale within the NTEA (borehole 775) indicates a silty clay composition (Appendix B). Regional studies also indicate there is no observed transmissivity between vertical fractures in the Pierre Shale, which appear to be short and not interconnected (Neuzil et al., 1984).

Upper confinement for the Basal Chadron Sandstone within the NTEA is represented by 200 to 300 feet of smectite-rich mudstones and claystones of the Middle Chadron (Figures 5a through 5d). Particle grain-size analyses of six samples collected from the Middle Chadron in the NTEA indicate all samples were either silty claystone or clayey siltstone, with an even mixture of silt- and clay-sized particles (Appendix B). X-ray diffraction and particle grain-size analyses indicate the compositions and particle size distributions of mudstone and claystone intervals of the Middle Chadron are highly similar to the Pierre Shale (Appendix B). This would be expected if the Pierre Shale was a source of materials for the overlying Middle Chadron. Geophysical logs generally indicate a lack of formation water for the Middle Chadron (Appendix A). All available data indicate an upward hydraulic gradient between the Basal Chadron Sandstone and the Upper/ Middle Chadron, with an average hydraulic head difference of approximately 90 feet between the two units. Coupled with no observed drawdown in the Upper/Middle Chadron related to pumping in the Basal Chadron Sandstone aquifer during the 2006 pump test (see Section 4.3), the magnitude of hydraulic head difference between Basal Chadron Sandstone and the Upper/Middle Chadron further indicates adequate hydraulic confinement and, therefore, hydraulic isolation between the two water-bearing units.

The Upper Chadron represents a second upper confining layer for both the Upper/Middle Chadron and the Basal Chadron Sandstone. This second upper confining layer represents 100 to 250 feet of laterally continuous bentonitic clay. Though minor interbedded tabular and lenticular sandstones occur in the Upper



Petition for Aquifer Exemption

North Trend Expansion Area

Chadron, the sandstones are thinly bedded, not laterally continuous and are very localized (Terry and LaGarry, 1998). All available data indicate an upward hydraulic gradient between the Basal Chadron Sandstone and the Brule Formation, with an average hydraulic head difference of approximately 80 feet between the two units. Similar to the Upper/Middle Chadron, no drawdown was observed in the Brule Formation related to pumping in the Basal Chadron Sandstone aquifer during the 2006 pump test (see Section 4.3). In addition, the large magnitude of hydraulic head difference between the Basal Chadron Sandstone and the Brule Formation, coupled with the observation that Brule Formation wells are often dry, further indicate adequate hydraulic confinement between the two water-bearing units. Though the Orella Member of the Brule Formation is composed of predominantly low-permeability clayey siltstones, discontinuous lenses of permeable facies (sandstone and siltstone units) create the possibility of permeability pathways in the Brule Formation. In addition, the primary groundwater supply in the vicinity of the NTEA is a sandy clay in the Brule Formation. Therefore, the upper confining unit represented by the Upper Chadron probably does not extend much above the contact between the Upper Chadron and overlying Brule Formation.

4.4.2 Hydrologic Conditions

The Basal Chadron Sandstone outcrops approximately 10 miles north of the NTEA, where recharge occurs. A travel time of approximately 1,049 years was estimated between the recharge zone and the northernmost monitoring well in the NTEA (COW-6) based on an average hydraulic gradient (0.00304 ft/ft) and gradient direction (N70°W) for the northern portion of the NTEA, estimated travel distance (10 miles), mean hydraulic conductivity from the 2006 pump test (2.3 ft/day) and estimate of effective porosity (0.05) for a coarse-grained arkosic sandstone. A potentiometric map and cross-sections of the Basal Chadron Sandstone indicate confined groundwater flow (Figures 5a through 5d and 22). Most wells screened in the Basal Chadron Sandstone in the NTEA flow as artesian wells at the surface. Elevations of the potentiometric surface within the NTEA indicate the recharge zone must be located above a minimum elevation of 3,720 feet amsl. Artesian conditions exist in the NTEA as a result of an elevated recharge zone north of the NTEA. The top of the Basal Chadron Sandstone occurs at much lower elevations within the NTEA (ranging from approximately 3,100 to 3,400 feet amsl), which is likely a flexural response to development of the monocline to the south.

Groundwater flow in the Basal Chadron Sandstone aquifer is predominantly to the east within the NTEA, with an average hydraulic gradient of 0.0018 ft/ft (9.5 feet/mile).



Petition for Aquifer Exemption

North Trend Expansion Area

Groundwater flow south of the NTEA is predominantly to the southeast, with an average steepened hydraulic gradient of 0.0058 ft/ft (30.6 feet/mile), coincident with the north-dipping fold limb. The elevation of the Basal Chadron Sandstone within the NTEA is typically more than 500 feet below the base of the White River, with the exception of shallower locations within the fold structure and at the northern end of the NTEA (Figures 5a, 5b and 5d).

Regional water-level data for the Basal Chadron Sandstone is limited (Figure 18). Based on the limited data available, the hydraulic gradient in the NTEA (to the east) is different from the hydraulic gradient in the CSA (generally to the north) (Figures 18 and 22). Together, groundwater flow directions from the NTEA and CSA suggest a discharge point at an elevation of at least approximately 3,700 feet amsl (or below) located east of Crawford, presumably at a location where the Basal Chadron Sandstone is exposed. Additional investigations to be conducted during development of mining activities in the NTEA will provide additional information regarding the impact of the fold structure on regional and local flow in the Basal Chadron Sandstone.

The Upper/Middle Chadron is generally present within the NTEA, though it occurs intermittently in the northern portion of the NTEA and is completely absent in the vicinity of the fold structure south of the NTEA (Figures 5a through 5d, and 12b). The resistivity curve for the Upper/Middle Chadron suggests this is a transmissive unit. The N-N curve generally reads lower cps, indicating that the unit is more saturated with higher porosity than overlying and underlying materials. Where present, available water-level information from the 2006 pump test (3,605 to 3,609 feet amsl) indicates confined conditions. This also suggests that the Upper/Middle Chadron is hydraulically connected to a recharge zone that occurs at least vertical 200 feet higher than the elevation of the unit within the NTEA, presumably located to north. Results from the 2006 pump test verify that this unit is not hydraulically connected to the Basal Chadron Sandstone. However, because wells screened in the Upper/Middle Chadron (MCOW-1, MCOW-2, MCOW-03 and MCOW-4) are generally dry, this unit is not considered a regional aquifer, at least not at the locations of the monitoring wells (Figure 19). It is possible that the Upper/Middle Chadron may produce recoverable water at other locations.

Available regional water-level information for the Brule Formation indicates unconfined groundwater flow generally toward the White River (Figures 17 and 21). Within the NTEA, groundwater generally flows to the southeast in the northern portion of the NTEA and to the northeast in the southern portion of the NTEA. Though the Brule Formation is the primary groundwater supply in the vicinity of the NTEA, low production



Petition for Aquifer Exemption

North Trend Expansion Area

rates indicate that the discontinuous sandstone lenses of the Orella Member may not be hydraulically well-connected. Recharge to this unit likely occurs directly within the NTEA, as the unit is unconformably overlain by 0 to 60 feet of unconsolidated alluvial and colluvial deposits (depending on local topography) and is exposed throughout the vicinity (Figure 3; personal communication with CBR staff, March 2008). This unit is likely in direct hydraulic communication with the White River, as indicated by apparent recharge to the Brule Formation in the vicinity of the White River (Figures 17 and 21). In that context, gaining and losing conditions along the White River are probably seasonally influenced. A sufficient number of monitoring wells will be installed in the Brule Formation in the vicinity of the White River to monitor water quality in the event of failure of an injection well or production well, and to prevent potential communication of mining fluids with surface water. Alluvial deposits along the margins of the White River may offer limited groundwater storage depending on river levels.

The individual water-bearing units in the NTEA have distinct and differing water-level elevations (Table 6). The available water-level data suggest hydrologic isolation of the Basal Chadron Sandstone with respect to the overlying water-bearing intervals in the NTEA. This inference is further supported by the difference in geochemical groundwater characteristics between the Basal Chadron Sandstone and the Brule Formation (see Section 4.2.2) (Table 12). At this time, there is no data to indicate a change in water quality between the recharge area and the NTEA.

In summary, the following multiple lines of evidence indicate adequate hydrologic confinement of the Basal Chadron Sandstone within the NTEA:

- Results of the 2006 aquifer pump test demonstrate no observed drawdown in observation wells screened in overlying water-bearing units throughout the majority of the NTEA (see Section 4.3).
- Site-specific x-ray diffraction and particle grain-size distribution analyses and geophysical logging confirm the presence of two upper confining units, each consisting of thick sequences (up to 250 and 300 feet) of low-permeability mudstone and claystone, and a thick (up to 1,500 feet), regionally extensive lower confining unit composed of very low-permeability black marine shale (see Section 4.4.1).
- Large differences in hydraulic head (80 to 90 feet) were observed between the Basal Chadron Sandstone and two overlying water-bearing units (see Section 4.4.1).



Petition for Aquifer Exemption

North Trend Expansion Area

- Significant historical differences exist in geochemical groundwater characteristics between the Basal Chadron Sandstone and the Brule Formation (Section 4.2.2).

4.4.3 Hydrological Affects of Folding

The overall hydraulic gradient direction in the Basal Chadron Sandstone aquifer is generally to the southeast (Figure 22). Steep folding of the Basal Chadron Sandstone associated with development of the monoclinical structure immediately south of the NTEA boundary does not appear to effect the overall hydraulic gradient direction. This observed potentiometric surface supports the interpretation that the White River Fault does not cut upsection into this stratigraphic unit, as faults typically act as a relatively impermeable boundary or a discrete zone of discharge. However, there is a noticeable increase in hydraulic gradient south and east of well location COW-2 where the gradient is nearly three times steeper than the hydraulic gradient in the NTEA (Figure 22). Several explanations for the increased hydraulic gradient are presented below:

- Based on the occurrence of increased hydraulic gradient coincident with the location of the fold structure and isohead lines that parallel the strike of the fold axis, it is feasible that development of the fold structure (e.g., jointing, fracturing, compression of the aquifer matrix) resulted in a change in pore connectivity, with a bulk decrease in permeability of the Basal Chadron Sandstone. Based on this observed change in gradient, transmissivity appears to be reduced by as much as 50 percent or more in the vicinity of the fold. The occurrence of isohead lines that parallel the strike of the fold further support a reduction in transmissivity as a result of folding, as one would expect a reduction in transmissivity to occur along the entire length of the fold.
- Structural thinning of stratigraphic units located along the length of the fold limb resulted in reduced transmissivity in the Basal Chadron Sandstone aquifer. Though a reduction in hydraulic conductivity may have occurred, only structural thinning is necessary to reduce transmissivity.
- Heterogeneity may exist within the Basal Chadron Sandstone, which reduces the transmissivity south of the NTEA.
- Any spatial variation in leakage through the upper confining layers could contribute to the observed gradient change. However, the rate of leakage required to produce the observed change in gradient would be minimal.



Petition for Aquifer Exemption

North Trend Expansion Area

- Regional influence from pumping (e.g., ISL mining activities at the CSA to the south) may be affecting the observed gradient.
- Any combination of scenarios listed above.

Yecheili et al. (2007) concluded that steep hydraulic gradients associated with pressure-induced permeability reductions were due to compressional stresses on the steep limbs of the Ramallah and Hebron monoclines in a layered structure in the Judea Group Aquifer system in Israel. Their study is analogous to the effects of tectonic folding on the hydrologic conditions within the Basal Chadron Sandstone. However, without a quantitative basis or additional data with which to further evaluate these possible explanations, development of a comprehensive groundwater model with an integrated systems analysis could be used to choose the best quantitative solution, as well as optimize ISL mining scenarios from a cost perspective.

As summarized in Section 4.3, further evaluation of drawdown data at two observation wells (COW-2 and RC-2) located between the pumping well (COW-5) and the fold structure, indicate the presence of a barrier boundary (possible low-K boundary) likely associated with reduced transmissivity due to tectonic compressional stresses on the steep limb of the fold (Figures 23 and 24). The steepness of the drawdown curves is consistent with a barrier boundary condition to the south of COW-2 and RC-2 (Kruseman and de Ridder, 1994).

Based solely on the 2006 pump test results, the existence of a fault that cuts upsection into the White River Group (and the Basal Chadron Sandstone aquifer) cannot be ruled out. However, numerous lines of evidence (listed below) support the inference that the White River Fault does not cut upsection into the Basal Chadron Sandstone (or younger overlying units) and, therefore, does not affect the hydraulic confinement of the Basal Chadron Sandstone aquifer:

- There is a lack of obvious linear features on the top surface of the Pierre Shale and Basal Chadron Sandstone that are typically associated with fault displacement, which would indicate a fault rupture (Figures 12a through 12d).
- Based on geophysical logging, there is adequate spatial resolution of continuous geophysical signatures across the steep fold limb for two important marker beds (Pierre Shale and Basal Chadron Sandstone) that indicate the geologic beds are not offset due to faulting (Figure 12a, lower right panel; Figure 12d; Appendix A).



Petition for Aquifer Exemption

North Trend Expansion Area

- If a permeable fault boundary did exist south of the NTEA, one would expect to have more dramatically decreased water levels near the fold structure (see Figures 5a, 5b and 5d). Significantly decreased water levels have not been observed, thereby indicating that the hydrologic effects of the fold structure are limited to reduced transmissivity within the Basal Chadron Sandstone aquifer.

Though the majority of units in the White River Group were folded by development of the monocline south of the NTEA, pervasive fracturing of the Brule Formation due to structural modification by the monocline is unlikely, as the unit experienced a low magnitude of very broad, concentric folding (see Section 3.4.2) (Figure 12c). Additionally, an older unit in the White River Group (Basal Chadron Sandstone) that was more severely folded exhibits reduced transmissivity along the fold limb, which does not negatively affect confined conditions.

4.5 Description of the Proposed Mining Operation and Relationship to Site Geology and Hydrology

The Basal Chadron Sandstone is currently mined via ISL mining techniques in the CSA and represents the production zone and target of solution mining in the NTEA. Ore-grade uranium deposits underlying the NTEA are located in the Basal Chadron Sandstone (Figure 2). The ore body located within the NTEA is a stacked roll-front system, which occurs at the boundary between the up-dip and oxidized part of a sandstone body and the deeper down-dip and reduced part of the sandstone body. Stratigraphic thickness of the unit within the NTEA ranges from approximately 20 to 170 feet, with an average thickness of approximately 54 feet (typically 30 feet of sandstone) (Figures 5a through 5d). North of the fold structure, the unit occurs at depths ranging from about 400 to 700 feet bgs within the NTEA (Figures 5a through 5d). Upper confining layers consist of the Middle Chadron and Upper Chadron, which consist predominantly of clay, claystone and siltstone. Based on drilling data collected to date, the thickness of the two Middle Chadron and Upper Chadron upper confining layers in the NTEA range from 200 to 300 and from 100 to 250 feet, respectively (Figures 5a through 5d). Geophysical logs from nearby oil and gas wells indicate that the thickness of the Pierre Shale lower confining layer ranges from approximately 1,200 to 1,500 feet (see Section 3.3.3.2). The full thickness of the Pierre shale is not depicted in Figures 5a through 5d, as the required scale would obscure stratigraphic details of the overlying White River Group. The Pierre Shale exhibits very low permeabilities on the order of 0.01 md (less than 1×10^{-10} cm/sec) (Wyoming Fuel Company, 1983).



Petition for Aquifer Exemption

North Trend Expansion Area

Production of uranium by ISL mining techniques involves a mining step and a uranium recovery step. The ISL mining process involves contacting a mineral deposit with leaching fluids (“lixiviant solution”) to dissolve the mineral without having to physically remove the ore from the subsurface. The ideal lixiviant solution is one that will oxidize the uranium in the ore and contains a complexing agent that will dissolve and form strong aqueous complexes that remain dissolved and interact little with the host rock. Typical lixiviants for in-situ leach mining are solutions of ions such as bicarbonate or carbonate that form stable complexes with the oxidized uranium, denoted as U(VI). Oxidants added to the lixiviant to cause the oxidation of uranium ore include oxygen or hydrogen peroxide. Mining is accomplished by installing a series of injection wells through which the leach solution is pumped into the ore body. Corresponding production wells and pumps promote flow through the ore body and allow for the collection and withdrawal of uranium-rich leach solution. At the Central Plant, uranium is removed from the leach solution by ion exchange, and then from the ion exchange resin by elution. The leach solution can then be reused for mining purposes. The elution liquid containing the uranium (the “pregnant” eluant) is then processed by precipitation, dewatering and drying to produce a transportable form of uranium. Demonstration that hydraulic control is being maintained will be provided by exterior monitor wells surrounding each wellfield. Uranium will be removed from the Basal Chadron Sandstone in the NTEA in the same manner that it is removed from the ore zone in the CSA by injection and subsequent extraction of leaching solutions. The site-specific ISL mining process for the NTEA is described in the UIC Permit Application.

The Basal Chadron Sandstone hydrologic properties must be known to formulate the best injection/ extraction well arrays and for appropriate containment. Based on the pumping rate, test duration and formation characteristics, the ROI (i.e., the area over which drawdown occurs) can also be determined for a given test. Table 13 presents relevant hydrologic information based upon an aquifer test performed in the NTEA during 2006, compared with the same properties in the CSA. These data indicate that mean transmissivity and hydraulic conductivity of the NTEA are lower than the CSA, yet high enough such that successful development of the NTEA can be accomplished. Water levels and water quality in the Basal Chadron Sandstone will be evaluated by production zone monitor wells during mining.

4.6 Lateral and Vertical Extent of the Exempt Aquifer

The lateral extent of the area requested for aquifer exemption is shown on Figure 2. A legal description of the lateral extent is presented in Table 2. The lateral extent of the



Petition for Aquifer Exemption

North Trend Expansion Area

proposed aquifer exemption presented here is equivalent to the proposed NRC permit boundary.

The vertical extent of the requested exemption is the full thickness of the Basal Chadron Sandstone (Chamberlain Pass Formation), which extends from the top of the Pierre Shale to the base of the Middle Chadron (Peanut Peak Member) (Table 3; Figures 5a through 5d). This vertical extent is slightly different than the vertical extent requested and received in the 1983 Aquifer Exemption Petition for the CSA, which includes the Middle Chadron (Peanut Peak Member) and Upper/Middle Chadron (Big Cottonwood Creek Member).

4.7 Local Water Supply

The White River and associated tributaries indirectly supply some drinking water to the residents of Crawford. The town system, which serves a population of 1,115 (Nebraska Department of Health & Human Services, 2004), is supplied by three infiltration galleries (located along the White River, Deadman's Creek and Soldier Creek) and two wells that produce "groundwater under the influence of surface water" (University of Nebraska Cooperative Extension HE Form 526). In 1981, average daily usage ranged from a low of 199 gallons per day (gpd) per person in February to a high of 508 gpd/person in July. The maximum recorded daily water usage in Crawford up to 1981 was nearly 1 million gallons. Based on the Crawford Municipal Water Conservation Plan (spring 2003), the average per capita water use in 2002 (including residential and business customers, public facilities including parks (etc.) and water lost to system leaks) was 323 gpd. Information regarding the Town of Crawford water system is summarized in Table 16 (Teahon, 2007).

In general, groundwater supplies in the vicinity of the NTEA are limited due to topography and shallow hydrostratigraphy (University of Nebraska-Lincoln, 1986). Groundwater quality within the White River drainage generally is poor (Engberg and Spalding, 1978). Locally, groundwater is obtained at limited locations from shallow alluvial sediments. The primary groundwater supply is a sandy clay in the Brule Formation, typically encountered at depths from 60 to 100 feet. The static water level for Brule Formation wells in the NTEA vicinity ranges from 10 to 60 feet bgs based on topography. Groundwater from the underlying Basal Chadron Sandstone aquifer is not used as a domestic supply within the NTEA because of the greater depth (400 to 700 feet bgs) and inferior water quality. Gosselin et al. (1996) state that: (1) "*the sands near the bottom of the Chadron Formation yield sodium-sulphate water with high total dissolved solids,*" and (2) in proximity to "*uranium deposits in the Crawford area,*



Petition for Aquifer Exemption

North Trend Expansion Area

groundwater from the Chadron Formation is not suitable for domestic or livestock purposes because of high radium concentrations.”

Based on the National Groundwater Association website (www.ngwa.org), average water use for rural (domestic) wells in Nebraska is approximately 380 gpd. Assuming an average family size of four persons, this correlates well with data from the USGS (*National Handbook of Recommended Methods for Water Data Acquisition* – Chapter 11) that suggests an average per capita use on the order of 97 gpd. Only one residence is located within the NTEA (Sections 27 and 34), which would indicate a total groundwater use within the NTEA of only 380 gpd based on the average per capita use.

Table 8 and Appendix E list the active, inactive and abandoned groundwater wells in the NTEA and the 2.25-mile AOR which are depicted on Figures 19a and 19b. Within the 2.25-mile AOR, 149 of the active wells are completed in the Brule Formation and 15 are completed in the Chadron Formation (not including the “RC” monitoring wells). The updated water user survey indicates that the only domestic groundwater supply within the NTEA is the Brule Formation (Well 77, Well 78 and Well 83). The only Chadron Formation water supply well within the NTEA (Well 81A) was abandoned. None of the water supply wells within the NTEA are used for drinking water. Groundwater pumped from active wells within the 2.25-mile AOR is used either to water livestock or for domestic purposes (Appendix E). Active water supply wells screened in the Chadron Formation within the 2.25-mile AOR are used exclusively for watering livestock, with the exception of 5 wells that are used domestically (Well 61, Well 98, Well 437, Well 443 and Well 5069) (Figures 19a and 19b). The extraction rate for Well 61 and Well 98 is currently unknown. The extraction rate for Well 437 and Well 443 is 10 gpm (Appendix E). The extraction rate for Well 5069 is 12 gpm (Appendix E). Well 5069 is the only well located within the town limits.

It should be noted that only 3 of the 5 active domestic water supply wells screened in the Chadron Formation are open to the Basal Chadron Sandstone (Well 61, Well 98 and Well 6059). Based on a detailed review of all available information from the water user survey and 3D geologic model, 4 active water supply wells assigned the Chadron Formation (Well 437, Well 440, Well 441 and Well 443) are open only to Chadron clay units (Table 8). These 4 wells were not cemented during well installation and contain either gravel pack or are open hole between the Brule Formation and the Chadron clay. Water levels at these wells ranges from 18 to 54 ft bgs. Given their locations and the measured water levels in the Brule Formation and Basal Chadron Sandstone, it is clear that the wells are not in hydraulic communication with Basal Chadron Sandstone



Petition for Aquifer Exemption

North Trend Expansion Area

and are likely in hydraulic communication with the Brule Formation (Figures 5a, 19a, 21 and 22).

Four active Chadron Formation wells (RC-1, Well 97, Well 123 and Well 437) are located in close proximity to the NTEA boundary (Figure 19a). Three of the wells (RC-1, Well 97 and Well 123) are artesian and do not contain pumps. Because of artesian pressure, most of the limited number of wells screened in the Basal Chadron Sandstone in the vicinity of the NTEA either flow at the surface, or have water levels very close to surface (Figures 5a through 5d). Well 97 and Well 123 are periodically used as limited alternate supplies of stock water. Artesian flow at the surface for Well 97 is estimated to be 6 gpm. The flow rates at Wells 123 and RC-1 are currently unknown.

Wells RC-1, RC-2 and RC-3 are located on land leased by CBR (Figure 19a). The prefix "RC" in the well name stands for "Regional Chadron" formation well. All three wells were originally installed as monitoring wells. The lease on the land containing RC-1 was discontinued by CBR and the well was not abandoned. The land was subsequently sold by the owner. RC-1 is now used as an agricultural water supply well. RC-2 is located within the NTEA and is used as a monitoring well. RC-3 was recently abandoned in May 2008.

CBR recently abandoned Well 65 and RC-3 in May 2008 and Well 425 in July 2008. Well 5004 and 5026 were also recently abandoned in June 2008 by an independent driller. CBR is scheduled to abandon Well 52 and Well 114 in August 2008. Additional descriptions of the scheduled well abandonment and well abandonment records are provided in the Class III UIC Permit Application. CBR has obtained approval of the well owners to abandon these wells. Once these wells have been abandoned as per NDEQ requirements, the affidavits of abandonment will be submitted to the NDEQ. A discussion of previously abandoned wells can be found in the Class III UIC Permit Application.

CBR will develop procedures so that hydraulic adjustments can be made in response to increased pumping rates by land owners at nearby water supply wells during ISL mining activities. Either the monitoring well system in place during mining operations or the monitoring of power consumption at water supply well locations will indicate increased pumping rates from nearby water supply wells screened in the Basal Chadron Sandstone (see UIC Class III Permit Application). Water supply well use appears to be limited to small volumes that should have a minimal effect on capture of



**Petition for Aquifer
Exemption**

North Trend Expansion Area

mining fluids. It is unlikely that increased pumping at nearby water supply wells would allow mining fluids to escape the NTEA.

In summary, there is no domestic use of groundwater from the Basal Chadron Sandstone within the NTEA. The only residence within the NTEA is supplied by two water supply wells (Wells 83 and 84) which are completed in the relatively shallow Brule Formation (Figure 19a and Table 8). The Brule Formation is vertically and hydraulically isolated from the aquifer proposed for exemption. Based on population projections (CBR, 2007), future water use within the NTEA and the 2.25-mile AOR likely will be a continuation of present use. It is unlikely that any irrigation development will occur within the NTEA due to the limited water supplies, topography and climate. Irrigation within the review area is anticipated to be consistent with the past (e.g., limited irrigation in the immediate vicinity of the White River). It is anticipated that the Town of Crawford municipal water supply will continue to be provided by the groundwater and infiltration galleries related to the White River and associated tributaries.



Petition for Aquifer Exemption

North Trend Expansion Area

5. Regulatory Criteria for Aquifer Exemption Demonstration

As required in Title 122, Chapter 5, Section 004 the aquifer exemption petition must demonstrate that the portion of the Basal Chadron Sandstone aquifer for which the exemption is sought: 1) does not currently serve as a source of drinking water; and 2) cannot now and will not in the future serve as a source of drinking water. The following information supports this determination.

5.1 The Basal Chadron Sandstone is not a Source of Drinking Water (Title 122; Chapter 5, Section 004.01)

Other than the monitoring wells installed by CBR, there are only 11 active permitted water supply wells within the NTEA (Table 8). All 11 of these water supply wells are completed within the shallow Brule Formation and are used for domestic as well as agricultural (i.e. livestock watering) purposes. The Brule Formation is hydraulically isolated from the underlying Basal Chadron Sandstone by up to 500 feet of low permeability claystones and siltstones (see Section 4.4.2). None of the water supply wells within the NTEA are used for drinking water. All active, inactive and abandoned water wells within the NTEA are depicted on Figure 19. Table 8 and Appendix E present information from the updated water user survey for the water supply wells within the NTEA. Note that some of the wells are old windmills (e.g., 198) or hand pump wells (e.g., Well 211 and Well 218) that are inactive and no longer in use, but have not yet been formally abandoned. There are no active water supply wells completed in the Basal Chadron Sandstone within the NTEA.

Figures 19a and 19b show the location of all active, inactive and abandoned water wells in the NTEA and within a 2.25-mile AOR as identified by CBR. Information from the updated water user survey for these additional water supply wells is listed in Table 8 and in Appendix E. Twelve active water supply wells are completed in the Basal Chadron Sandstone outside of the NTEA (Well 52, Well 55, Well 61, Well 97, Well 98, Well 114, Well 123, RC-1, Well 5001, Well 5003, Well 5035 and Well 5069). Nine of these wells are used exclusively for agricultural purposes (Well 52, Well 55, Well 97, Well 114, Well 123, RC-1, Well 5001, Well 5003 and Well 5035) and only three wells (Well 61, Well 98 and Well 5069) are used as a domestic/agricultural water supply. All other active wells that are completed in the Chadron Formation as listed in Table 8 (Well 437, Well 440, Well 441 and Well 443) are screened in Chadron clay units that overlie the Basal Chadron Sandstone (see Section 4.7). Well 61, Well 98 and Well 5069 are the only domestic water supply wells within the 2.25-mile AOR that are screened in the Basal Chadron Sandstone. Groundwater from artesian well RC-1, located



Petition for Aquifer Exemption

North Trend Expansion Area

southeast of the NTEA, is limited to agricultural use by the landowner for livestock watering.

In summary, there is no domestic groundwater use of the Basal Chadron Sandstone within the NTEA. There are no public drinking water supplies that use groundwater from the Basal Chadron Sandstone outside of the NTEA and within the 2.25-mile AOR.

5.2 The Basal Chadron Sandstone Cannot/Will Not Serve as Future Source of Drinking Water (Title 122, Chapter 5)

The small numbers of residences within the area are supplied domestic water from wells completed in the relatively shallow Brule Formation. Based on population projections, future water use within the permit and area surrounding the proposed exemption area will likely be a continuation of present use. It is anticipated that the Town of Crawford municipal water supply will continue to be provided by the White River and associated tributaries.

In addition to the absence of wells used for drinking water supply within the 2.25-mile AOR (Figures 19a and 19b), CBR must demonstrate that the Basal Chadron Sandstone within the NTEA cannot and will not serve as a future source of drinking water based on one of the following four criteria:

- 004.02A It is mineral, hydrocarbon, or geothermal energy bearing with production capability;
- 004.02B It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;
- 004.02C It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or
- 004.02D It is located above a Class III well mining area subject to subsidence or catastrophic collapse.

Of these four criteria, both 004.02A and 004.02C are applicable to aquifer exemption for the NTEA.



Petition for Aquifer Exemption

North Trend Expansion Area

5.2.1 The Basal Chadron Sandstone is Mineral Bearing with Production Capability (Title 122, Chapter 5, 004.2A)

Based on water quality data from the NTEA presented in Section 4.2.2, the Basal Chadron Sandstone contains significant levels of radionuclides, in particularly radium-226 concentrations up to 38.8 pCi/L (Table 12). All available water quality information indicates that the Basal Chadron Sandstone is a mineral-bearing interval within the NTEA.

Results of the 2006 pump test conducted in the Basal Chadron Sandstone indicate a mean hydraulic conductivity of 2.3 feet/day (8.1×10^{-4} centimeters per second [cm/sec]), a mean transmissivity of 60 square feet per day (ft^2/day ; ranging from 42 to $75 \text{ ft}^2/\text{day}$), and a mean permeability of approximately 1,100 millidarcies (md) (Table 13). The mean storativity was 5.3×10^{-5} (ranging from 2.3×10^{-5} to 8.4×10^{-5}) (Table 13). Estimated hydraulic parameters for individual well locations for the 2006 pump test are summarized in Table 15. These data indicate that mean transmissivity and hydraulic conductivity of the Basal Chadron Sandstone are lower in the NTEA than the CSA, yet high enough such that successful development of the NTEA can be accomplished.

In summary, all available data support the determination that the Basal Chadron Sandstone is a mineral bearing interval with production capability that is amenable to ISL operations.

5.2.2 The Basal Chadron Sandstone Groundwater Cannot Technically/Economically be Rendered Fit for Consumption (Title 122, Chapter 005.02C)

Water quality results from two wells completed in the Basal Chadron Sandstone within the NTEA are shown in Tables 9 and 10. As shown, groundwater from the Basal Chadron Sandstone aquifer within the NTEA has a TDS value less than 10,000 ppm, indicating that the unit qualifies as an underground source of drinking water as defined in Chapter 1 of Title 122 of the NDEQ regulations.

Groundwater from the Basal Chadron Sandstone aquifer can significantly exceed groundwater standards within the NTEA (Tables 9, 10, 11 and 12). Concentrations of radium-226 up to approximately 45 pCi/L have been detected. Concentrations of uranium $>0.03 \text{ mg/L}$ are common in the mineralized zone within the NTEA (Figure 2).



Petition for Aquifer Exemption

North Trend Expansion Area

The MCLs for radium-226 and uranium are 5 pCi/l and 0.03 mg/L, respectively (EPA, 2000a). Although expensive, it is technologically possible to remove both radium and uranium from groundwater. Removal of these constituents has been required of municipal water supplies since December 2003 (USEPA, 2000b). USEPA (1998) identified Point of Entry (POE) or Point of Use (POU) removal technologies that would be amenable to individuals using well water, including POU ion exchange and POU reverse osmosis. USEPA evaluated the cost of implementing treatment technologies and determined that the threshold above which treatment becomes economically impractical is about 2.5 percent of the median household income. The median 2004 household income in Dawes County was \$31,378 (<http://quickfacts.census.gov/qfd/states/31/31045.html>), so the maximum cost an individual might be able to incur if they desired to treat well water to MCLs would be about \$784/year. The USEPA indicated that the typical POU reverse osmosis and POU ion exchange cost is about \$2.26-2.63/thousand gallons (EPA, 1998). With a household use of 83,000 gallons/year, the approximate treatment cost would be about \$218/year. However, this cost analysis assumed that water would be obtained through a municipality, so costs would be dispersed, subject to an economy of scale, among a large group of users and additional costs associated with the system (i.e. disposal of spent units, etc) are likewise dispersed. Additionally, individual well users are not subject to treatment regulations specified in 40 CFR Parts 9, 141 and 142.

If individuals elect to perform wellhead treatment, the cost could be much higher for installation of an individual treatment system, and would be expected to include more maintenance and application costs if a complex treatment system was selected. Available treatment technologies can be customized based on a specific set of design parameters, which include a range of flow rates and pressure. The proven approaches to uranium and co-associated radium treatment are not readily adaptable to small wellhead sized systems. Periodic well use (i.e., periods of no flow) of individual domestic wells would either require regular system modifications or periodic treatment that directs treated water to a tank or cistern. Additionally, the size, cost and operational requirements that are necessary to reduce uranium and radium to below MCLs do not lend current systems to individual domestic use. Current treatment technologies are most economically viable as a community-wide treatment system for a central water supply. Costs for radium and uranium treatment systems are approximately \$50,000 each, as the systems are independent of one another. Media exchange per system costs approximately \$25,000. Frequency of media exchange depends upon contaminant level and utilization. Disposal of effluent and materials from such treatment also would be problematic. Therefore, while technologies exist to treat



Petition for Aquifer Exemption

North Trend Expansion Area

groundwater for the removal of radium and uranium, to do so might be considered cost prohibitive on an individual basis.

Additionally, the State of Wyoming has determined the individual household treatment for radium has the potential to negatively impact human health by concentrating the radioactive source within a household and creating regulated radioactive source. The Wyoming Department of Environmental Quality (WDEQ; Water Quality/Land Quality Joint Advisory Board; *In Situ Groundwater Classification and Restoration*, November 14, 2001) issued a statement that individual household treatment for radium would not be considered. Excerpts from the document specifically applicable to ISL operations include:

Treating a groundwater source, which contains radium at background concentrations commonly found in the production zone, could produce a filtrate or wastewater which would be prohibited for unrestricted release. Therefore, the concept of treatability for radium levels no longer seems applicable for Class I waters.

As discussed in the introduction under Section 5.0, Chapter 8 of the Wyoming Water Quality Divisions R&R, radium will not be considered as treatable due to concerns with the safe disposal of any water treatment by-products.



Petition for Aquifer Exemption

North Trend Expansion Area

6. Conclusions

As required under Title 122, injection into a USDW is prohibited unless an aquifer exemption is obtained. The aquifer exemption must demonstrate that the portion of the aquifer for which the exemption is sought: 1) does not currently serve as a source of drinking water; and 2) cannot now and will not in the future serve as a source of drinking water for one of four reasons.

The following multiple lines of evidence establish the technical and regulatory basis for the proposed aquifer exemption.

- Geologic information presented in this application demonstrate the lateral continuity of the upper and lower confining layers for the Basal Chadron Sandstone on both regional and local scales, as well as the lateral continuity and thickness distribution of the proposed mining interval.
- The aquifer proposed for exemption has been adequately characterized to be under confined conditions and is hydraulically isolated from overlying water-bearing units within the NTEA.
- A 2006 pump test within the NTEA indicates that transmissivity is relatively consistent and that the aquifer is capable of production and amenable to ISL operations.
- The Basal Chadron Sandstone does not currently serve as a source of drinking water in the NTEA and cannot and will not in the future serve as a source of drinking water.
- Site-specific water quality results indicate that groundwater is mineral-bearing. Additionally, the presence of sodium-sulphate and high TDS yields unfavorable water quality conditions.
- Because of the presence of high levels of uranium, and in particular, radium, economic impracticability and technical complications of removing these radionuclides render the use of the Basal Chadron Sandstone unsuitable as a source of underground drinking water in the NTEA.

Assuming the required permits are obtained to conduct ISL operations in the exempted aquifer zone, CBR is committed to restoring the aquifer to water quality conditions that

**Petition for Aquifer
Exemption**

North Trend Expansion Area

are consistent with pre-mining use. ISL mining has been conducted by CBR in the CSA since 1991 using the same procedures and processes proposed for the NTEA. CBR has demonstrated the ability to safely restore wellfields in the current mining area, as exemplified by ongoing restoration processes for mine units in the CSA.



Petition for Aquifer Exemption

North Trend Expansion Area

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Petition for Aquifer Exemption

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Petition for Aquifer Exemption

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Petition for Aquifer Exemption

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**Petition for Aquifer
Exemption**

North Trend Expansion
Area

TABLES

TABLE 1
GENERAL STRATIGRAPHIC CHART FOR NORTHWEST NEBRASKA

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

System	Series	Formation or Group	Rock Types	Thickness
Miocene		Ogallala	SS, Slt	1560*
		Arikaree	SS, Slt	1070*
Oligocene/Eocene		White River	SS, Slt, Cly	1450*
Cretaceous	Upper	Pierre	Sh	1500
		Niobrara	Chalk, Ls, Sh	300
		Carlile	Sh	200-250
		Greenhorn	Ls	30
		Graneros	Sh	250-280
		D Sand	SS	5-30
	Lower	D Shale	Sh	60
		G Sand	SS	10-45
		Huntsman	Sh	60-80
		J Sand	SS	10-30
		Skull Creek	Sh	220
		Dakota	SS, Sh	180
Jurassic	Upper	Morrison	Sh, SS	300
		Sundance	SS, Sh, Ls	300
Permian	Guadalupe Leonard	Satanka	Ls, Sh, Anhy	450
		Upper	Ls, Anhy	150
		Lower	Sh	150
	Wolfcamp	Chase	Anhy	80
		Council Grove	Anhy, Sh	300
		Admire	Dolo, Ls	70
Pennsylvanian	Virgil	Shawnee	Ls	80
	Missouri	Kansas City	Ls, Sh	80
	Des Moines	Marmaton/	Ls, Sh	130
		Cherokee		
	Atoka	Upper/Lower	Ls, Sh	200
Mississippian	Lower	Lower	Ls, Sh	30
Pre-Cambrian			Granite	

* Maximum thickness based on Swinehart, et. al, 1985.

TABLE 2
DESCRIPTON OF PROPOSED AQUIFER EXEMPTION LOCATION - NORTH TREND

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Township/Range	Section	Location	Comments
T32N R52W	21	NE 1/4	Plus NW1/4 lying east of the Burlington-Northern Santa Fe Railway, and all of the SE1/4 lying east of the BNSF Railway
T32N R52 W	22	W1/2	
		SE 1/4	
T32N R52 W	27		All except for a parcel of land containing 80 acres, more or less, located in the SE1/4NE1/4 and the NE1/4SE1/4
T32N R52W	28	E1/2NE1/4	
		E1/2SE1/4	
T32N R52W	33	NE1/4NE1/4	
T32N R52W	34	W1/2	
		NE1/4	

TABLE 3
REPRESENTATIVE STRATIGRAPHIC SECTION - NORTH TREND

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

DEPTH (FT-BGS)	GROUP	FORMATION & MEMBER (SCHULTZ AND STOUT, 1955)			FORMATION & MEMBER (REVISED)		REFERENCES (REVISED)
25-110	White River Group	Brule Formation	Whitney Member		Brule Formation	"Brown Siltstones"	LaGarry (1998)
						Whitney Member	
			Orella Member	Orella D		Orella Member	
				Orella C			
				Orella B			
				Orella A			
110-290		Chadron Formation	Upper Chadron	Chadron C	Chadron Formation	Big Cottonwood Creek Member	Terry (1998) Terry & LaGarry (1998)
~290-390			Upper/Middle Chadron	Chadron B			
390-615			Middle Chadron	Chadron A	Peanut Peak Member	Terry (1998) Terry & LaGarry (1998)	
400-700			Red Clay Horizon		Chamberlain Pass Formation	Upper Interior Paleosol	Terry (1998)
	Basal Chadron Sandstone		Channel Sandstone			Terry (1998)	
Varying	Montana Group		Pierre Shale	Interior Paleosol		Pierre Shale	Yellow Mounds Paleosol
659+		Pierre Shale		Pierre Shale	Terry (1998)		

NOTES:

- 1) Topsoil, colluvial and alluvial deposits are not shown, but are Quaternary in age and range in thickness from 0 to 25 ft-bgs.
- 2) ft-bgs = feet below ground surface

TABLE 4
COMPARISON OF MEAN MONTHLY PRECIPITATION WITH NORMAL MEAN MONTHLY DISCHARGE OF
THE WHITE RIVER

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Month	Mean Precipitation ¹		Mean Discharge ²	
	inches	centimeters	Ft ³ /sec	Meters ³ /sec
January	0.61	1.55	21	0.59
February	0.76	1.93	23	0.65
March	1.74	4.42	27	0.76
April	2.65	6.73	25	0.71
May	3.11	7.9	27	0.76
June	2.42	6.15	22	0.62
July	2.77	7.04	16	0.45
August	1.21	3.07	13	0.37
September	1.38	3.51	14	0.4
October	1.66	4.22	17	0.48
November	0.82	2.08	19	0.54
December	0.79	2.01	20	0.57

NOTES:

1 - Climatology of the US No. 81, 1971-2000, NOAA, 25-Nebraska

2 - U.S. Department of the Interior, 1981, Period of Record 1931-2004.

TABLE 5
NORMAL MEAN MONTHLY DISCHARGE OF THE WHITE RIVER, 1999-2006
PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Month	1999 (Ft³/sec)	2000 (Ft³/sec)	2001 (Ft³/sec)	2002 (Ft³/sec)	2003 (Ft³/sec)	2004 (Ft³/sec)	2005 (Ft³/sec)	2006 (Ft³/sec)
January	22.6	21.7	21	22.9	22.6	23	23.9	24.1
February	22.4	24.1	24.3	23.6	24	24.8	23.3	24.5
March	23.1	25.5	27	26.8	26.4	25.9	24.5	26.4
April	26.1	29.1	26.4	25.3	26.5	22.7	25.3	25.9
May	23.7	10	24.7	23.9	25.9	21.1	26.5	23.2
June	27.1	20.5	18.6	16.6	23.2	17.1	26.5	17.8
July	21.4	15.4	14.4	10.3	13.2	17.4	17.6	11
August	15	11.5	12.5	10.1	11.7	11.3	18.1	10
September	17	12.1	12.9	13.7	23.3	17.8	14.8	14.8
October	19.4	17.4	17.2	18.1	17.5	20.8	18.5	*
November	20.8	20.1	22	22.3	22.6	21.3	21	*
December	21.4	20.7	22.2	22.2	23.1	22.1	23.1	*
Average	21.7	16.7	20.3	19.7	21.6	20.4	21.9	19.7

Source: Nebraska Department of Natural Resources (NDNR) 2008.

*Data not available for fourth quarter of 2006.

TABLE 6
WATER LEVELS - BRULE FORMATION AND BASALCHADRON SANDSTONE (SPRING 2008)

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES – CRAWFORD, NEBRASKA

Well	3/4/08 - 3/10/08	3/17/2008	3/28/2008	4/4/2008	4/16/2008	6/9/2008
BASAL CHADRON SANDSTONE						
RC-1	3689.47	3691.78	3675.61	3675.61	3696.40	NM
RC-2	3702.57	3700.26	3702.57	3700.26	3700.26	NM
COW-1	3707.22	3707.22	3707.22	3707.22	3707.22	NM
COW-2	3704.91	3711.84	3709.53	3697.98	3709.53	NM
COW-3	3715.26	3715.26	3715.26	3715.26	3717.57	NM
COW-4	3714.19	3714.19	3714.19	3714.19	3714.19	NM
COW-5	3707.60	3712.22	3712.22	3712.22	3712.22	NM
COW-6	3717.42	3722.04	3719.73	3717.42	3720.88	NM
CPW-2	3708.76	3718.00	3718.00	3731.86	3713.38	NM
WELL 97	NM	NM	NM	3699.96	3690.72	NM
WELL 123	3669.80	3669.80	3676.73	3674.42	3672.11	NM
BRULE FORMATION						
BOW-1	3,619.85	3,619.90	3,620.06	3,620.08	NM	3,620.76
BOW-2	DRY	DRY	DRY	DRY	NM	3,615.57
WELL 95	NM	NM	NM	NM	NM	3,605.47
WELL 118	NM	NM	NM	NM	NM	3,588.78
WELL 197	NM	NM	NM	NM	NM	3,628.76
WELL 208	NM	NM	NM	NM	NM	3,635.73
WELL 75	NM	NM	NM	NM	NM	3,675.90
WELL 108	NM	NM	NM	NM	NM	3,630.70

NOTES:

- 1) Groundwater elevations are in feet above mean sea level (ft-amsl).
- 2) Groundwater elevations for the Basal Chadron Sandstone are based on pressure readings (psi).
- 3) Groundwater elevations for the Brule Formation are based on depth to water measurements.

NM - not measured

TABLE 7
WATER QUALITY SUMMARY FOR THE ALLUVIUM, BRULE FORMATION, AND CHADRON FORMATION - CSA
PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

CONSTITUENT ¹	BRULE FORMATION		CHADRON FORMATION		ALLUVIUM	
	RANGE	MEAN	RANGE	MEAN	RANGE	MEAN
Calcium	7.1 - 98	48	11 - 41	20	67 - 74	70.6
Magnesium	0.3 - 16	6.6	0.8 - 7.2	3.2	6.4 - 10	8.7
Sodium	12 - 340	104	340 - 540	411	34 - 41	36.5
Potassium	4.1 - 15.9	9.9	7.0 - 19.8	12.4	10.3 - 13	11.1
Bicarbonate	137 - 627	364	308 - 411	368	299 - 364	321
Sulfate	1 - 23	10	254 - 620	407	11 - 20	16.3
Chloride	1.6 - 192	48	134 - 250	176	5 - 10	6.7
Specific Conductance (µmhos)	246 - 1481	714	1500 - 2500	1932	507 - 614	548
pH	6.80 - 8.50	7.80	7.60 - 8.70	8.20	7.10 - 8.40	7.70
(pH units)						
Uranium	0.001 - 0.021	0.0064	<0.001 - 2.40	0.092	0.006 - 0.022	0.015
(mg/l)						
Radium-226	0.1 - 3.0	0.7	0.1 - 619	53	0.4 - 18.3	2.5
(pCi/l)						

NOTES:

¹ Concentrations in mg/l, unless otherwise noted.

mg/l = milligrams per liter
pCi/L = picoCuries per liter

TABLE 8
ACTIVE, INACTIVE AND ABANDONED WATER SUPPLY WELLS IN THE NTEA AND 2.25-MILE
AREA OF REVIEW

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well #	Estimated Depth	Formation	Well Use	Well Status	Within NTEA
3	100	Brule Fm	Agricultural	Active	No
4	100	Brule Fm	Domestic/Agricultural	Active	No
20	50	Brule Fm	Domestic/Agricultural	Active	No
56	200	Brule Fm	Domestic	Active	No
66	60	Brule Fm	Domestic/Agricultural	Active	No
74	60	Brule Fm	Agricultural	Active	No
75	65	Brule Fm	Agricultural	Active	Yes
76	30	Brule Fm	Agricultural	Inactive	Yes
77	70	Brule Fm	Domestic	Active	Yes
78	98	Brule Fm	Domestic	Active	Yes
79	98	Brule Fm	Agricultural	Inactive	No
82	120	Brule Fm	Agricultural	Inactive	Yes
83	50	Brule Fm	Domestic	Active	Yes
84	50	Brule Fm	Agricultural	Active	Yes
85	80	Brule Fm	Domestic	Active	No
86	300	Brule Fm	Agricultural	Inactive	No
87	50	Brule Fm	Agricultural	Active	No
88	60	Brule Fm	Domestic	Active	No
89	35	Brule Fm	Agricultural	Active	No
90	35	Brule Fm	Agricultural	Active	No
91	80	Brule Fm	Domestic/Agricultural	Active	No
92	167	Brule Fm	Domestic	Active	No
93	85	Brule Fm	Domestic	Active	No
94	52	Brule Fm	Domestic	Active	No
95	100	Brule Fm	Domestic	Active	No
96	86	Brule Fm	Domestic	Active	No
99	50	Brule Fm	Domestic	Active	No
100	35	Brule Fm	Agricultural	Active	No
101	75	Brule Fm	Domestic	Active	No
102	100	Brule Fm	Domestic	Active	No
103	125	Brule Fm	Agricultural	Active	No
104	25	Brule Fm	Domestic	Active	No
105	70	Brule Fm	Agricultural	Active	No
106	100	Brule Fm	Domestic	Active	No
107	100	Brule Fm	Domestic	Active	No
108	75	Brule Fm	Agricultural	Active	No
109	55	Brule Fm	Domestic	Active	No
110	100	Brule Fm	Domestic	Active	No
111	90	Brule Fm	Domestic	Active	No
112	110	Brule Fm	Domestic	Active	No
113	110	Brule Fm	Domestic	Active	No
115	90	Brule Fm	Domestic	Active	No
116	35	Brule Fm	Domestic	Active	No
117	160	Brule Fm	Agricultural	Active	No
118	90	Brule Fm	Agricultural	Active	No

TABLE 8
ACTIVE, INACTIVE AND ABANDONED WATER SUPPLY WELLS IN THE NTEA AND 2.25-MILE
AREA OF REVIEW

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well #	Estimated Depth	Formation	Well Use	Well Status	Within NTEA
121	16	Brule Fm	Agricultural	Active	No
122	60	Brule Fm	Agricultural	Active	No
126	290	Brule Fm	Agricultural	Active	No
127	105	Brule Fm	Domestic	Active	No
149	175	Brule Fm	Agricultural	Active	No
161	60	Brule Fm	Domestic	Active	No
162	*	Brule Fm	Domestic	Active	No
168	65	Brule Fm	Agricultural	Active	No
172	20	Brule Fm	Agricultural	Inactive	No
173	30	Brule Fm	Agricultural	Active	No
174	30	Brule Fm	Agricultural	Active	No
175	25	Brule Fm	Domestic / Agricultural	Active	No
176	70	Brule Fm	Domestic	Active	No
184	60	Brule Fm	Domestic	Active	No
185	70	Brule Fm	Domestic	Active	No
186	20	Brule Fm	Domestic	Active	No
187	78	Brule Fm	Agricultural	Active	No
188	95	Brule Fm	Domestic	Active	No
189	30	Brule Fm	Agricultural	Active	No
190	30	Brule Fm	Agricultural	Active	No
197	70	Brule Fm	Agricultural	Active	Yes
198	*	Brule Fm	Agricultural	Active	Yes
199	21	Brule Fm	Agricultural	Active	No
200	30	Brule Fm	Agricultural	Active	No
201	30	Brule Fm	Agricultural	Inactive	No
206	60	Brule Fm	Agricultural	Inactive	Yes
207	30	Brule Fm	Agricultural	Active	No
208	30	Brule Fm	Agricultural	Active	Yes
209	100	Brule Fm	Agricultural	Active	Yes
210	*	Brule Fm	Agricultural	Inactive	No
211	*	Brule Fm	Agricultural	Inactive	No
212	*	Brule Fm	Agricultural	Inactive	Yes
213	30	Brule Fm	Agricultural	Active	Yes
214	37	Brule Fm	Agricultural	Active	No
215	50	Brule Fm	Agricultural	Active	No
216	37	Brule Fm	Agricultural	Active	No
217	*	Brule Fm	Agricultural	Active	No
218	*	Brule Fm	Agricultural	Active	No
220	35	Brule Fm	Agricultural	Active	No
221	35	Brule Fm	Agricultural	Active	No
222	35	Brule Fm	Agricultural	Active	No
223	35	Brule Fm	Agricultural	Active	No
224	*	Brule Fm	Agricultural	Active	No
227	30	Brule Fm	Agricultural	Active	No
228	30	Brule Fm	Agricultural	Active	No

TABLE 8
ACTIVE, INACTIVE AND ABANDONED WATER SUPPLY WELLS IN THE NTEA AND 2.25-MILE
AREA OF REVIEW

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well #	Estimated Depth	Formation	Well Use	Well Status	Within NTEA
229	30	Brule Fm	Agricultural	Inactive	No
230	*	Brule Fm	Domestic/Agricultural	Active	No
231	*	Brule Fm	Agricultural	Active	No
233	80	Brule Fm	Domestic/Agricultural	Active	No
235	30	Brule Fm	Agricultural	Active	No
237	50	Brule Fm	Domestic/Agricultural	Active	No
241	21	Brule Fm	Domestic/Agricultural	Active	No
243	30	Brule Fm	Domestic/Agricultural	Active	No
244	30	Brule Fm	Domestic/Agricultural	Active	No
245	25	Brule Fm	Agricultural	Active	No
246	40	Brule Fm	Domestic/Agricultural	Active	No
247	30	Brule Fm	Agricultural	Active	No
248	248	Brule Fm	Agricultural	Active	No
249	30	Brule Fm	Agricultural	Active	No
250	30	Brule Fm	Domestic/Agricultural	Active	No
251	100	Brule Fm	Agricultural	Active	No
252	*	Brule Fm	Domestic/Agricultural	Active	No
253	*	Brule Fm	Agricultural	Active	No
254	*	Brule Fm	Domestic/Agricultural	Active	No
255	30	Brule Fm	Agricultural	Active	No
256	40	Brule Fm	Agricultural	Inactive	No
257	50	Brule Fm	Agricultural	Active	No
258	*	Brule Fm	Agricultural	Active	No
259	*	Brule Fm	Domestic/Agricultural	Active	No
262	30	Brule Fm	Domestic/Agricultural	Active	No
263	*	Brule Fm	Agricultural	Inactive	No
436	37	Brule Fm	Domestic	Active	No
438	60	Brule Fm	Agricultural	Active	Yes
439	60	Brule Fm	Agricultural	Active	No
442	60	Brule Fm	Agricultural	Active	No
5002	25	Brule Fm	Agricultural	Active	No
5004	85	Brule Fm	Agricultural	Abandoned	No
5005	40	Brule Fm	Domestic	Active	No
5006	100	Brule Fm	Domestic	Active	No
5007	50	Brule Fm	Agricultural	Active	No
5008	48	Brule Fm	Agricultural	Active	No
5009	60	Brule Fm	Domestic	Active	No
5010	30	Brule Fm	Agricultural	Inactive	No
5011	110	Brule Fm	Agricultural	Active	No
5012	80	Brule Fm	Agricultural	Active	No
5013	45	Brule Fm	Agricultural	Active	No
5014	50	Brule Fm	Agricultural	Active	No
5015	50	Brule Fm	Domestic	Active	No
5016	38	Brule Fm	Agricultural	Active	No
5017	60	Brule Fm	Agricultural	Active	No
5018	40	Brule Fm	Agricultural	Active	No

TABLE 8
ACTIVE, INACTIVE AND ABANDONED WATER SUPPLY WELLS IN THE NTEA AND 2.25-MILE
AREA OF REVIEW

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well #	Estimated Depth	Formation	Well Use	Well Status	Within NTEA
5019	60	Brule Fm	Domestic	Active	No
5020	100	Brule Fm	Domestic	Active	No
5021	50	Brule Fm	Agricultural	Active	No
5022	50	Brule Fm	Agricultural	Inactive	No
5023	50	Brule Fm	Domestic	Active	No
5024	40	Brule Fm	Agricultural	Active	No
5025	60	Brule Fm	Agricultural	Inactive	No
5026	65	Brule Fm	Domestic	Abandoned	No
5027	60	Brule Fm	Agricultural	Active	No
5028	36	Brule Fm	Agricultural	Inactive	No
5029	80	Brule Fm	Agricultural	Active	No
5030	50	Brule Fm	Agricultural	Inactive	No
5031	*	Brule Fm	Agricultural	Active	No
5032	114	Brule Fm	Domestic	Active	No
5033	46	Brule Fm	Agricultural	Active	No
5034	55	Brule Fm	Agricultural	Active	No
5036	26	Brule Fm	Agricultural	Inactive	No
5037	63	Brule Fm	Domestic	Active	No
5038	105	Brule Fm	Agricultural	Inactive	No
5039	56	Brule Fm	Agricultural	Active	No
5040	*	Brule Fm	Agricultural	Active	No
5041	40	Brule Fm	Agricultural	Active	No
5042	90	Brule Fm	Agricultural	Active	No
5043	60	Brule Fm	Agricultural	Active	No
5045	50	Brule Fm	Agricultural	Active	No
5046	24	Brule Fm	Agricultural	Inactive	No
5047	140	Brule Fm	Domestic	Active	No
5048	50	Brule Fm	Domestic	Active	No
5049	40	Brule Fm	Agricultural	Active	No
5050	50	Brule Fm	Agricultural	Inactive	No
5052	*	Brule Fm	Agricultural	Inactive	No
5053	50	Brule Fm	Agricultural	Active	No
5054	*	Brule Fm	Agricultural	Inactive	No
5056	*	Brule Fm	Agricultural	Active	No
5057	26	Brule Fm	Agricultural	Active	No
5058	55	Brule Fm	Agricultural	Active	No
5059	60	Brule Fm	Agricultural	Active	No
5060	*	Brule Fm	Agricultural	Inactive	No
5062	*	Brule Fm	Agricultural	Inactive	No
5063	50	Brule Fm	Agricultural	Inactive	No
5064	*	Brule Fm	Agricultural	Inactive	No
5066	56	Brule Fm	Domestic	Active	No
5068	75	Brule Fm	Domestic	Active	No
52	420	Chadron Fm	Agricultural	Active	No
55	320	Chadron Fm	Agricultural	Active	No

TABLE 8
ACTIVE, INACTIVE AND ABANDONED WATER SUPPLY WELLS IN THE NTEA AND 2.25-MILE
AREA OF REVIEW

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well #	Estimated Depth	Formation	Well Use	Well Status	Within NTEA
60	312	Chadron Fm	Agricultural	Inactive	No
61	280	Chadron Fm	Domestic/Agricultural	Active	No
65	260	Chadron Fm	Agricultural	Abandoned	No
81	630	Chadron Fm	Agricultural	Abandoned	Yes
97	380	Chadron Fm	Agricultural	Active	No
98	100	Chadron Fm	Domestic/Agricultural	Active	No
114	470	Chadron Fm	Agricultural	Active	No
123	280	Chadron Fm	Agricultural	Active	No
425	700	Chadron Fm	Agricultural	Abandoned	No
437 [†]	200	Chadron Fm	Domestic	Active	No
440 [†]	240	Chadron Fm	Agricultural	Active	No
441 [†]	240	Chadron Fm	Agricultural	Active	No
443 [†]	140	Chadron Fm	Domestic	Active	No
5001	280	Chadron Fm	Agricultural	Active	No
5003	280	Chadron Fm	Agricultural	Active	No
5035	285	Chadron Fm	Agricultural	Active	No
5044	400	Chadron Fm	Agricultural	Inactive	No
5069	360	Chadron Fm	Domestic	Active	No
RC1	370	Chadron Fm	Agricultural	Active	No
RC2	630	Chadron Fm	Not Used	Active	Yes
RC3	293	Chadron Fm	Not Used	Abandoned	No

NOTES:

1) RC-1, RC-2 and RC-3 were originally installed as monitoring wells. RC-1 is currently used as an agricultural water supply well. RC-2 is no longer used. RC-3 was abandoned.

2) Wells designated as completed in the Brule Formation, in many cases, are also completed in the overlying alluvium.

[†] Indicates well is completed into Chadron clay only and is in hydraulic communication with Brule Fm.

* No Reported Depth

TABLE 9
WATER QUALITY SUMMARY - BASAL CHADRON SANDSTONE WELL W-007 (WELL 81A)

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Major Ions	Units	Detection Limit	9/5/1996	12/13/1996	3/20/1997	6/26/1997	Average Value
Calcium (Ca)	mg/L	1.0	29.4	28.9	29.1	30.9	29.6
Magnesium (Mg)	mg/L	1.0	5.4	5.33	5.2	5.2	5.3
Sodium (Na)	mg/L	1.0	555	568	561	582	567
Potassium (K)	mg/L	1.0	15.0	14.7	15.1	15.1	15.0
Carbonate (CO ₃)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bicarbonate (HCO ₃)	mg/L	0.10	399	404	398	401	401
Sulfate (SO ₄)	mg/L	1.0	740	744	743	720	737
Chloride (Cl)	mg/L	0.10	196	204	208	201	202
Ammonium (NH ₄) as N	mg/L	0.05	0.73	0.68	0.75	1	0.74
Nitrite (NO ₂) as N	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Nitrate (NO ₃) as N	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Fluoride (F)	mg/L	0.10	1.24	1.21	1.22	1.24	1.23
Silica (SiO ₂)	mg/L	1.0	11.5	11.3	10.9	11.5	11.3
Non-Metals							
Total Dissolved Solids (TDS) @ 180°C	mg/L	1.0	1820	1810	1795	1790	1804
Conductivity	pmho/cm	1.0	2640	2750	2790	2710	2723
Alkalinity (CaCO ₃)	mg/L	1.0	327	331	326	329	328
pH	std. units	0.10	8.02	8.21	8	8.15	8.10
Trace Metals							
Aluminum (Al)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Arsenic (As)	mg/L	0.001	< 0.001	< 0.001	0.002	< 0.001	<0.002
Barium (Ba)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Boron (B)	mg/L	0.10	1.66	1.60	1.60	1.59	1.61
Cadmium (Cd)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Chromium (Cr)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Copper (Cu)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Iron (Fe)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05

TABLE 9
WATER QUALITY SUMMARY - BASAL CHADRON SANDSTONE WELL W-007 (WELL 81A)

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Trace Metals	Units	Limit	9/5/1996	12/13/1996	3/20/1997	6/26/1997	Value
Lead (Pb)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Manganese (Mn)	mg/L	0.01	0.02	< 0.01	0.01	0.01	0.01
Mercury (Hg)	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Molybdenum (Mo)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Nickel (Ni)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Selenium (Se)	mg/L	0.001	< 0.001	0.175	< 0.001	< 0.001	<0.175
Vanadium (V)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Zinc (Zn)	mg/L	0.01	0.02	0.01	0.02	< 0.01	<0.02
Radiometric							
Uranium (UNat)	mg/L	0.0003	< 0.0003	0.0060	<0.0003	0.0003	<0.0032
Radium 226 (Ra226)	pCi/L	0.2	10.5	11.9	10.3	14.7	11.9
Radium Precision ±			0.4	0.6	0.6	1.3	
Quality Assurance Data		target range					
Anion	meq		27.55	27.94	27.93	27.31	27.68
Cation	meq		26.45	27.02	26.74	27.74	26.99
WYDEQ A/C Balance	%	-5 - +5	-2.04	-1.66	-2.18	0.77	-1.28
Calc TDS	mg/L		1754	1780	1773	1768	1769
TDS A/C Balance	dec. %	0.80 - 1.20	1.04	1.02	1.01	1.01	1.02

NOTES:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

meq = milliequivalents

pmho/cm = picomhos per centimeter

dec. % = decimal percent

TABLE 10
WATER QUALITY SUMMARY - BRULE FORMATION WELL W-008 (WELL 78)
PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Major Ions	Units	Detection Limit	10/11/1996	12/13/1996	3/20/1997	7/17/1997	Average Value
Calcium (Ca)	mg/L	1.0	67.6	67.6	67.4	77.0	69.9
Magnesium (Mg)	mg/L	1.0	9.2	9.2	9.0	9.8	9.3
Sodium (Na)	mg/L	1.0	41.8	43.9	41.0	46.3	43.3
Potassium (K)	mg/L	1.0	16.6	16.7	16.1	16.9	16.6
Carbonate (CO ₃)	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bicarbonate (HCO ₃)	mg/L	0.10	244	248	245	248	246
Sulfate (SO ₄)	mg/L	1.0	52.2	51.0	51.3	66.5	55.3
Chloride (Cl)	mg/L	0.10	26.9	27.0	27.2	31.9	28.3
Ammonium (NH ₄) as N	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Nitrite (NO ₂) as N	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Nitrate (NO ₃) as N	mg/L	0.10	6.12	5.66	5.76	5.47	5.75
Fluoride (F)	mg/L	0.10	0.38	0.35	0.38	0.35	0.37
Silica (S102)	mg/L	1.0	68.0	68.0	64.9	68.0	67.2
Non-Metals							
Total Dissolved Solids (TDS) @ 180°C	mg/L	1.0	436	423	432	479	443
Conductivity	pmho/cm	1.0	606	622	618	650	624
Alkalinity (CaCO ₃)	mg/L	1.0	200	203	201	203	202
pH	std. units	0.10	7.89	8.22	7.91	7.90	7.98
Trace Metals							
Aluminum (Al)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Arsenic (As)	mg/L	0.001	0.005	0.003	0.006	0.007	0.005
Barium (Ba)	mg/L	0.10	0.20	0.20	0.19	0.20	0.20
Boron (B)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Cadmium (Cd)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Chromium (Cr)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Copper (Cu)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01

TABLE 10
WATER QUALITY SUMMARY - BRULE FORMATION WELL W-008 (WELL 78)
PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Trace Metals	Units	Detection Limit	10/11/1996	12/13/1996	3/20/1997	7/17/1997	Average Value
Iron (Fe)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Lead (Pb)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Manganese (Mn)	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Mercury (Hg)	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Molybdenum (Mo)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Nickel (Ni)	mg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05
Selenium (Se)	mg/L	0.001	0.018	0.018	0.015	0.017	0.017
Vanadium (V)	mg/L	0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.10
Zinc (Zn)	mg/L	0.01	0.04	0.02	0.02	0.03	0.02
Radiometric							
Uranium (UNat)	mg/L	0.0003	0.0123	0.0069	0.014	0.016	0.0123
Radium 226 (Ra226)	pCi/L	0.2	<0.2	0.5	0.3	<0.2	0.4
Radium Precision ±				0.1	0.2		
Quality Assurance Data		target range					
Anion	meq		6.30	6.31	6.29	6.75	6.41
Cation	meq		6.41	6.50	6.33	7.13	6.59
WYDEQ A/C Balance	%	-5 - +5	0.81	1.53	0.38	2.73	1.36
Calc TDS	mg/L		432	433	425	465	439
TDS A/C Balance	dec. %	0.80 - 1.20	1.01	0.98	1.02	1.03	1.01

NOTES:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

meq = milliequivalents

pmho/cm = picomhos per centimeter

dec. % = decimal percent

PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES

Third Quarter 1996

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	9/5/1996	8.8	1	0.2
	Th-230		10.8		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
Brule Formation					
W-77	U-Nat	9/9/1996	31.1		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-78	U-Nat	9/5/1996	16.2	1.2	0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		13.5		1
	Po-210		<1.0		1
W-83	U-Nat	9/9/1996	19.5		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-107	U-Nat	9/9/1996	10.8		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1

Fourth Quarter 1996

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	12/10/1996	<0.2		0.2
	Th-230		<0.2		0.2
	Ra-226		13.5	1.1	0.2
	Pb-210		12.9	4.5	1
	Po-210		3.3	0.7	1
Brule Formation					
W-77	U-Nat	12/10/1996	15.6		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-78	U-Nat	12/10/1996	7.45		0.2
	Th-230		<0.2		0.2
	Ra-226		0.4	0.2	0.2
	Pb-210		<1.0		1
	Po-210		1.4	0.4	1
W-83	U-Nat	12/10/1996	10.8		0.2
	Th-230		<0.2		0.2
	Ra-226		0.4	0.2	0.2
	Pb-210		2.5	1.2	1
	Po-210		<1.0		1
W-107	U-Nat	12/10/1996	8.12		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1

PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES

First Quarter 1997

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	3/11/1997	<0.2		0.2
	Th-230		<0.2		0.2
	Ra-226		10.9	1	0.2
	Pb-210		4.9	0.6	1
	Po-210		<1.0		1
Brule Formation					
W-77	U-Nat	3/11/1997	18.3		0.2
	Th-230		1.2	0.6	0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-78	U-Nat	3/11/1997	10.2		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-83	U-Nat	3/11/1997	14.9		0.2
	Th-230		1	0.5	0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-107	U-Nat	3/12/1997	6.09		0.2
	Th-230		<0.2		0.2
	Ra-226		0.5	0.1	0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1

Second Quarter 1997

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	6/16/1997	<0.2		0.2
	Th-230		<0.2		0.2
	Ra-226		12.7	1.1	0.2
	Pb-210		<1.0	1.2	1.2
	Po-210		12.4	1.2	1
Brule Formation					
W-77	U-Nat	6/16/1997	17.9		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		1.7	0.1	1
W-78	U-Nat	6/16/1997	10.7		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		2	0.1	1
W-83	U-Nat	6/16/1997	15.5		0.2
	Th-230		<0.2		0.2
	Ra-226		1.3	0.2	0.2
	Pb-210		<1.0		1
	Po-210		5.2	0.2	1
W-107	U-Nat	6/16/1997	8.9		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		8.6	0.3	1

**PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES**

Third Quarter 2004

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	7/30/2004	0.7		0.2
	Th-230		<0.2		0.2
	Ra-226		10.6	1.7	0.2
	Pb-210		<1.0		1
	Po-210		<2.7		2.7
Brule Formation					
W-77	U-Nat	7/30/2004	15		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<2.7		2.7
W-78	U-Nat	7/30/2004	9.6		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		1.4	0.8	1
	Po-210		<2.7		2.7
W-83	U-Nat	7/30/2004	16		0.2
	Th-230		<0.2		0.2
	Ra-226		0.8	0.7	0.2
	Pb-210		<1.0		1
	Po-210		<2.7		2.7
W-107	U-Nat	7/30/2004	8		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<2.7		2.7

Fourth Quarter 2004

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	11/17/2004	0.77		0.2
	Th-230		<0.2		0.2
	Ra-226		11.4	1.2	0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
Brule Formation					
W-77	U-Nat	11/17/2004	16		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-78	U-Nat	11/11/2004	9.3		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-83	U-Nat	11/17/2004	16		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-107	U-Nat	11/19/2004	8		0.2
	Th-230		<0.2		0.2
	Ra-226		0.7	0.4	0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1

**PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES**

First Quarter 2005

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	3/5/2005	0.7	1.2	0.2
	Ra-226		11		0.2
Brule Formation					
W-77	U-Nat	3/4/2005	20		0.2
	Ra-226		<0.2		0.2
W-78	U-Nat	3/4/2005	20		0.2
	Ra-226		<0.2		0.2
W-83	U-Nat	3/4/2005	20		0.2
	Ra-226		<0.2		0.2
W-107	U-Nat	3/4/2005	8		0.2
	Ra-226		<0.2		0.2

Note: Due to an error on the chain of custody, the groundwater samples for the first quarter 2005 were not analyzed for thorium-230, lead-210, and polonium-210.

Second Quarter 2005

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
<i>Basal Chadron Sandstone</i>					
W-81	U-Nat	5/27/2005	0.7	1.6	0.2
	Th-230		<0.2		0.2
	Ra-226		9.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
<i>Brule Formation</i>					
W-77	U-Nat	5/27/2005	17		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-78	U-Nat	5/27/2005	12	0.6	0.2
	Th-230		<0.2		0.2
	Ra-226		0.6		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-83	U-Nat	5/27/2005	18	0.6	0.2
	Th-230		<0.2		0.2
	Ra-226		0.6		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1
W-107	U-Nat	5/27/2005	8.7		0.2
	Th-230		<0.2		0.2
	Ra-226		<0.2		0.2
	Pb-210		<1.0		1
	Po-210		<1.0		1

PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES

Third Quarter 2005

Location	Radionuclide	Date	Concentration pCi/L	Error Estimate pCi/L	LLD pCi/L
Basal Chadron Sandstone					
W-81	U-Nat	9/16/2005	1.2	1.2	0.2
	Ra-226		10.2		0.2
Brule Formation					
W-77	U-Nat	9/16/2005	18		0.2
	Ra-226		<0.2		0.2
W-78	U-Nat	9/16/2005	12		0.2
	Ra-226		<0.2		0.2
W-83	U-Nat	9/16/2005	19	0.4	0.2
	Ra-226		0.2		0.2
W-107	U-Nat	9/16/2005	8.9		0.2
	Ra-226		<0.2		0.2

NOTES:

pCi/L = picoCuries per liter

TABLE 12
WATER QUALITY SUMMARY - BRULE FORMATION AND BASAL CHADRON SANDSTONE (MARCH-APRIL 2008)

PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES

Location ID: Date Collected: Formation:	Units	Bow 1 03/07/08 Brule	Bow 1 03/24/08 Brule	Bow 1 04/07/08 Brule	Cow 1 03/04/08 Chadron	Cow 1 03/18/08 Chadron	Cow 1 04/01/08 Chadron	Cow 2 03/05/08 Chadron	Cow 2 03/19/08 Chadron	Cow 2 04/03/08 Chadron	Cow 3 03/04/08 Chadron	Cow 3 03/18/08 Chadron
Major Ions												
Bicarbonate as HCO ₃	mg/L	252	253	255	357	355	359	387	392	392	391	396
Calcium	mg/L	61	67	57	55	58	57	8	9	11	9	10
Carbonate as CO ₃	mg/L	<1	<1	<1	<1	<1	<1	11	11	12	10	10
Chloride	mg/L	35	35	35	259	260	257	149	157	160	163	164
Fluoride	mg/L	0.3	0.3	0.3	1.1	1	0.9	1.5	1.4	1.3	1.6	1.4
Magnesium	mg/L	7	9	7	6	7	7	<1	1	2	2	2
Nitrogen, Ammonia as N	mg/L	<0.05	<0.05	<0.1	0.99	0.98	0.99	0.48	0.53	0.49	0.76	0.56
Nitrogen, Nitrate+Nitrite as N	mg/L	7.5	7.8	8.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrogen, Nitrite as N	mg/L	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H
Potassium	mg/L	19	18	21	26	27	24	18	18	19	20	20
Silica	mg/L	68.1 D	93	65.3	11.7	11.5	12 D	13	13.1	14.4	12.5	12.7
Sodium	mg/L	65	65	62	775 D	800 D	708	496 D	487 D	505	519 D	538 D
Sulfate	mg/L	62	59	63	1,180 D	1,180 D	1,130 D	566 D	596 D	599 D	588 D	612 D
Non-Metals												
Alkalinity, Total as CaCO ₃	mg/L	207	208	209	292	291	294	336	340	341	337	340
Conductivity	umhos/cm	691	676	678	3,810	3,600	3,590	2,410	2,260	2,280	2,520	2,400
pH	SU	7.77	7.92	7.75	7.92	8.38 H	7.76	8.45	8.49	8.37	8.03	8.62 H
Solids, Total Dissolved TDS @ 180 C	mg/L	472 H	429 H	474	2,300	2,290 H	2,440	1,400	1,470 H	1,500	1,430	1,460 H
Trace Metals												
Aluminum	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	mg/L	0.01	0.01	<0.1 D	0.002	<0.001	<0.001	0.002	<0.001	<0.001	0.002	0.002
Barium	mg/L	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	mg/L	<0.1	<0.1	<0.1	2	1.9	1.6	1.9	1.8	1.6	1.9	1.9
Cadmium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	mg/L	0.003	0.001	<0.05 D	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Manganese	mg/L	<0.01	<0.01	<0.01	0.03	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/L	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	mg/L	0.027	0.028	0.027	0.008	0.004	<0.001	0.005	0.002	<0.001	0.004	0.002
Vanadium	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	mg/L	0.48	0.32	0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Radiometric												
Lead 210	pCi/L	<0.3	<1.4	<0.9	<1.1	<2.2	<1	<1.9	<1.6	<1.4	<1.4	<1.8
Polonium 210	pCi/L	<0.5	0.9	1	NA	5.4	1	<0.8	<1	1.6	1.4	4.4
Radium 226	pCi/L	<0.1	<0.2	<0.17	22.5	21.8	23.3	7.7	8.1	9.7	0.5	0.6
Thorium 230	pCi/L	<0.1	<0.08	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.06	<0.1	<0.2
Uranium	mg/L	0.0256	0.025	0.024	0.0008	0.0004	0.0003	0.0133	0.0146	0.0125	0.0087	0.009
Quality Assurance												
A/C Balance (± 5)	%	0.001	2.97	2.87	0.011	1.59	2.55	0.626	3.18	1.51	0.107	0.903
Anions	meq/L	6.94	6.93	7.06	37.7	37.8	36.8	22.8	23.7	23.9	23.7	24.2
Cations	meq/L	6.94	7.36	6.66	37.7	39	34.9	22.5	22.2	23.2	23.7	24.7
Solids, Total Dissolved Calculated	mg/L	473	505	471	2,480	2,520	2,380	1,450	1,490	1,520	1,520	1,560
TDS Balance (0.80 - 1.20)	dec. %	1	0.85	1.01	0.93	0.91	1.03	0.97	0.99	0.99	0.94	0.94

TABLE 12
WATER QUALITY SUMMARY - BRULE FORMATION AND BASAL CHADRON SANDSTONE (MARCH-APRIL 2008)

PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES

Location ID: Date Collected: Formation:	Units	Cow 3 04/01/08 Chadron	Cow 4 03/04/08 Chadron	Cow 4 03/18/08 Chadron	Cow 4 04/01/08 Chadron	Cow 5 03/05/08 Chadron	Cow 5 03/19/08 Chadron	Cow 5 04/03/08 Chadron	Cow 6 03/06/08 Chadron	Cow 6 03/20/08 Chadron	Cow 6 04/03/08 Chadron	CPW-2 03/05/08 Chadron	CPW-2 03/19/08 Chadron	CPW-2 04/03/08 Chadron
Major Ions														
Bicarbonate as HCO ₃	mg/L	390	329	334	335	403	429	403	378	396	376	414	416	410
Calcium	mg/L	11	31	30	30	30	30	32	58	55	60	22	21	22
Carbonate as CO ₃	mg/L	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	4
Chloride	mg/L	170	227	228	236	227	213	226	305	338	306	156	157	163
Fluoride	mg/L	1.4	1.2	1.1	1.1	1.2	1.2	1.2	0.8	0.7	0.7	1.5	1.5	1.4
Magnesium	mg/L	3	6	6	7	5	6	6	11	11	12	4	4	4
Nitrogen, Ammonia as N	mg/L	0.57	0.93	0.77	0.8	0.74	0.72	0.78	1.09	1.02	1.06	0.84	0.59	0.55
Nitrogen, Nitrate+Nitrite as N	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrogen, Nitrite as N	mg/L	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H
Potassium	mg/L	20	17	19	18	13	13	14	30	30	31	14	13	14
Silica	mg/L	14.2	12.2	12.1	13.6	12.1	12.5	13.7	12.2	12.5	13.7	11.9	12.2	13.4
Sodium	mg/L	532	670 D	694 D	671	643 D	607 D	654	826 D	773 D	848	546 D	500 D	530
Sulfate	mg/L	617 D	947 D	979 D	962 D	832 D	858 D	859 D	1,190 D	628 D	1,200 D	631 D	649 D	648 D
Non-Metals														
Alkalinity, Total as CaCO ₃	mg/L	341	270	273	275	331	352	331	310	325	308	339	341	342
Conductivity	umhos/cm	2,390	3,290	3,160	3,110	3,160	2,930	2,950	2,560	3,860	3,840	2,560	2,370	2,390
pH	SU	8.44	8.08	8.16 H	7.95	8	8.17	7.97	8.05	8.12	7.73	8.06	8.24	8.02
Solids, Total Dissolved TDS @ 180 C	mg/L	1,490	2,020	1,950 H	2,000	1,890	1,880	1,840	2,550	2,440 H	2,510	1,510	1,530	1,510
Trace Metals														
Aluminum	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	mg/L	0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	0.003	0.002	<0.001	0.002	0.001	<0.001
Barium	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	mg/L	1.7	1.8	1.8	1.6	2	1.9	1.8	1.7	1.7	1.6	1.7	1.8	1.7
Cadmium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	mg/L	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	0.08	<0.03	<0.03	0.16	<0.03	<0.03
Lead	mg/L	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	<0.001	0.004	0.001	<0.001	<0.001
Manganese	mg/L	<0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.04	<0.01	<0.01	<0.01
Mercury	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	mg/L	<0.001	0.007	0.003	<0.001	0.006	0.003	<0.001	0.009	0.004	<0.001	0.005	0.002	<0.001
Vanadium	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	mg/L	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.04	0.02	0.02	<0.01	<0.01	<0.01
Radiometric														
Lead 210	pCi/L	<1.8	23.3	17.2	<1.2	<2	20.1	<0.6	<0.5	<0.4	<1.9	<2.7	<1.6	<0.7
Polonium 210	pCi/L	1.3	<1.2	1.1	<1	1.6	1.3	<0.9	1.4	7.6	1	1.7	1.3	1.4
Radium 226	pCi/L	1.1	38.8	25.1	19.3	38.7	42	44.6	1.8	1	1.9	11.7	12.5	12.8
Thorium 230	pCi/L	<0.1	<0.1	0.1	<0.1	<0.1	0.2	<0.2	<0.1	<0.1	<0.09	<0.1	<0.1	<0.2
Uranium	mg/L	0.0079	0.0348	0.0355	0.0305	0.0149	0.0172	0.0155	0.0017	0.0018	0.0014	0.0361	0.0341	0.0355
Quality Assurance														
A/C Balance (± 5)	%	0.046	0.197	0.613	0.745	0.143	3.72	0.093	1.11	13.3	2.32	2.32	2.81	0.211
Anions	meq/L	24.5	31.6	32.3	32.2	30.4	31	30.9	39.6	29.1	39.8	24.4	24.8	25
Cations	meq/L	24.5	31.7	32.7	31.8	30.3	28.8	31	40.5	38.1	41.7	25.6	23.5	24.9
Solids, Total Dissolved Calculated	mg/L	1,570	2,070	2,130	2,100	1,960	1,950	2,000	2,620	2,040	2,660	1,590	1,560	1,600
TDS Balance (0.80 - 1.20)	dec. %	0.95	0.98	0.92	0.95	0.96	0.96	0.92	0.97	1.2	0.94	0.95	0.98	0.94

TABLE 12
WATER QUALITY SUMMARY - BRULE FORMATION AND BASAL CHADRON SANDSTONE (MARCH-APRIL 2008)

PETITION FOR AQUIFER EXEMPTION - NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES

Location ID: Date Collected: Formation:	Units	RC-1 03/04/08 Chadron	RC-1 03/19/08 Chadron	RC-1 04/03/08 Chadron	RC-2 03/04/08 Chadron	RC-2 03/18/08 Chadron	RC-2 04/01/08 Chadron	Well 97 03/03/08 Chadron	Well 97 03/17/08 Chadron	Well 97 03/31/08 Chadron	Well 123 03/03/08 Chadron	Well 123 03/17/08 Chadron	Well 123 03/31/08 Chadron
Major Ions													
Bicarbonate as HCO ₃	mg/L	384	382	372	381	373	368	384	531	373	375	367	361
Calcium	mg/L	20	19	20	13	14	14	17	18	18	10	11	11
Carbonate as CO ₃	mg/L	<1	<1	6	<1	5	7	<1	2	7	3	5	9
Chloride	mg/L	170	185	181	142	142	153	152	157	167	170	160	181
Fluoride	mg/L	1	0.9	0.9	1.4	1.3	1.3	1.1	1	1	0.8	0.7	0.7
Magnesium	mg/L	2	2	3	<1	1	2	1	2	2	<1	1	2
Nitrogen, Ammonia as N	mg/L	0.4	0.36	0.4	0.52	0.59	0.47	0.39	0.36	0.4	0.27	0.26	0.28
Nitrogen, Nitrate+Nitrite as N	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrogen, Nitrite as N	mg/L	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H	<0.1 H
Potassium	mg/L	17	17	17	15	15	15	15	14	14	10	11	9
Silica	mg/L	10.3	10.1	11.1	11.8	11.7	13	10	10.2	10.8	10.6	10.4	11 D
Sodium	mg/L	502 D	486 D	509	494 D	508 D	496	502 D	498 D	484	452 D	462 D	422
Sulfate	mg/L	590 D	604 D	631 D	579 D	602 D	600 D	576 D	595 D	595 D	435 D	460 D	466 D
Non-Metals													
Alkalinity, Total as CaCO ₃	mg/L	315	313	314	312	313	314	315	438	318	313	310	311
Conductivity	umhos/cm	2,480	2,340	2,320	2,370	2,270	2,250	2,410	2,270	2,260	2,170	2,070	2,050
pH	SU	8.1	8.35	8.02	8.18	8.53 H	8.25	8.17 H	8.52 H	8.22	8.26 H	8.65 H	8.35
Solids, Total Dissolved TDS @ 180 C	mg/L	1,420	1,550 H	1,500	1,360	1,400 H	1,390	1,390 H	1,370 H	1,400	1,200 H	1,250 H	1,240
Trace Metals													
Aluminum	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	mg/L	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Barium	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	mg/L	1.4	1.3	1.1	1.8	1.8	1.6	1.5	1.6	1.2	1.4	1.3	1.2
Cadmium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	mg/L	<0.03	<0.03	<0.03	0.07	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	0.72	<0.03
Lead	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001
Manganese	mg/L	<0.01	0.01	<0.01	0.02	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	mg/L	0.005	0.002	<0.001	0.005	0.002	<0.001	0.005	0.002	<0.001	0.005	0.002	<0.001
Vanadium	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Radiometric													
Lead 210	pCi/L	<1.6	<1.2	<1.2	<1.2	<2	<1.9	<1.8	17.8	<2.1	<2	39.2	<2
Polonium 210	pCi/L	1.3	<0.9	1.1	<0.8	4.6	<0.7	<0.8	1.6	2.1	<0.4	<0.5	1.2
Radium 226	pCi/L	0.9	0.8	1.3	1	1.4	1.5	0.4	0.3	1.6	<0.2	<0.2	0.6
Thorium 230	pCi/L	<0.1	0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.05
Uranium	mg/L	<0.0003	<0.0003	<0.0003	0.0029	0.0032	0.0028	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Quality Assurance													
A/C Balance (± 5)	%	0.029	3.01	1.5	0.538	1.02	0.686	1.2	5.24	2.25	0.94	1.79	4.37
Anions	meq/L	23.4	24.1	24.6	22.4	23.2	23.2	22.6	25.6	23.5	20.2	20.3	21.1
Cations	meq/L	23.4	22.7	23.8	22.6	23.3	22.8	23.2	23.1	22.5	20.5	21.1	19.3
Solids, Total Dissolved Calculated	mg/L	1,500	1,510	1,560	1,440	1,480	1,480	1,460	1,560	1,480	1,280	1,300	1,290
TDS Balance (0.80 - 1.20)	dec. %	0.95	1.03	0.96	0.94	0.95	0.94	0.95	0.88	0.95	0.94	0.96	0.96

NOTES:

1) Detections are bolded.

D - reporting limit increased due to sample matrix interference
H - analysis performed past recommended holding time

mg/L - milligrams per liter
umhos/cm - micromhos per centimeter
SU - standard units

pCi/L - picoCuries per liter
meq/L - milliequivalents per liter
dec. % - decimal percent

TABLE 13
SUMMARY OF 2006 NORTH TREND PUMP TEST RESULTS vs. EXISTING PERMIT AREA

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

	Tests #1-#4 Existing Class III Permit Area (mean)	Test #5 North Trend 2004 & 2005 (mean)	Test #6 North Trend 2006 (mean)
Transmissivity (ft ² /day)	363	103	60
Formation Thickness (feet)	39.0	19.8	26
Hyd. Cond. (ft/day)	9.3	5.2	2.3
Storativity	9.7E-05	7.1E-05	5.3E-05

TABLE 14
SUMMARY OF 2006 NORTH TREND PUMP TEST WELL INFORMATION

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well	Distance to Pumping Well	North	East	Section	Township & Range
Basal Chadron Sandstone Pumping Well					
COW-5 (PW)	0.00	523,541.90	1,082,946.00	T32N R52W	27
Basal Chadron Sandstone Observation Wells					
COW-1	3,614.28	525,991.00	1,085,604.00	T32N R52W	27
COW-2	4,001.38	519,632.50	1,083,799.00	T32N R52W	34
COW-3	3,315.00	521,315.40	1,080,490.00	T32N R52W	27
COW-4	3,609.34	526,204.30	1,080,509.00	T32N R52W	27
CPW-2	2,291.19	521,626.30	1,081,689.00	T32N R52W	27
RC-2	6,634.66	516,911.30	1,082,714.00	T32N R52W	34
Brule Formation Observation Wells					
BOW-1	2,301.76	521,642.20	1,081,644.00	T32N R52W	27
BOW-2	31.78	523,534.20	1,082,915.00	T32N R52W	27
Upper/Middle Chadron Observation Wells					
MCOW-1	2,268.07	521,627.10	1,081,729.00	T32N R52W	27
MCOW-2	2,323.47	521,681.10	1,081,552.00	T32N R52W	27
MCOW-3	43.45	523,582.40	1,082,951.00	T32N R52W	27
MCOW-4	1,280.16	523,634.60	1,081,671.00	T32N R52W	27

TABLE 14
SUMMARY OF 2006 NORTH TREND PUMP TEST WELL INFORMATION
PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well	TOC Elev. (ft-amsl)	Surface Elevation (ft-amsl)	Casing Stickup (ft)	Hole Depth (ft; bgs)	Casing Depth (ft; bgs)
Basal Chadron Sandstone Pumping Well					
COW-5 (PW)	3,669.05	3,667.65	1.40	740	708
Basal Chadron Sandstone Observation Wells					
COW-1	3,633.77	3,632.57	1.20	580	557
COW-2	3,654.52	3,653.22	1.30	620	594
COW-3	3,685.33	3,684.63	0.70	670	646
COW-4	3,689.04	3,687.94	1.10	670	645
CPW-2	3,676.92	3,675.82	1.10	710	685
RC-2	3,651.22	3,648.42	2.80	630	630
Brule Formation Observation Wells					
BOW-1	3,677.39	3,675.49	1.90	65	65
BOW-2	3,668.73	3,667.93	0.80	59	59
Upper/Middle Chadron Observation Wells					
MCOW-1	3,676.80	3,675.50	1.30	380	350
MCOW-2	3,678.82	3,677.52	1.30	370	360
MCOW-3	3,668.85	3,667.65	1.20	390	391
MCOW-4	3,681.66	3,679.86	1.80	371	371

TABLE 14
SUMMARY OF 2006 NORTH TREND PUMP TEST WELL INFORMATION

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well	Top Screen (ft; bgs)	Bottom Screen (ft; bgs)	Screen Length (ft)	Screen Interval (feet)	Casing O.D. (in.)	06/28/06 Static Water Elevation (ft; AMSL)
Basal Chadron Sandstone Pumping Well						
COW-5 (PW)	653	708	55	22	4.5	3,704.85
Basal Chadron Sandstone Observation Wells						
COW-1	537	557	20	10	4.5	3,699.81
COW-2	569	594	25	15	4.5	3,704.41
COW-3	596	646	50	33	4.5	3,710.59
COW-4	585	645	60	41	4.5	3,705.30
CPW-2	615	685	70	35	4.5	3,705.99
RC-2	572	630	58	25	4.5	3,703.93
Brule Formation Observation Wells						
BOW-1	45	65	20	5	4.5	3,620.68
BOW-2	22	59	37	10	4.5	3,608.57
Upper/Middle Chadron Observation Wells						
MCOW-1	305	350	45	5	4.5	3,607.29
MCOW-2	315	360	45	7	4.5	3,606.83
MCOW-3	325	391	66	17	4.5	3,606.14
MCOW-4	290	371	81	19	4.5	3,608.27

TABLE 15
SUMMARY OF 2006 NORTH TREND PUMP TEST RESULTS

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

Well	Distance from Pumping Well (feet)	Analytical Results	Test #6 Analytical Method	
			Theis	Theis Recovery
COW-5 (PW)	0.00	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	NA NA NA	* * *
COW-1	3,614.28	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	42.0 1.6 2.30E-05	NA NA NA
COW-2	4,001.38	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	74.8 2.9 7.05E-05	NA NA NA
COW-3	3,315.00	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	71.5 2.8 8.40E-05	NA NA NA
COW-4	3,609.34	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	51.7 2.0 3.43E-05	NA NA NA
CPW-2	2,291.19	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	60.7 2.3 4.55E-05	NA NA NA
RC-2	6,634.66	Transmissivity (ft ² /day) Hyd. Cond. (ft/day) Storativity	58.2 2.2 6.18E-05	NA NA NA

NA - Data not analyzed; pumping data were sufficient for analysis.

* Unable to analyze recovery data due to lack of check valve on top of pump.

TABLE 16
SUMMARY OF TOWN OF CRAWFORD WATER SYSTEM

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

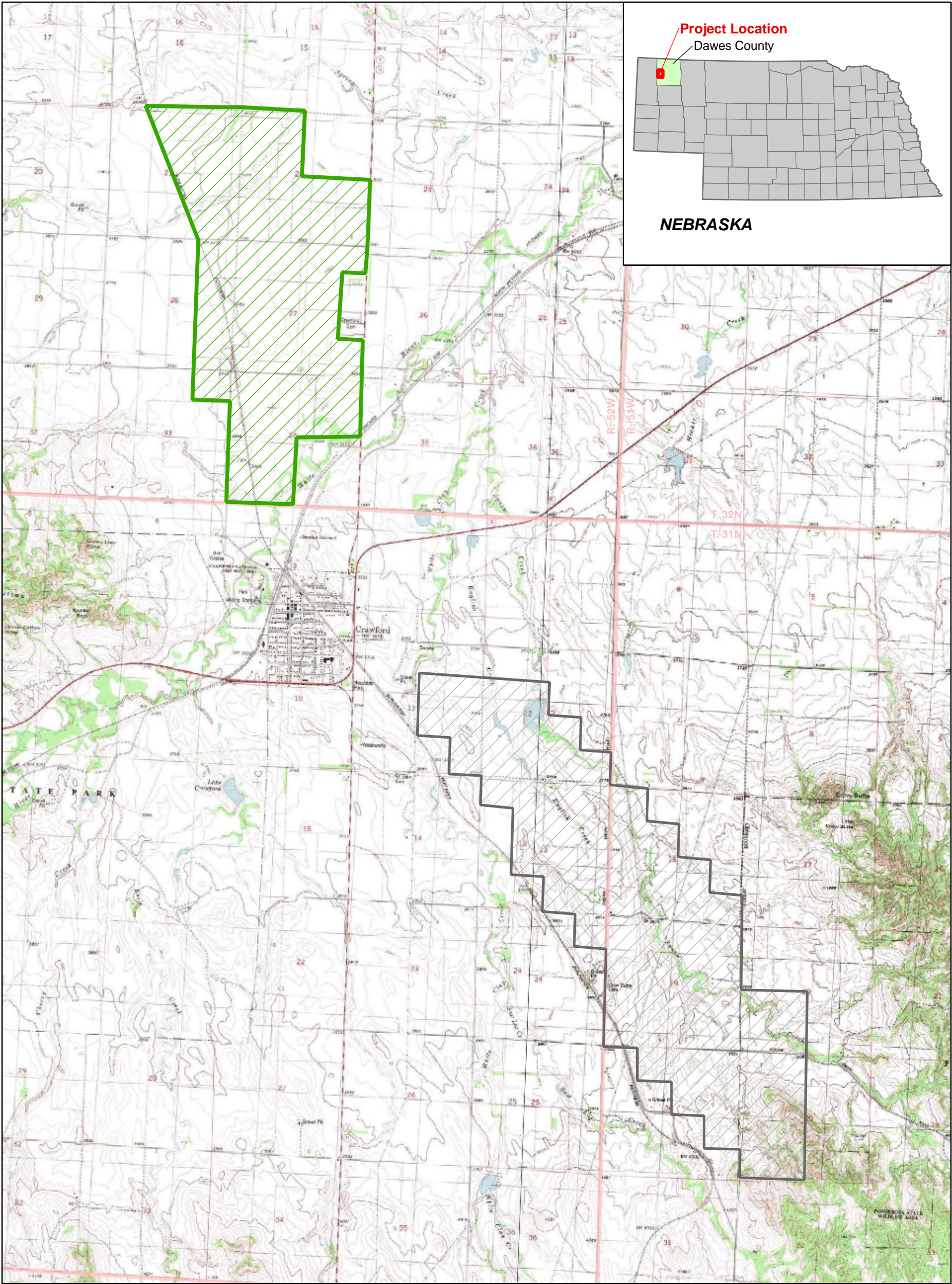
Description	Capacity
Raw Water Storage Capacity	500,000 gallons
Treated Water Capacity	
West Tank	1,000,000 gallons
East Tank	750,000 gallons
Average Daily Use (2006)	419,181 gallons
Maximum Daily Use	1,000,000 gallons
Supply Wells	
South Well #1 (100 feet deep); Reg: G-93533 NW1/4 SW1/4 Sec. 15, T31N, R52W	104 gpm
West Well #2 (100 feet deep); Reg: G-93532 NW1/4 SW1/4 Sec. 15, T31N, R52W	54 gpm
Infiltration Gallery	
Pump #1; 27 feet; Reg: G-93551 SE1/4 SW1/4 Sec. 8 T31N R52W	420 gpm
Pump #2; 27 feet; Reg: G-93551 SE1/4 SW1/4 Sec. 8 T31N R52W	420 gpm
Dewatering Wells; 20 to 26 feet deep SE1/4 SW1/4 Sec. 8 T31N R52W Reg Nos: 93528, 93529, 93530	33 gpm (each)





**Petition for Aquifer
Exemption**

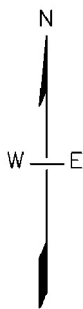
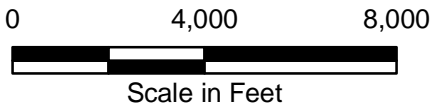
North Trend Expansion
Area

FIGURES



LEGEND

-  Proposed North Trend Expansion Area
-  Class III Permit Boundary



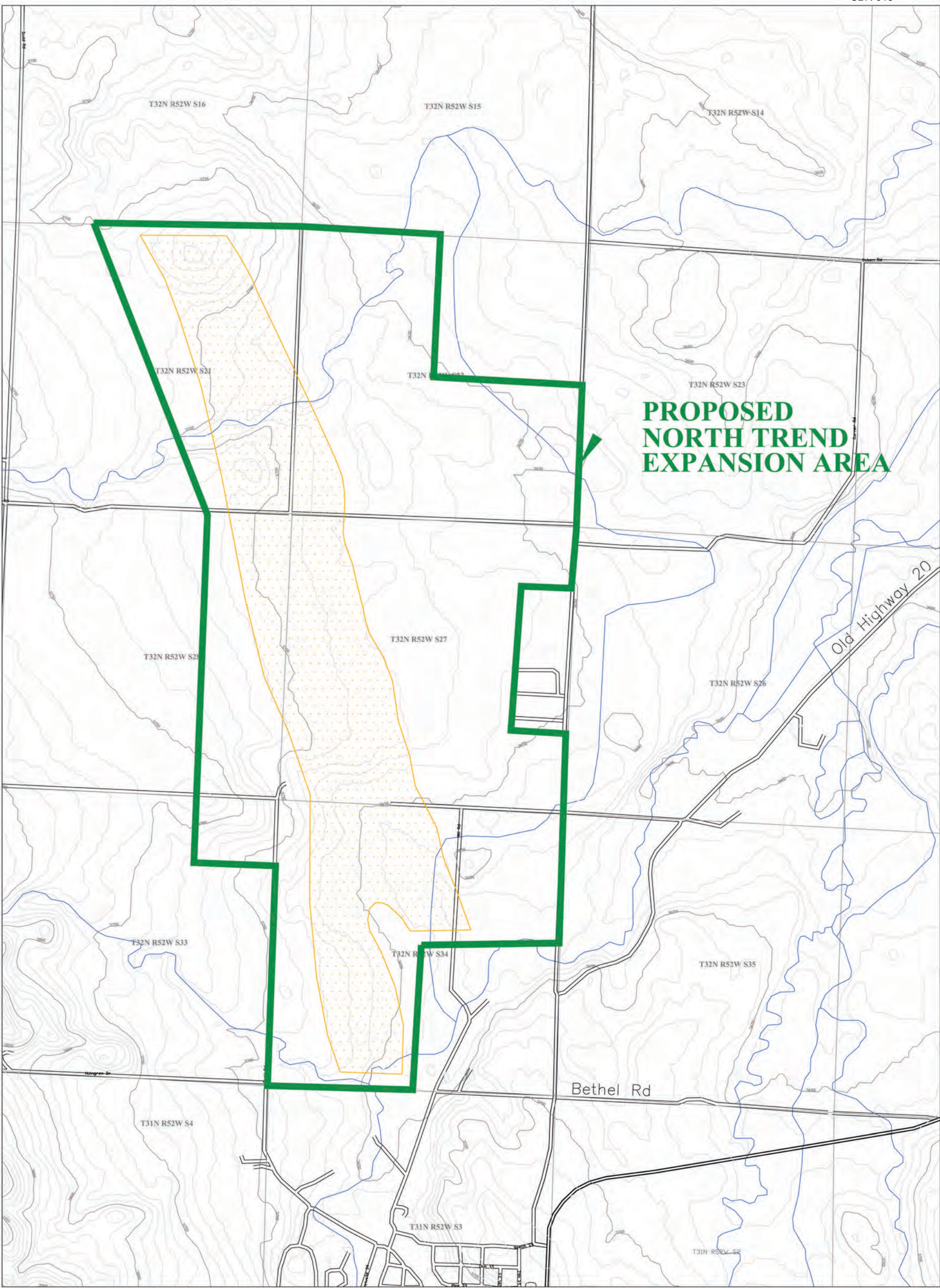
**CROW BUTTE
RESOURCES, INC.**

**FIGURE 1
LOCATION MAP
NORTH TREND EXPANSION AREA**

PROJECT: CO001322 MAPPED: JC CHECKED: MS
FILE: Fig1_ProjectLocation.mxd - 2/26/2008 @ 11:21:46 AM



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LEGEND



Ore Trend Outline



Proposed Aquifer Exemption Boundary



0 875 1750 3500
SCALE IN FEET 1" = 1750'



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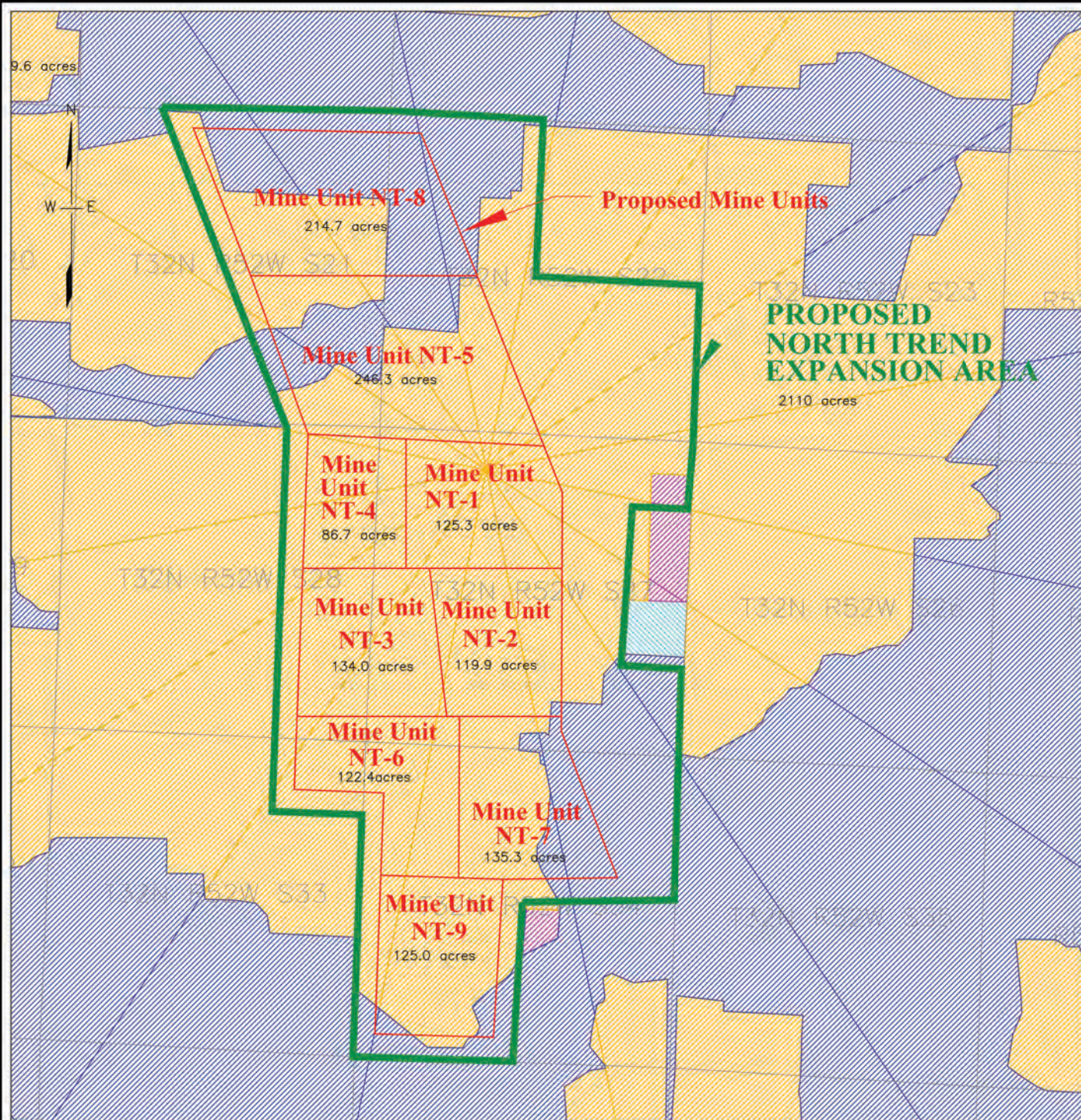
FIGURE 2
NORTH TREND EXPANSION ORE BODY
AND PROPOSED AQUIFER EXEMPTION AREA

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: CBR NT AE Fig_2.pdf - 03/06/2008 @10:03AM



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LEGEND

- RESIDENTIAL
- CROPLAND
- FOREST
- RANGELAND
- COMMERCIAL & SERVICES
- RECREATION

MU	ACRES RANGELAND	ACRES CROPLAND
1	0.0	125.3
2	1.0	118.9
3	0.0	134.0
4	0.0	86.7
5	80.8	165.5
6	0.0	122.4
7	47.2	88.1
8	130.2	84.5
9	8.7	116.3
TOTALS	267.9	1041.7

0 1250 2500 5000
SCALE IN FEET 1" = 2500'



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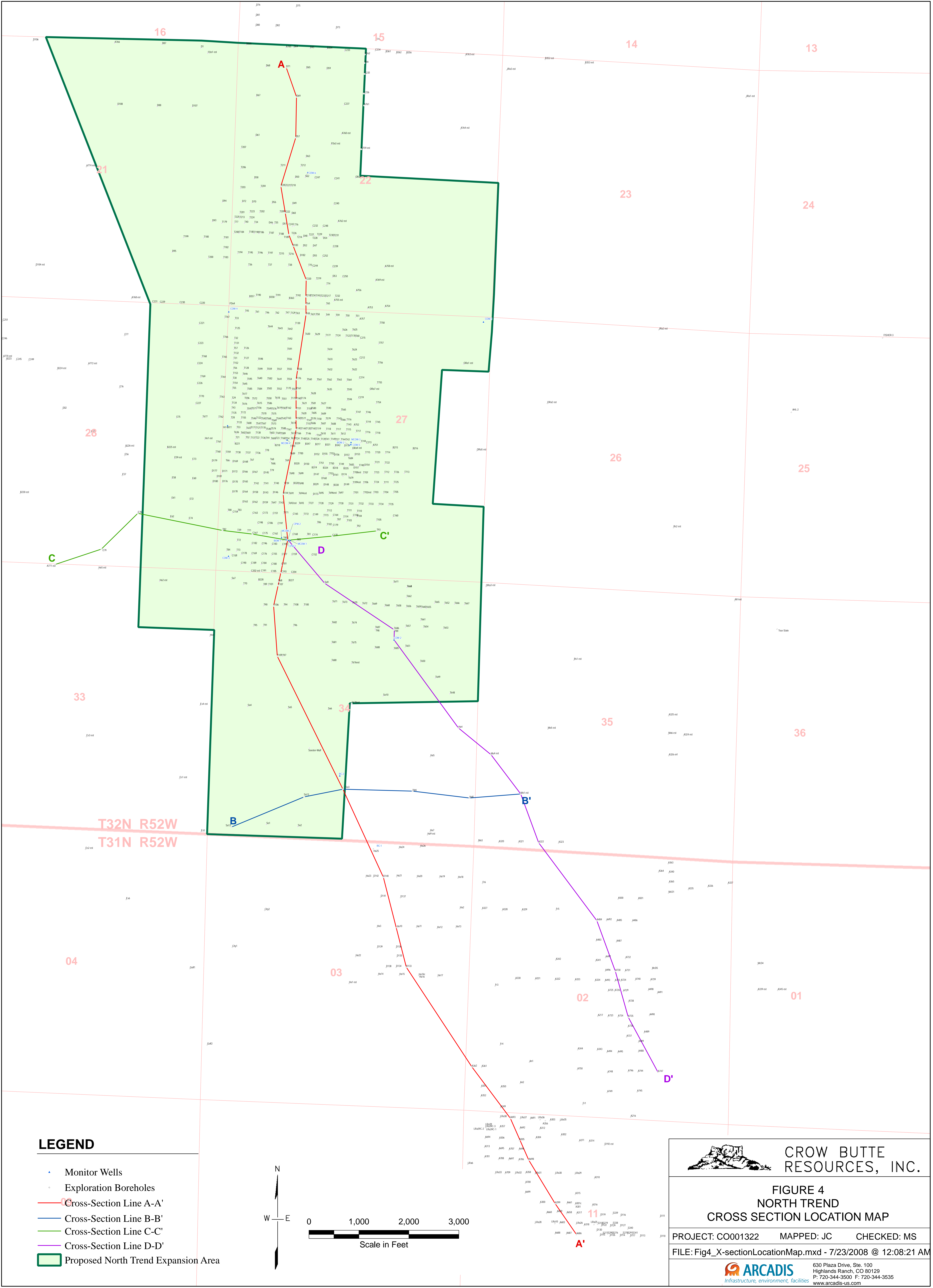
FIGURE 3 NORTH TREND WELLFIELD LAND USE AND PROPOSED MINE UNITS

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: CBR NT AE Fig_3.pdf - 03/06/2008 @ 10:35 AM

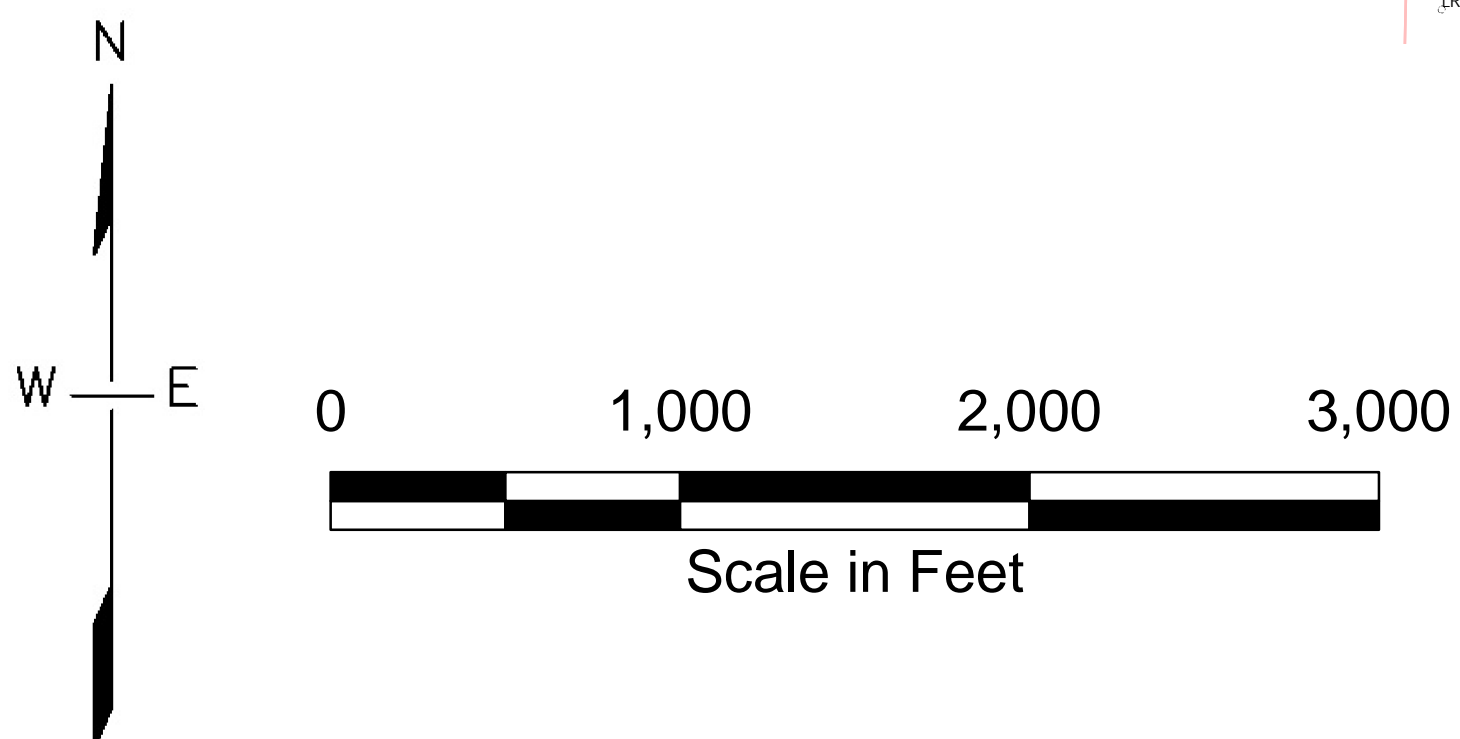
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LEGEND

- Monitor Wells
- Exploration Boreholes
- Cross-Section Line A-A'
- Cross-Section Line B-B'
- Cross-Section Line C-C'
- Cross-Section Line D-D'
- Proposed North Trend Expansion Area



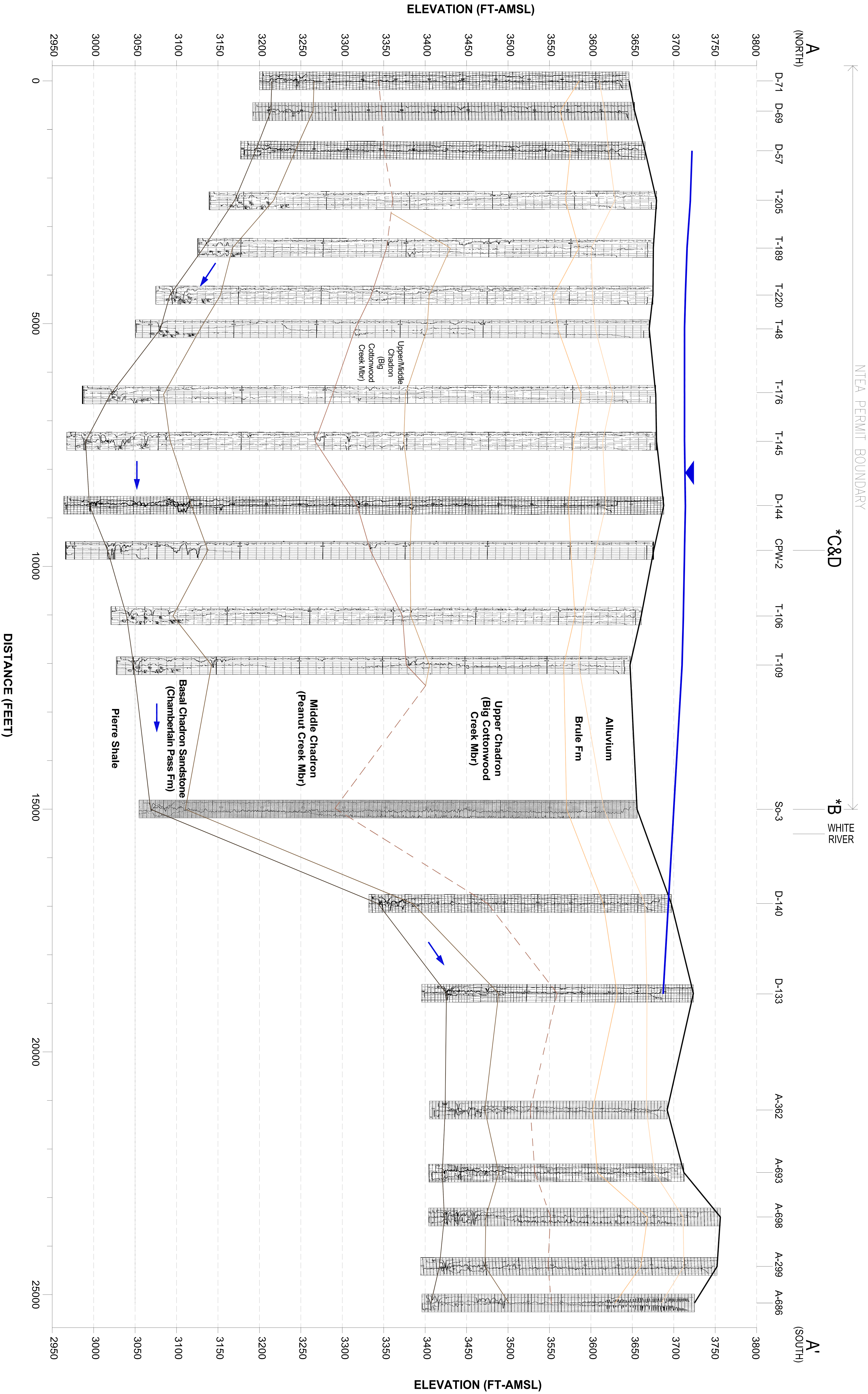
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FIGURE 4
NORTH TREND
CROSS SECTION LOCATION MAP

PROJECT: CO001322 MAPPED: JC CHECKED: MS
FILE: Fig4_X-sectionLocationMap.mxd - 7/23/2008 @ 12:08:21 AM



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- Notes:
- 1) Geologic units that underlie the Pierre Shale are not shown.
 - 2) Occurrences of the Upper Interior Paleosol (Chamberlain Pass Fm) and Yellow Mounds Paleosol could not be discerned on available logs.
 - 3) For locations where the Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr) was not observed in logs, the contact between the Upper Chadron Fm (Big Cottonwood Creek Mbr) and the Middle Chadron Fm (Peanut Creek Mbr) was extrapolated based on known occurrence, and is shown as dashed lines.
 - 4) Groundwater elevations were measured on 4/16/2008 (FT-AMSL).
- * Letter indicates location of intersecting cross-section lines shown on Figure 4.

- Legend:
- Topographic Surface
 - Top of Brule Fm
 - Top of Upper Chadron (Big Cottonwood Creek Mbr)
 - Top of Upper/Middle Chadron (Big Cottonwood Creek Mbr)
 - Top of Middle Chadron (Peanut Creek Mbr)
 - Top of Basal Chadron Sandstone (Chamberlain Pass Fm)
 - Top of Pierre Shale
 - Potentiometric Surface (Basal Chadron Sandstone) - 4/16/08
 - Groundwater Flow Direction

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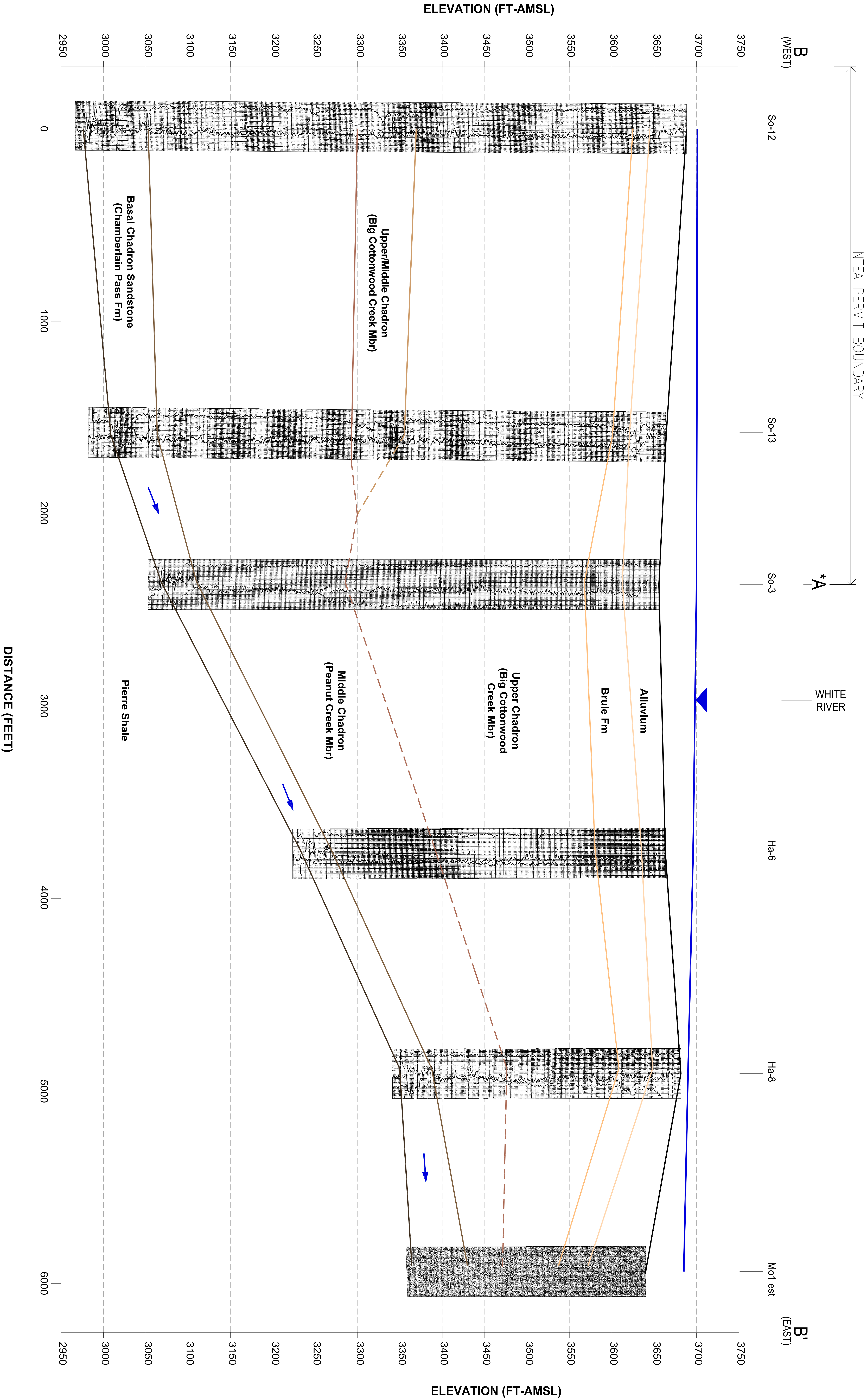
FIGURE 5a
NORTH TREND STRUCTURAL
CROSS-SECTION: A-A'

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: Fig 5a.dwg DATE/TIME: 6/18/2008 2:49 PM

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Notes:

- 1) Geologic units that underlie the Pierre Shale are not shown.
- 2) Occurrences of the Upper Interior Paleosol (Chamberlain Pass Fm) and Yellow Mounds Paleosol could not be discerned on available elogs.
- 3) For locations where the Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr) was not observed in elogs, the contact between the Upper Chadron Fm (Big Cottonwood Creek Mbr) and the Middle Chadron Fm (Peanut Peak Mbr) was extrapolated based on known occurrence, and is shown as dashed lines.
- 4) Groundwater elevations were measured on 4/16/2008 (FT-AMSL).

* Letter indicates location of intersecting cross-section lines shown on Figure 4.



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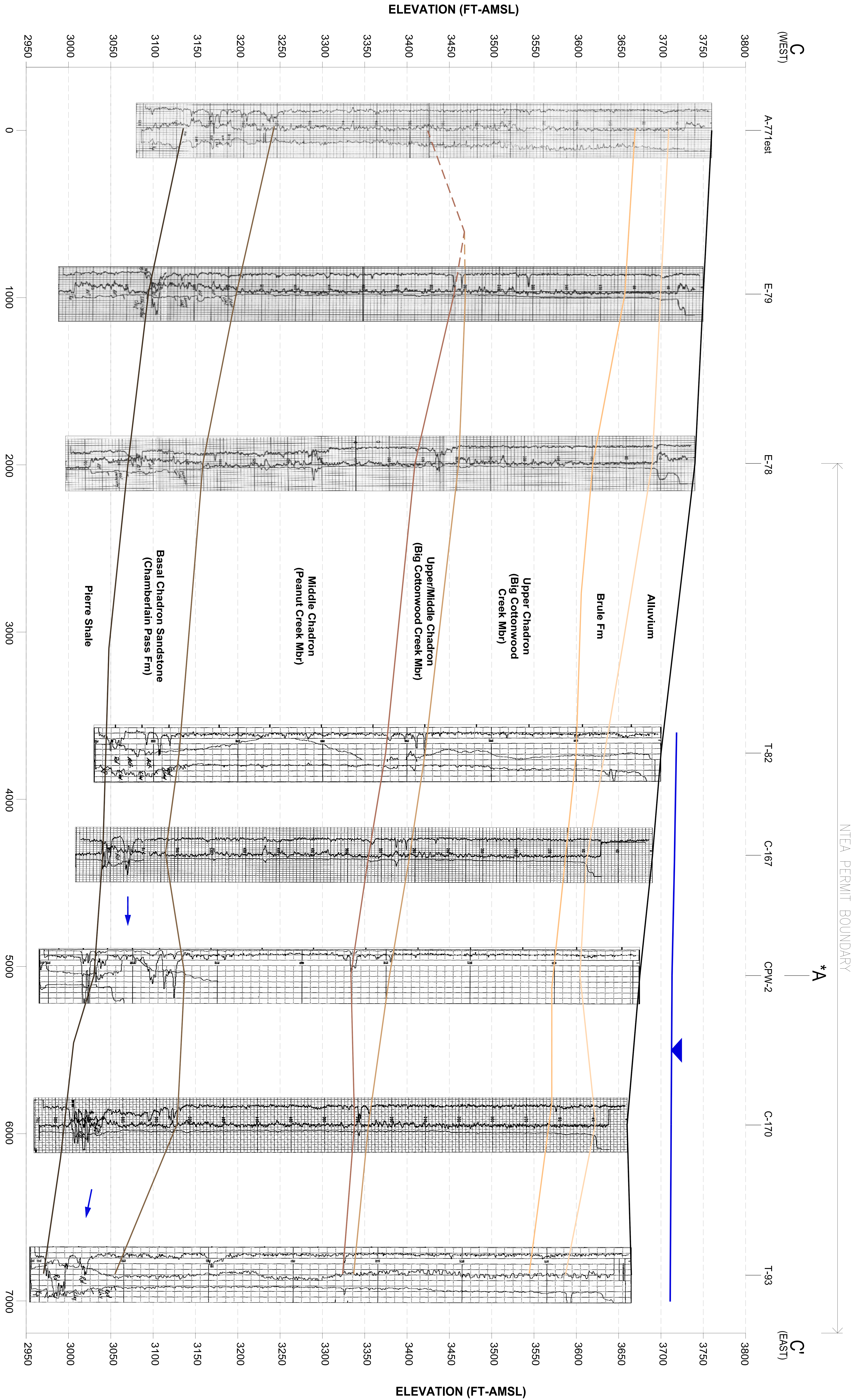
FIGURE 5b

**NORTH TREND STRUCTURAL
CROSS-SECTION: B-B'**

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: Fig 5b.dwg DATE/TIME: 6/18/2008 2:51 PM

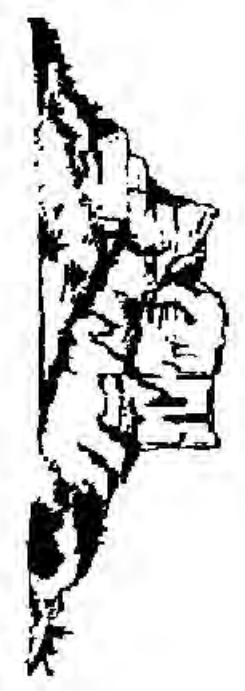
ARCADIS 630 Plaza Drive, Ste. 100
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Notes:

- 1) Geologic units that underlie the Pierre Shale are not shown.
- 2) Occurrences of the Upper Interior Paleosol (Chamberlain Pass Fm) and Yellow Mounds Paleosol could not be discerned on available elogs.
- 3) For locations where the Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr) was not observed in elogs, the contact between the Upper Chadron Fm (Big Cottonwood Creek Mbr) and the Middle Chadron Fm (Peanut Peak Mbr) was extrapolated based on known occurrence, and is shown as dashed lines.
- 4) Groundwater elevations were measured on 4/16/2008 (FT-AMSL).

* Letter indicates location of intersecting cross-section lines shown on Figure 4.



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FIGURE 5c

**NORTH TREND STRUCTURAL
CROSS-SECTION: C-C'**

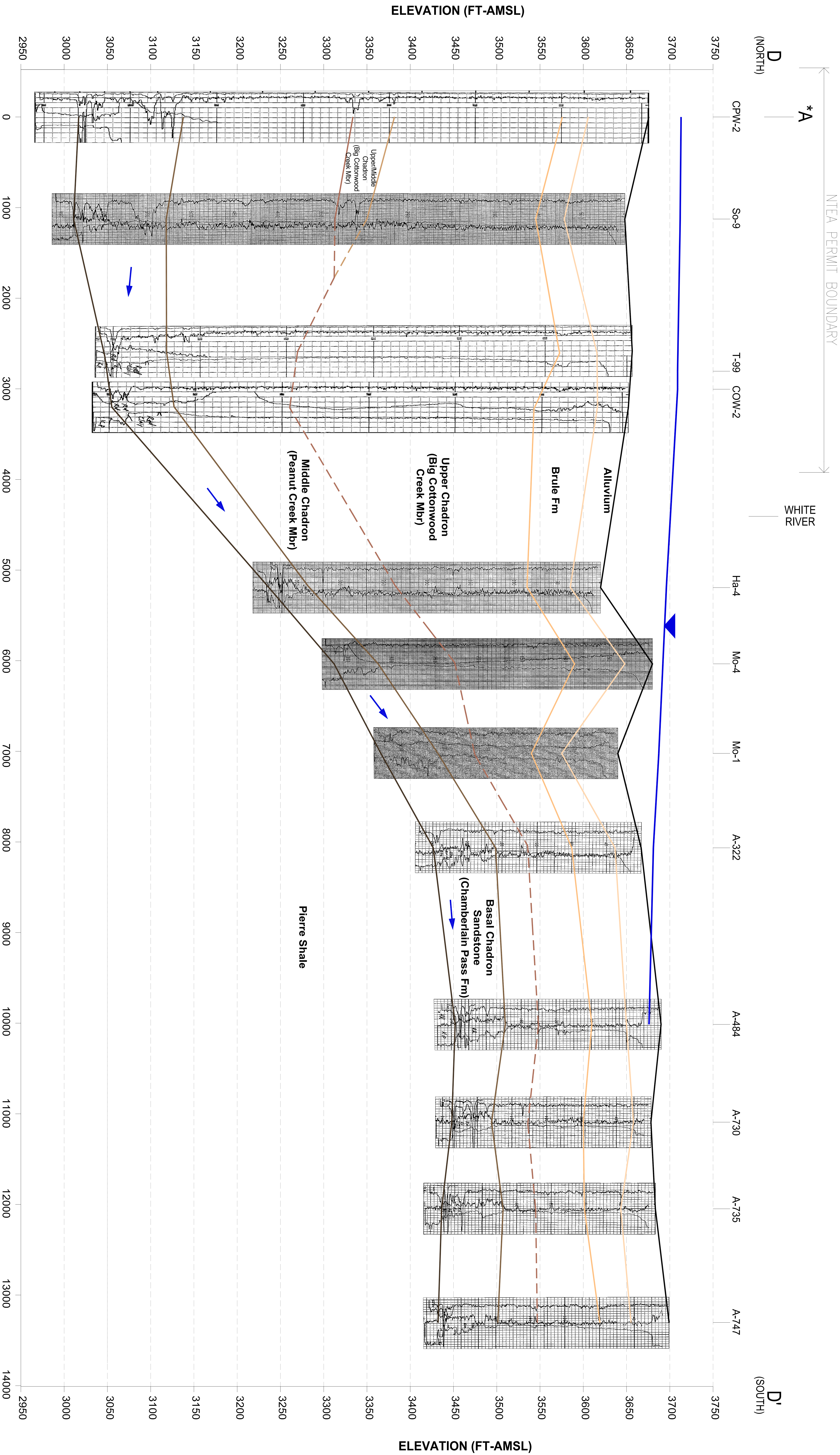
PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: Fig 5c.dwg DATE/TIME: 6/18/2008 2:51 PM

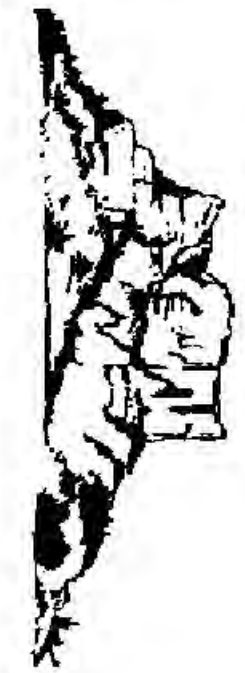


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- Notes:**
- 1) Geologic units that underlie the Pierre Shale are not shown.
 - 2) Occurrences of the Upper Interior Paleosol (Chamberlain Pass Fm) and Yellow Mounds Paleosol could not be discerned on available elogs.
 - 3) For locations where the Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr) was not observed in elogs, the contact between the Upper Chadron Fm (Big Cottonwood Creek Mbr) and the Middle Chadron Fm (Peanut Peak Mbr) was extrapolated based on known occurrence, and is shown as dashed lines.
 - 4) Groundwater elevations were measured on 4/16/2008 (FT-AMSL).
- * Letter indicates location of intersecting cross-section lines shown on Figure 4.



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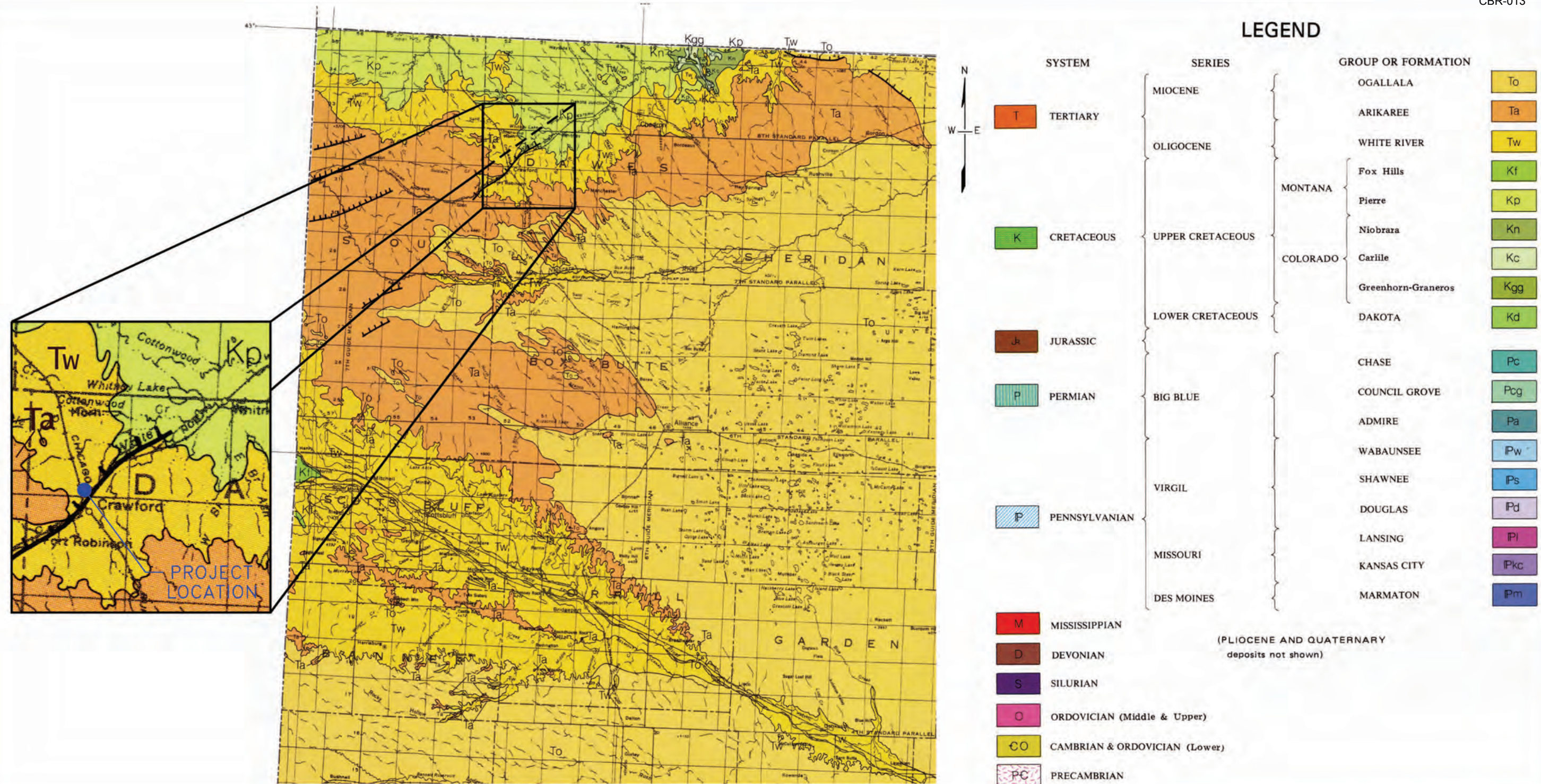
FIGURE 5d

**NORTH TREND STRUCTURAL
CROSS-SECTION: D-D'**

PROJECT: CO001322 **MAPPED:** JC **CHECKED:** MS

FILE: Fig 5d.dwg **DATE/TIME:** 6/18/2008 2:49 PM

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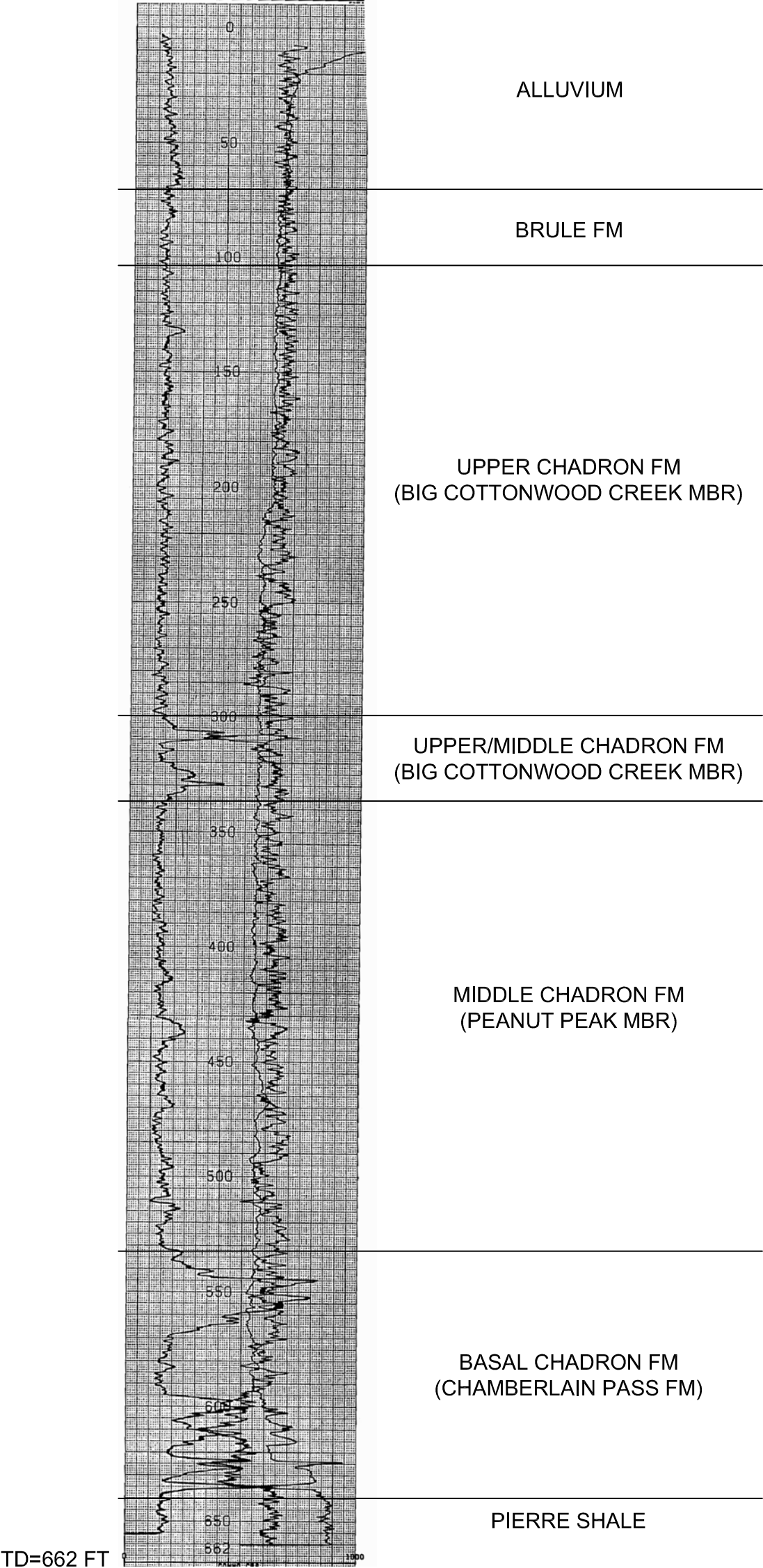
FIGURE 6
BEDROCK GEOLOGY OF THE
NORTH TREND EXPANSION AREA

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: CBR NT AE Fig_6.pdf - 05/08/2008 @ 4:20 PM.

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SO-9



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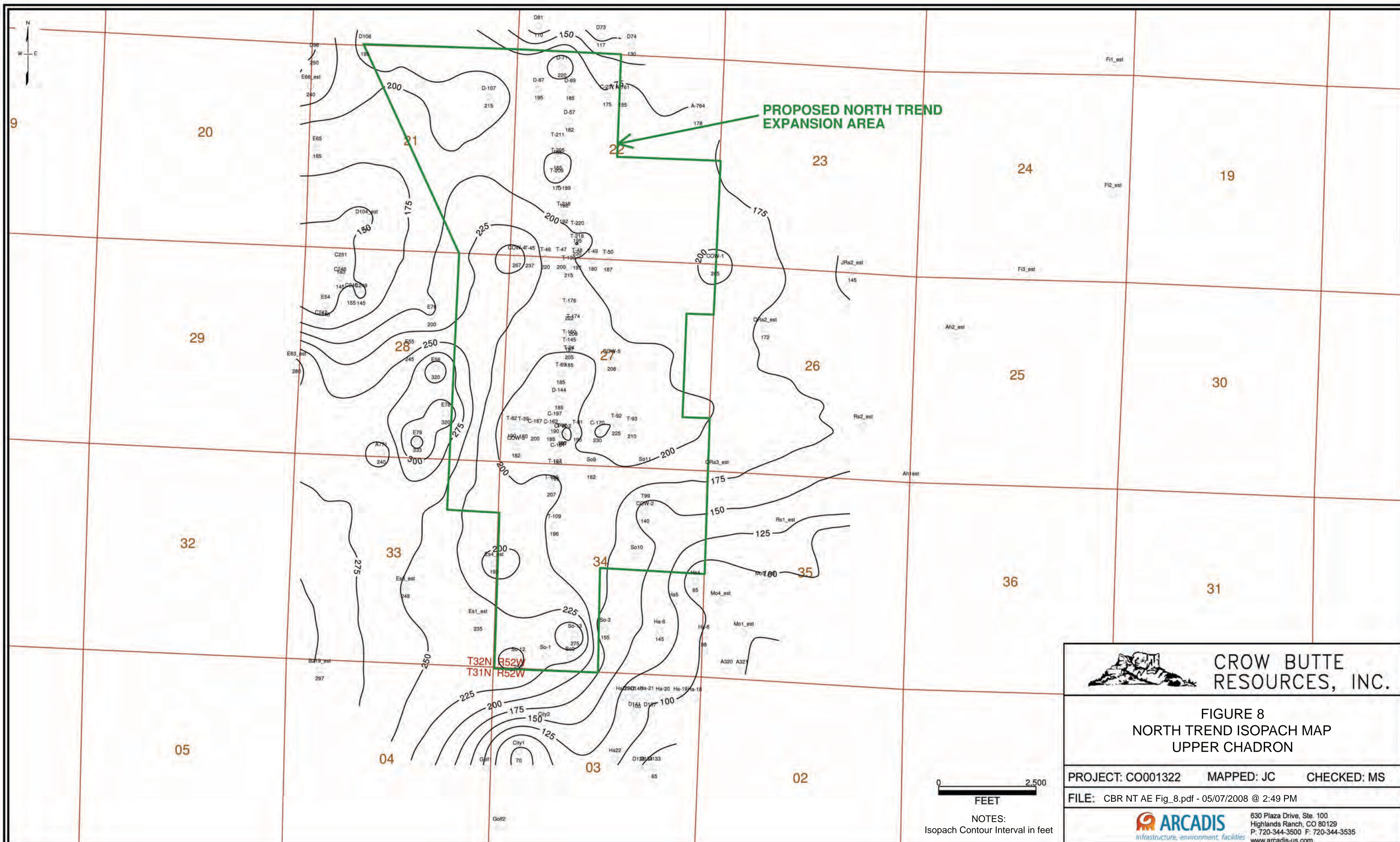
FIGURE 7
NORTH TREND EXPANSION AREA
TYPE LOG (SO-9)

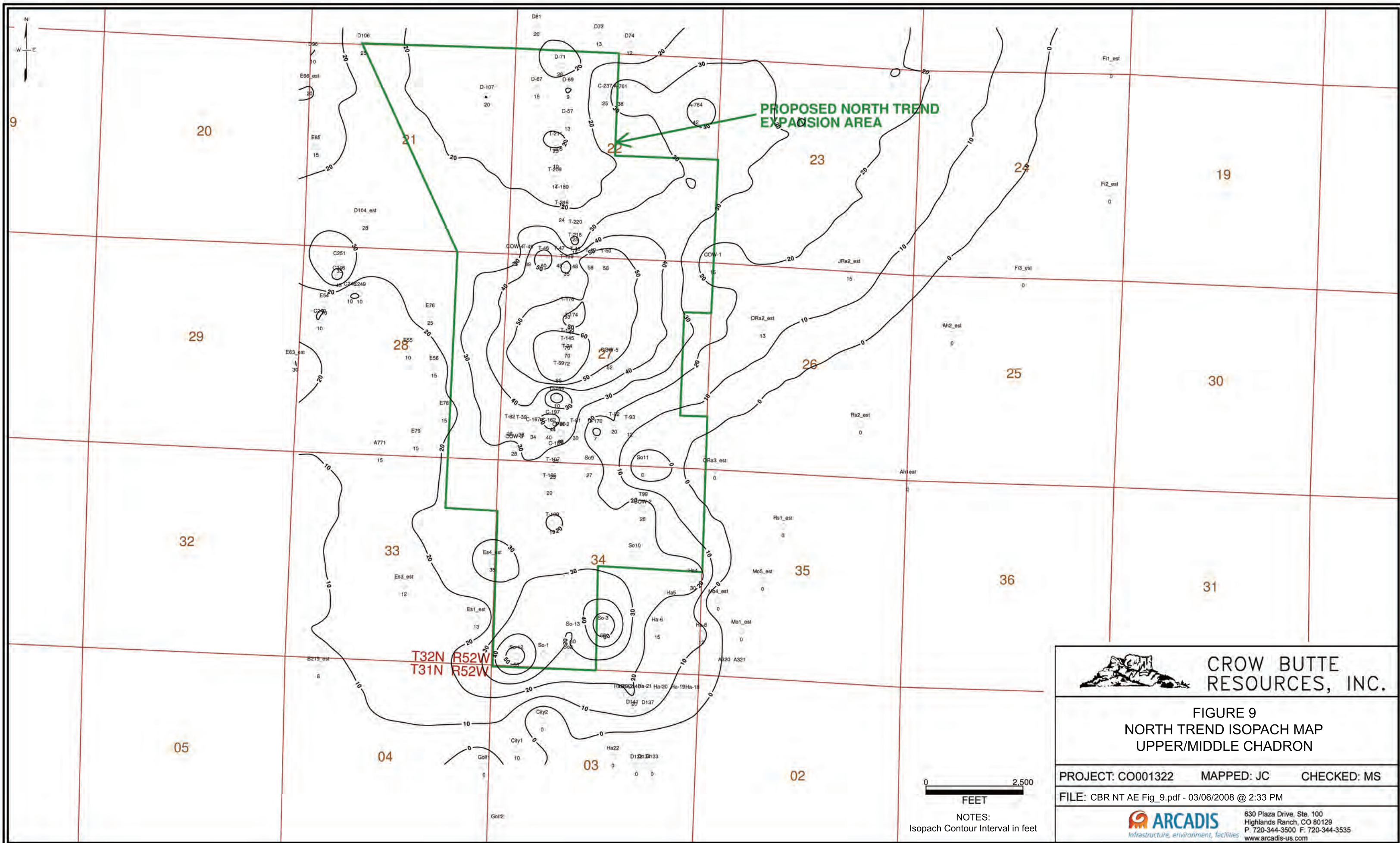
PROJECT: CO001322 MAPPED: JC CHECKED: MS

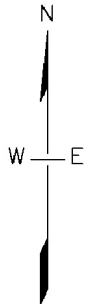
FILE: 01322G01.dwg DATE/TIME: 5/7/2008 9:52 AM



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**PROPOSED NORTH TREND
EXPANSION AREA**

**T32N R52W
T31N R52W**

0 2,500
FEET

NOTES:
Contour Interval in feet [amsl]



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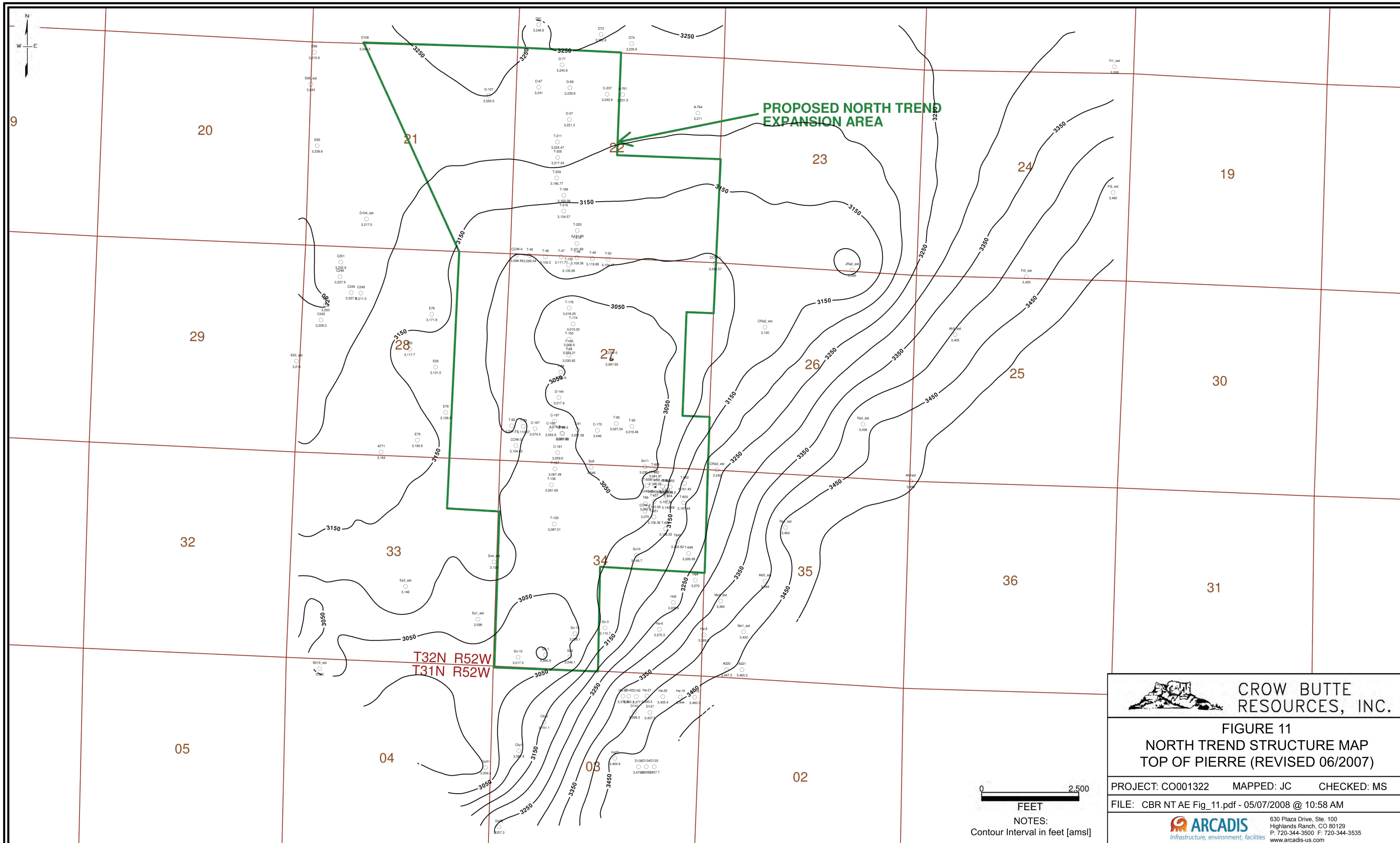
**FIGURE 10
NORTH TREND ISOPACH MAP
BASAL CHADRON SANDSTONE (REV 05/08)**

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: Fig10_NTIsopach_BasalChadron.mxd - 5/9/2008 @ 11:00:17 PM



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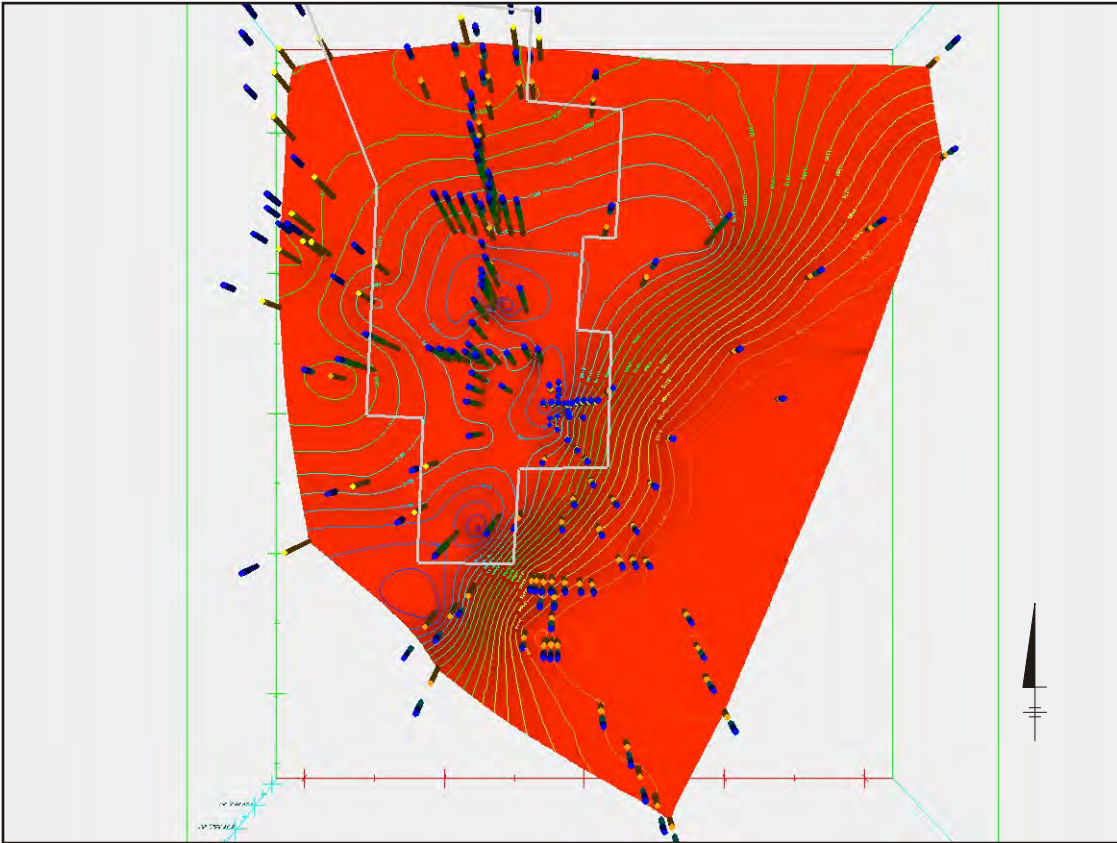
**FIGURE 11
NORTH TREND STRUCTURE MAP
TOP OF PIERRE (REVISED 06/2007)**

PROJECT: CO001322 MAPPED: JC CHECKED: MS

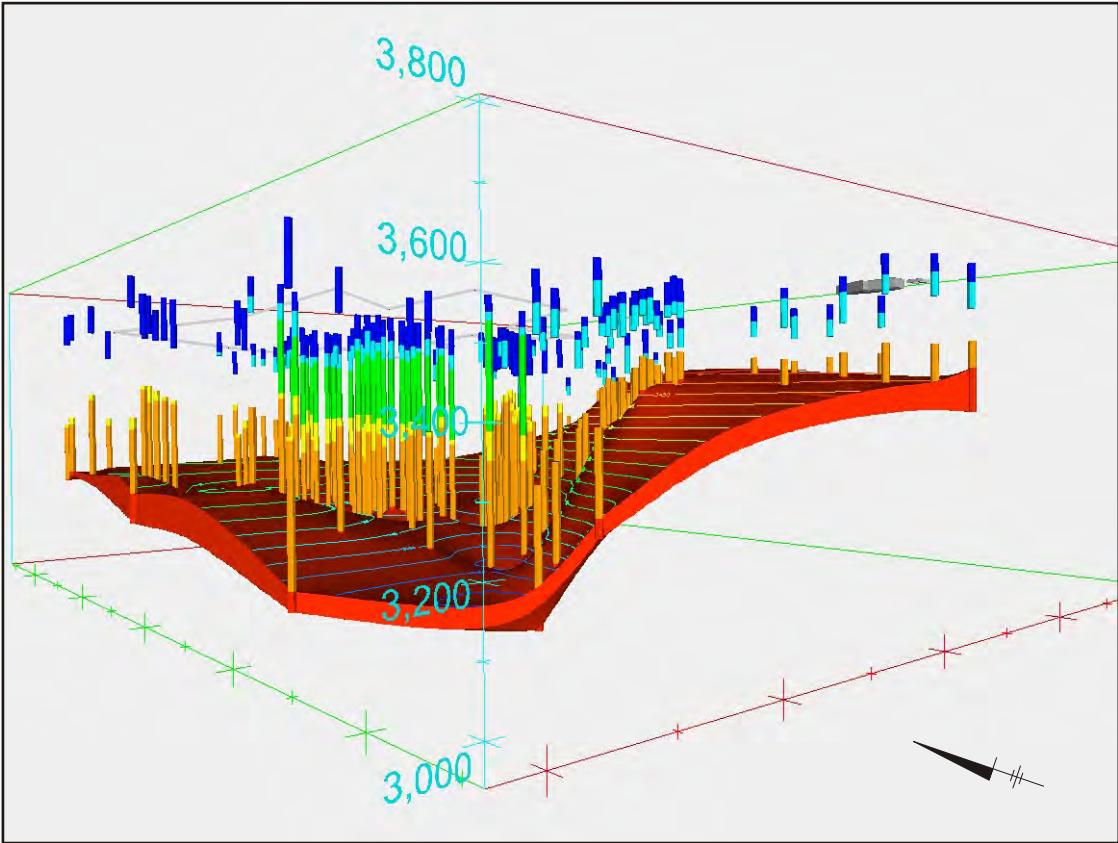
FILE: CBR NT AE Fig_11.pdf - 05/07/2008 @ 10:58 AM



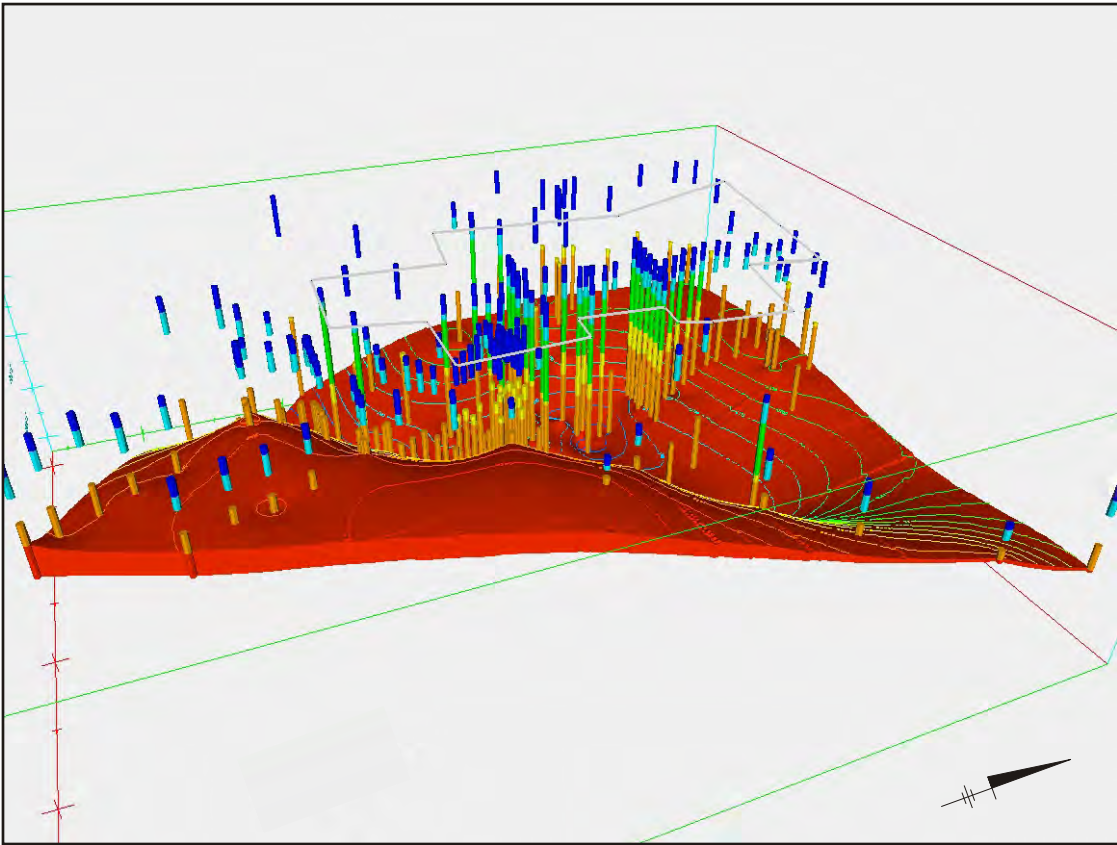
630 Plaza Drive, Ste. 100
Highlands Ranch, CO 80129
P: 720-344-3500 F: 720-344-3535
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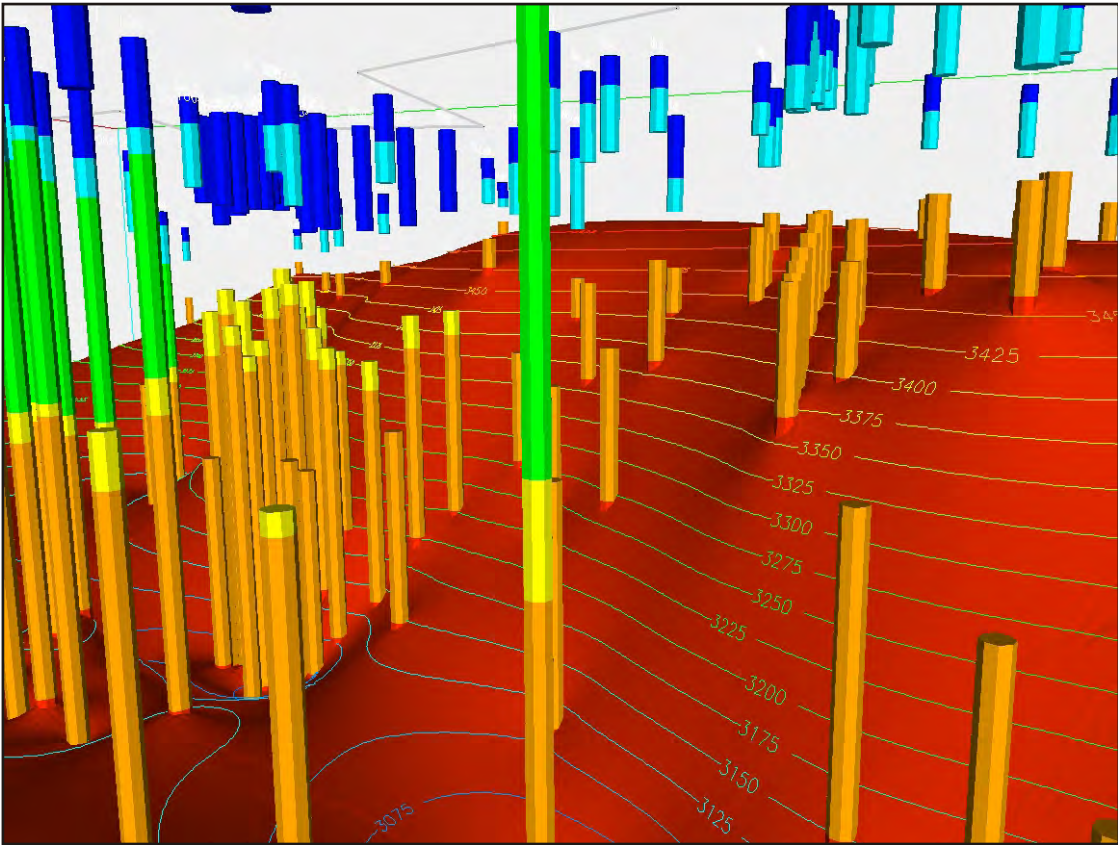
PLAN VIEW (PERMIT BOUNDARY SHOWN)



OBLIQUE VIEW - FACING NORTHEAST (PARALLEL TO FOLD AXIS)



OBLIQUE VIEW - FACING NORTHWEST (PERPENDICULAR TO FOLD AXIS)



OBLIQUE VIEW - FACING EAST-NORTHEAST INTO NORTH LIMB OF FOLD

LEGEND:

STRATIGRAPHY

- Alluvium
- Brule Fm
- Upper Chadron Fm (Big Cottonwood Creek Mbr)
- Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr)
- Middle Chadron Fm (Peanut Peak Mbr)
- Basal Chadron Fm (Chamberlain Pass Fm)

NOTES:

- All of the 3D model output has a 10x vertical exaggeration.
- Elevations are in ft-amsl (axes and contours).



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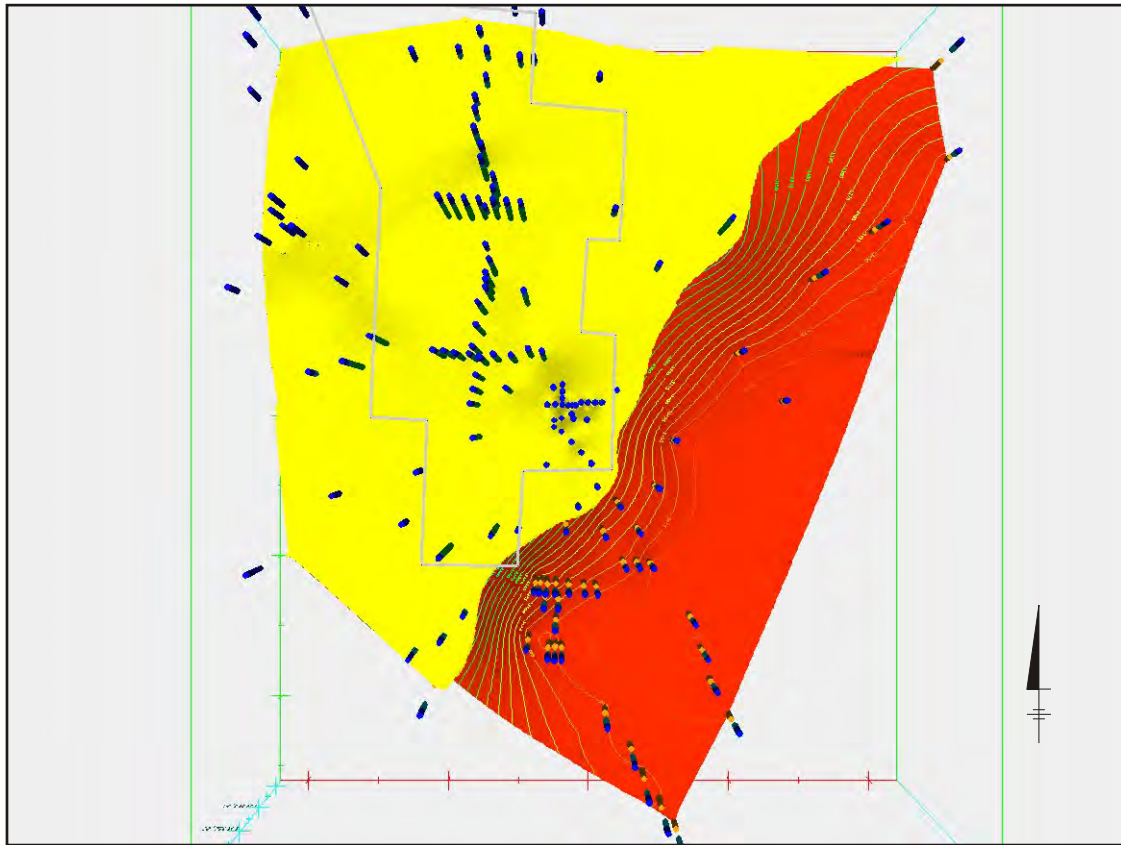
**BASAL CHADRON SANDSTONE
(CHAMBERLAIN PASS FM)**

PROJECT: CO001322 MAPPED: CHECKED: MS

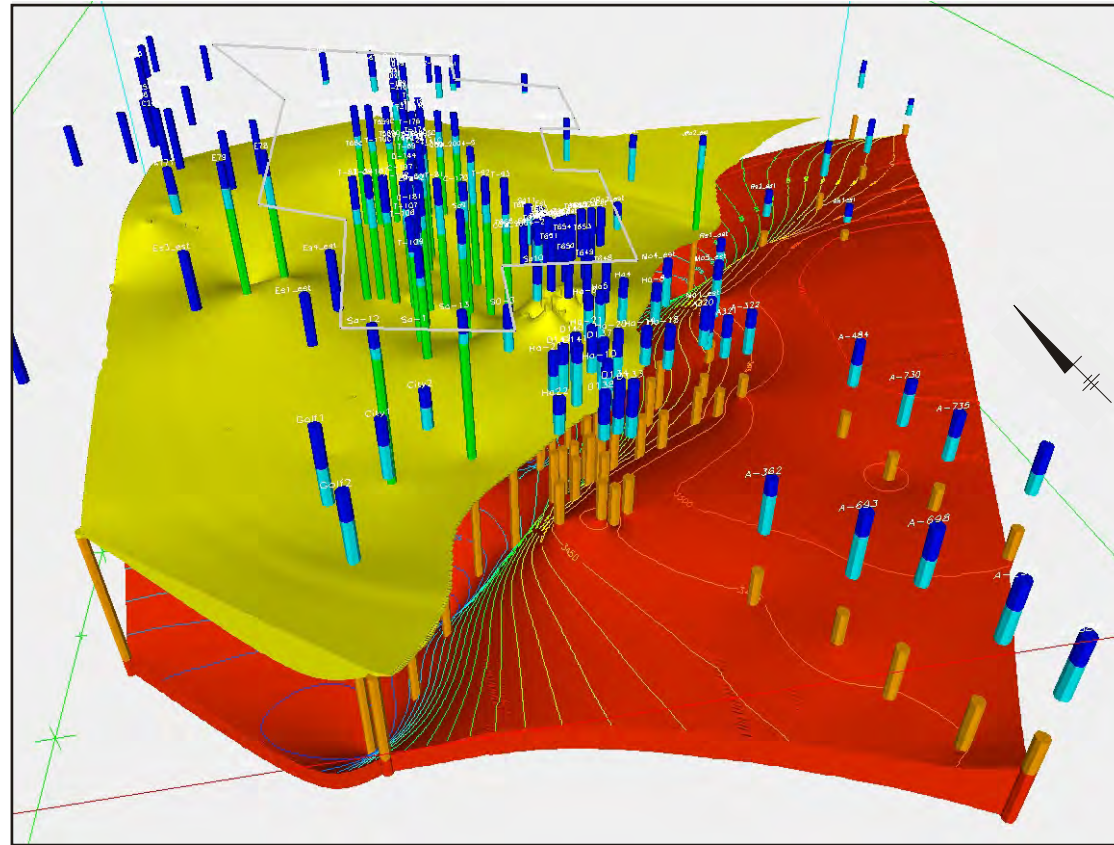
FILE: **FIGURE 12a**



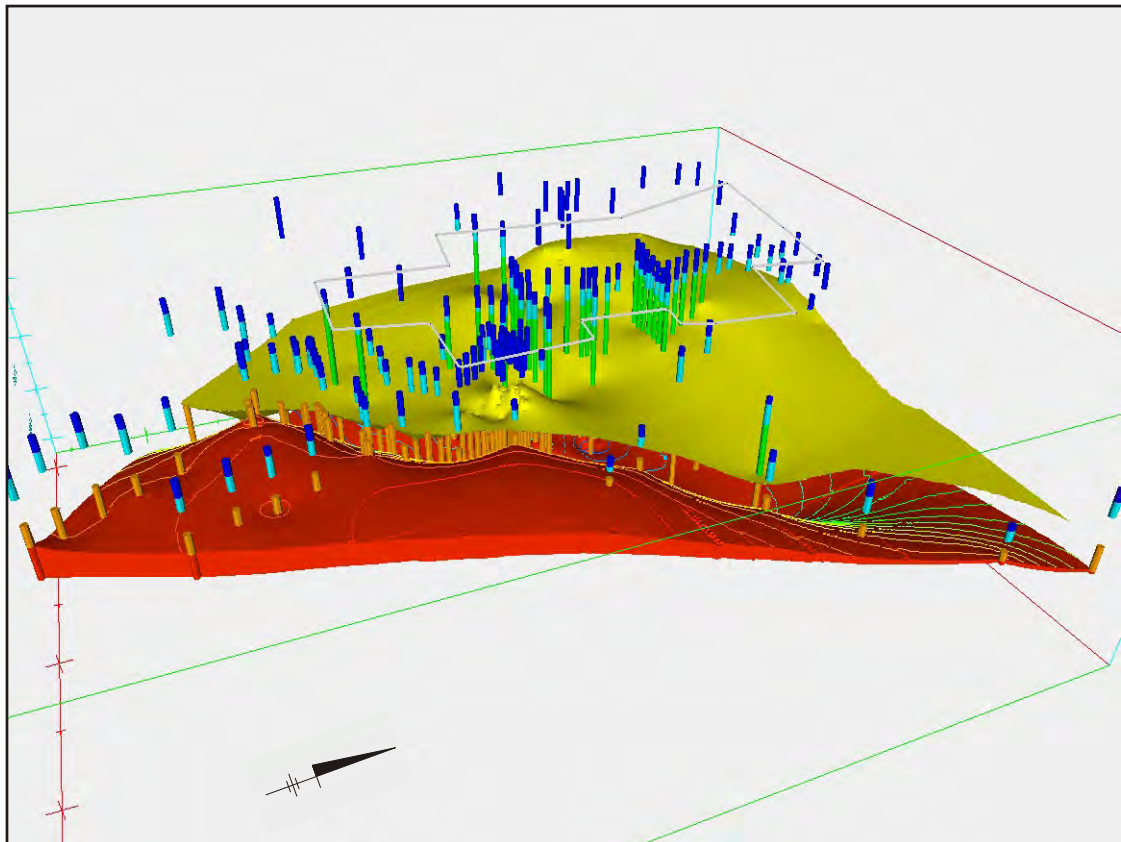
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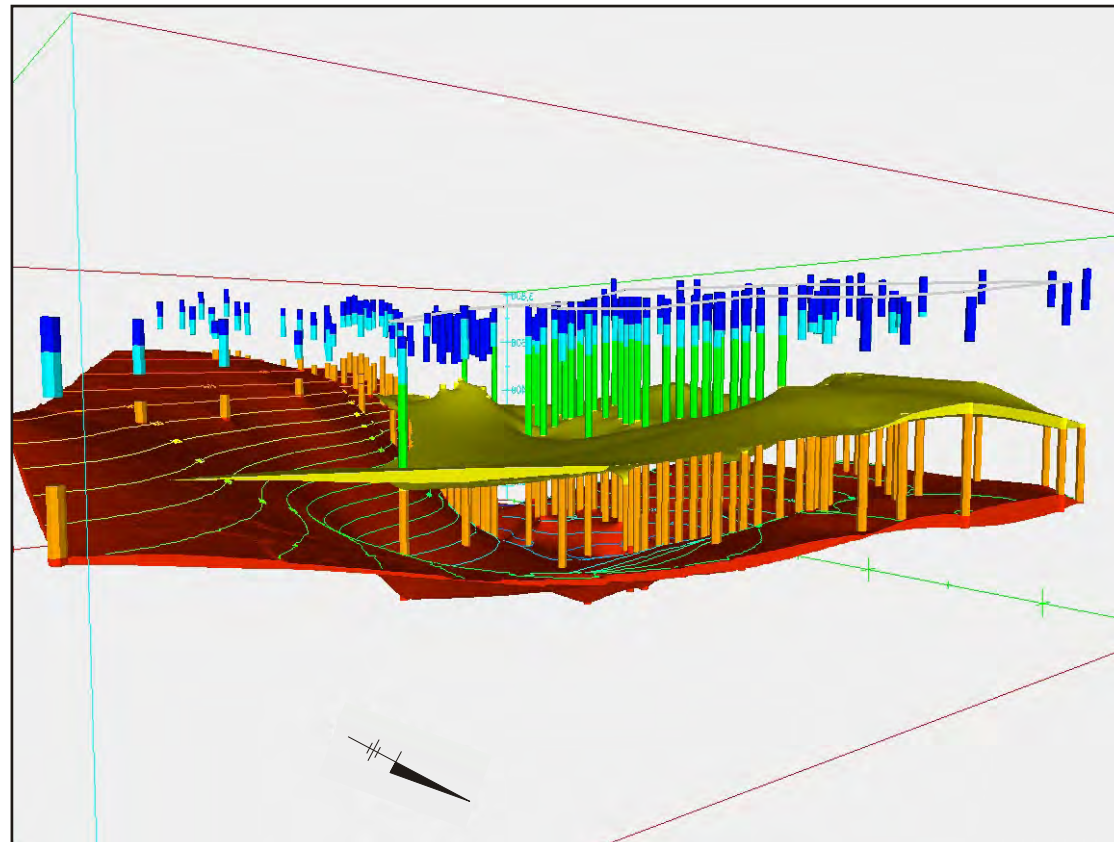
PLAN VIEW (PERMIT BOUNDARY SHOWN)



OBLIQUE VIEW - FACING NORTHEAST (PARALLEL TO FOLD AXIS)



OBLIQUE VIEW - FACING NORTHWEST (PERPENDICULAR TO FOLD AXIS)



OBLIQUE VIEW - FACING SOUTHWEST (PARALLEL TO FOLD AXIS)

LEGEND:

STRATIGRAPHY

- Alluvium
- Brule Fm
- Upper Chadron Fm (Big Cottonwood Creek Mbr)
- Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr)
- Middle Chadron Fm (Peanut Peak Mbr)
- Basal Chadron Fm (Chamberlain Pass Fm)

NOTES:

- All of the 3D model output has a 10x vertical exaggeration.
- Elevations are in ft-amsl (axes and contours).



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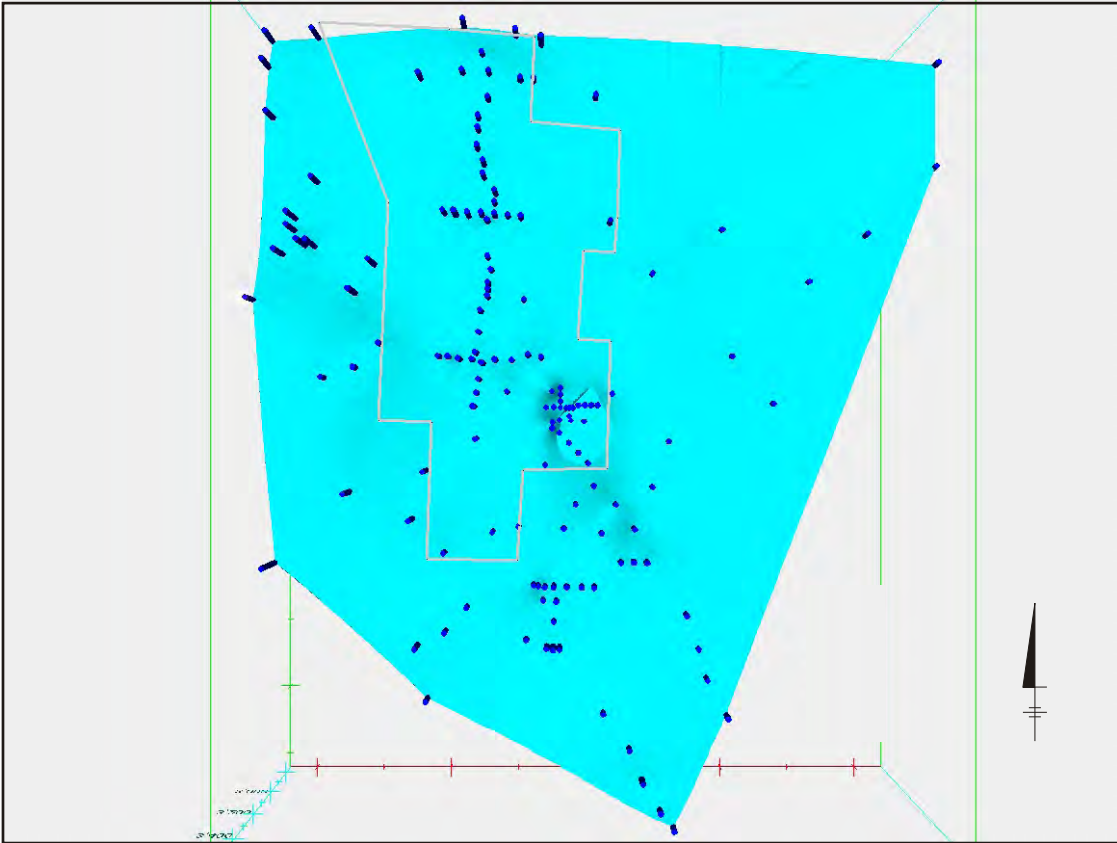
**BASAL CHADRON SANDSTONE
(CHAMBERLAIN PASS FM) AND UPPER/MIDDLE
CHADRON (BIG COTTONWOOD CREEK MBR)**

PROJECT: CO001322 MAPPED: CHECKED: MS

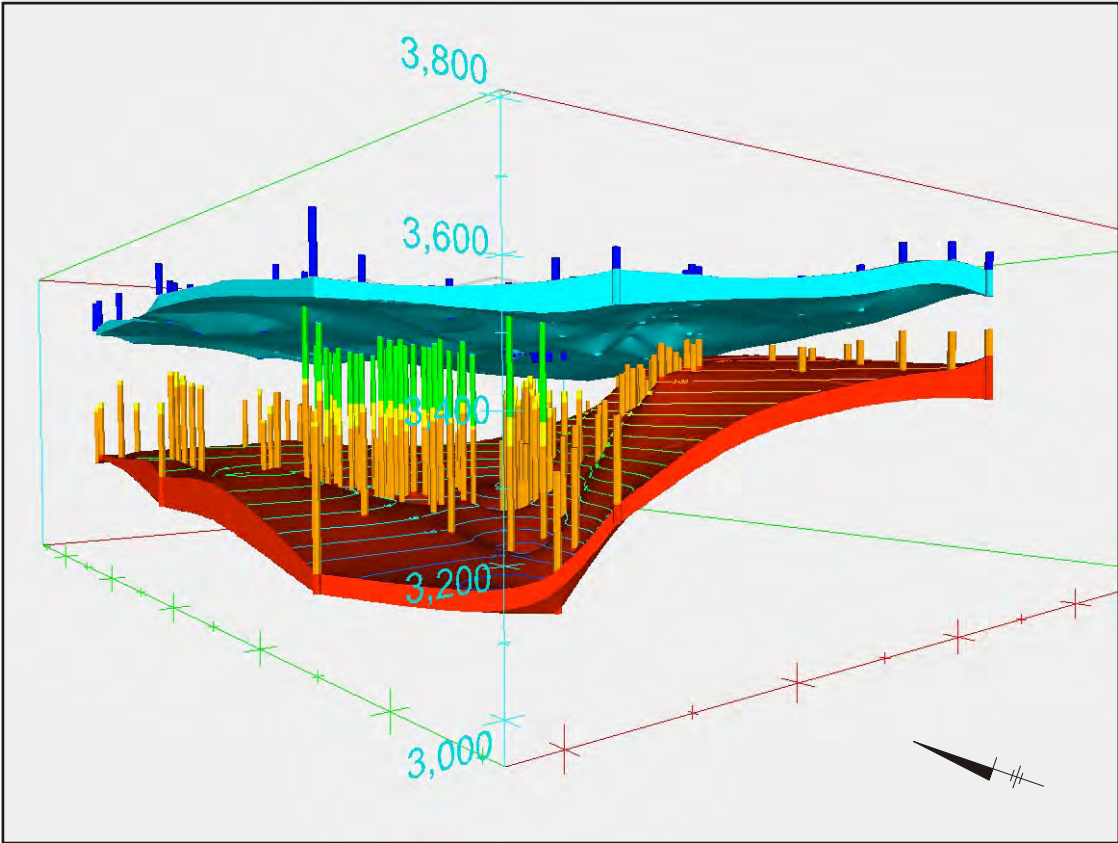
FILE: **FIGURE 12b**



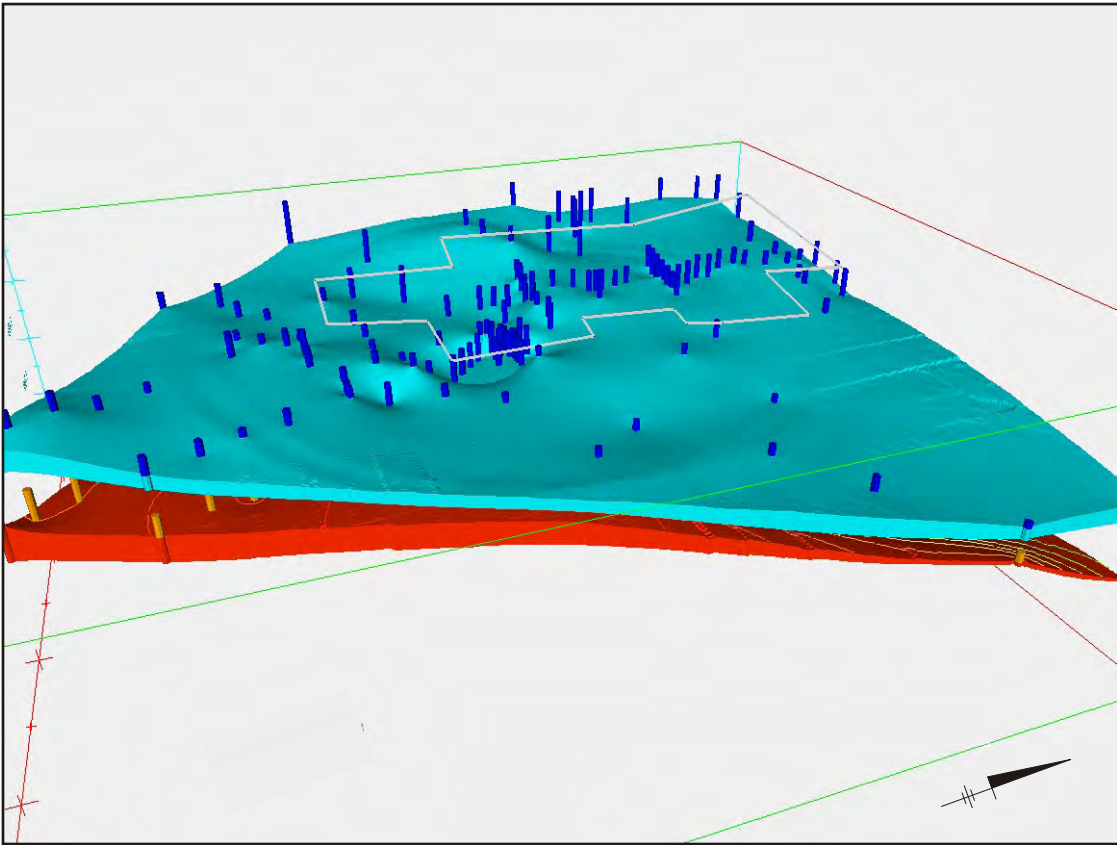
630 Plaza Drive, Ste. 100
Highlands Ranch, CO 80129
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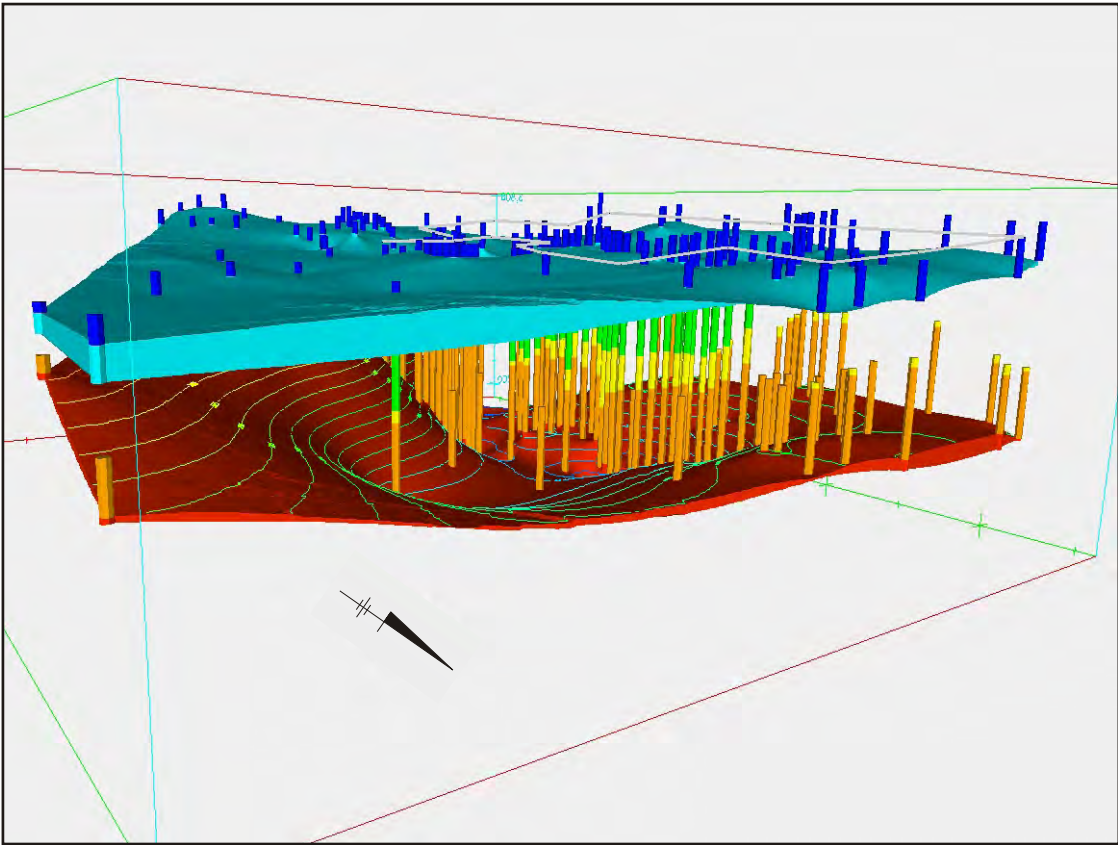
PLAN VIEW (PERMIT BOUNDARY SHOWN)



OBLIQUE VIEW - FACING NORTHEAST (PARALLEL TO FOLD AXIS)



OBLIQUE VIEW - FACING NORTHWEST (PERPENDICULAR TO FOLD AXIS)



OBLIQUE VIEW FACING SOUTHWEST (PARALLEL TO FOLD AXIS)

LEGEND:

STRATIGRAPHY

- Alluvium
- Brule Fm
- Upper Chadron Fm (Big Cottonwood Creek Mbr)
- Upper/Middle Chadron Fm (Big Cottonwood Creek Mbr)
- Middle Chadron Fm (Peanut Peak Mbr)
- Basal Chadron Fm (Chamberlain Pass Fm)

NOTES:

- All of the 3D model output has a 10x vertical exaggeration.
- Elevations are in ft-amsl (axes and contours).



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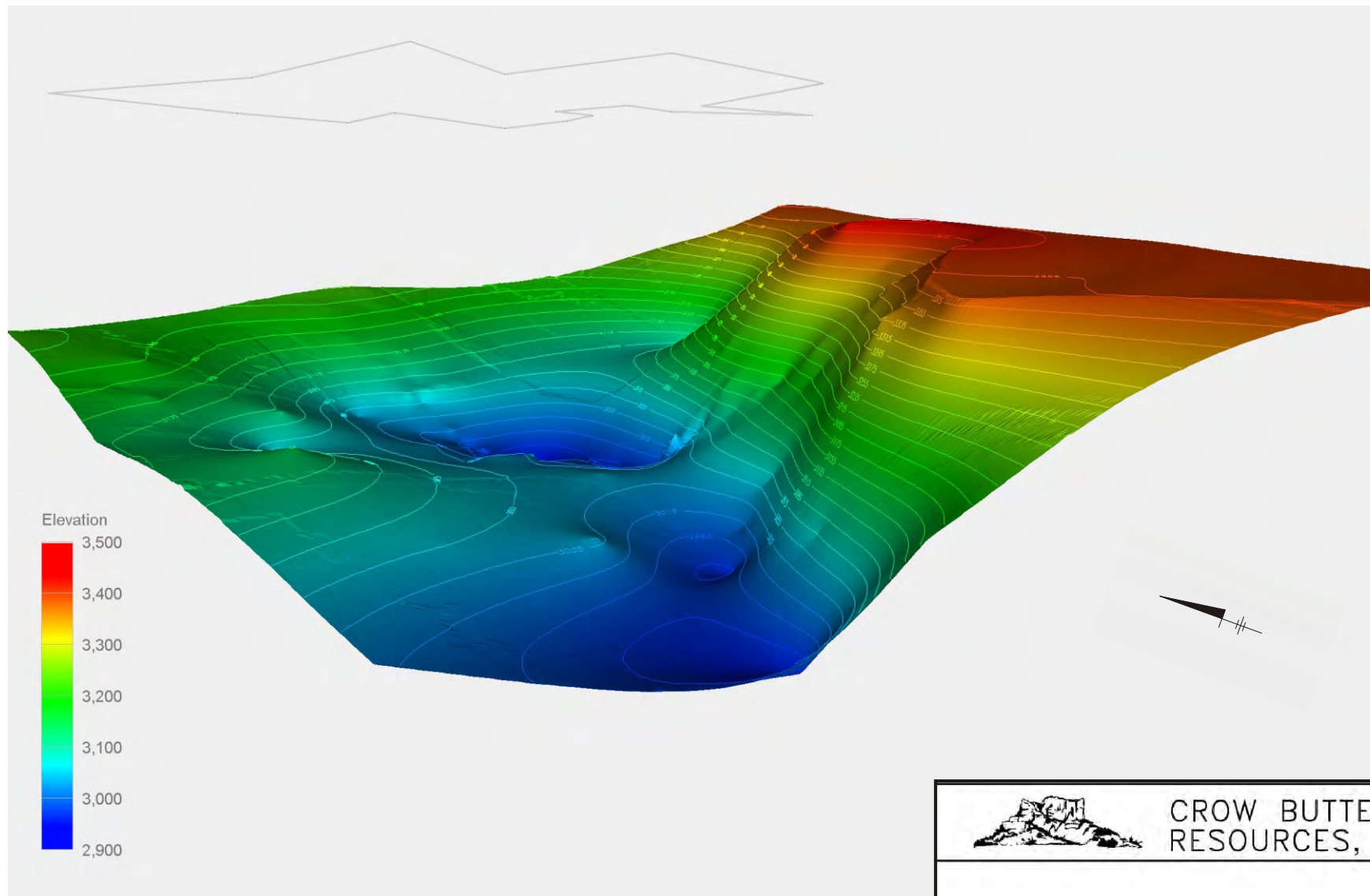
**BASAL CHADRON SANDSTONE
(CHAMBERLAIN PASS FM) AND
BRULE FM**

PROJECT: CO001322 MAPPED: CHECKED: MS

FILE: **FIGURE 12c**



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NOTES:

- All of the 3D model output has a 10x vertical exaggeration.
- Elevations are in ft-amsl (color legend and contours).



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TOP OF PIERRE SHALE

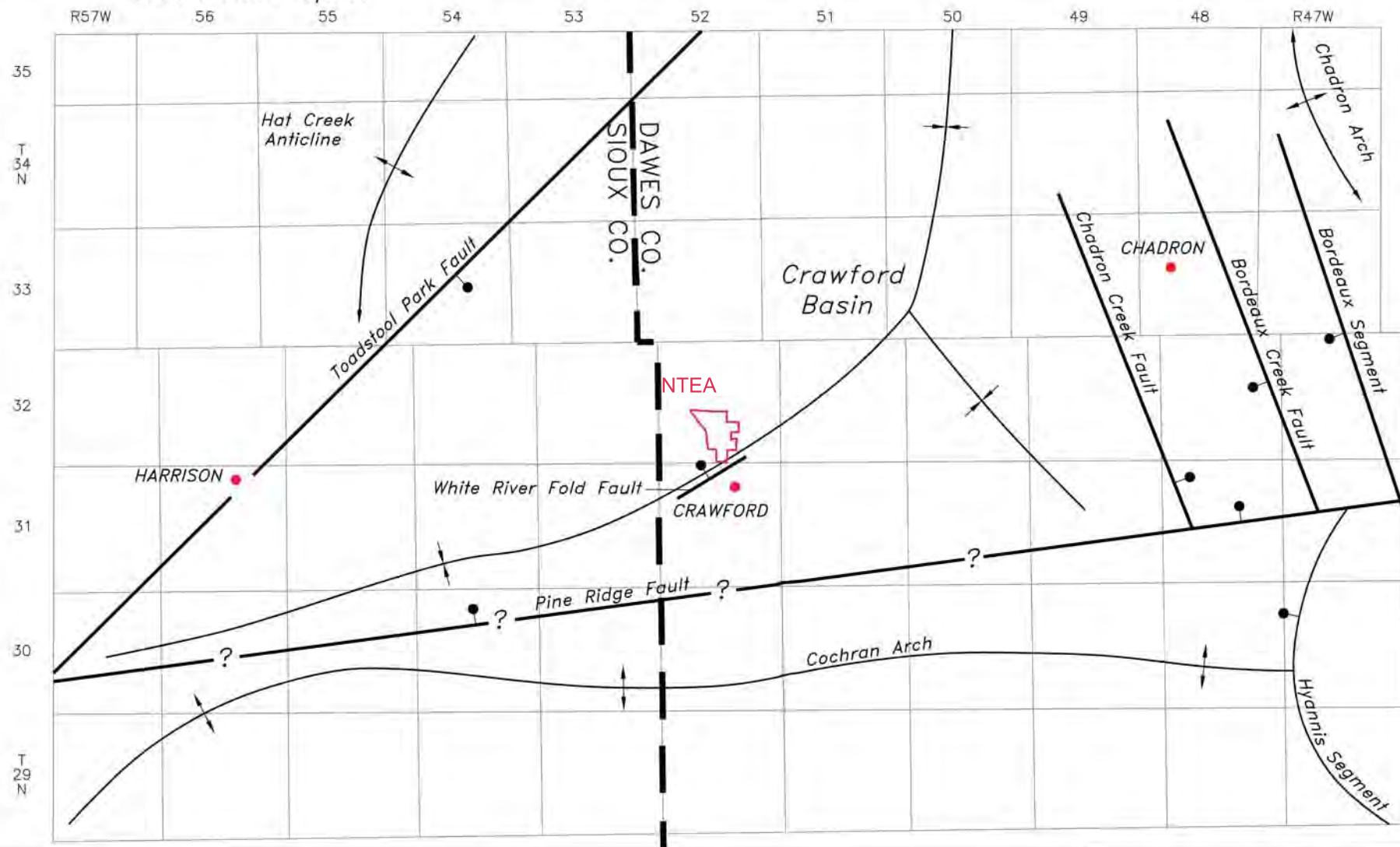
PROJECT: CO001322 MAPPED: CHECKED: MS

FILE: **FIGURE 12d**



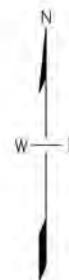
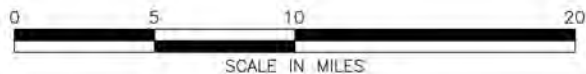
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Black Hills Uplift



LEGEND

- Fault (Ball on downthrown side)
- Anticline
- Syncline



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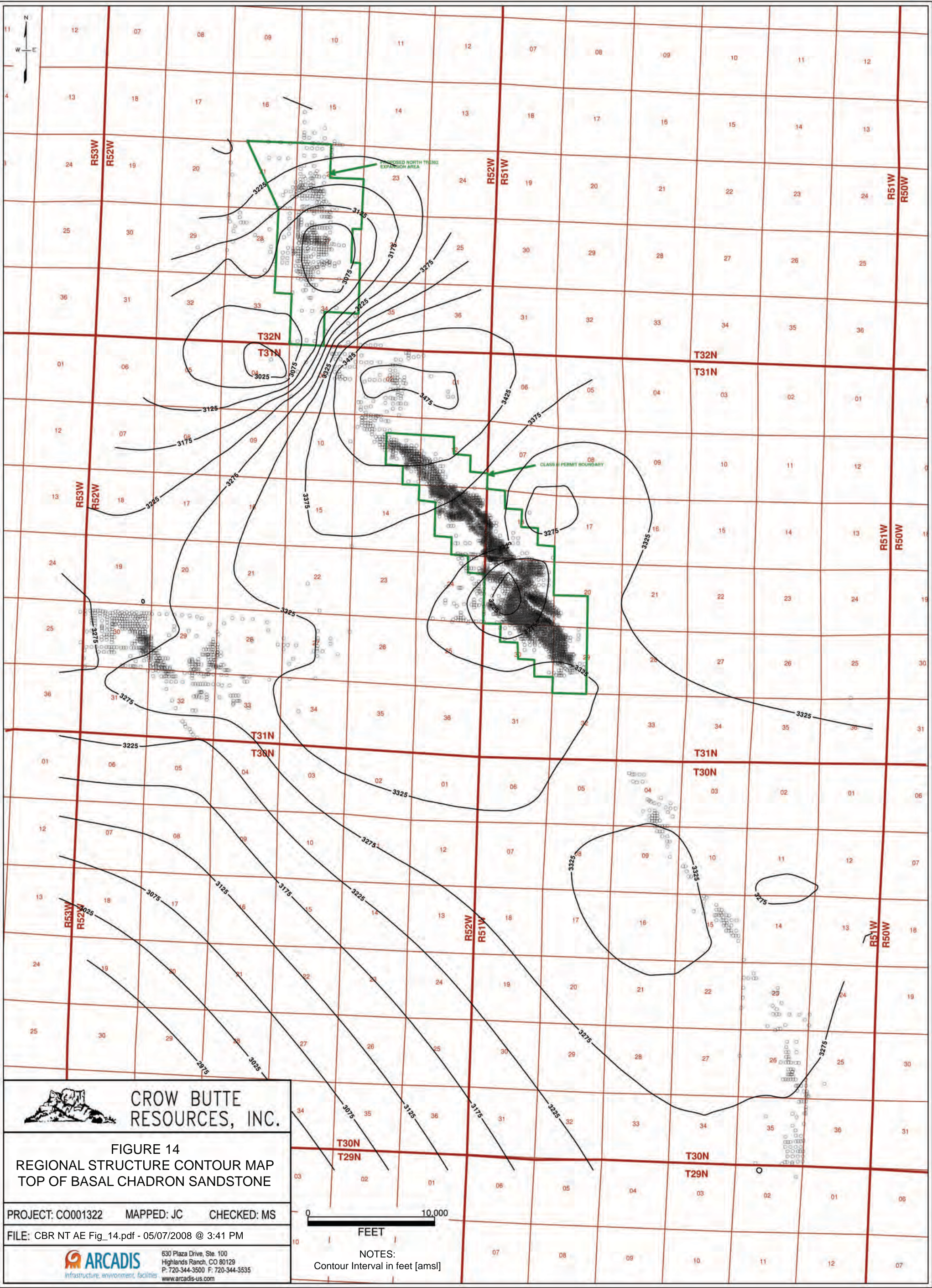
FIGURE 13
REGIONAL STRUCTURAL FEATURE MAP,
NORTHERN NEBRASKA

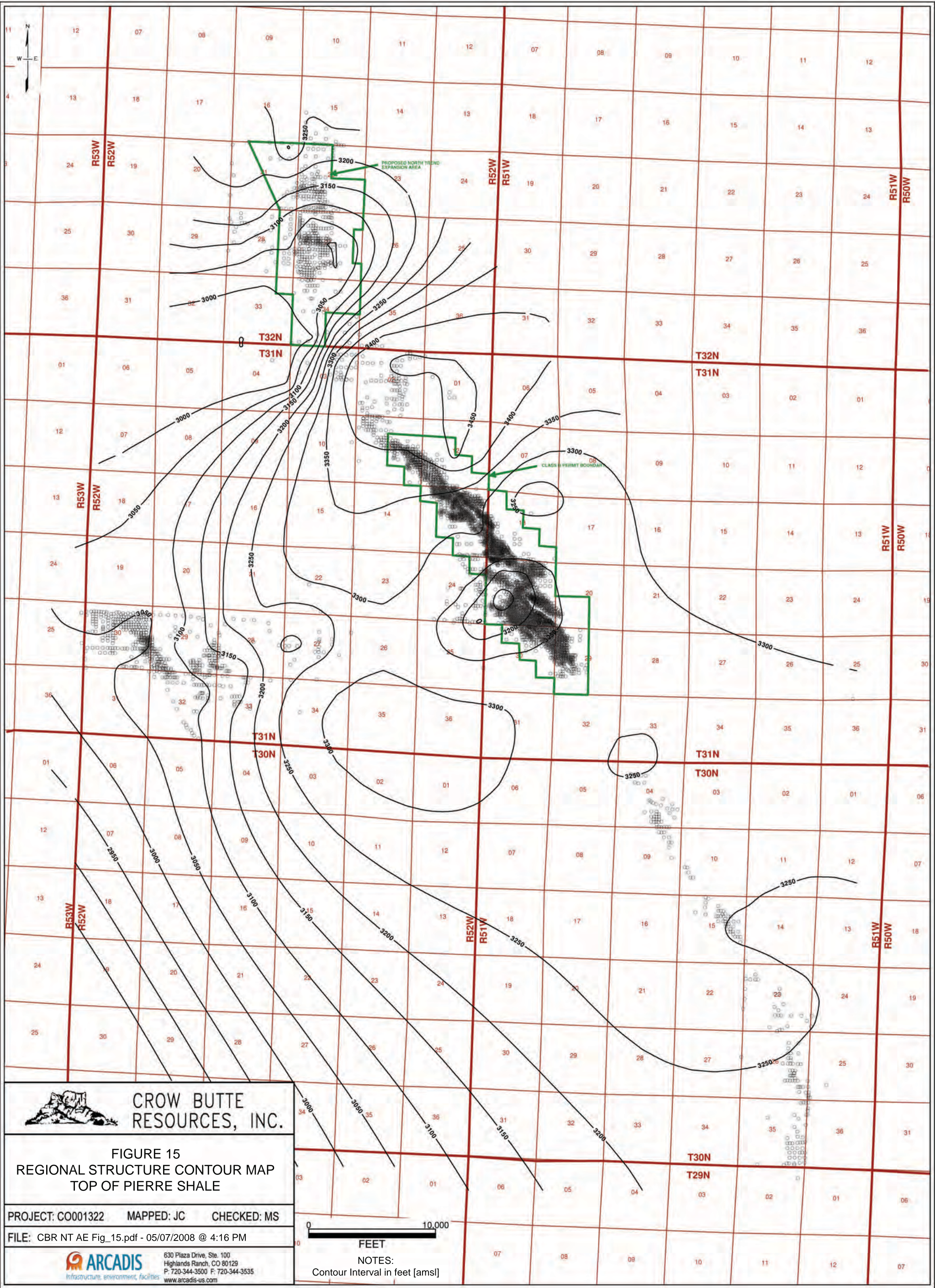
PROJECT: C0001322 MAPPED: JC CHECKED: MS

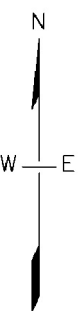
FILE: CBR NT AE Fig_13.pdf - 07/17/2008 @ 8:00AM



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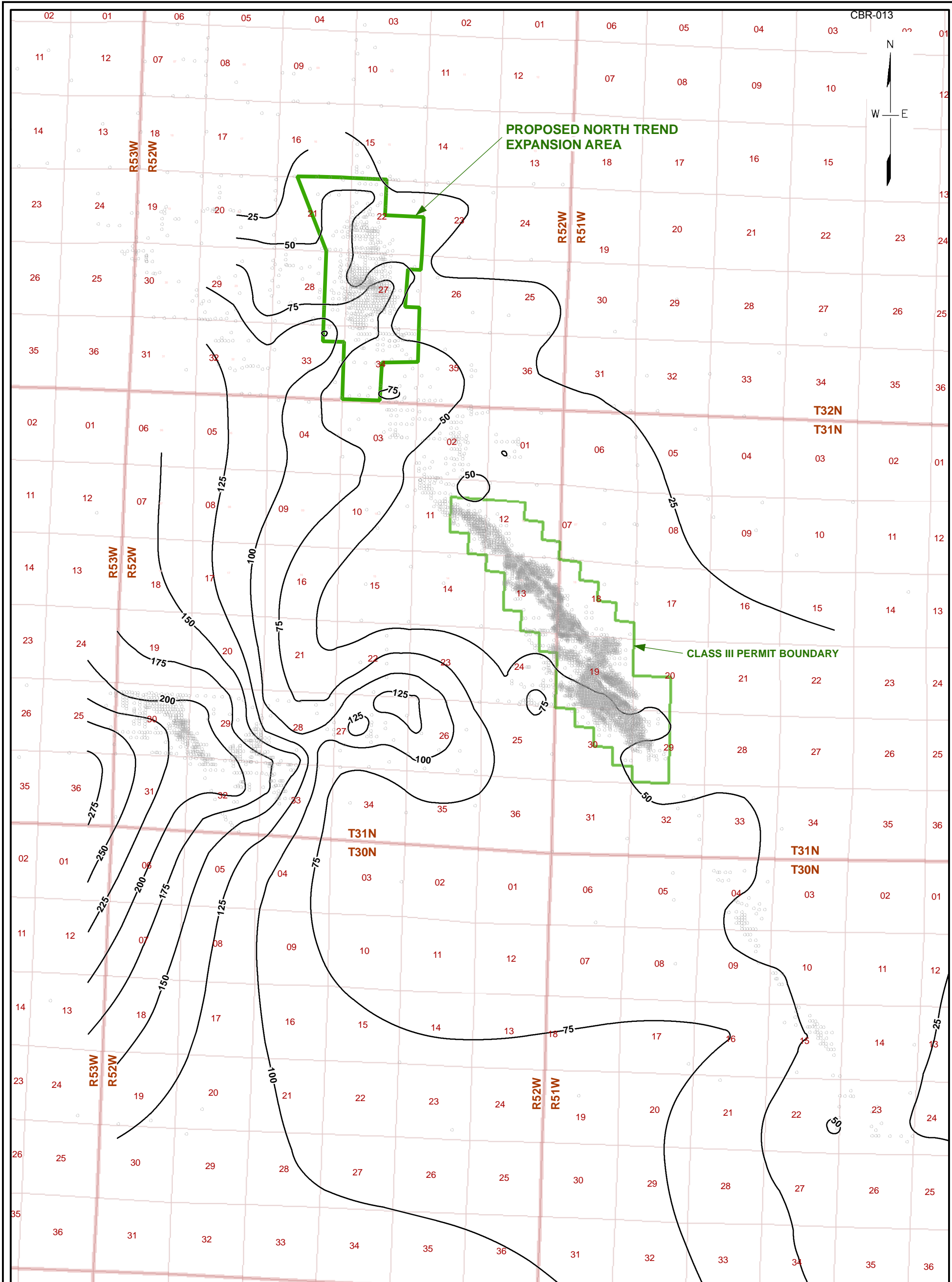






PROPOSED NORTH TREND
EXPANSION AREA

CLASS III PERMIT BOUNDARY



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FIGURE 16
REGIONAL ISOPACH MAP
BASAL CHADRON SANDSTONE

PROJECT: CO001322 MAPPED: JC CHECKED: MS

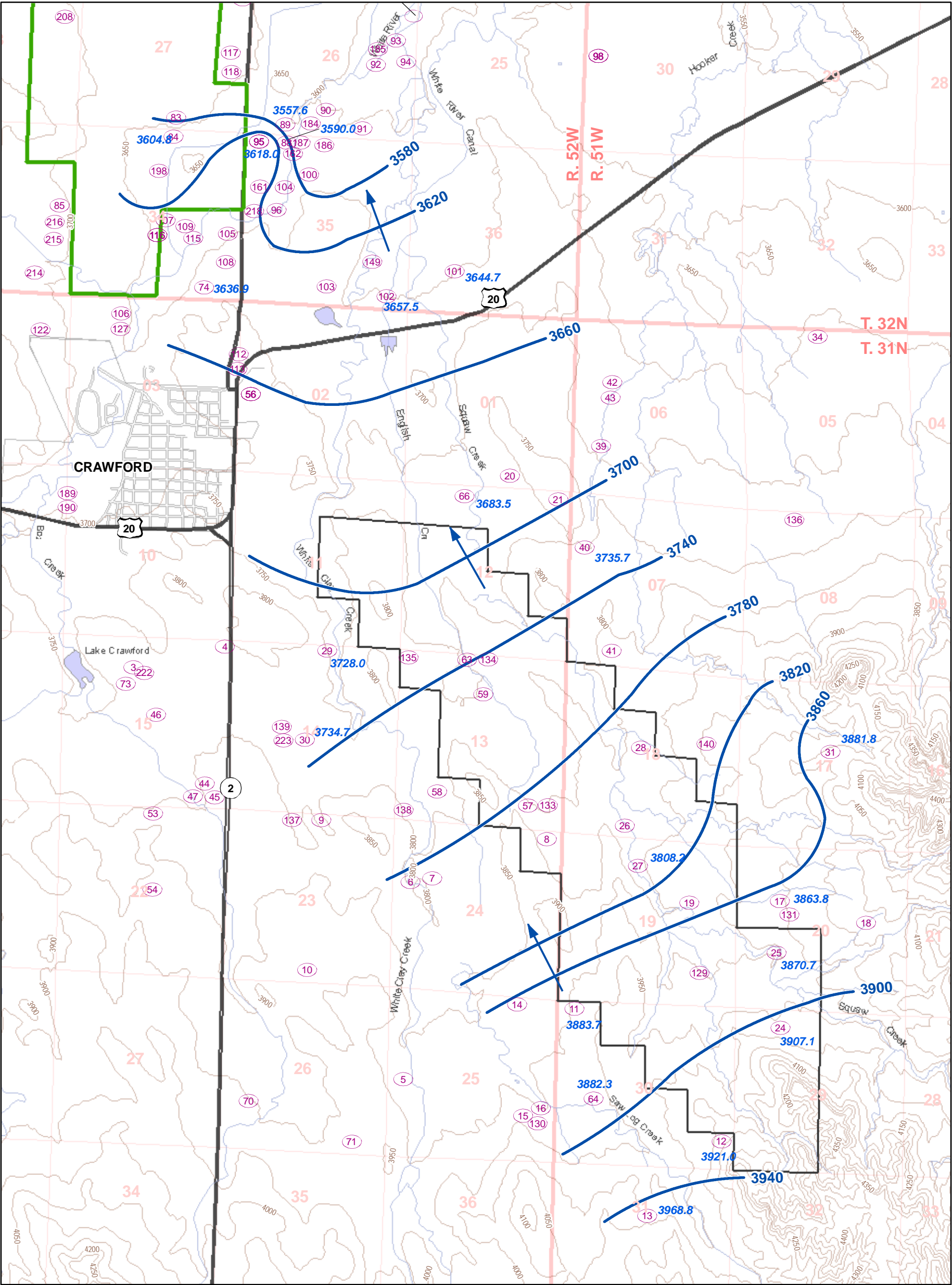
FILE: Fig16_Regional_Isopach_Map_BasalChadron.mxd - 5/12/2008 @ 11:31:32 AM



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Highlands Ranch, CO 80129
P: 720-344-3500 F: 720-344-3535
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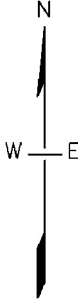
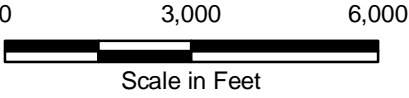
0 10,000
FEET

1: NOTES:
Contour Interval in feet [amsl]



LEGEND

- Groundwater Elevation (Brule Formation, FT-AMSL)
- Elevation Contours (FT-AMSL, 40-Ft Interval)
- Brule Formation Water Well 3968.8 and Water Level Elevation (FT-AMSL)
- Proposed North Trend Expansion Area
- Class III Permit Boundary
- Groundwater Flow Direction



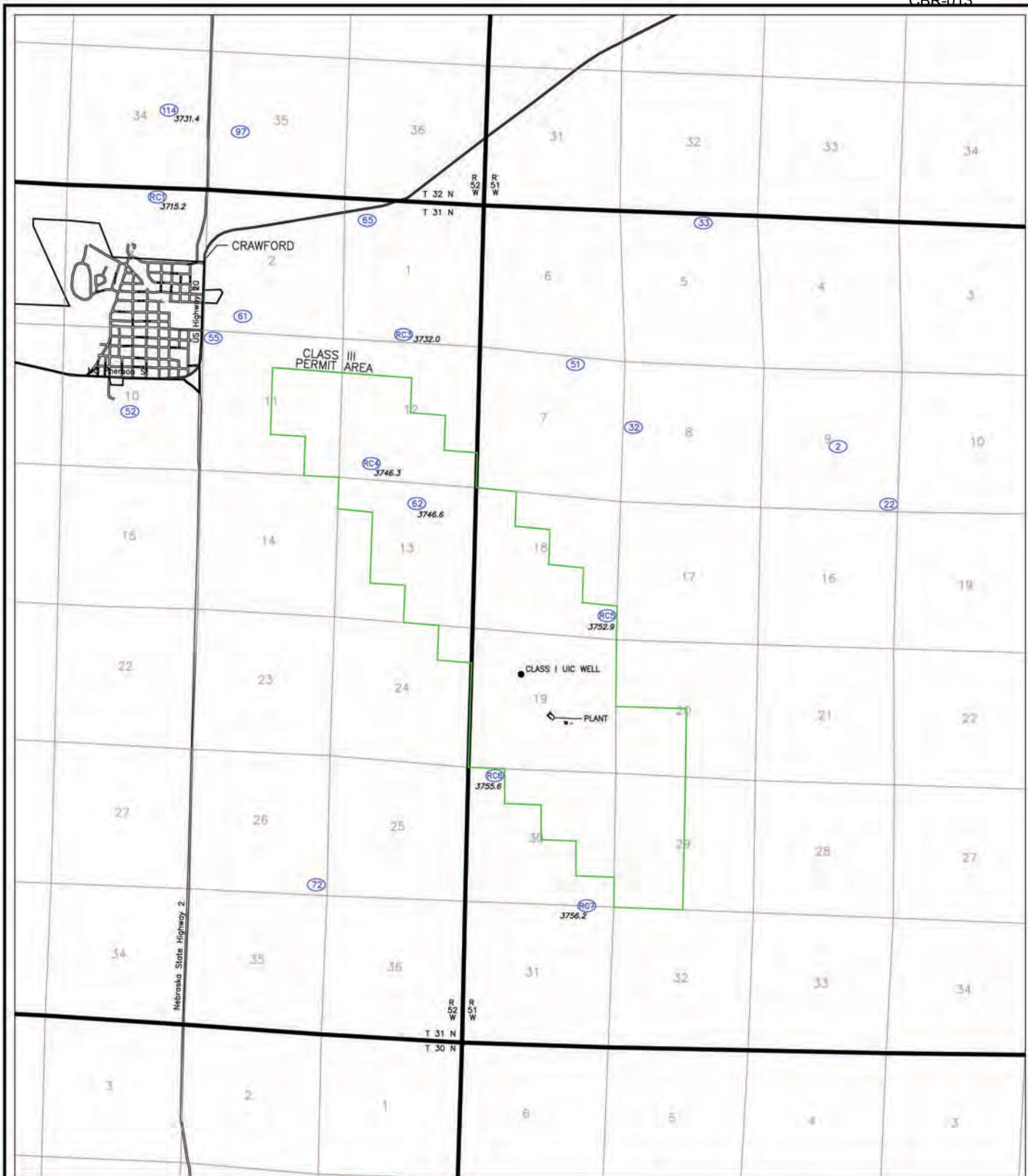
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**FIGURE 17
REGIONAL WATER LEVEL MAP
BRULE FORMATION 1982-1983**

PROJECT: CO001322 MAPPED: JC CHECKED: MS
FILE: Fig17_Regional_WL_Brule.mxd - 5/30/2008 @ 11:31:40 AM



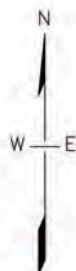
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LEGEND

(129) Chadron Formation Water Level Elevation (amsl)
3968.8

0 0.5 1.0 2.0
SCALE IN FEET 1" = 1 MILE



**CROW BUTTE
RESOURCES, INC.**

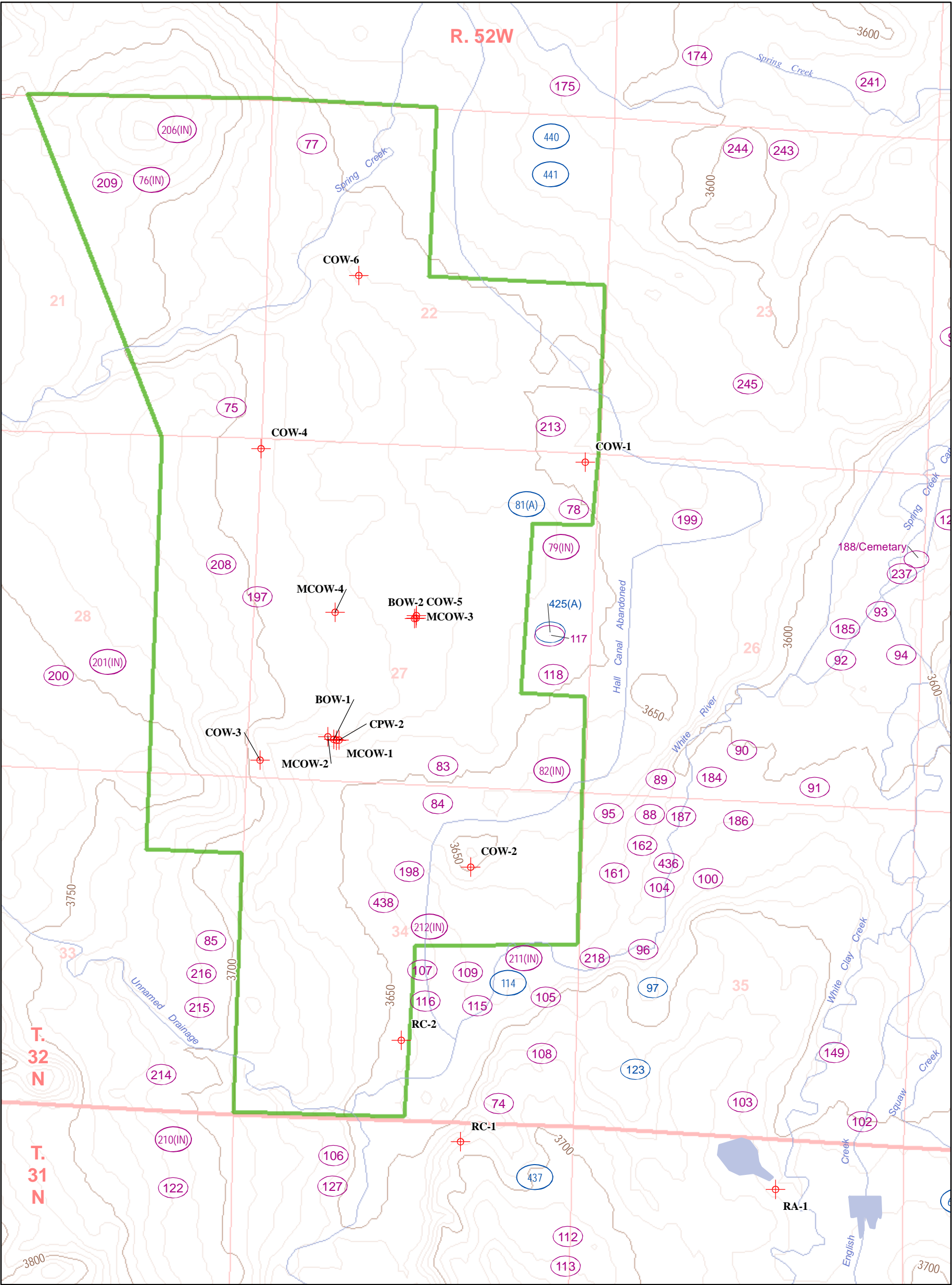
**FIGURE 18
REGIONAL WATER LEVEL MAP
BASAL CHADRON SANDSTONE 1982-1983**

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: CBR NT AE Fig18.pdf - 05/07/2008 @ 11:49AM

ARCADIS
Infrastructure environment facilities

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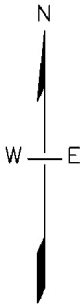
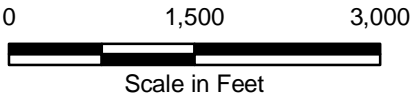


LEGEND

- Monitoring Well
- Brule Water Well (Active)
- Brule Water Well (Abandoned)
- Brule Water Well (Inactive)
- Chadron Water Well (Active)
- Chadron Water Well (Abandoned)
- Chadron Water Well (Inactive)

Elevation Contours (in Feet)

Proposed North Trend Expansion Area



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RESOURCES, INC.

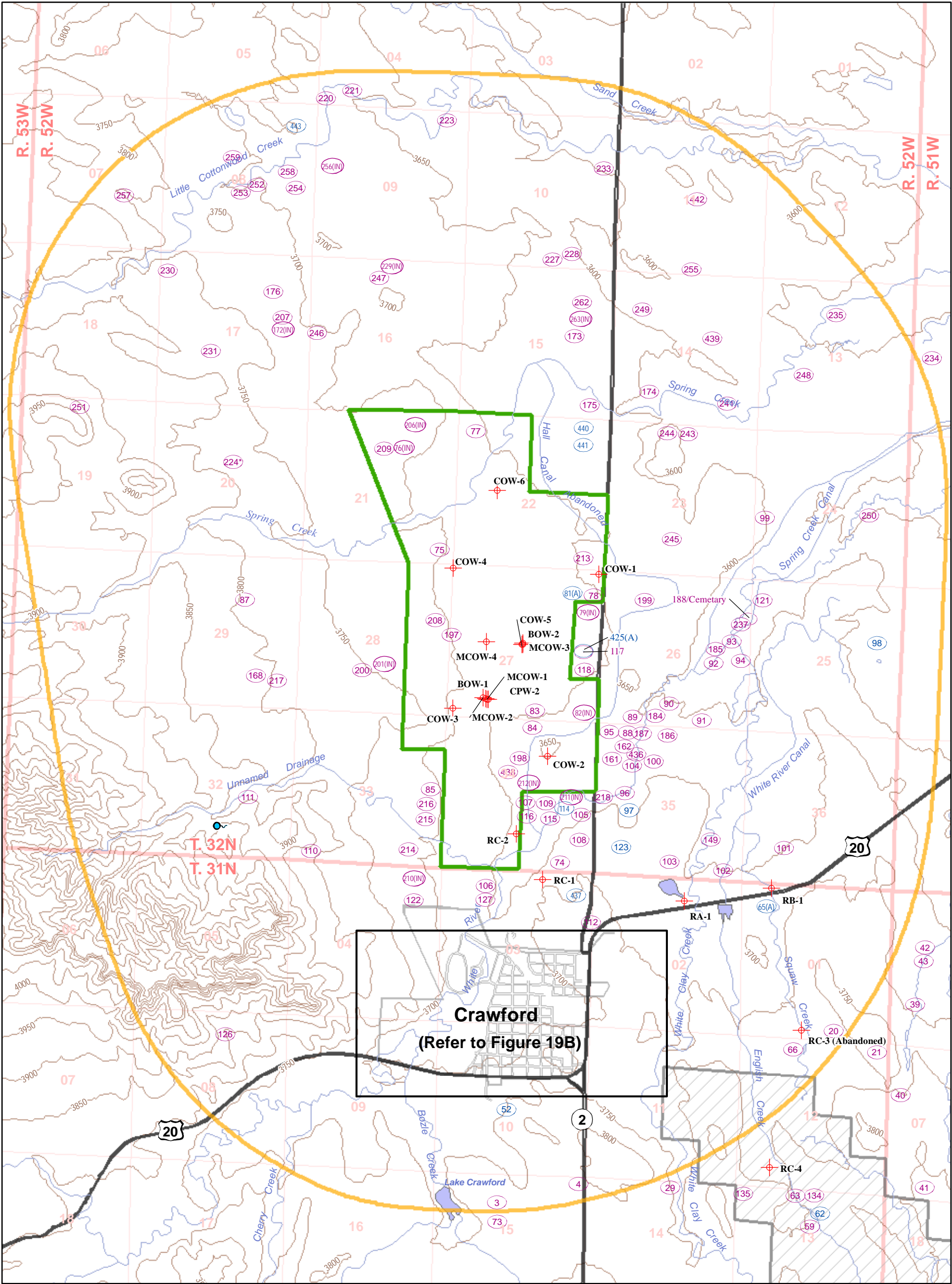
FIGURE 19
LOCATION OF GROUNDWATER WELLS
IN NORTH TREND EXPANSION AREA

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: Fig19_LocOfGWwells.mxd - 8/1/2008 @ 10:39:12 AM



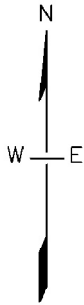
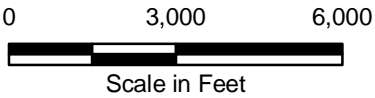
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LEGEND

- | | | | |
|--|--------------------------------|--|-------------------------------------|
| | Monitoring Well | | Lakes |
| | Brule Water Well (Active) | | Streams |
| | Brule Water Well (Abandoned) | | Elevation Contours (in Feet) |
| | Brule Water Well (Inactive) | | Proposed North Trend Expansion Area |
| | Chadron Water Well (Active) | | Class III Permit Boundary |
| | Chadron Water Well (Abandoned) | | 2.25-Mile Radius Offset |
| | Chadron Water Well (Inactive) | | |
| | Spring | | |

* Locations of some wells are approximate and are based on available information.



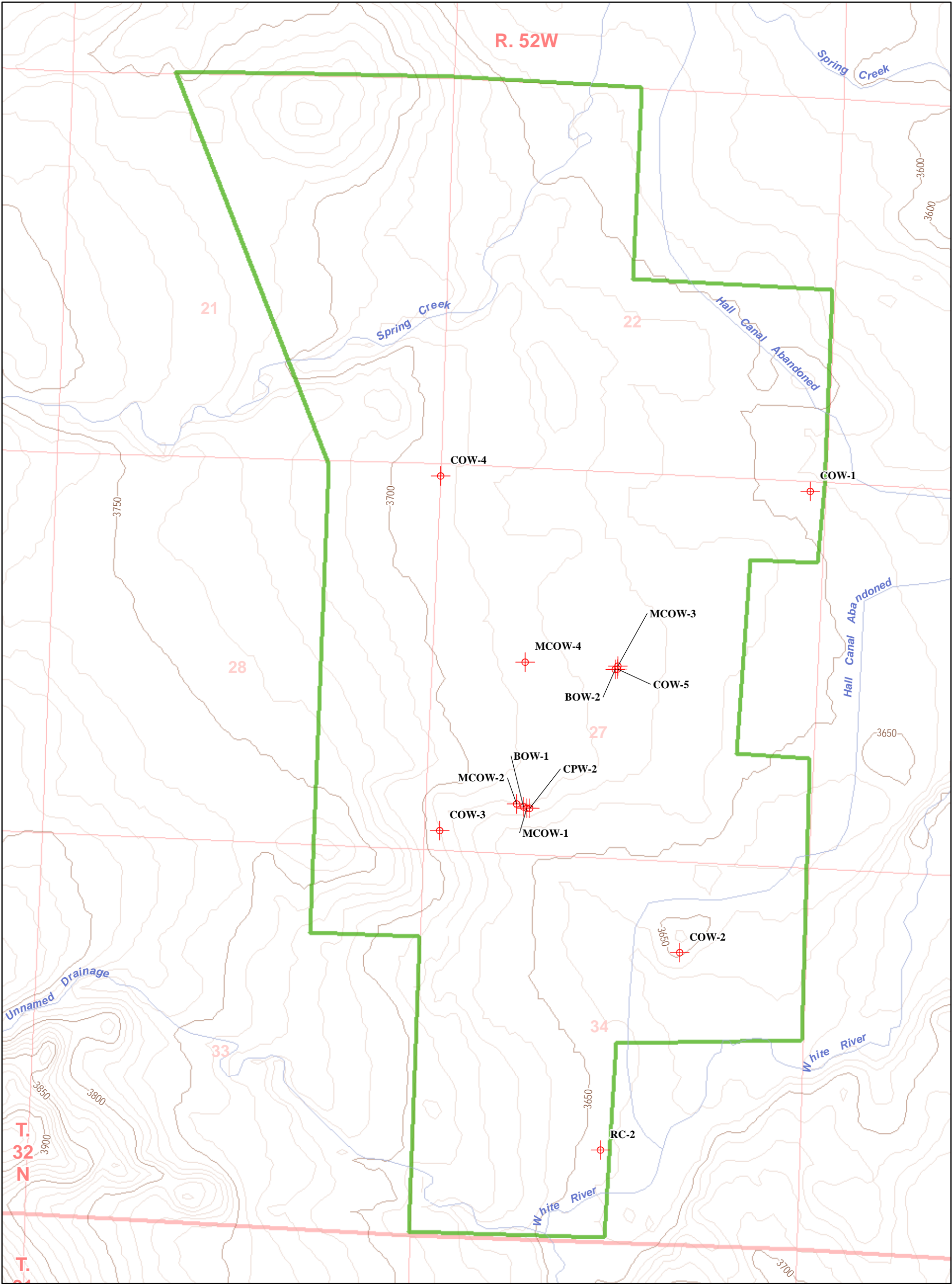
CROW BUTTE
RESOURCES, INC.

FIGURE 19A
LOCATION OF GROUNDWATER WELLS WITHIN
2 1/4 MILES OF NORTH TREND EXPANSION AREA

PROJECT: CO001322 MAPPED: JC CHECKED: MS
FILE: Fig19A_LocOfGWwells_2mB.mxd - 7/23/2008 @ 9:50:24 AM

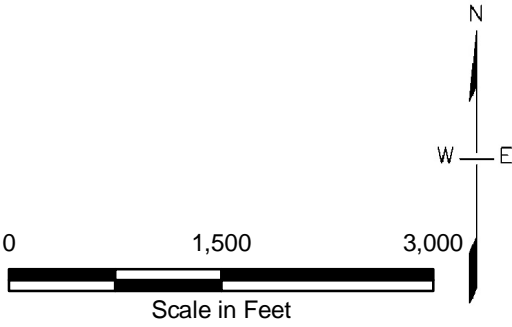


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LEGEND

- North Trend Monitoring Well
- Elevation Contours (in Feet)
- Proposed North Trend Expansion Area



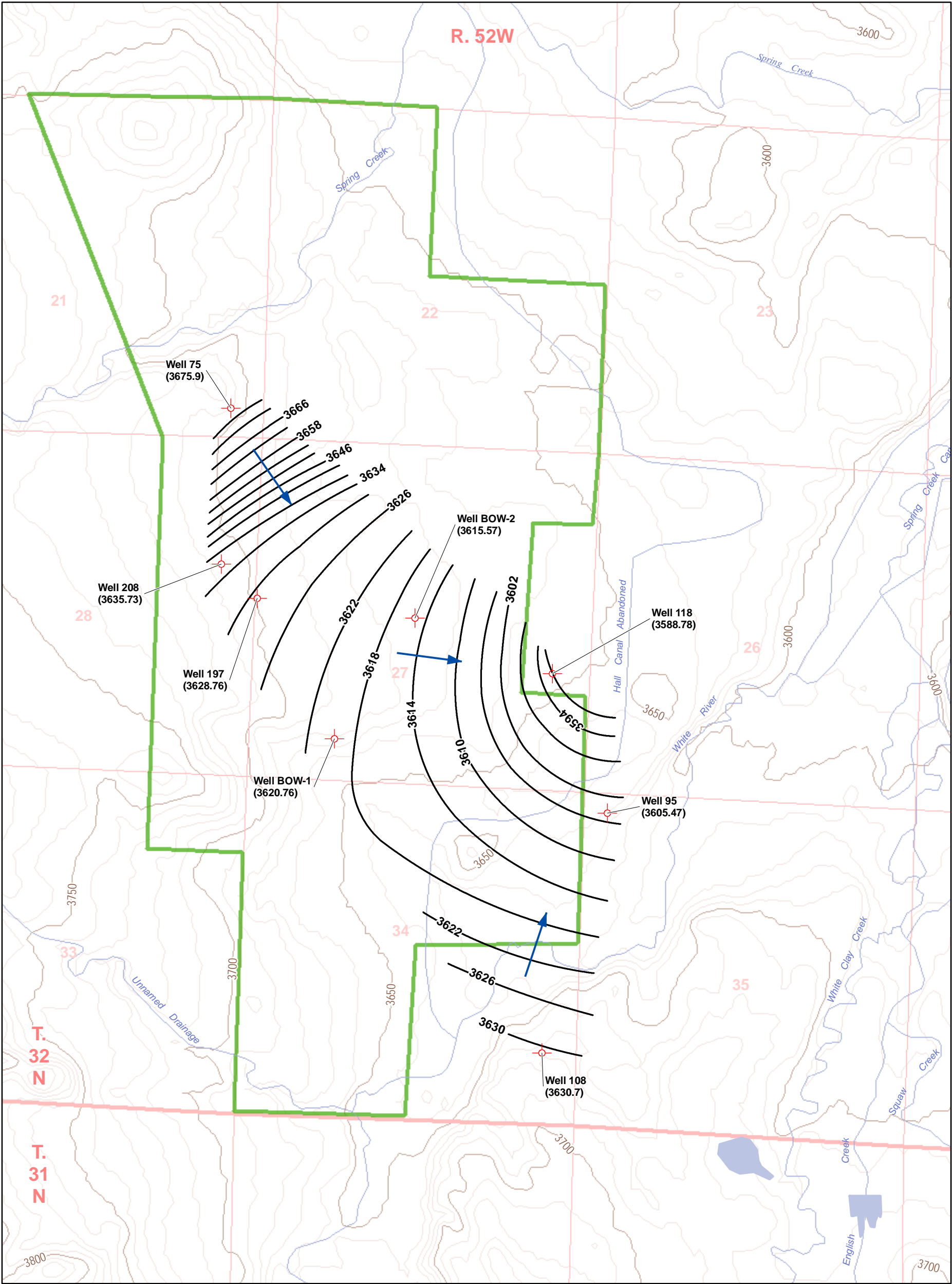
CROW BUTTE
RESOURCES, INC.

FIGURE 20
LOCATION OF NORTH TREND PUMP TEST
MONITORING WELLS

PROJECT: CO001322 MAPPED: JC CHECKED: MS
FILE: Fig20_PumpTestMW.mxd - 6/13/2008 @ 3:11:12 PM

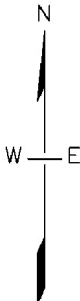
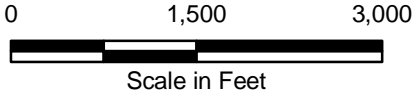


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LEGEND

- North Trend Monitoring Well
- Elevation Contours (FT-AMSL)
- Groundwater Elevation Contour (FT-AMSL, 4-FT Interval)
- (3560.17) Groundwater Elevation (FT-AMSL)
- Stream or Canal
- Direction of Groundwater Flow
- Lake



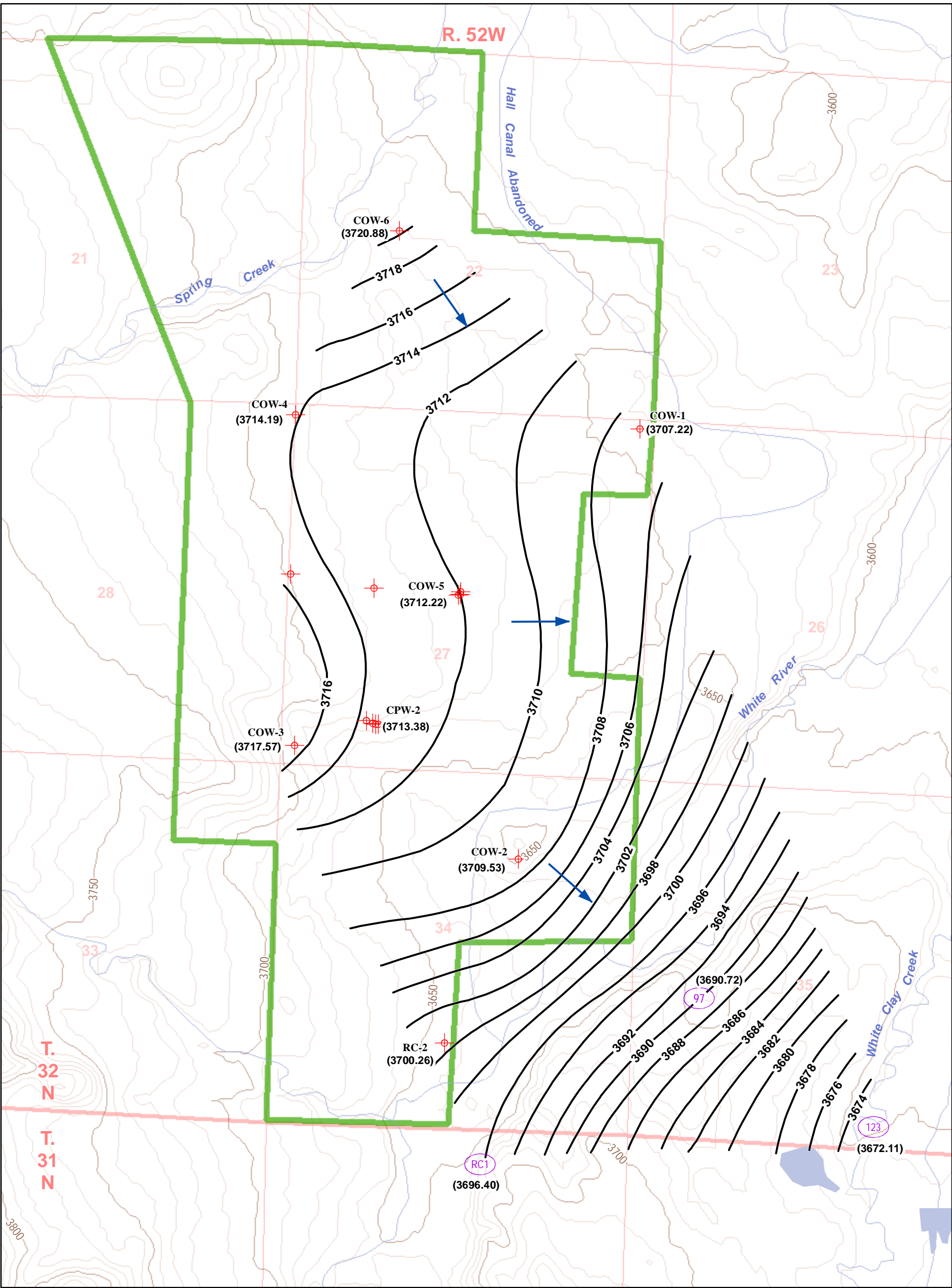
CROW BUTTE
RESOURCES, INC.

FIGURE 21
NORTH TREND EXPANSION AREA
WATER LEVEL MAP
BRULE FORMATION (06/09/08)

PROJECT: CO001322 MAPPED: JC CHECKED: MS
FILE: Fig21_NT_WL_Brute_061308.mxd - 6/13/2008 @ 3:22:10 PM



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LEGEND

- North Trend Monitoring Well
 - Basal Chadron Sandstone Water Well
 - Elevation Contours (FT-AMSL)
 - Groundwater Potentiometric Surface (FT-AMSL)
 - (3700.26) Groundwater Elevation (FT-AMSL)
 - Stream or Canal
 - Lake
 - Direction of Groundwater Flow
 - Proposed North Trend Expansion Area
- 0 1,500 3,000
Scale in Feet
- N
W E



CROW BUTTE
RESOURCES, INC.

FIGURE 22
NORTH TREND EXPANSION AREA
POTENTIOMETRIC SURFACE
BASAL CHADRON SANDSTONE (4/16/08)

PROJECT: CO001322 MAPPED: JC CHECKED: MS

FILE: Fig22_GW_BasalChadron.mxd - 5/28/2008 @ 2:59:55 PM



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Figure 23
Drawdown at COW-2 (2006 Pump Test)

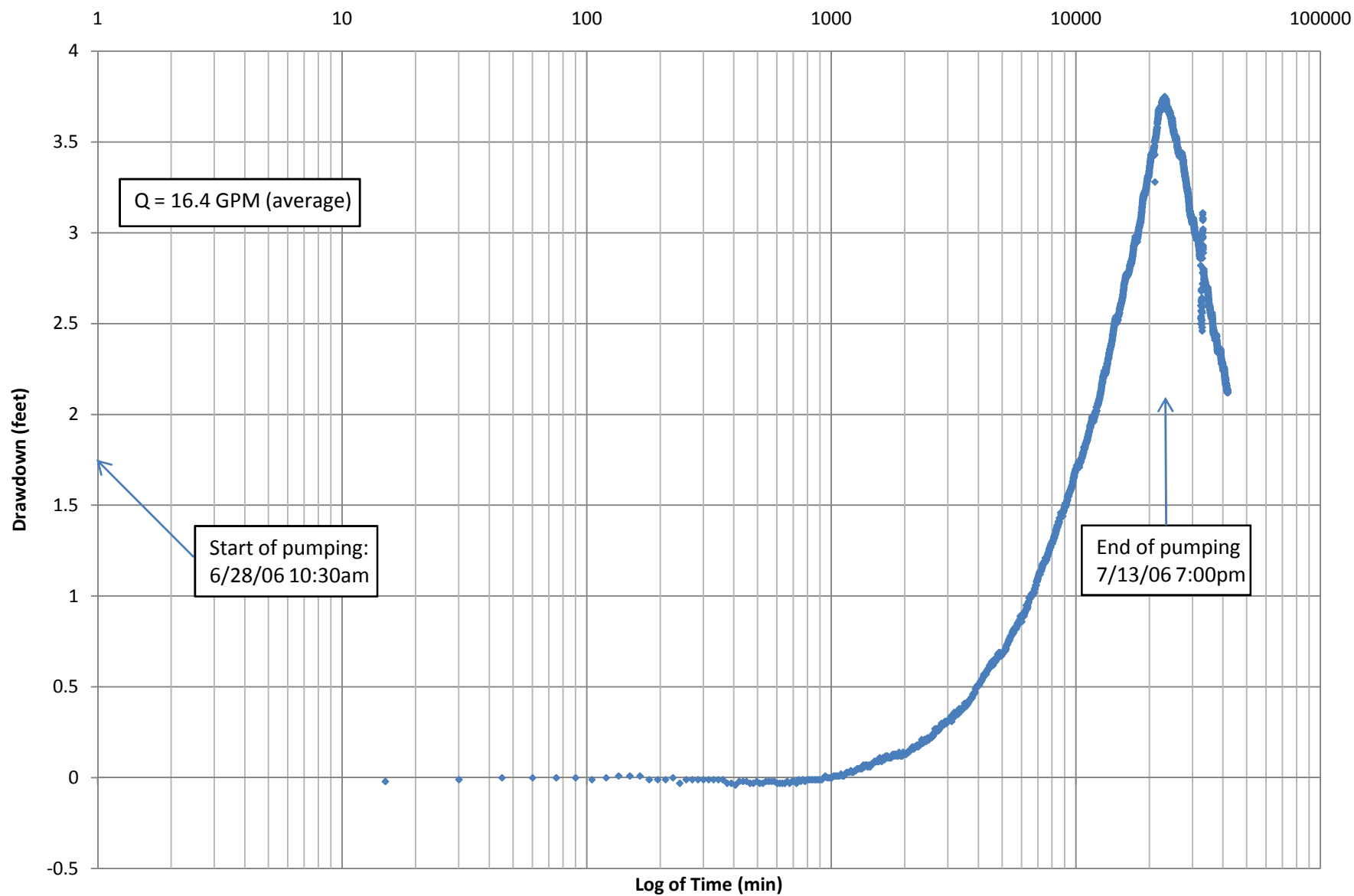
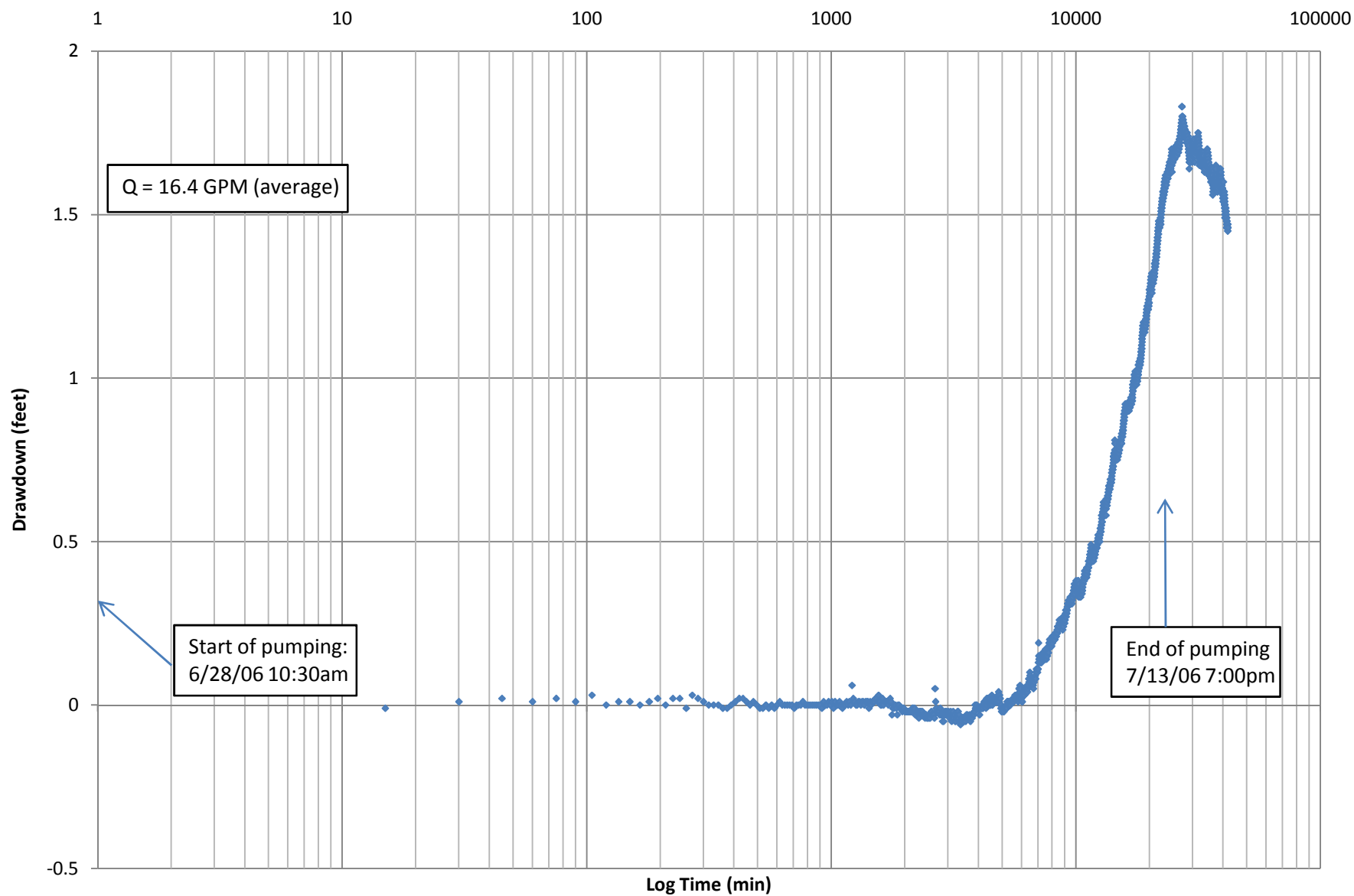


Figure 24
Drawdown at RC-2 (2006 Pump Test)



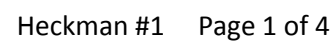
**Petition for Aquifer
Exemption**

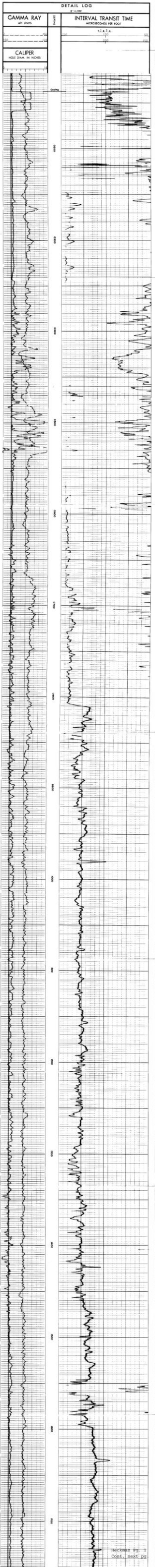
North Trend Expansion
Area

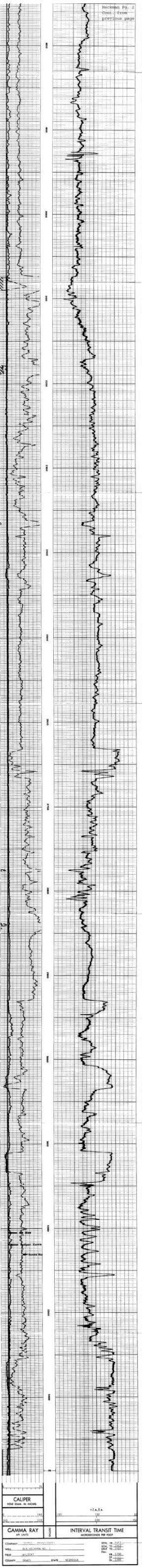
ARCADIS

APPENDICES

GAMMA RAY API UNITS	DEPTH	INTERVAL TRANSIT TIME MICROSECONDS PER FOOT	
		$T = K_1 + K_2 \cdot R$	
	200	170	50
	400	200	110
CALIPER HOSE DIAM. IN INCHES			







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Electrical Log Services, Inc.
MIDLAND, TEXAS 79701

FEB 26 1959

REFERENCE K 4393M

COMPLETION RECORD

SPUD DATE

COMP DATE

DST RECORD

CASING RECORD

PERFORATING RECORD


ACID FRAC SHOT

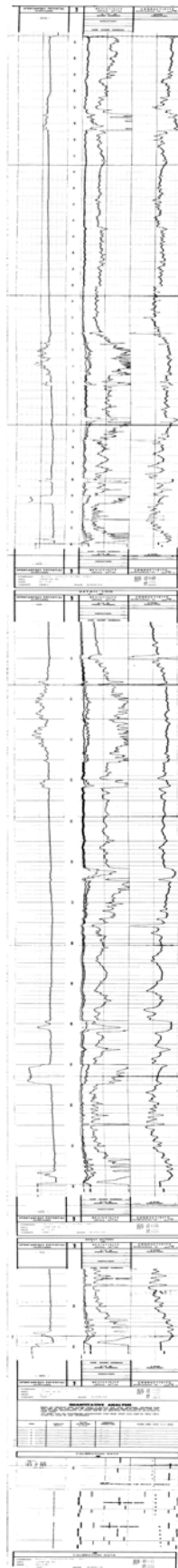
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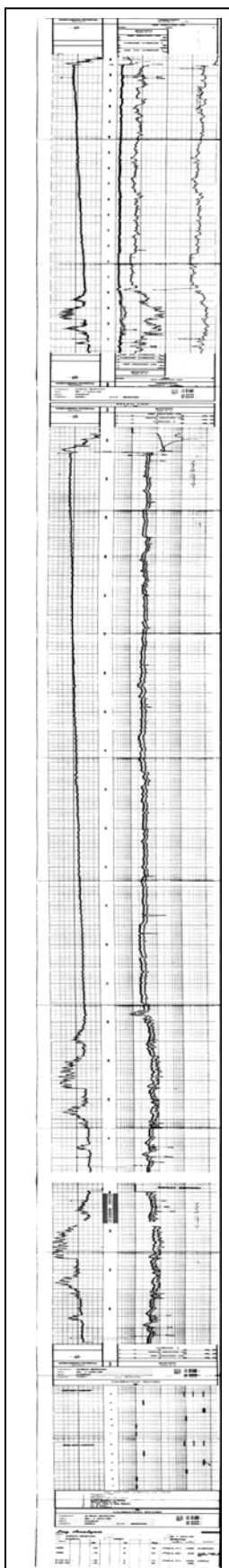
GOR

T P

REMARKS

REMARKS									
Changes in Mud Type or Additional Samples									
Date	Sample No.			Type Log	Depth	Scale Changes		Scale Up Hole	
Depth—Driller						Scale Up Hole		Scale Down Hole	
Type Plug in Hole									
Dent 1 Vice _____ gth - Fluid Loss _____ Source of Sample _____ Pa @ Meas. Temp. _____ Pa @ Meas. Temp. _____ Pa @ Meas. Temp. _____ Source Mat. Pa _____ Pa @ Batt. _____ Pa @ Batt. _____ Pa @ Batt. _____									
Run No.		Tool Type		Equipment Date		Tool Position		Other	
Run No. _____ C.D. _____ S.O. _____ Equip. PANEL No. _____ Used. CART No. _____ SONDE No. _____ LAP No. _____ S.S.R. _____									
 REPRODUCTION FOR RESALE PROHIBITED									
Check one filling in brackets where applicable: Surface determined inside or outside for MP-60 _____ MP-60 inside error corrected for _____ MP-60 signal in the _____ MP-60 zero in _____ hole or depth of _____									





SCHLUMBERGER WELL SURVEYING CORPORATION			
Location of Well	COMPANY: <u>W. A. Ostermeyer</u>	COUNTY: <u>W. A.</u>	FIELD OR SURVEY: <u>1105</u>
	WELL: <u>Ostermeyer #1</u>		
BEST COPY AVAILABLE	RUN NO.: <u>One</u>	COMPANY: <u>W. A. Ostermeyer</u>	WELL: <u>Ostermeyer #1</u>
	FIELD: <u>Wildcat</u>		
	SURVEY: <u>NE 8-10-22-52W</u>		
	COUNTY: <u>Wagon</u>		
	STATE: <u>Nebraska</u>		
Elevation D.F.: _____ or G.L.: _____	FILING No. _____		
First Reading 2410 ft. Last Reading 2412 ft. Footage Measured 2 ft. Casing Shoe Depth: SCHLUMBERGER 2410 ft. Max. depth reached: DRILLER 2412 ft. Bottom Depth: DRILLER 2412 ft. Depth Datum: Drive Bushing			
DIAMETER OF HOLE		MUD CHARACTERISTICS	
from 0.00 to 2.00 9 7/8		Nature: <u>Normal</u>	
from . . . to . . .		Weight: <u>11</u>	
from . . . to . . .		Viscosity: <u>62</u>	
Bottom Temperature: <u>66</u> °F.		Resistivity: <u>1.0</u> @ 70 °F.	
REMARKS			
RETURN TO SCHLUMBERGER 2100 CENTRAL AVE. KANSAS CITY, MO.			
DATE: <u>October 27, 1945</u> OBSERVERS: <u>L. G. Eiden</u>			
SELF-POTENTIAL millivolts	DEPTH	RESISTIVITY ohms, m.m.	
-10 +	0	Normal	25 50
	0	125	250
	0	Lateral	25 50
	0	150	500
SCHLUMBERGER WELL SURVEYING CORPORATION			
Location of Well	COMPANY: <u>W. A. Ostermeyer</u>	COUNTY: <u>W. A.</u>	FIELD OR SURVEY: <u>1105</u>
	WELL: <u>Ostermeyer #1</u>		
BEST COPY AVAILABLE	RUN NO.: <u>2</u>	COMPANY: <u>W. A. Ostermeyer</u>	WELL: <u>Ostermeyer #1</u>
	FIELD: <u>Wildcat</u>		
	SURVEY: <u>SW 1/4-10-22-52W</u>		
	COUNTY: <u>Wagon</u>		
	STATE: <u>Nebraska</u>		
Elevation D.F.: _____ or G.L.: _____	FILING No. _____		
First Reading 1020 ft. Last Reading 1012 ft. Footage Measured 8 ft. Casing Shoe Depth: SCHLUMBERGER 1010 ft. Max. depth reached: DRILLER 1012 ft. Bottom Depth: DRILLER 1012 ft. Depth Datum: Top rotary drive head in			
DIAMETER OF HOLE		MUD CHARACTERISTICS	
from 0.00 to 2.00 9 7/8		Nature: <u>Normal</u>	
from . . . to . . .		Weight: <u>11</u>	
from . . . to . . .		Viscosity: <u>62</u>	
Bottom Temperature: <u>120</u> °F.		Resistivity: <u>6.6</u> @ 65 °F.	
REMARKS			
Drilling mud resistivity 0.2 ft. End down above 1012 ft. at 2600'			
DATE: <u>November 2, 1945</u> OBSERVERS: <u>L. G. Eiden</u>			



THE PINNEY WELL, NEAR CRAWFORD

NO ADDITIONAL
INFORMATIONNO LOGS
NO FORMS

DANES COUNTY, NEBRASKA

Elevation, about 2655'; depth, 3185'.

Location: 8 miles north and one mile east of Crawford, NW, NW, Sec. 13,
T. 32 N., R. 32 W. This is near the border of the Pierre Plains.

The drilling of this well was started September 2, 1928, and abandoned
in 1930. Correlation by L. W. Hewitt:

1. Soil and subsoil, 50'.
2. Tertiary, silts, sands and shales, 280'; depth, 280'.
3. Pierre shale, 704'; depth, 990'.
4. Niobrara formation, largely shaly shale, 220'; depth, 1210'.
5. Carlile shale, 630'; depth, 1840'.
6. Greenhorn limestone, 80'; depth, 1920'.
7. Graneros shale (upper portion), 750'; combined thickness including the
basal shales and sandstones sometimes referred to as the Dakota group,
850'; depth, 2770'.
8. Dakota sandstone, 84'; depth, 2854'.
9. Fuson shale and Dakota sandstone, not subdivided because of lack of
samples, upper 255' largely dark gray and argillaceous to sandy; lower
56' gray sandstone, with dark grains of greenstone; combined thickness,
311'; depth, 3165'.

g. 3655'

Pinney Well at Crawford,

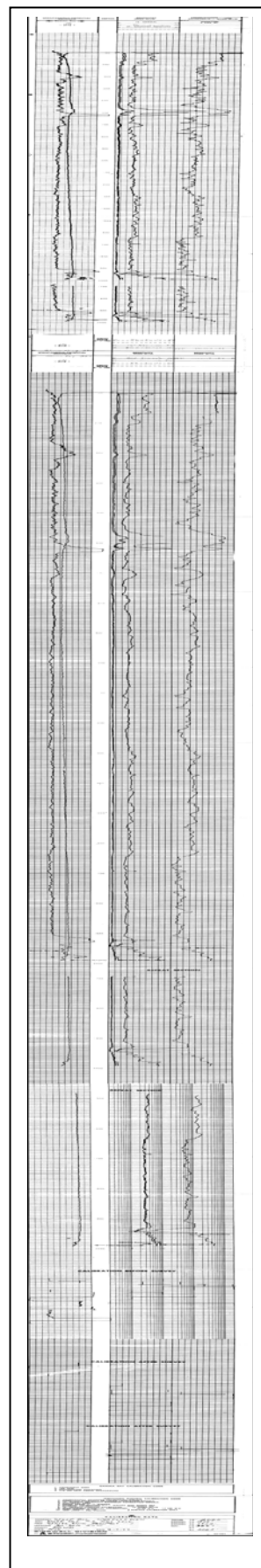
4

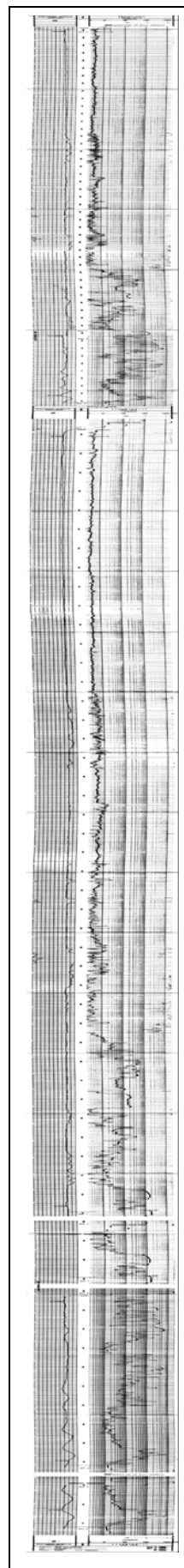
Log of Pinney Number 1, NW $\frac{1}{4}$ NW $\frac{1}{4}$, Sect 13, Twp 32 N
R 32 West, Dawes County, Nebraska.

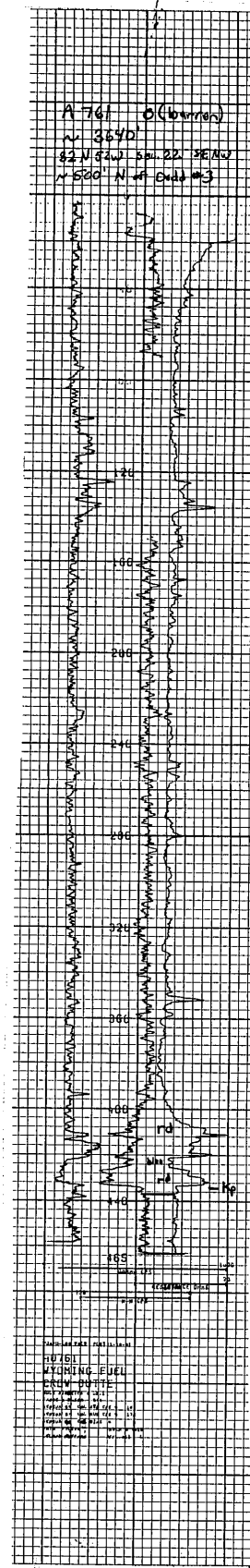
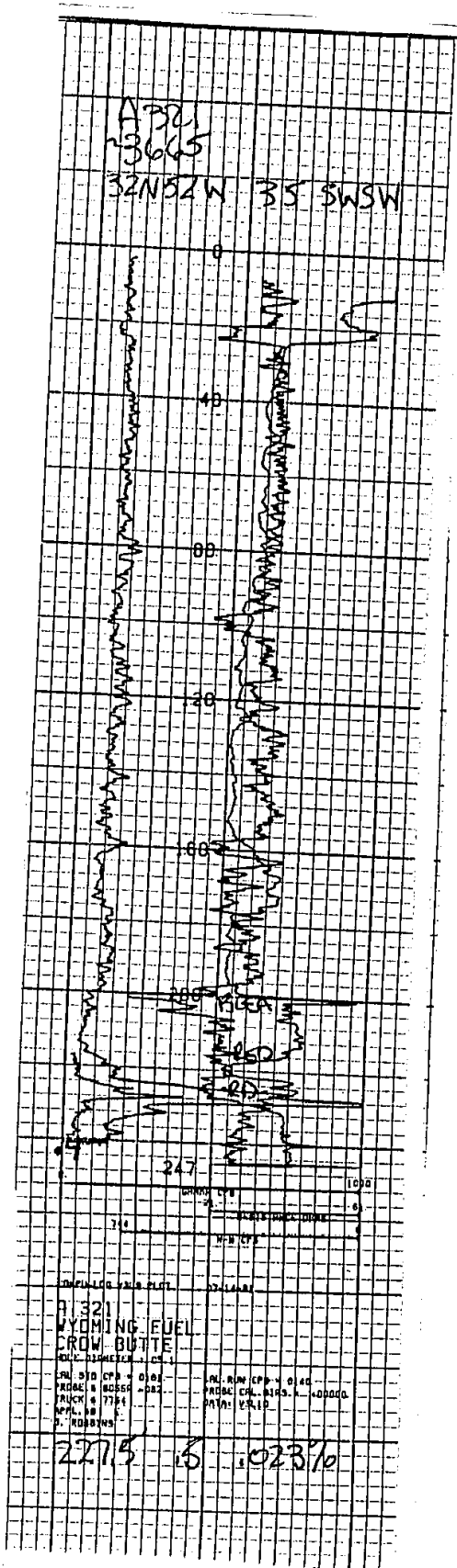
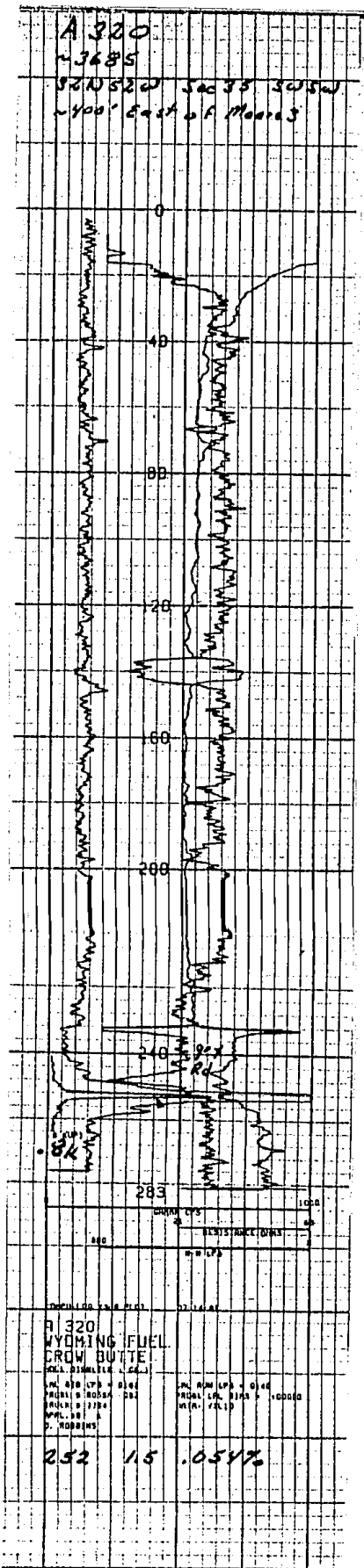
0 to	30 ft.	Quick sand, some gravel.
30 to	245 ft.	greenish clay.
245 to	269 ft.	yellow clay, set 270 ft of 15 $\frac{1}{2}$ inch casing.
269 to	440 ft.	dark shale.
440 to	810 ft.	light shale.
810 to	860 ft.	dark shale, some gas.
860 to	885 ft.	light shale, hard.
885 to	893 ft.	dark shale, heavy wet gas.
893 to	927 ft.	light shale, set 904 ft of 12 $\frac{1}{2}$ inch casing.
927 to	970 ft.	yellow and light brown shale.
970 to	990 ft.	dark brown shale, showing some gas.
990 to	1025 ft.	light chalky shale.
1025 to	1065 ft.	light yellow shale.
1065 to	1095 ft.	light blue shale.
1095 to	1210 ft.	shale.
1210 to	1307 ft.	dark brown shale, sandy, good show oil and gas.
1307 to	1430 ft.	light brown shale.
1430 to	1640 ft.	dark slate, shale.
1640 to	1800 ft.	dark gray shale.
1800 to	1840 ft.	shale, oil and gas showing.
1840 to	1920 ft.	lime, shells, etc. (Greenhorn)
1920 to	2290 ft.	gray sandy shale.
2290 to	2350 ft.	black shale, cavy.
2350 to	2355 ft.	Bentonite.
2355 to	2600 ft.	Black shale, (Mowery)
2600 to	2680 ft.	gray shale.
2680 to	2690 ft.	sandy shale, gas, little water, (stray) (Muddy ?)
2690 to	2700 ft.	black shale.
2700 to	2705 ft.	hard lime shell.
2705 to	2730 ft.	dark shale, cavy, water shut off, 6 5/8 in casing.
2730 to	2771 ft.	shale.
2771 to	2865 ft.	Sandstone, hard, water, (Dakota)
2865 to	2870 ft.	shale, greenish purple. (Present depth) Aug 13/29.

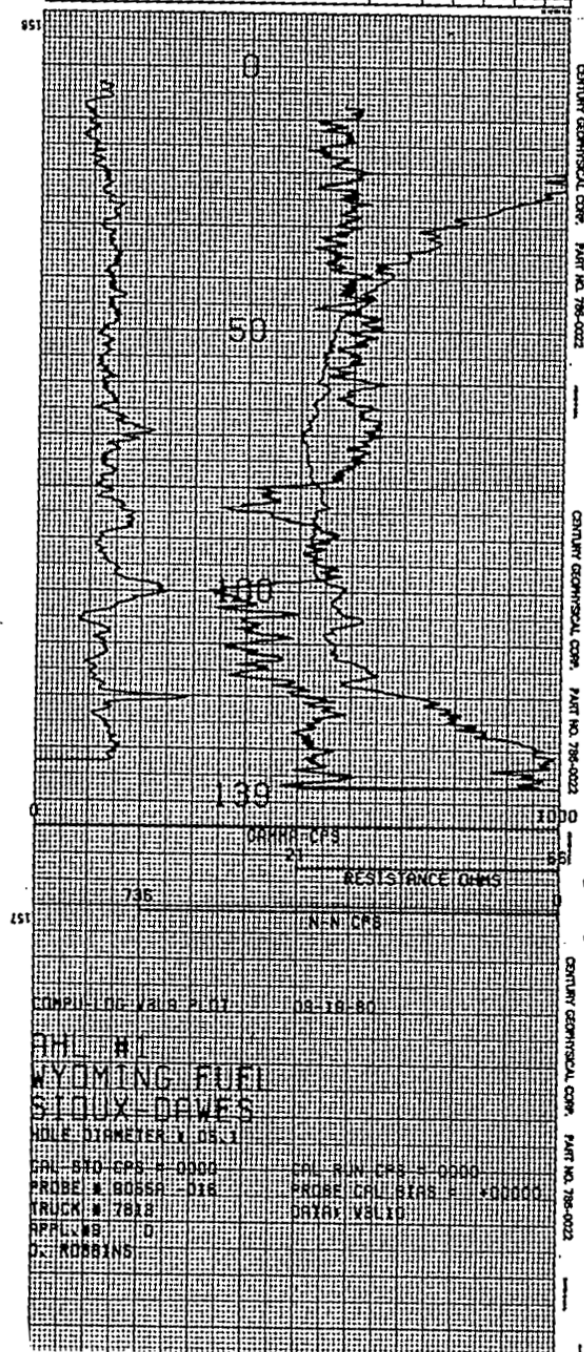
Respectfully submitted

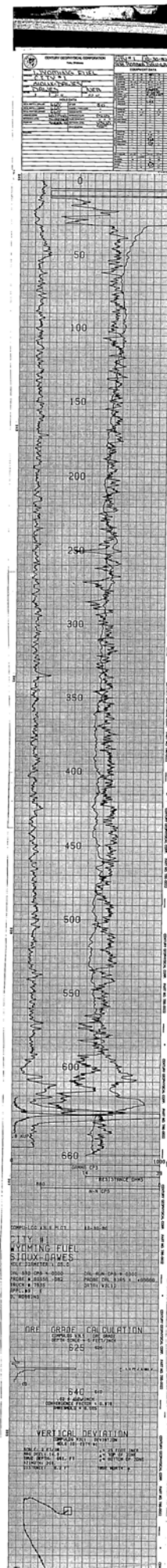
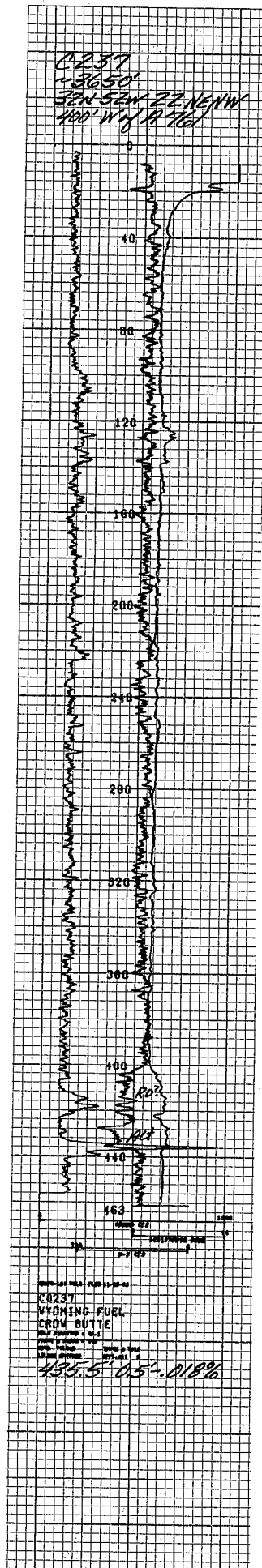
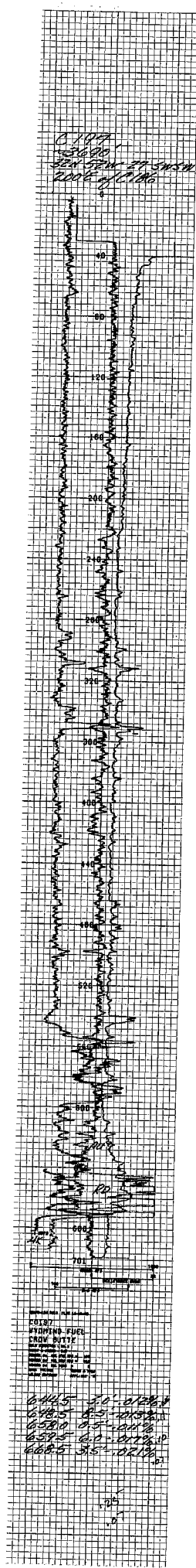
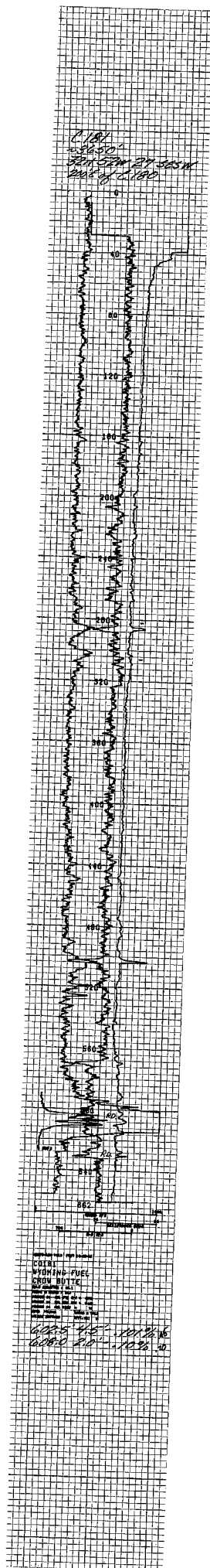
William Erbe
Owner, and promoter.

[illegible]

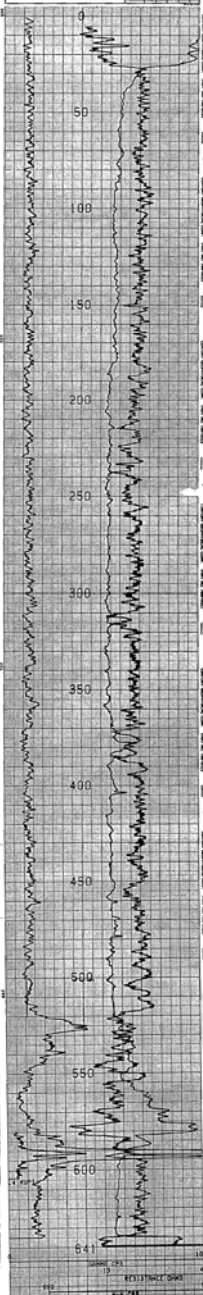




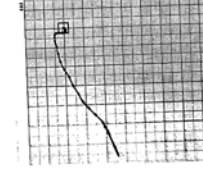
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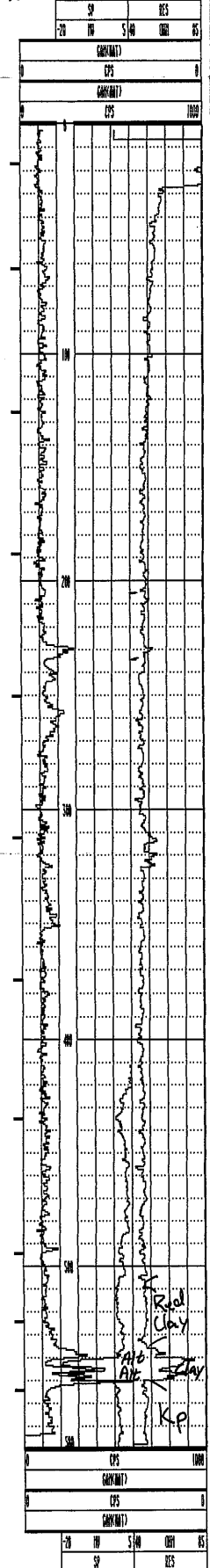
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DATE	TIME	WIND	SEA	TEMP	WIND	SEA	TEMP

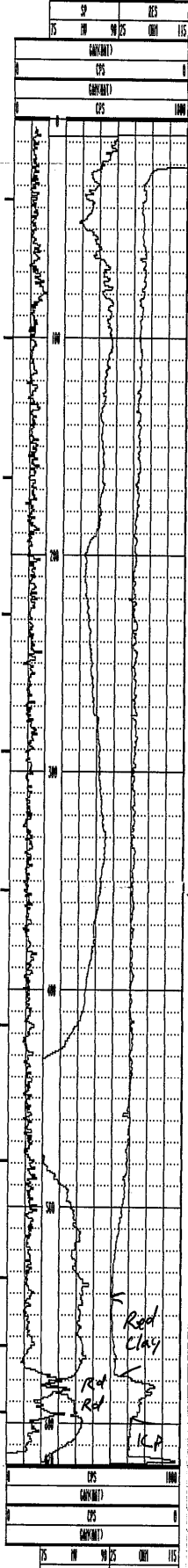


COW-2004-1
Elev: 3645
27 32N 52W
150'W + 40'S from NE sec 40W



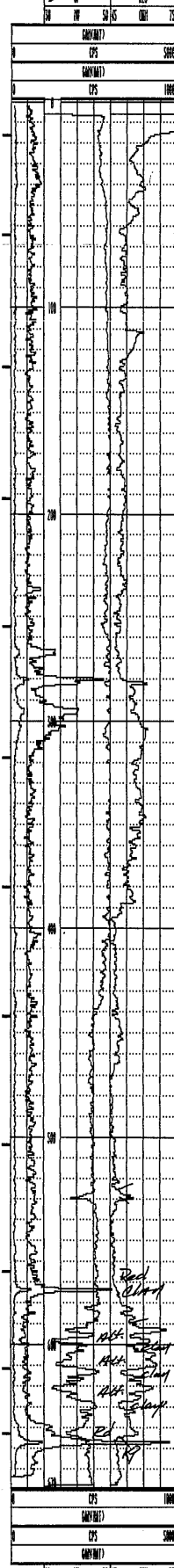
COW-2004-1
Drift 4.1'
AZ 325.9

COW-2004-2
Elev: 3655
Sec 34 NWNE 32N 52W
200'S from T99



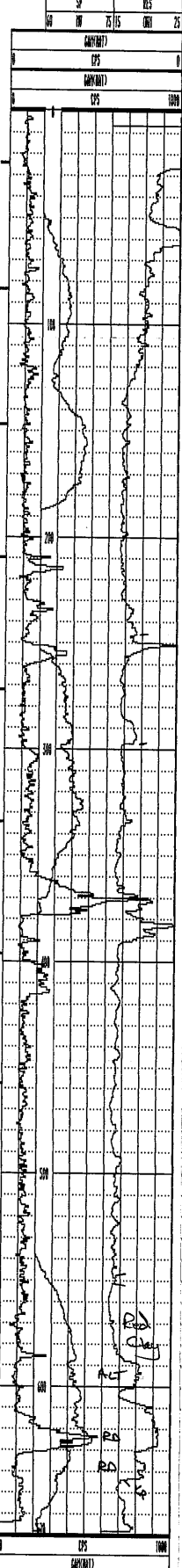
COW-2004-2
Drift 4.1'
AZ 184.4

COW-2004-3
Elev: 3670
82N 52N 27SUSW
110 S from T84



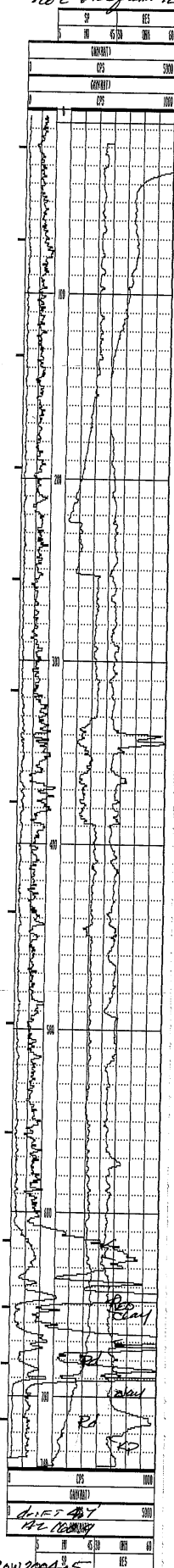
COW-2004-3
648.0' 1.5' 0.13
Drift 2.3
AZ 345.7

COW-2004-4
Elev: 3685
Sec 27NWNW 32N 52W
200 W from T-45



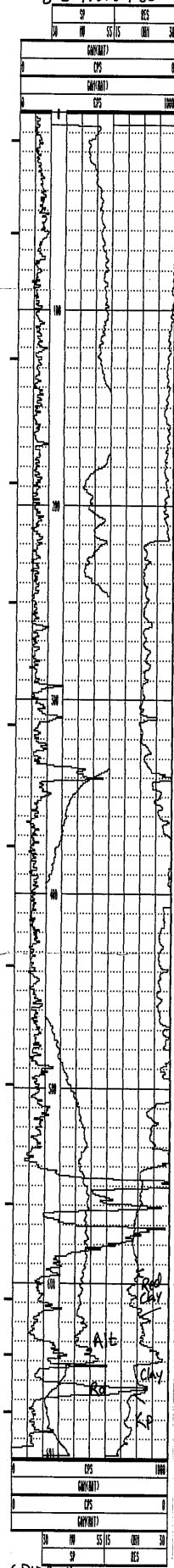
COW-2004-4
Drift 2.3
AZ 345.7

Cow-2004-5
3675
Sec. 27 32 52
100'E & 75' from T42



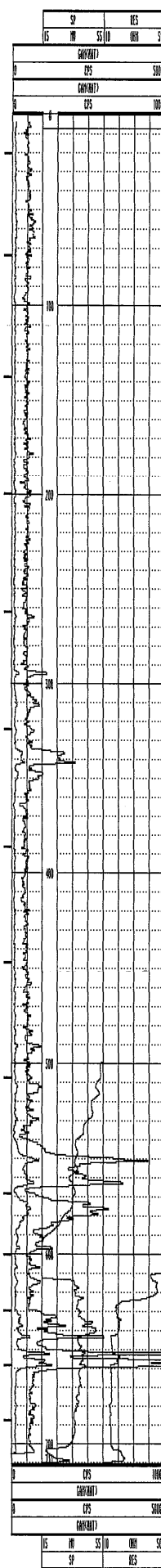
SP	RES
COW 2004-5	
644.6, 5.5 - .017	
667.0, 5.0 - .015	
684.0, 3.5 - .01	

CPW-2004
Elev. 3680
Sec 27 SE SW 32N 52W
5' E from T80



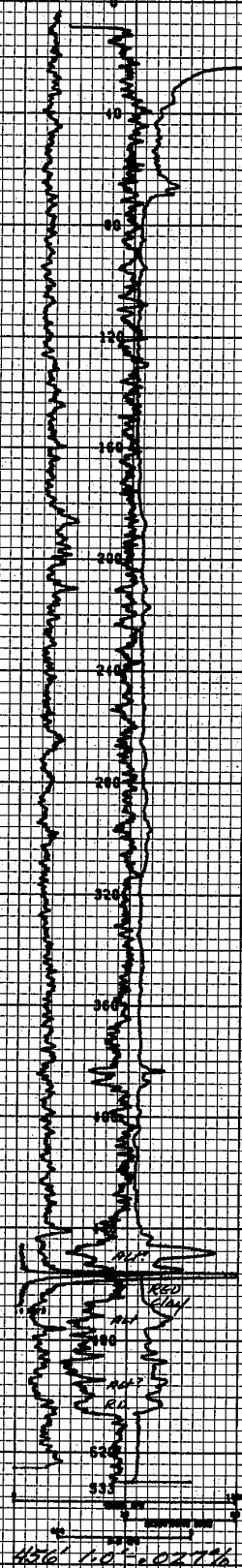
CPW 2004
Drift 3.8'
Az 129.6

CPW-2004-2



CBR-013

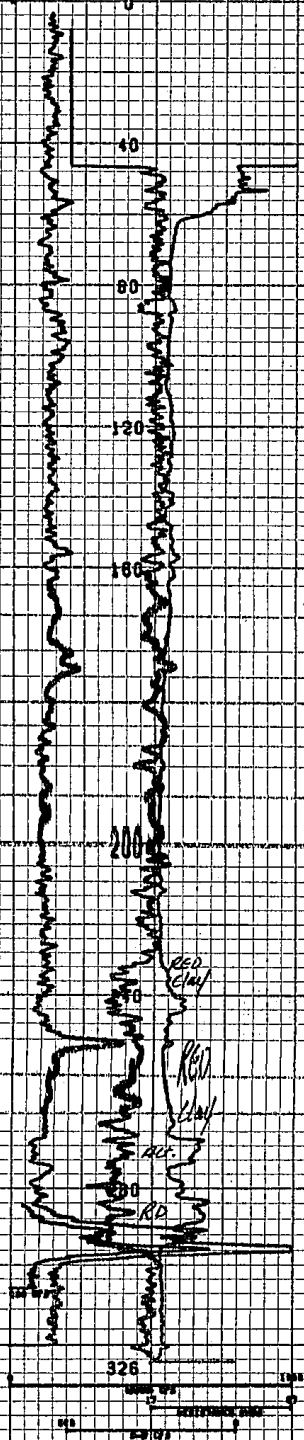
D107
43690'
32N 52W 21 NENE
700' E of D88



DEPARTMENT OF THE ARMY
08107
MONTING FUEL
CROW BUTTE
WENT DOWN IN FIRE
FIRE & GROUND - CRO
BURNED AREA
CROWN BUTTE

ARMY & NAVAL
OFFICE OF THE
JUDGE ADVOCATE GENERAL

D133
~3720'
31N 52W 3 SWNE
200'E of D134

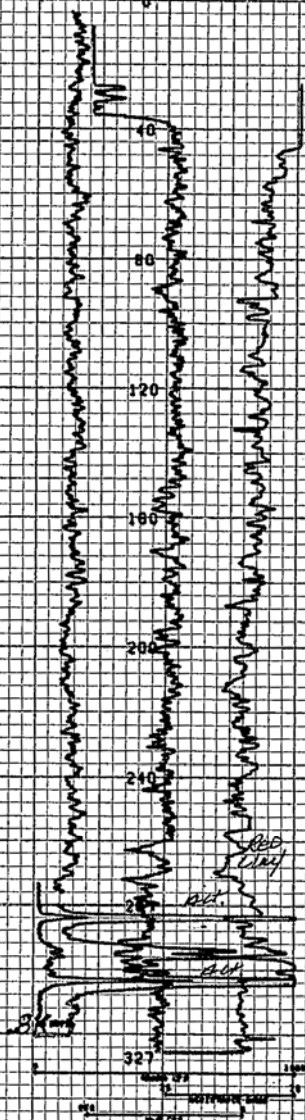


D0133
WYOMING FUEL
CROW BUTTE

TEST LOCATION: 100'
TEST DATE: 10/1/10
TEST TIME: 10:00 AM
TESTER: J. L. HARRIS

290.0' 0.5' - 0.10%
291.5' 0.5' - 0.10%
294.5' 1.5' - 0.16%

D134
~3720'
31N 52W 3 SWNE
400'E & 800'S of H3

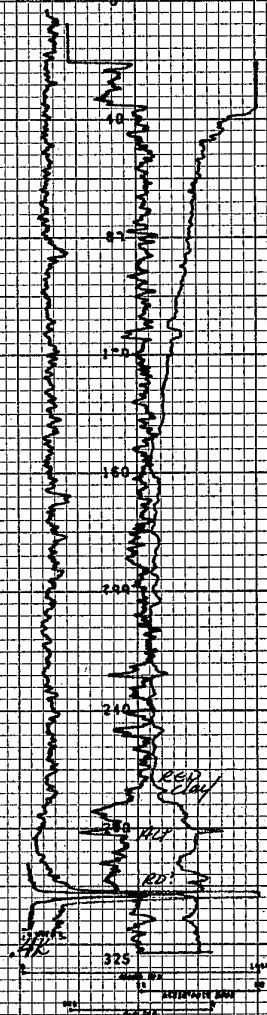


D0134
WYOMING FUEL
CROW BUTTE

TEST LOCATION: 100'
TEST DATE: 10/1/10
TEST TIME: 10:00 AM
TESTER: J. L. HARRIS

283' 1.0' - 0.21%
302.5' 1.0' - 0.57%

D137
~3710'
31N 52W 3 NWNE
600'N & 500'E of H10

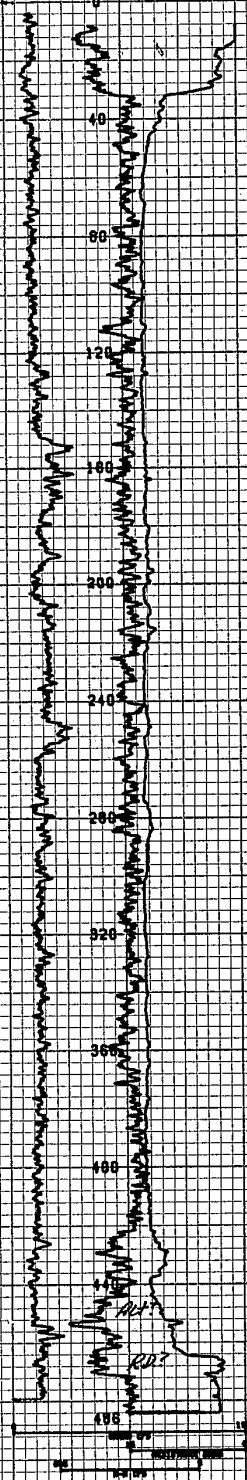


D0137
WYOMING FUEL
CROW BUTTE

TEST LOCATION: 100'
TEST DATE: 10/1/10
TEST TIME: 10:00 AM
TESTER: J. L. HARRIS

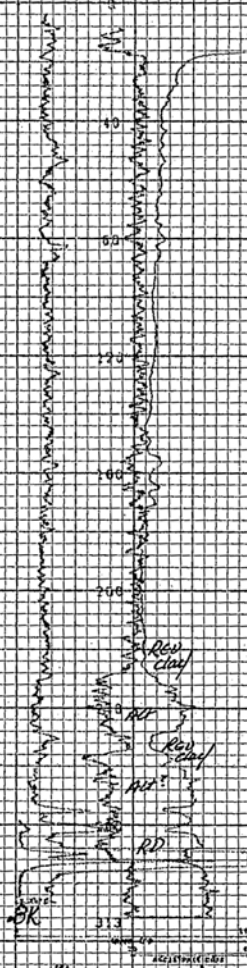
302.5' 2.0' - 0.24%

D57
~3670'
32N 52W 22 SW/NW
800' N of D50



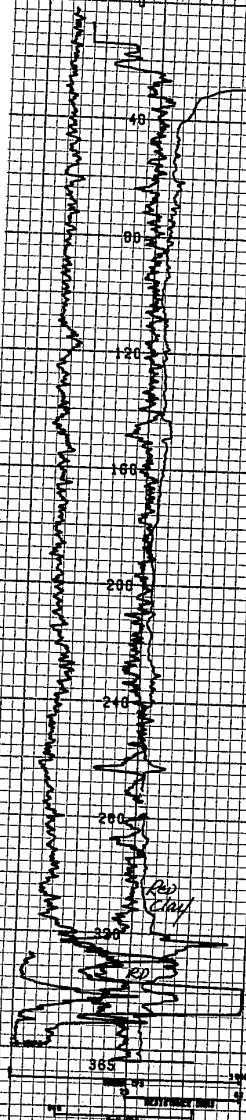
00057
WYOMING FUEL
CROW BUTTE

D138
~3710'
31N 52W 35WNE
200' W of D134

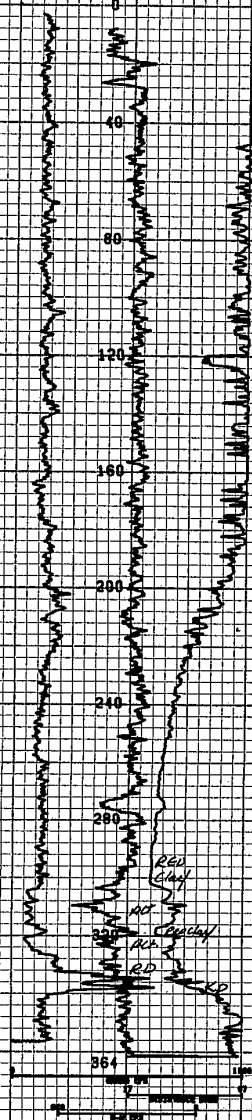


20040905 137 0000
 00238
 HYDROGEN FUEL
 CROW BUTTE
 DATE RECEIVED 11/11/04
 PRICE 2.00000000
 QUANTITY 100.00000000
 TOTAL 200.00000000
 CROWN ON THE PUMP 0
 DATE 11/11/04
 CROWN BUTTE 001-111 0
 2890' 410' .036%

D140
~ 3690'
51N 52W 3 NWN E
350' W 400' W of D137

[illegible]

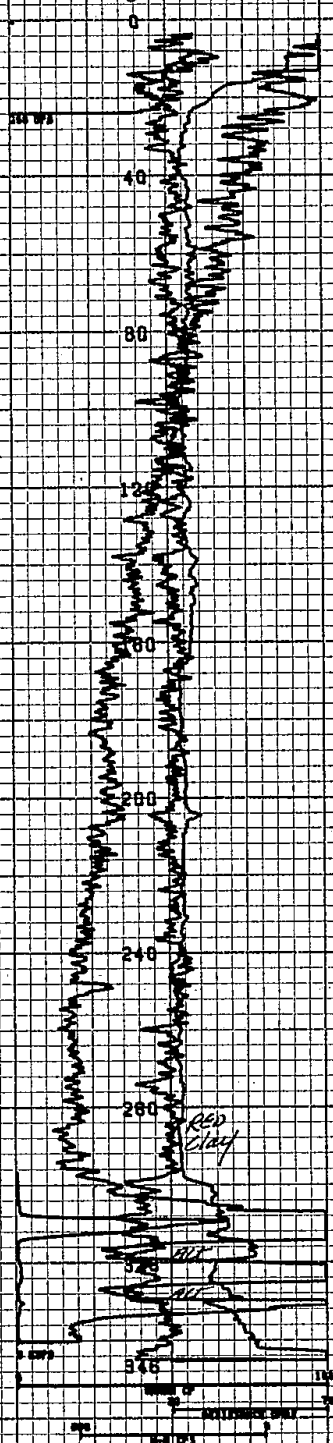
D141
 103700'
 51N 52W 3 NW NE
 200' W of D137



DD141
 WYOMING FUEL
 CROW BUTTE

330.0' 0.5' - 0.12%

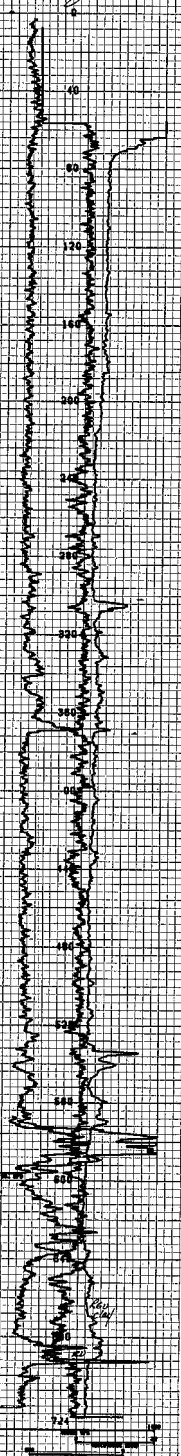
D142
 103680'
 51N 52W 3 NW NE
 200' W of D140



DD142
 WYOMING FUEL
 CROW BUTTE

307.5' 5.5' - 0.113%

D144
 103620'
 51N 52W 3 NW NE
 200' W of D143

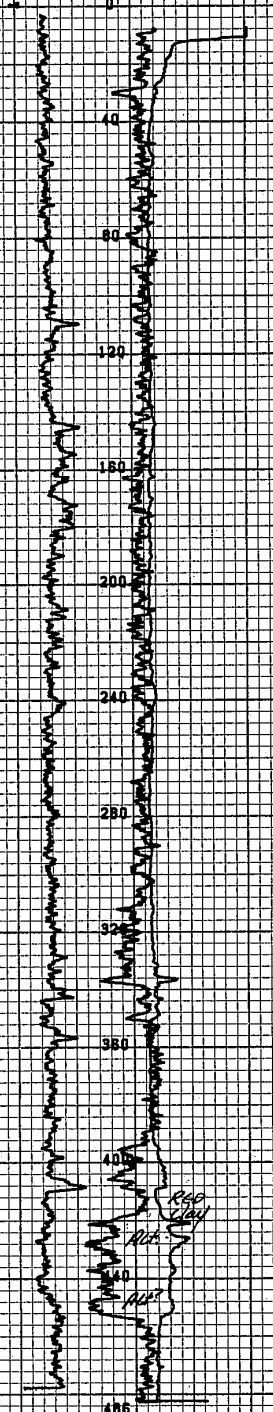


DD144
 WYOMING FUEL
 CROW BUTTE

692.5' 0.5' - 0.17%

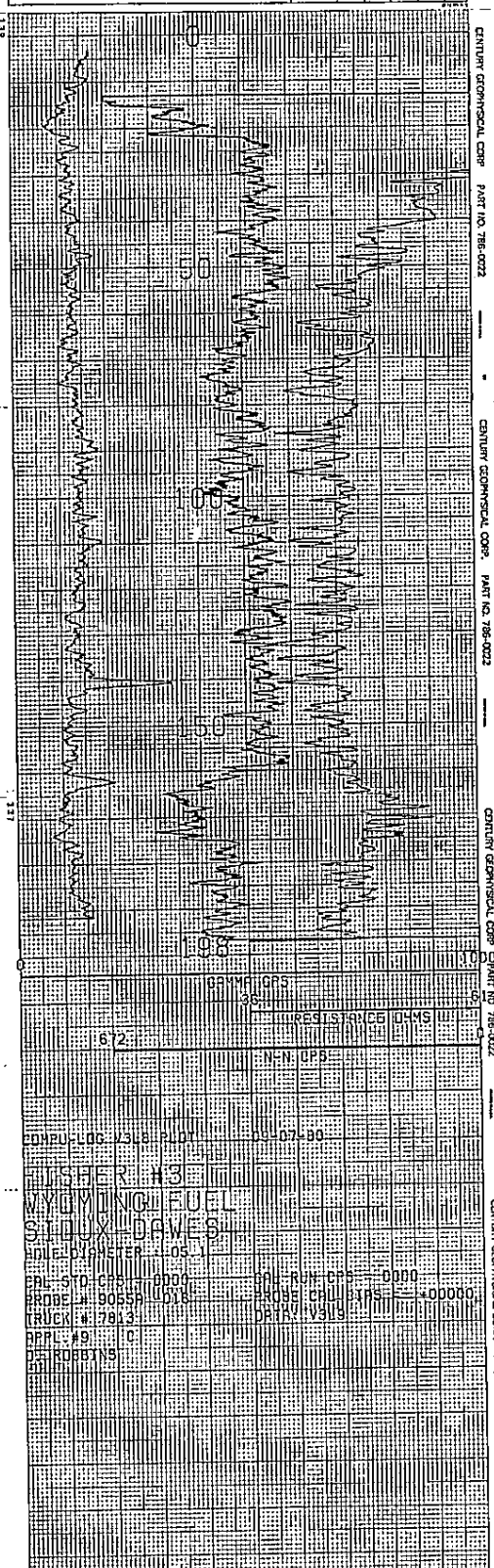
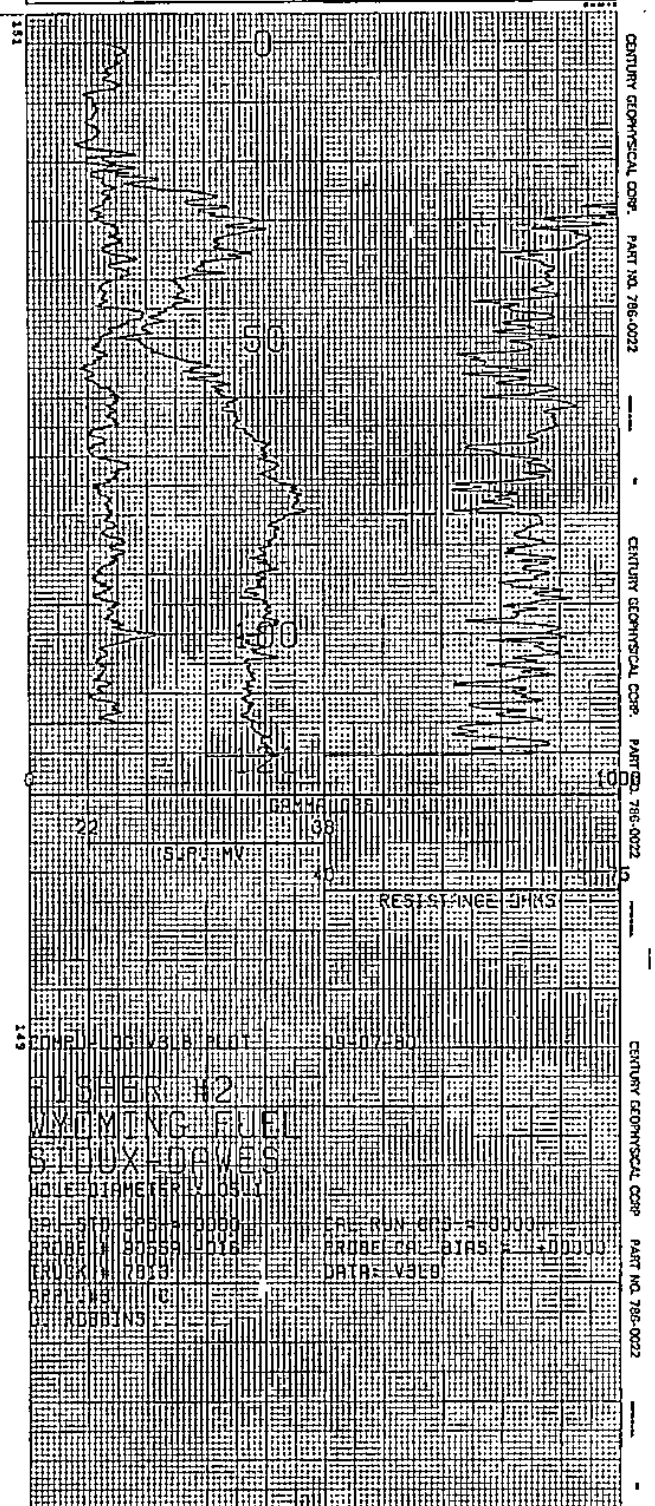
CBR-013

D67
 103660'
 51N 52W 22 NW NW
 200' N of D61



DD67
 WYOMING FUEL
 CROW BUTTE

486' 0.5' - 0.1%

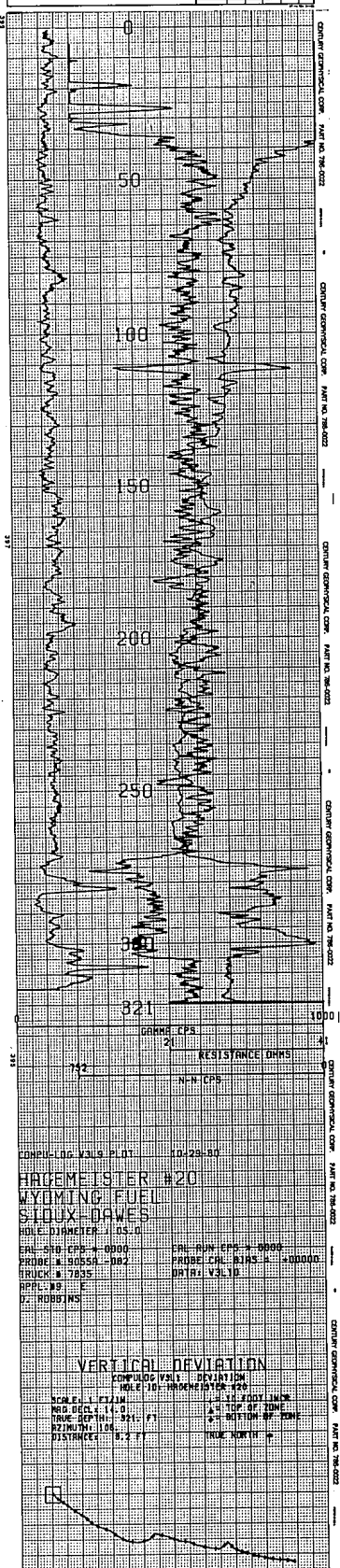
[illegible][illegible]

CENTURY GEOPHYSICAL CORPORATION
Task: 10-29-80
EQUIPMENT DATA

WYOMING FUEL
HAGEMEISTER #20
SIDUX-DAWES
DAWES
VER

HOLE DATA

DATE	10-29-80
TIME	10:00
LOCATION	WYOMING FUEL
WELL NO.	HAGEMEISTER #20
WELL TYPE	WYOMING FUEL
WELL DEPTH	1000
WELL DIAMETER	10.0
WELL STATUS	WYOMING FUEL
WELL OWNER	WYOMING FUEL
WELL OPERATOR	WYOMING FUEL
WELL MAINTENANCE	WYOMING FUEL
WELL RECORD	WYOMING FUEL
WELL LOG	WYOMING FUEL
WELL DATA	WYOMING FUEL
WELL RESULTS	WYOMING FUEL
WELL COMMENTS	WYOMING FUEL

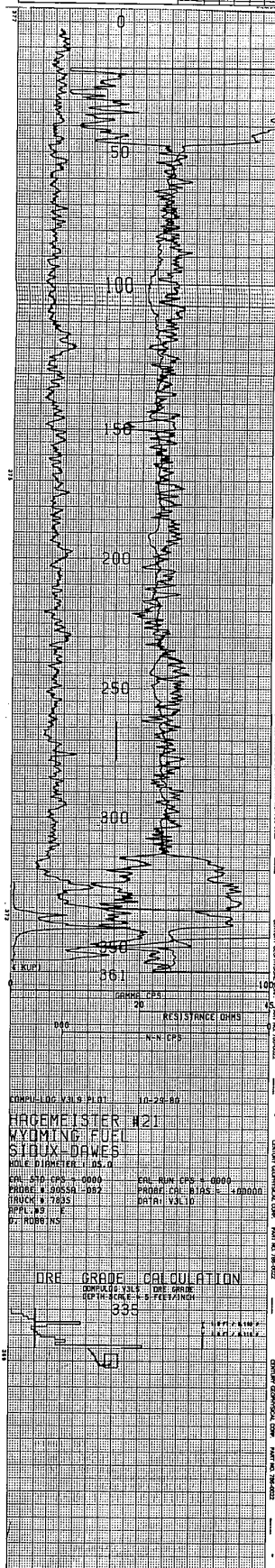


CENTURY GEOPHYSICAL CORPORATION
Task: 10-29-80
EQUIPMENT DATA

WYOMING FUEL
HAGEMEISTER #21
SIDUX-DAWES
DAWES
VER

HOLE DATA

DATE	10-29-80
TIME	10:00
LOCATION	WYOMING FUEL
WELL NO.	HAGEMEISTER #21
WELL TYPE	WYOMING FUEL
WELL DEPTH	1000
WELL DIAMETER	10.0
WELL STATUS	WYOMING FUEL
WELL OWNER	WYOMING FUEL
WELL OPERATOR	WYOMING FUEL
WELL MAINTENANCE	WYOMING FUEL
WELL RECORD	WYOMING FUEL
WELL LOG	WYOMING FUEL
WELL DATA	WYOMING FUEL
WELL RESULTS	WYOMING FUEL
WELL COMMENTS	WYOMING FUEL

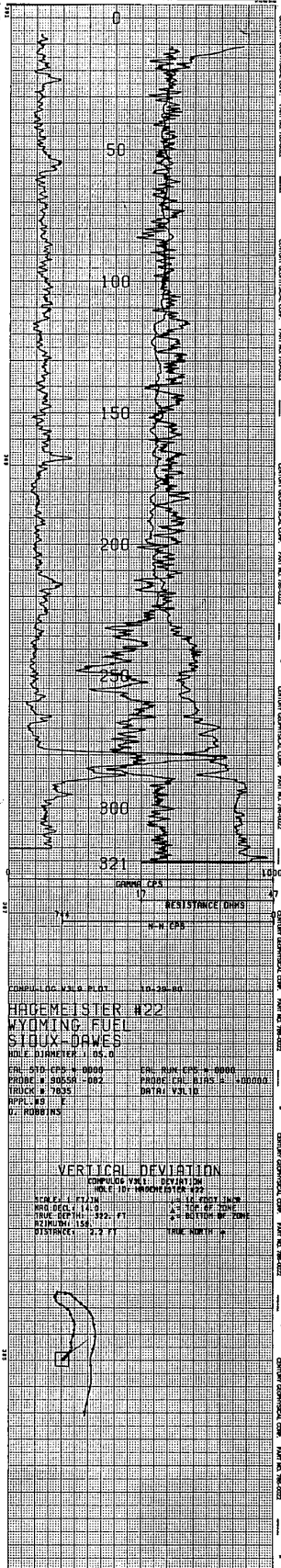


CENTURY GEOPHYSICAL CORPORATION
Task: 10-29-80
EQUIPMENT DATA

WYOMING FUEL
HAGEMEISTER #22
SIDUX-DAWES
DAWES
VER

HOLE DATA

DATE	10-29-80
TIME	10:00
LOCATION	WYOMING FUEL
WELL NO.	HAGEMEISTER #22
WELL TYPE	WYOMING FUEL
WELL DEPTH	1000
WELL DIAMETER	10.0
WELL STATUS	WYOMING FUEL
WELL OWNER	WYOMING FUEL
WELL OPERATOR	WYOMING FUEL
WELL MAINTENANCE	WYOMING FUEL
WELL RECORD	WYOMING FUEL
WELL LOG	WYOMING FUEL
WELL DATA	WYOMING FUEL
WELL RESULTS	WYOMING FUEL
WELL COMMENTS	WYOMING FUEL



3668

CENTURY GEOPHYSICAL CORPORATION
Tape Station

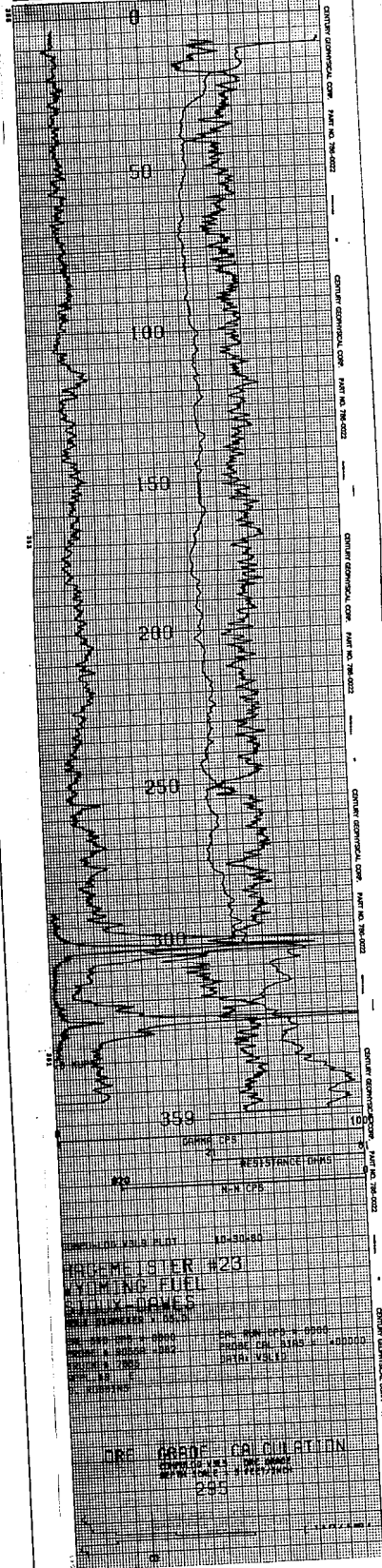
WYOMING FUEL
HAGEMEISTER #23
SIOUX-DAWES
DAWES

HOLE DATA

DATE	TIME	WELL NO.	WELL NAME
12-15-51	10:00	23	HAGEMEISTER #23
12-15-51	10:00	23	SIOUX-DAWES
12-15-51	10:00	23	DAWES

EQUIPMENT DATA

LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT



CENTURY GEOPHYSICAL CORPORATION
Tape Station

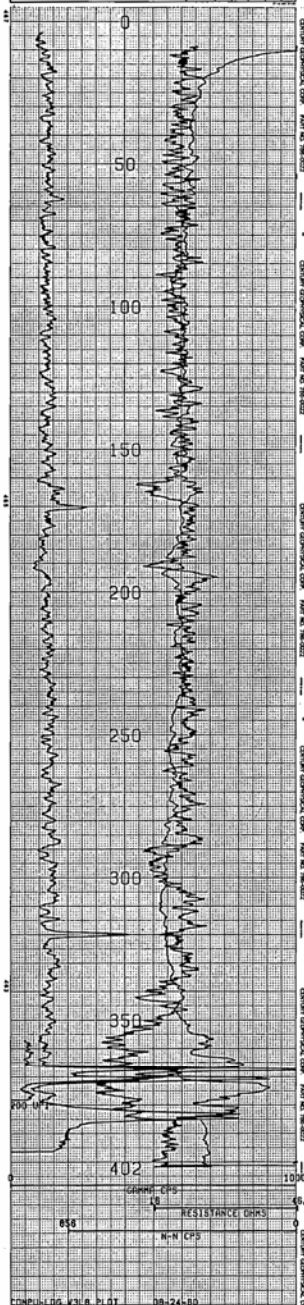
WYOMING FUEL
HAGEMEISTER #4
SIOUX-DAWES
DAWES

HOLE DATA

DATE	TIME	WELL NO.	WELL NAME
12-15-51	10:00	4	HAGEMEISTER #4
12-15-51	10:00	4	SIOUX-DAWES
12-15-51	10:00	4	DAWES

EQUIPMENT DATA

LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT



CENTURY GEOPHYSICAL CORPORATION
Tape Station

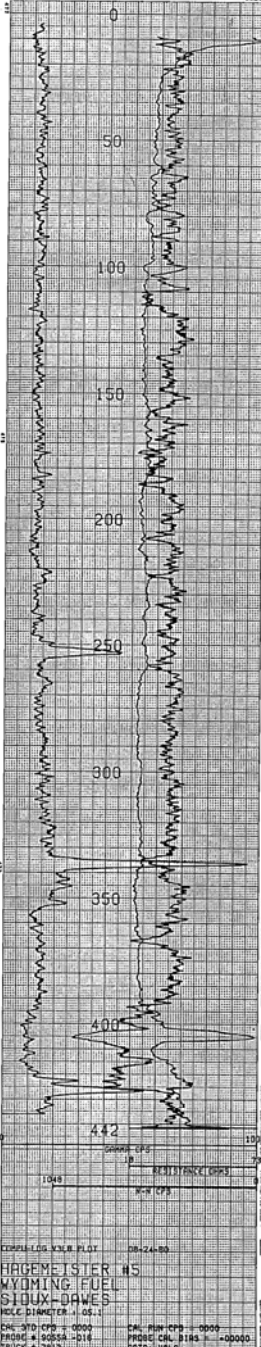
WYOMING FUEL
HAGEMEISTER #5
SIOUX-DAWES
DAWES

HOLE DATA

DATE	TIME	WELL NO.	WELL NAME
12-15-51	10:00	5	HAGEMEISTER #5
12-15-51	10:00	5	SIOUX-DAWES
12-15-51	10:00	5	DAWES

EQUIPMENT DATA

LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT



CENTURY GEOPHYSICAL CORPORATION
Tape Station

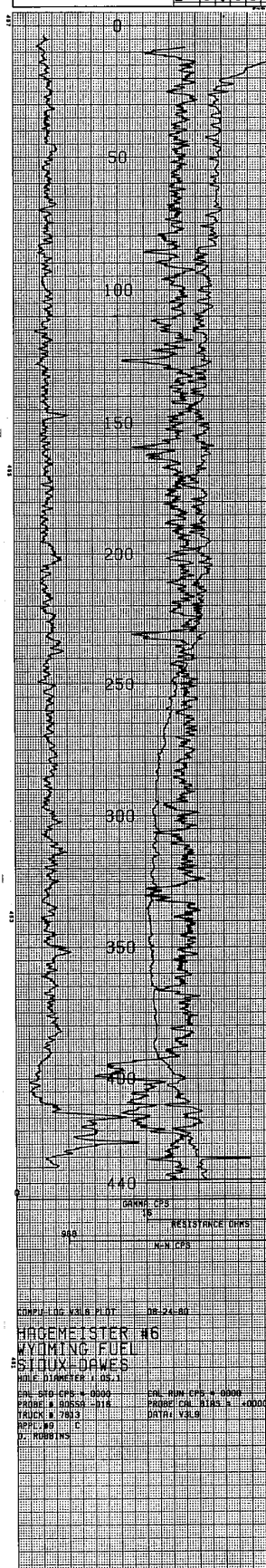
WYOMING FUEL
HAGEMEISTER #6
SIOUX-DAWES
DAWES

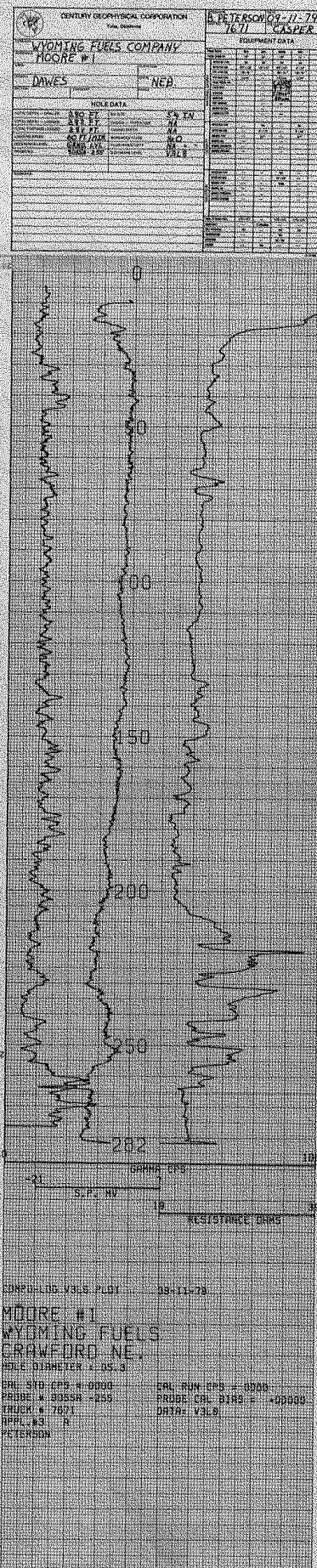
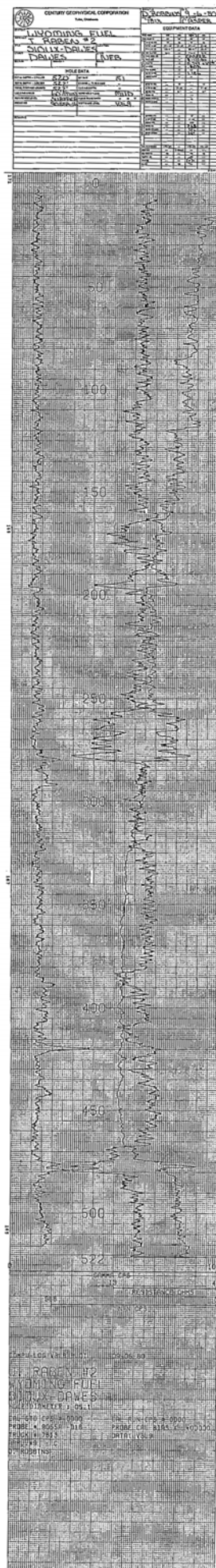
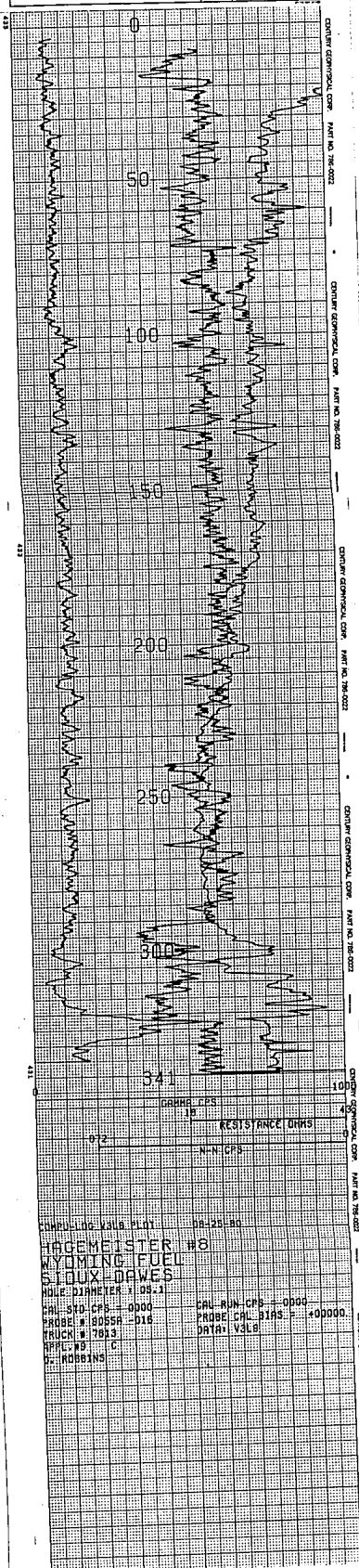
HOLE DATA

DATE	TIME	WELL NO.	WELL NAME
12-15-51	10:00	6	HAGEMEISTER #6
12-15-51	10:00	6	SIOUX-DAWES
12-15-51	10:00	6	DAWES

EQUIPMENT DATA

LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT
LOGGING UNIT	LOGGING UNIT	LOGGING UNIT





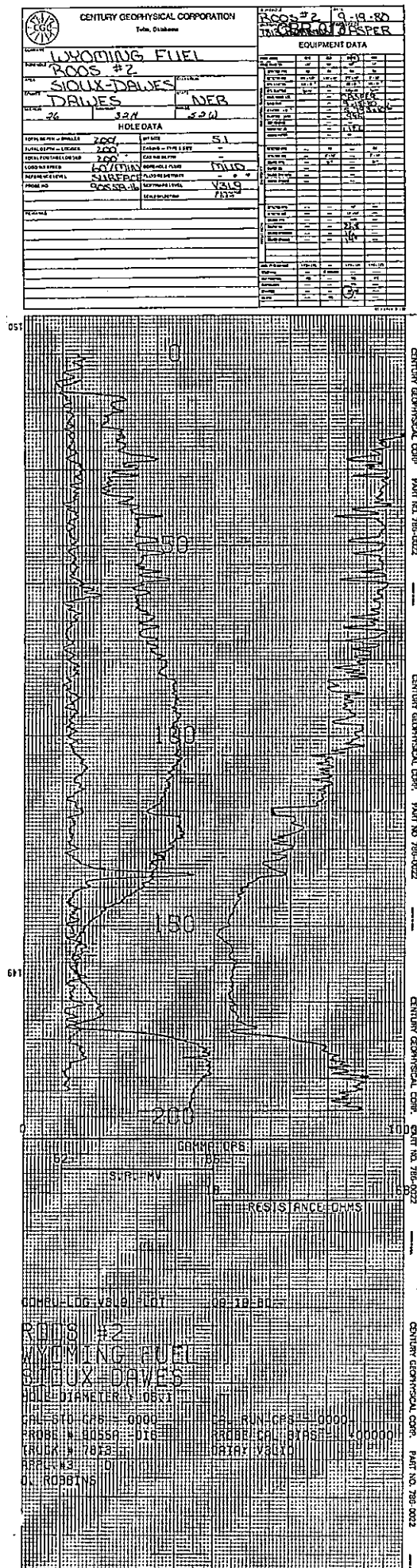
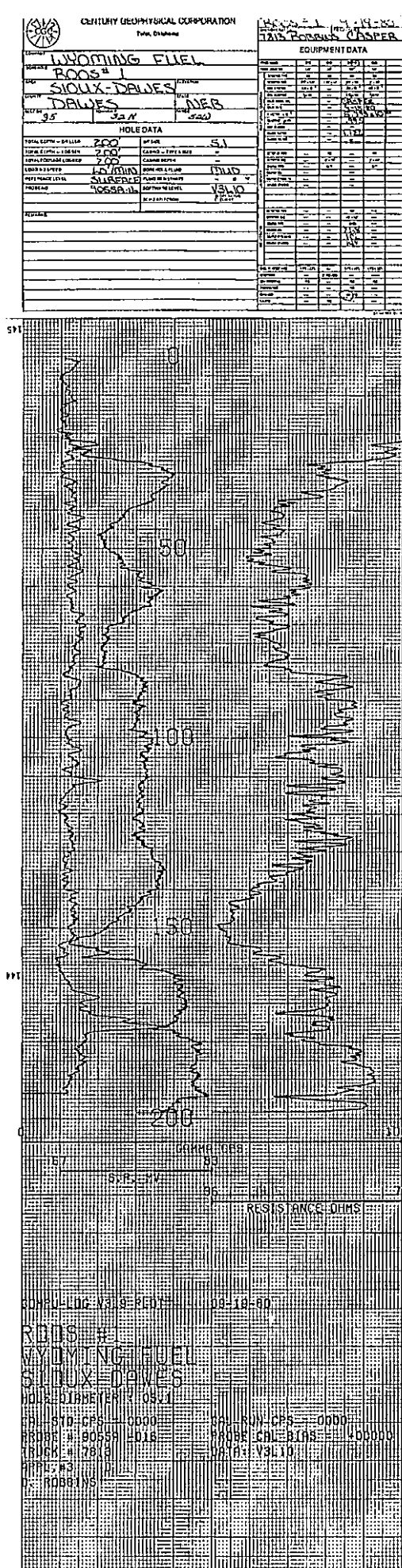
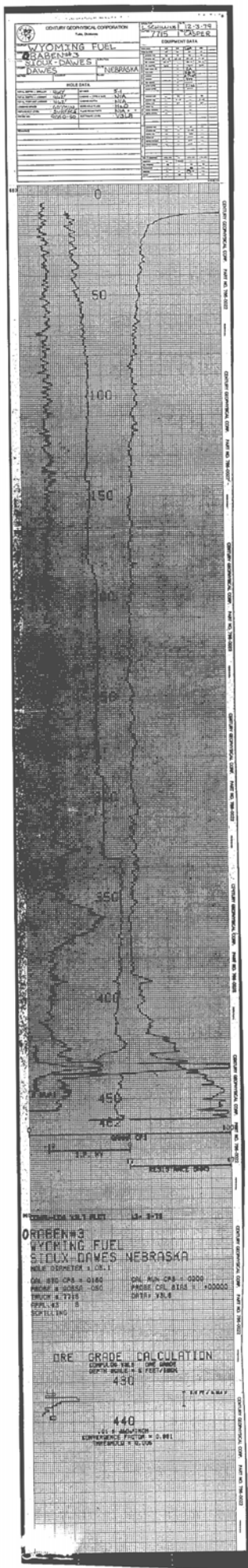
0 50 100 150 200 250 300

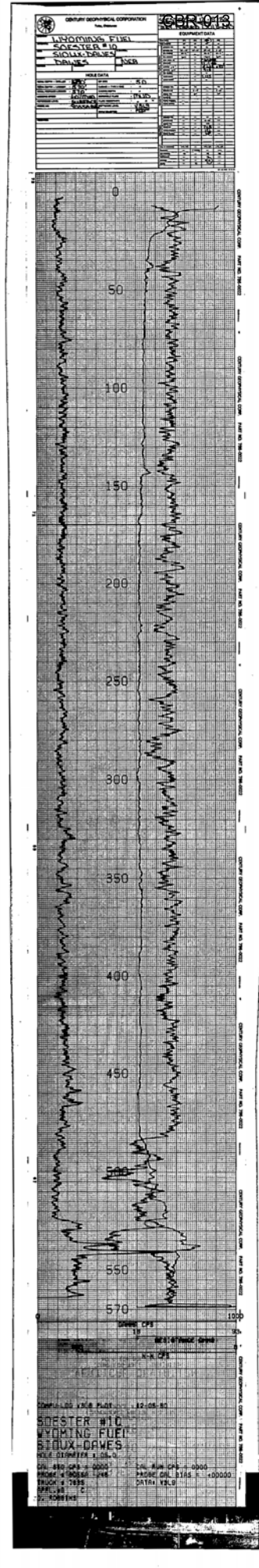
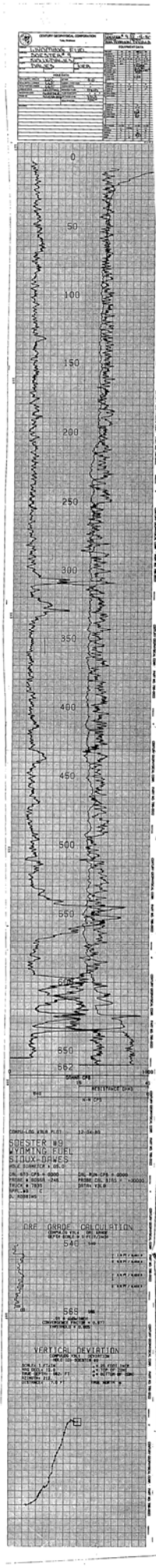
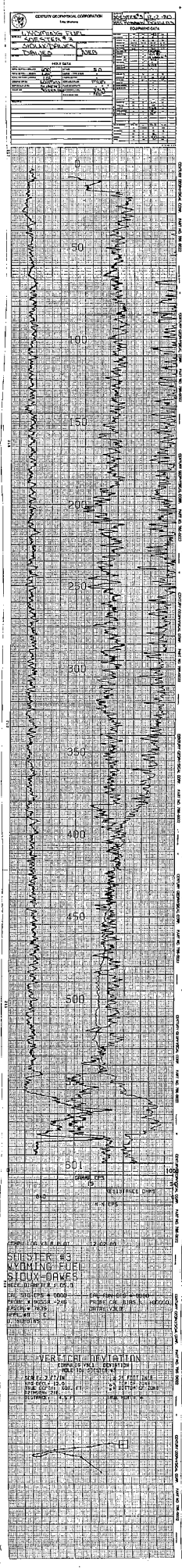
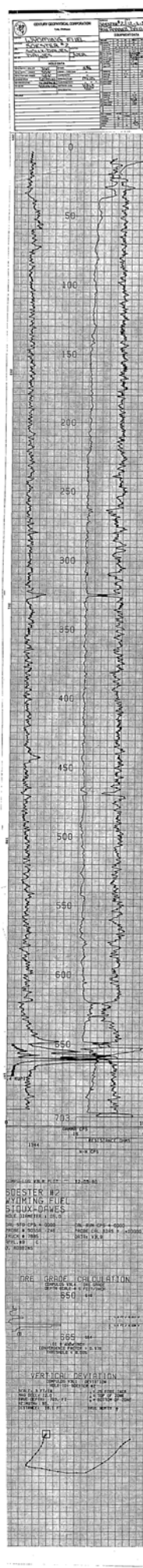
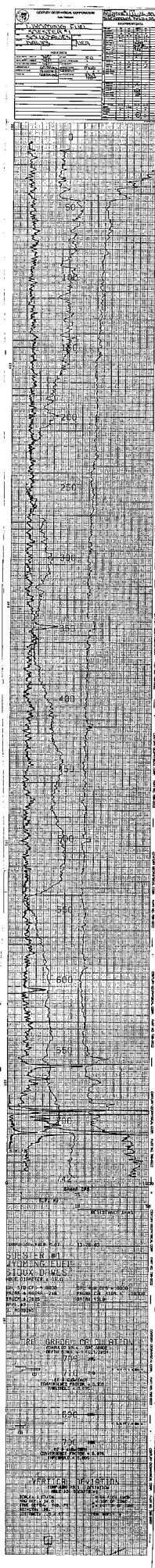
720 19 64 0

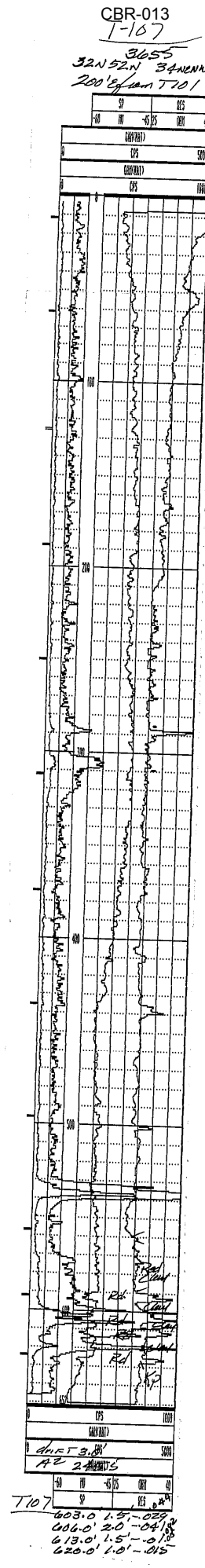
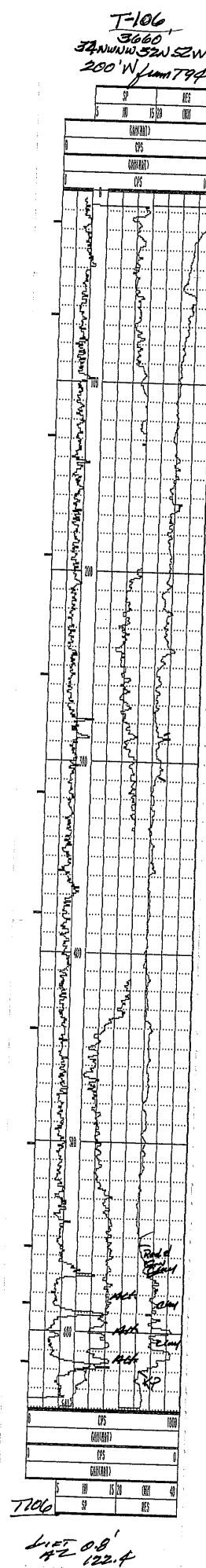
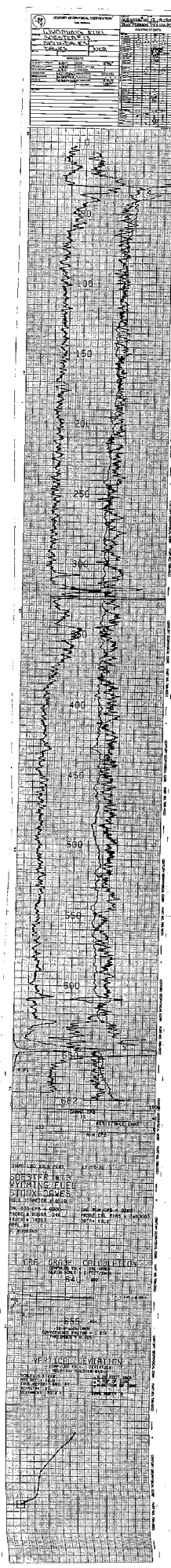
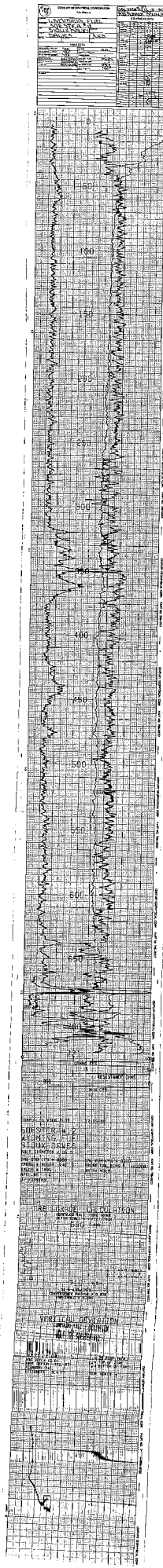
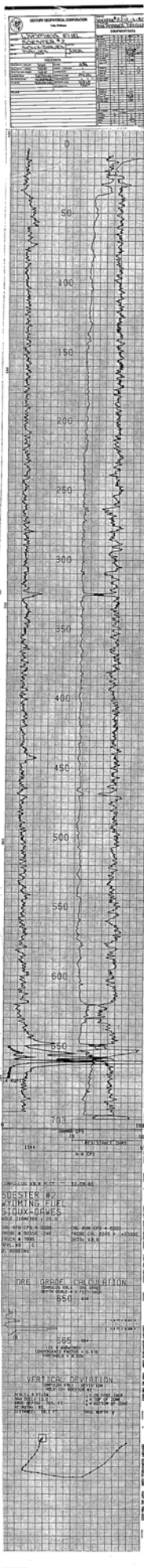
COMPU-LOG V3L4 PILOT 09-07-80

MOORE #S
WYOMING FUEL
SIDUX-DAVES
HOLE DIAMETER : 05.1

CAL: 978-CPS + 0000 CAL: RUN-CPS + 0000
PRIME # 9055R -D18 PRIME CAL DIAS. S. #00000
TRUCK # 7813 DATA: V3L5
RPPL #3 C
D. RUBBINS



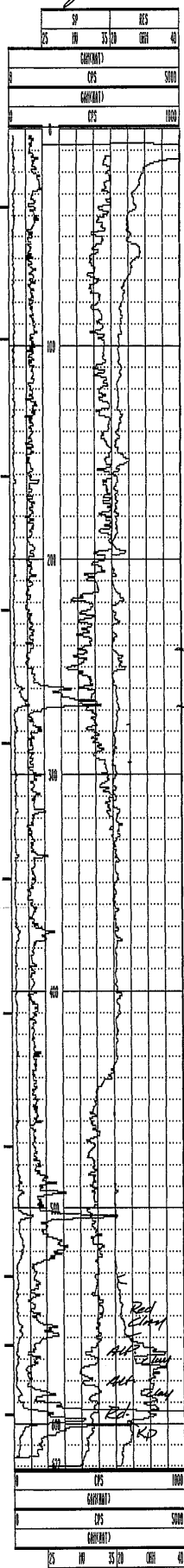




T106
LIFT 0.8'
#2 122.4

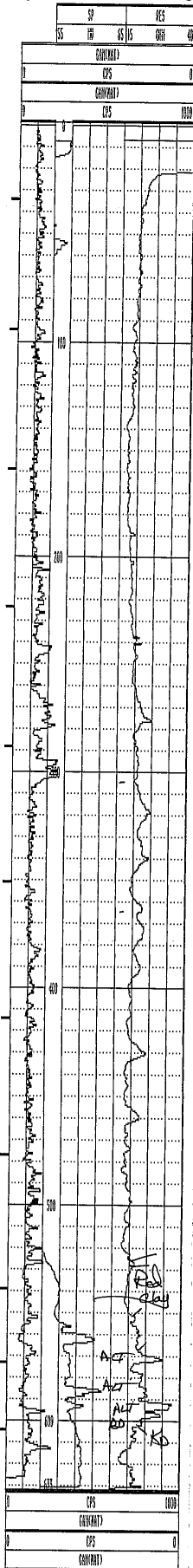
T107
403.0 1.5 - 0.25
606.0 2.0 - 0.15
613.0 1.5 - 0.15
620.0 1.0 - 0.15

T-109
3650
32N 52N 34SENW
100 W from T87



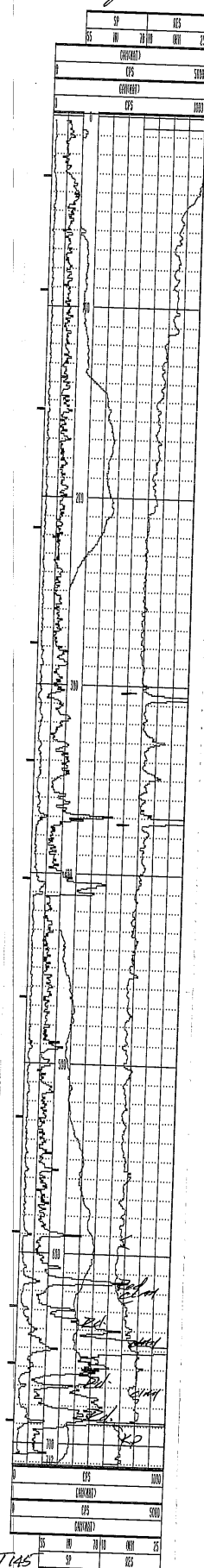
T109
695.0' 6.5'-0.18
dift 3.4
AZ 42.4

T-130
3690
100 s from T63
Sec 27 NE 1/4 32N 52N



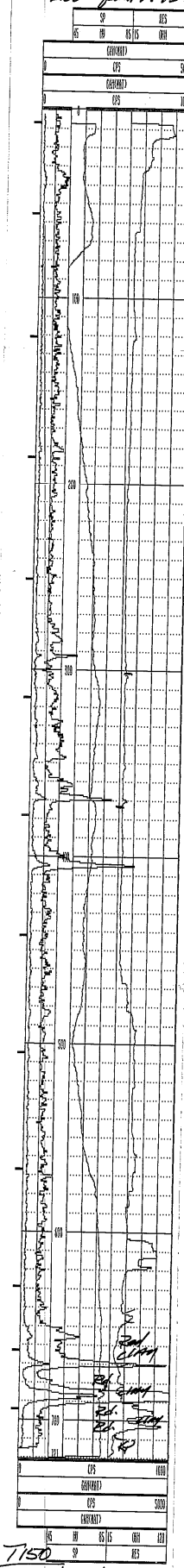
T130
dift 9.9

T-146
3680
32N 52N 27SENW
200 W from T120



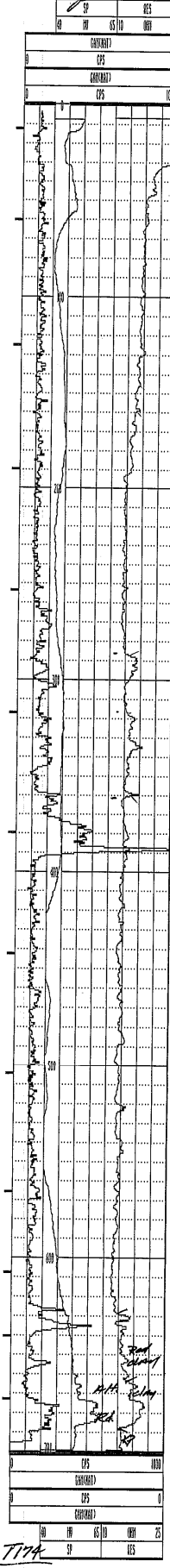
T146
646.5' 7.0'-0.13
689.5' 10'-0.17
dift 12.7
AZ 321.2

T-150
3680
32N 52N 27SENW
200 W from T146



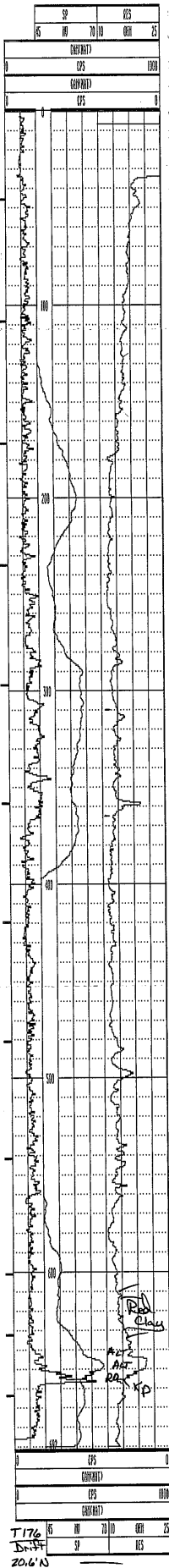
T150
671.0' 1.5'-0.13
685.5' 5.5'-0.23
dift 5.4
AZ 316.1

GBR013
3680
32N 52N 27SENW
100 E from T160

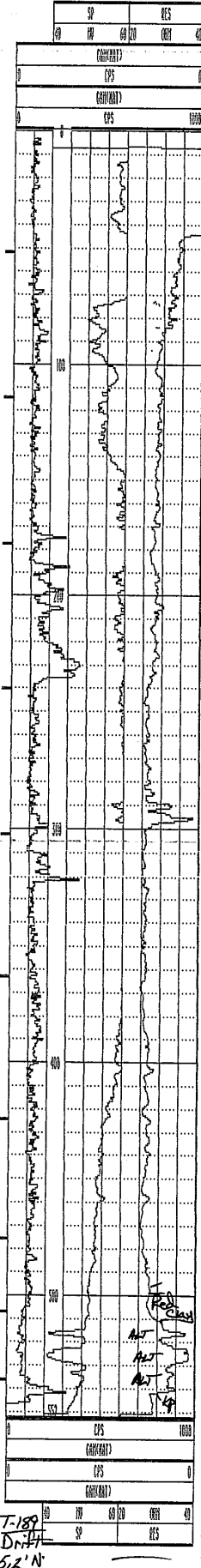


T174
dift 19.7
AZ 1.4

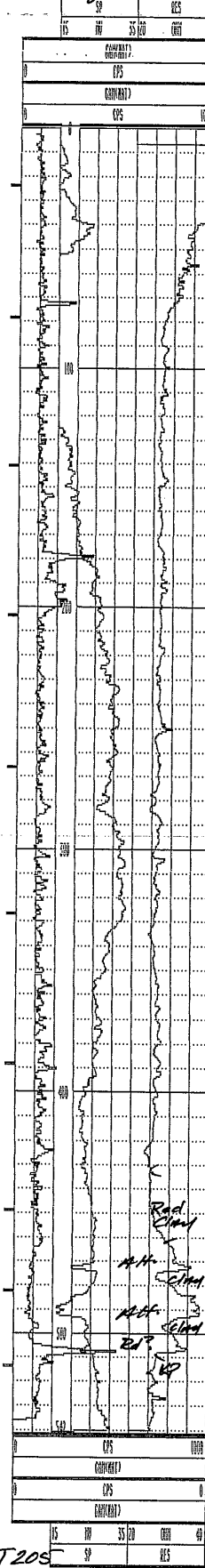
T-176
3680
200' N from T161
Sec 27 NESE 34W 52W



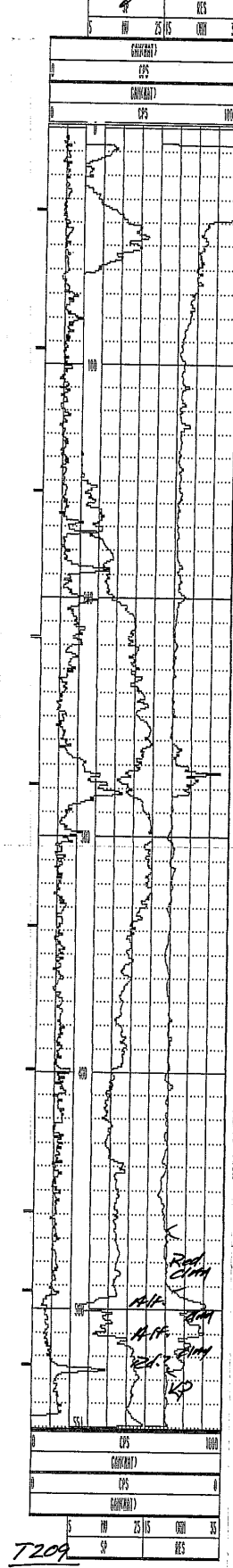
T-189
3680
Sec 22 SWSW 32N 52W
200' E from T-188



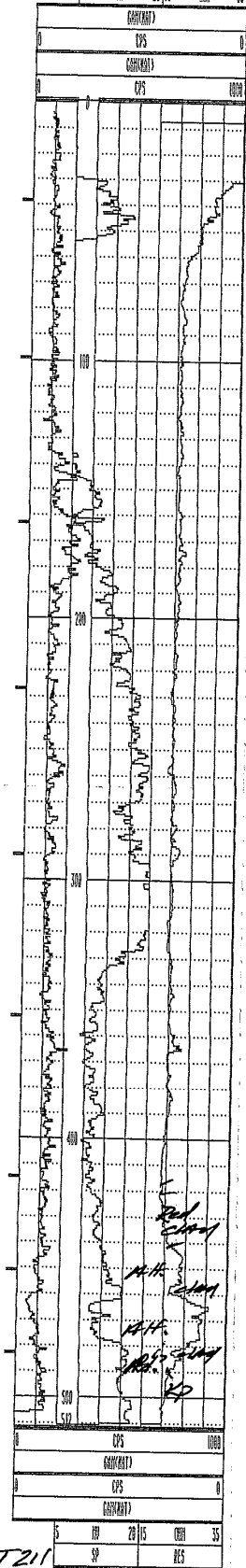
T-205
3680
32N 52W 22 NWSW
200' E from T203



T-209
3680
32N 52W 22 NWSW
200' E from T202



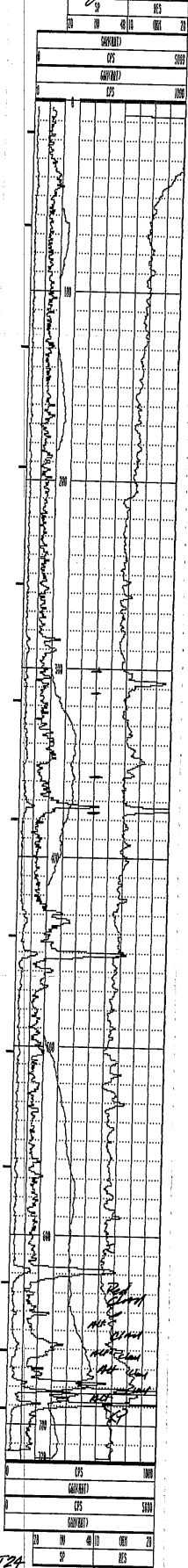
T-211
3670
32N 52W 27SE NW
400' E 150' N from T-205



T211

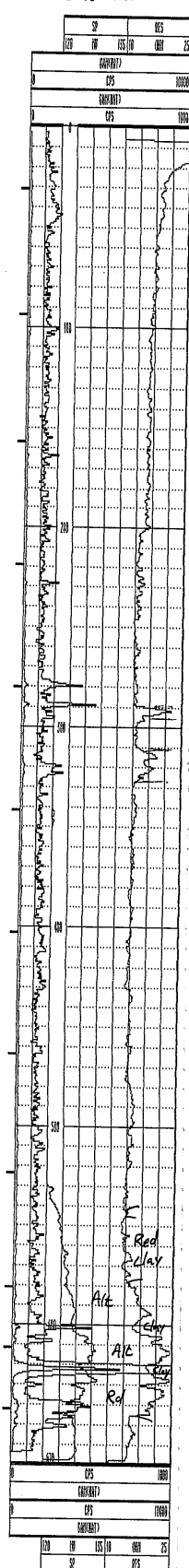
driest 4.7
AZ 356.4

T-24
3690
32N 52W 27SE NW
1200' E from T-21



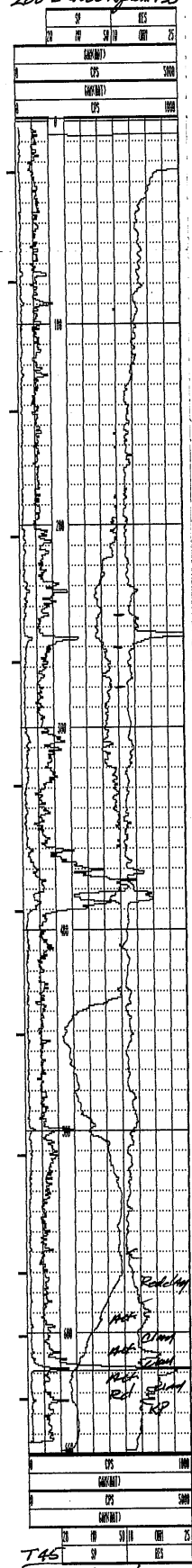
T24
692.0' 2.0'-021
689.5' 1.0'-017
driest 15.5 AZ 285.1

T-39
Elev 3700
Sec 27 SW SW 32N 52W
1800' S + 400' E from W
side center



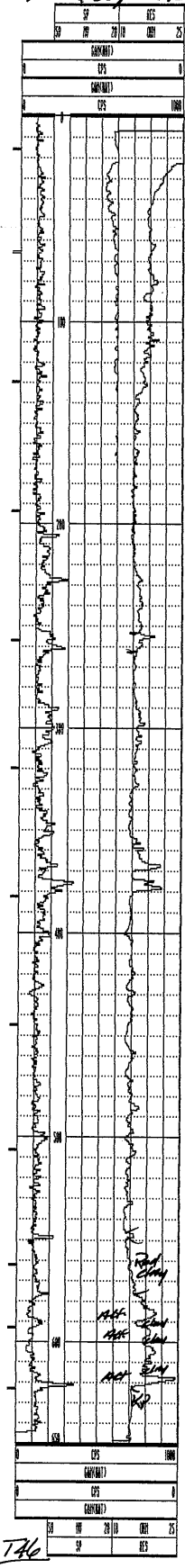
T39
D: H 5.5 6225 10'-113
AZ 335.5

T-45
3690
32N 52W 27N NW NW
200' E 4150' N from T-33



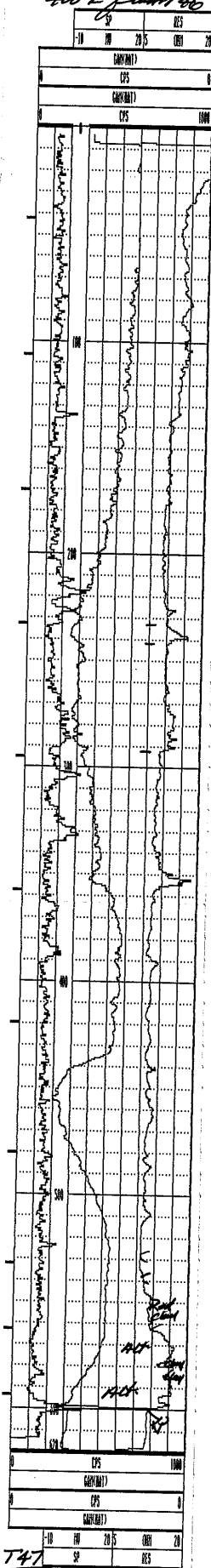
T45
619.0' 1.0'-02
driest 16.0
AZ 14.0

CBR-013
T-46
3680
27N NW NW 32N 52W
400' E 30' N from T-45



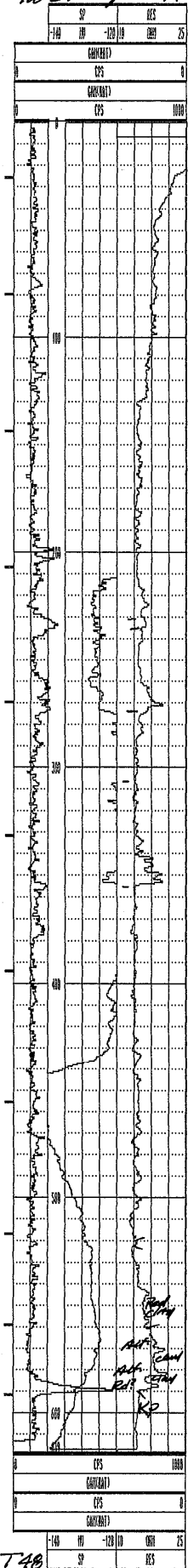
T46
driest 9.9 AZ 100.2

T-47
3680
27 NWNW 32 N 52 N
400' E from T66



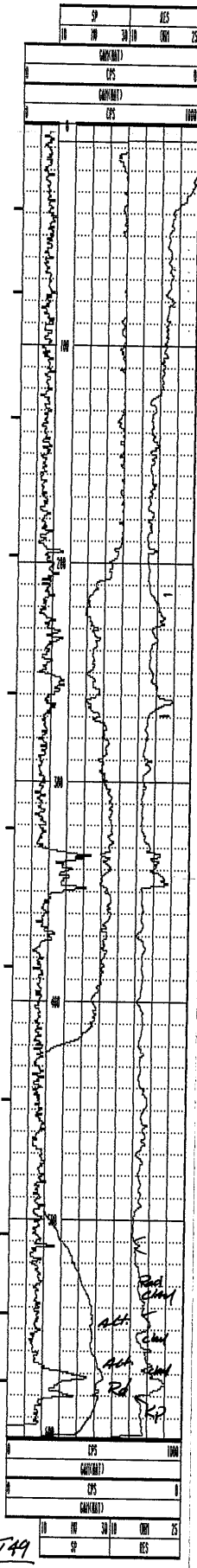
T47
600.0' 1.0' -0.12
dIFT 7.8
AZ 76d

T-48
3675
27 NWNW 32 N 52 N
400' E from T47



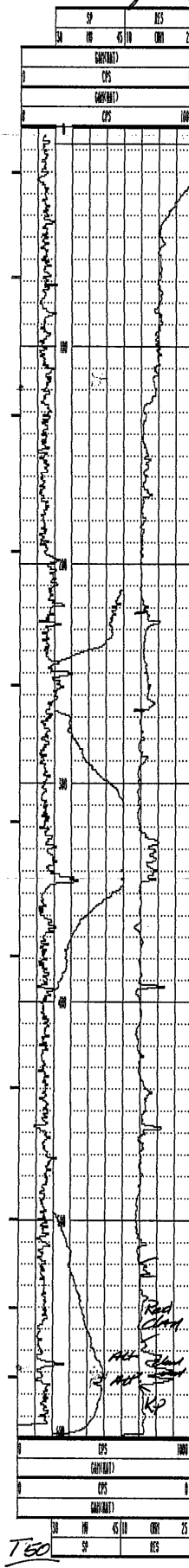
T48
dIFT 27
AZ 139.3

T-49
3670
27 NWNW 32 N 52 N
400' E & 20' S from T48



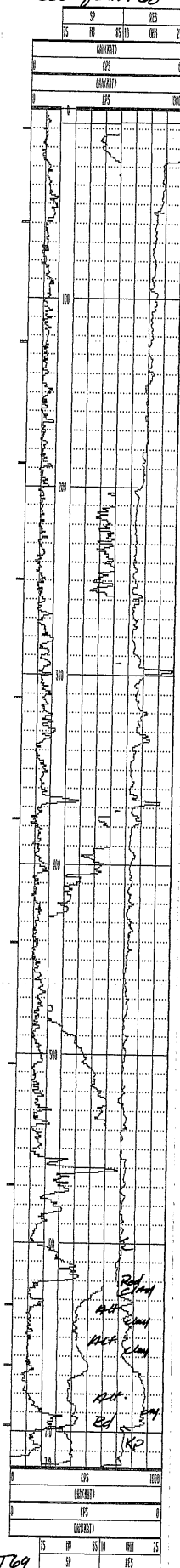
T49
dIFT 5.3'
AZ 354.9

T-50
3665
27 NWNW 32 N 52 N
800' E & 305' from T48



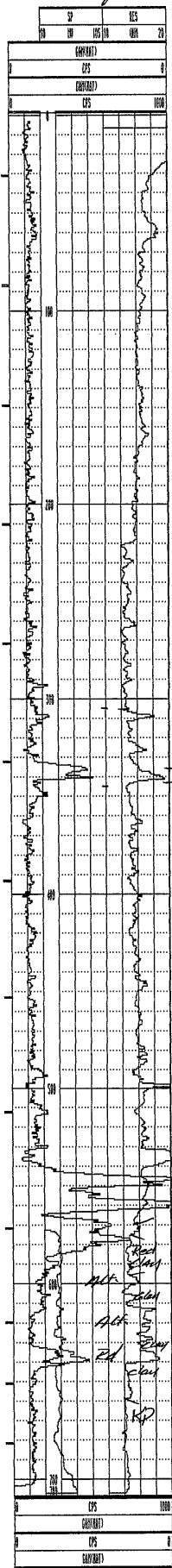
T50
dIFT 10.8'
AZ 206

CBR-013
T-69
3685
27 NWNW 32 N 52 N
300' E from T68



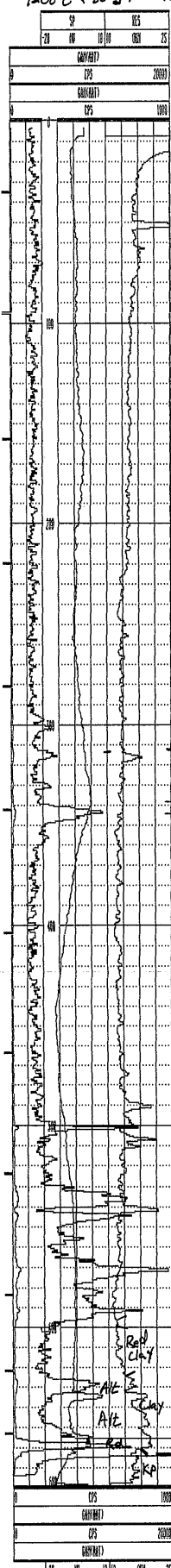
T69
dIFT 7.4' AZ 321.1

T-80
 3680
 275SE 32N 52W
 820'E + 150'S from T71



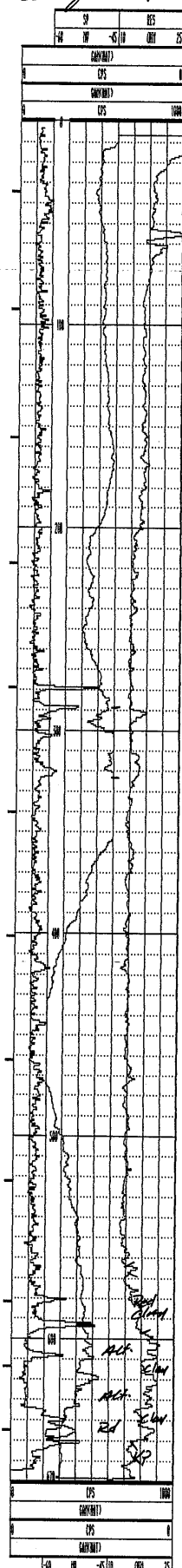
T80
 drift 58'
 A2 0.5

T-81
 Elev: 3675
 Sec 275SE 32N 52W
 1200' E + 60' S from T71



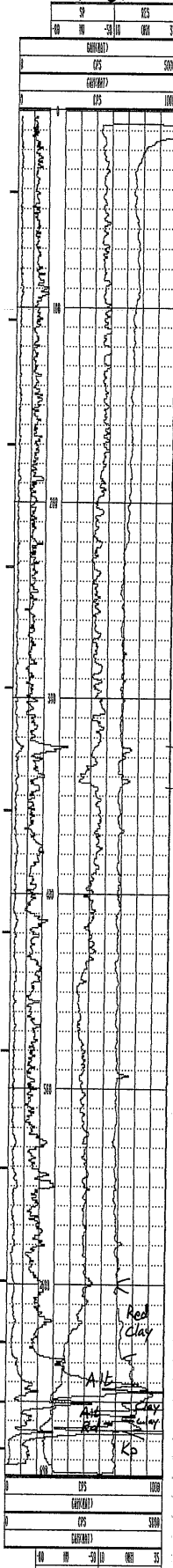
T81
 drift 75' 68.5 30'-174
 A2 346.3

T82
 3720
 275SE 32N 52W
 320' W from T39



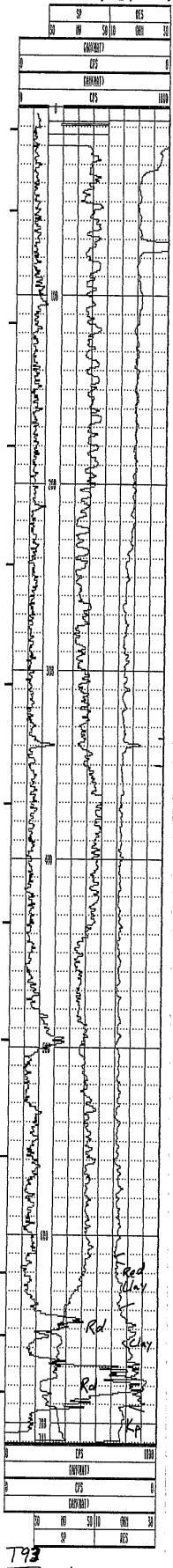
T82
 drift 9.4'
 A2 523.3

T-92
 Elev: 3670
 Sec 275SE 32N 52W
 400' E + 130' S from T87



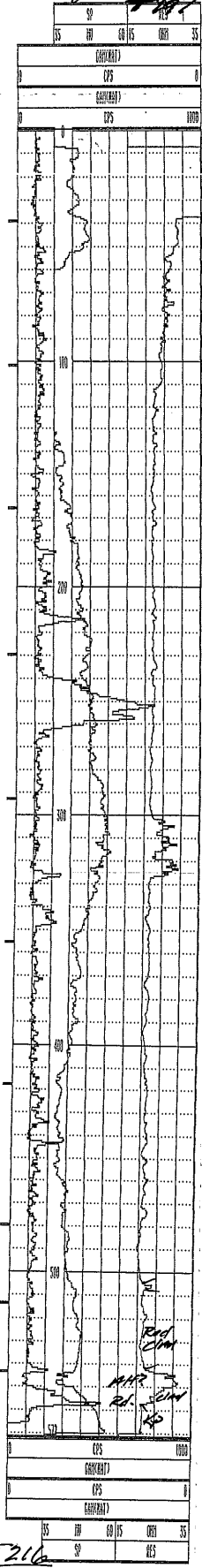
T92
 drift 6.1'
 A2 524
 68.5 40'-0.01
 68.5 55'-0.1
 670 15'-0.19

T-93
 Elev: 3665
 Sec 275SE 32N 52W
 400' E + 70' S from T92



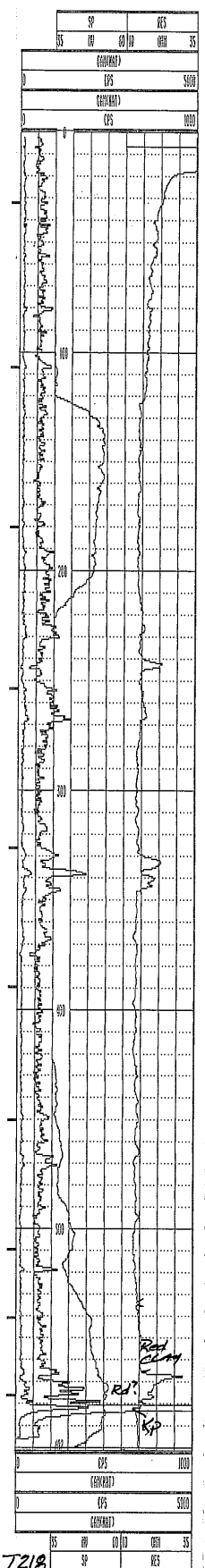
T93
 drift 1.9'
 A2 330.8
 670.5 15'-0.10

T-216
3680'
32N 52N 22 SESW
400' E from T98



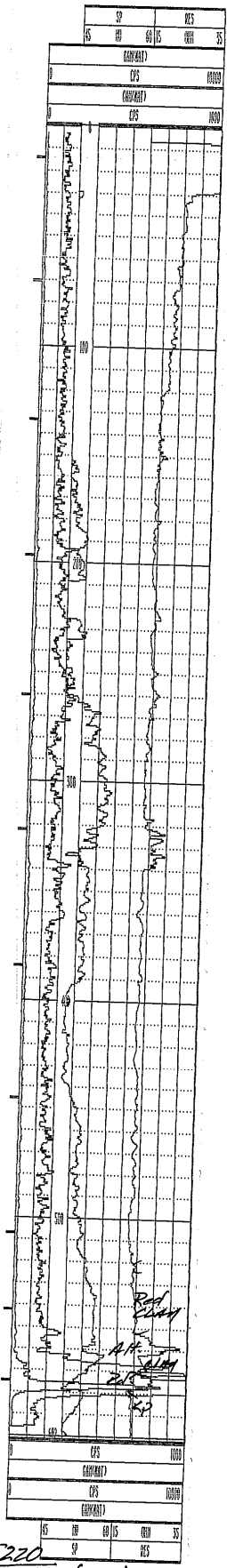
T216
diffe 13.5'
AZ 347.7

T-218
3675'
32N 52N 22 SESW
200' W from T93



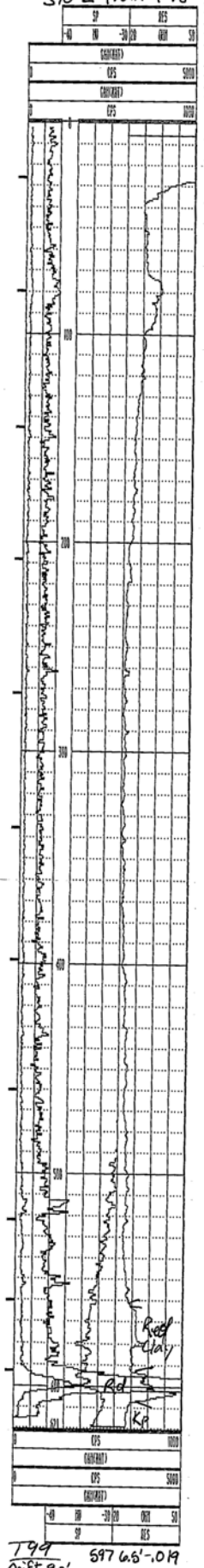
T218
582.0' 2.5-.021
diffe 5.0'
AZ 349.4

T-220
3680'
32N 52N 22 SESW
200' W from T219



T220
568.5' 1.0-.013
571.5' 4.0-.013
576.5' 4.0-.078
diffe 6.4' AZ 262

1-49
Elev. 3060
Sec 34 NW 1/4 32N 52E
390' E from T98



T99
diffe 9.0'
AZ 227.7

7648
Dn 57
10.3 SE

T-649
1.7' SE

T650
7.7
SW

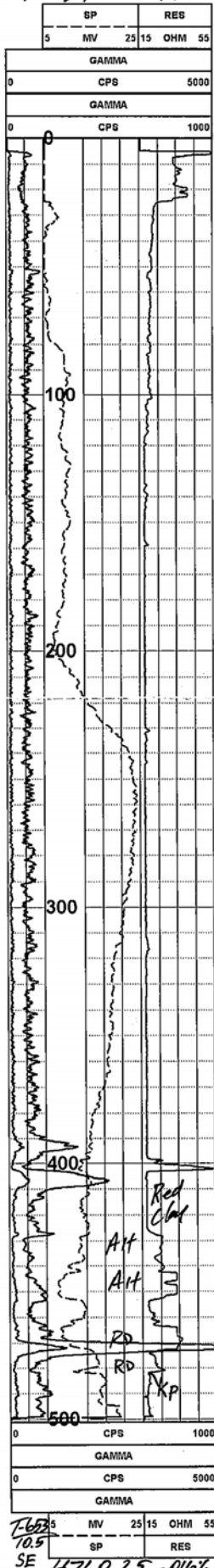
10	MV	35	15	OHM
SP		RES		

3.0' NNW

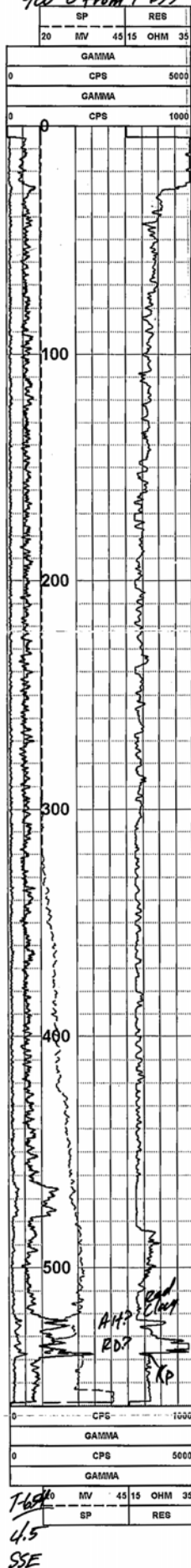
538.5 1.5' - .015 M

T-652
13.3
SE

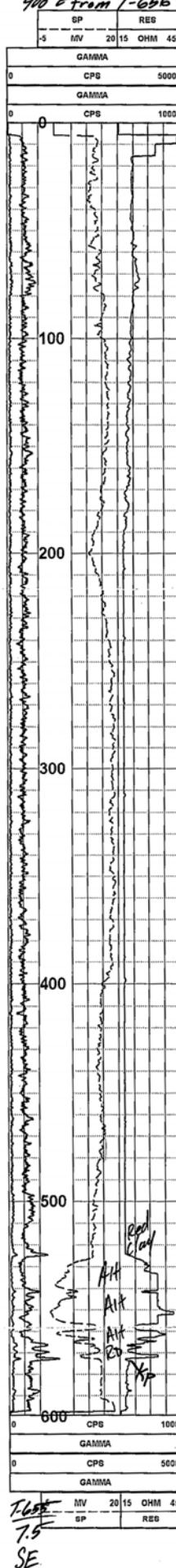
T-653
3635
SEC 74 NENE 32N 52W
400' E from T-654



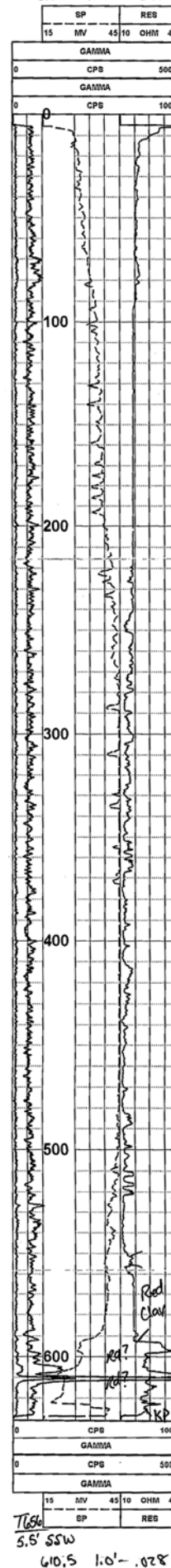
T-654
3640
SEC 74 NENE 32N 52W
400' S from T-655



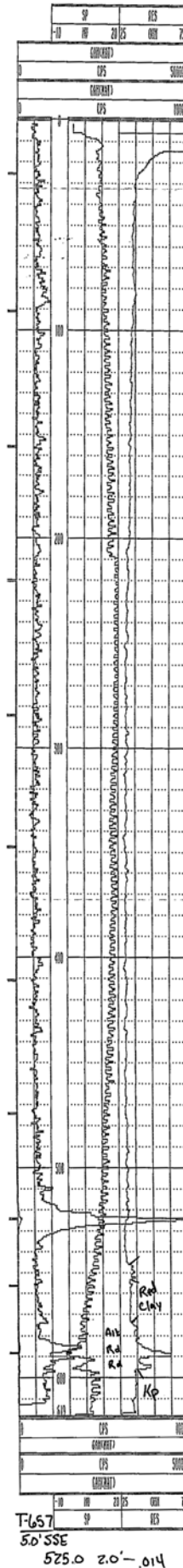
T-655
3645
SEC 74 NENE 32N 52W
400' E from T-656

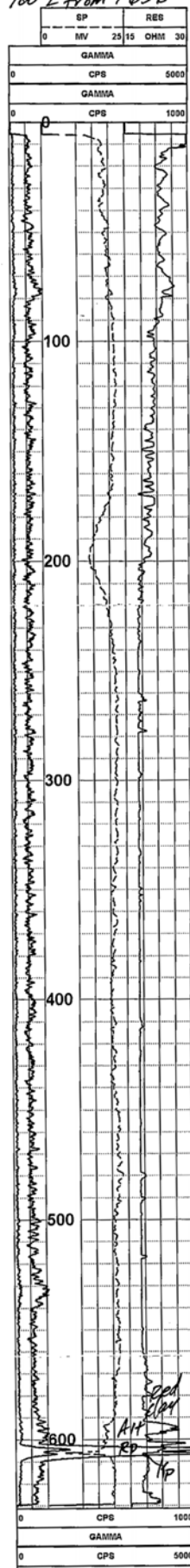
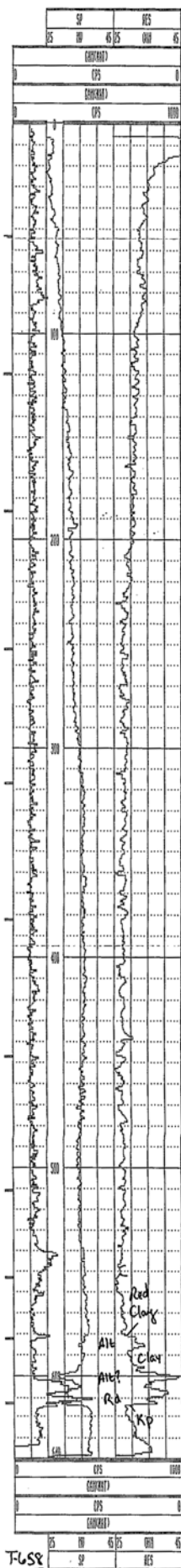


T-656
3645
SEC 74 NENE 32N 52W
800' N from T-651



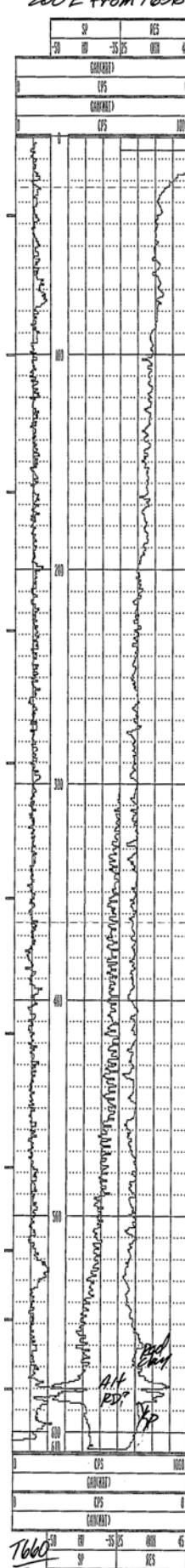
CBR-013
T-657
3650
SEC 74 NENE 32N 52W
400' N from T-651



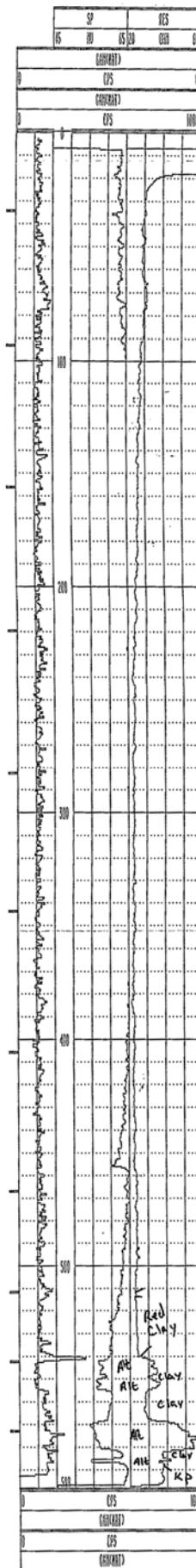


0	MV	25	15	OHM	30
GP				REG	

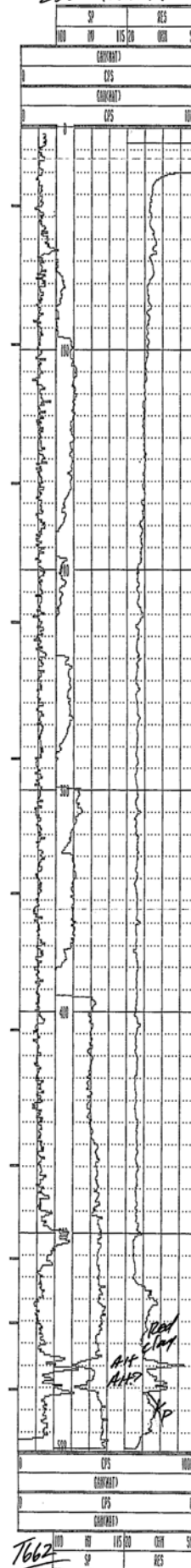
4.6
SW 604.0 3.0 .018%



T660
9.2
S



T661
8.6' SW



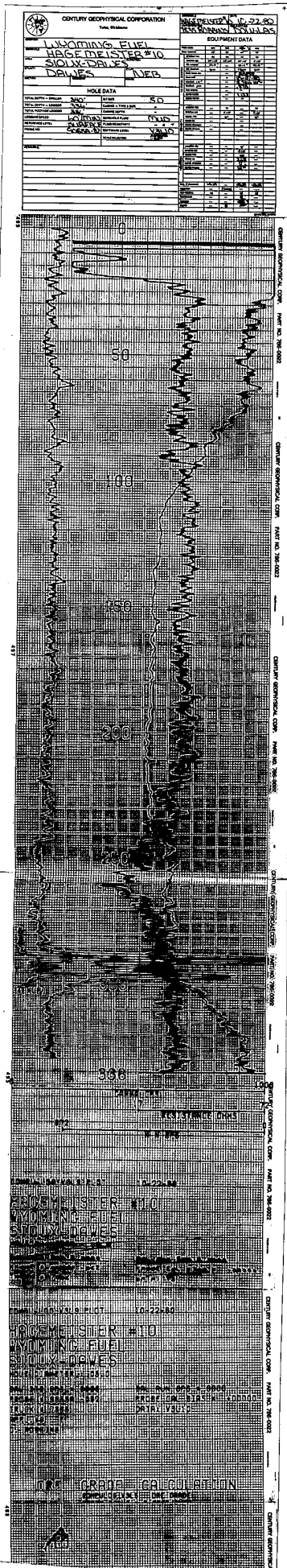
7662
8.4
SSE

10	MOV	25	10	OHM	35
SP			RES		

SSE 624.5 1.5 .022%

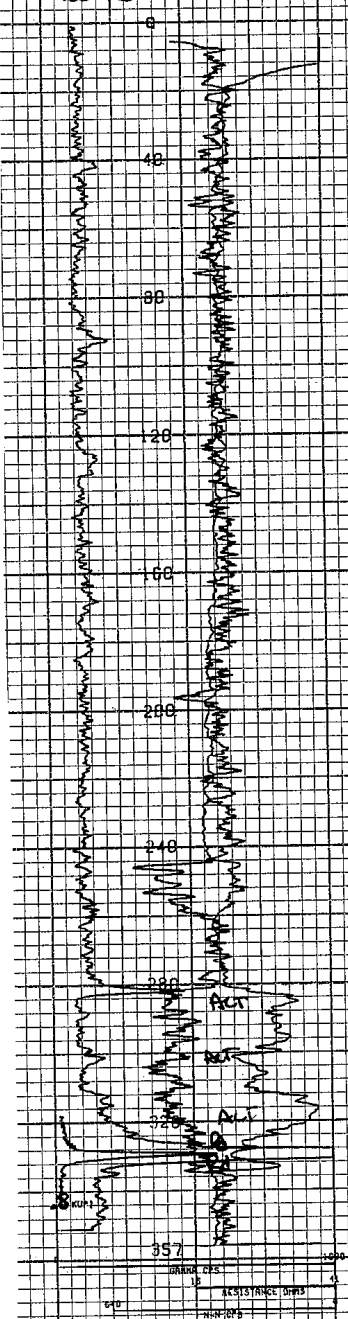
15	MV	15	15	OHM	55
GP			RES		

2.7
Sw 638.0 1.0.0111/

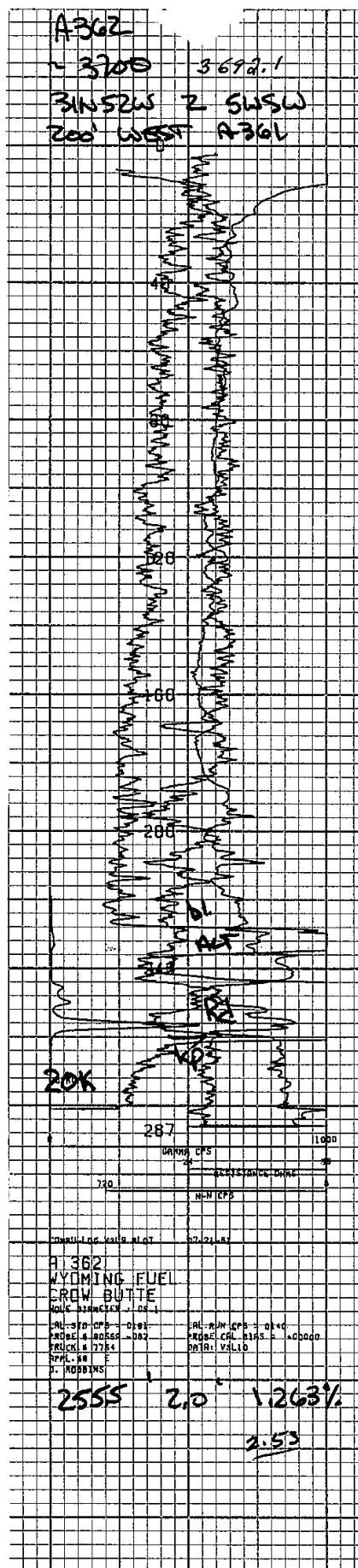
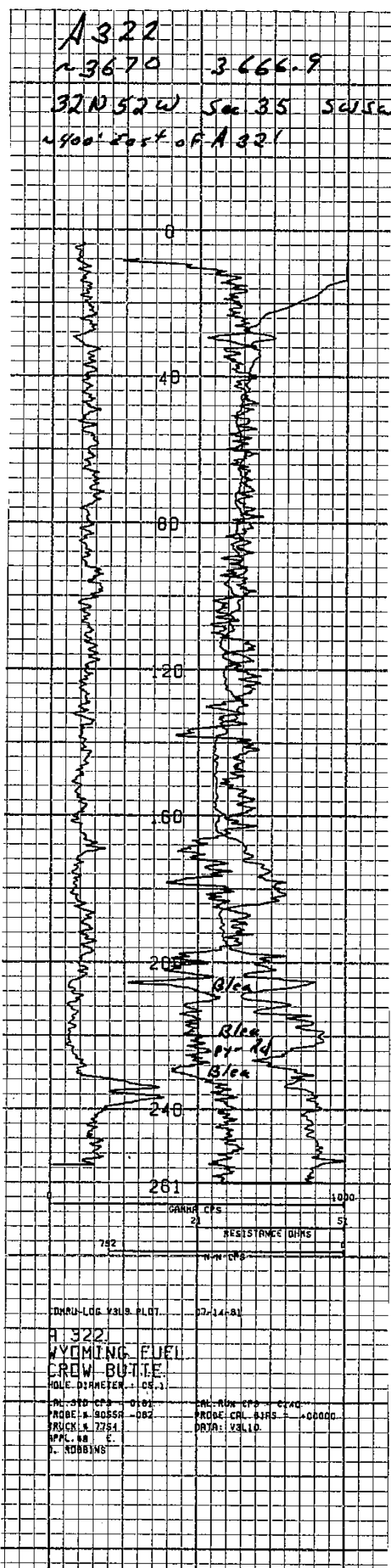


CBR-013

A299
~ 3745 3751.5
31N52W || SENW
400' NORTH OF R.10

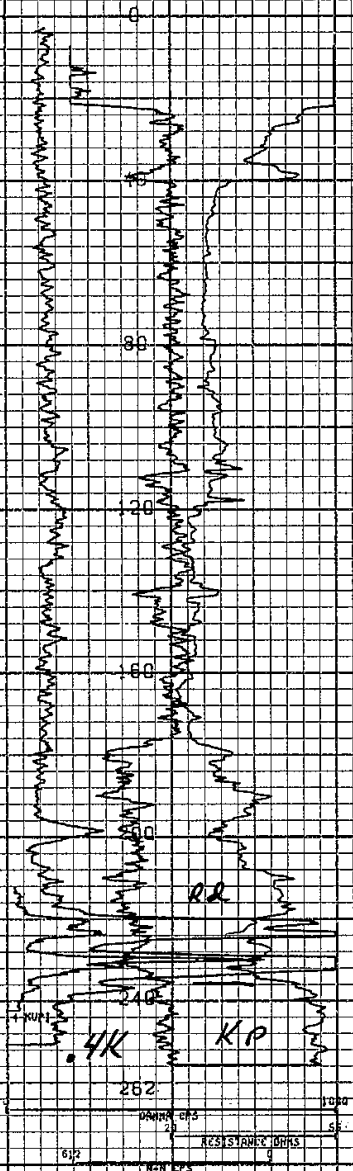


320P-LGS-731R-PLCT 32-0A-91
 R 299
 WYOMING FUEL
 CROW BUTTE
 (OLE DIAMETER : od 1
 CNA-5TP-1SP- 0100 CNA-RUN-CPB - 0156
 240RSC 1 500RSC -052 PROF-CAF-BIAS 8 - 120000
 CRUCHI 00 7794 DATA: V9L13
 WFL AP
 D. N080ZMS
 3208.5 1.5 1050%



A 484

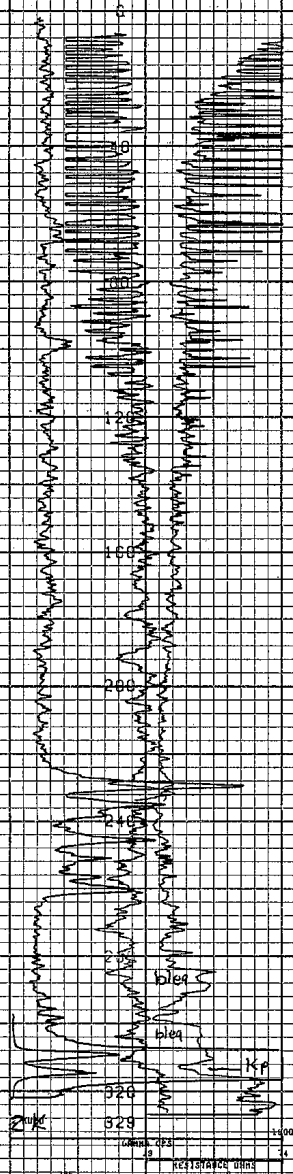
~3685 3689.9
31N 52W Sec 2 NE NW
200' North of A 483



ADP-100 7310 PLOT 08-27-81
A0484
WYOMING FUEL
CROW BUTTE
SOIL DIAMETER 1.05"
CAL. 500-000-0100 CAL. 500-000-0100
ADRE 10050-0100 ADRE 10050-0100
RUCK 10050-0100 RUCK 10050-0100
APPL. 611 6
CLARK HOFFMAN
221 4.5' .0127
230.5 4.0' .020

A 686

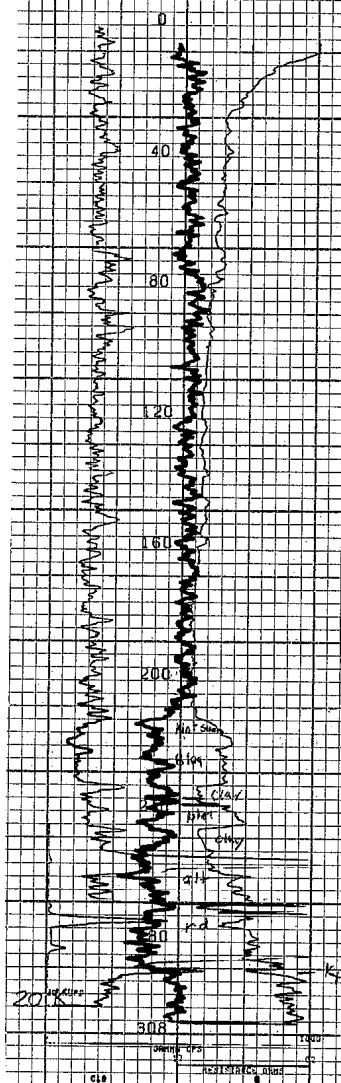
~3725.1
31N 52W Sec 11 SE NW
200' N of A 319



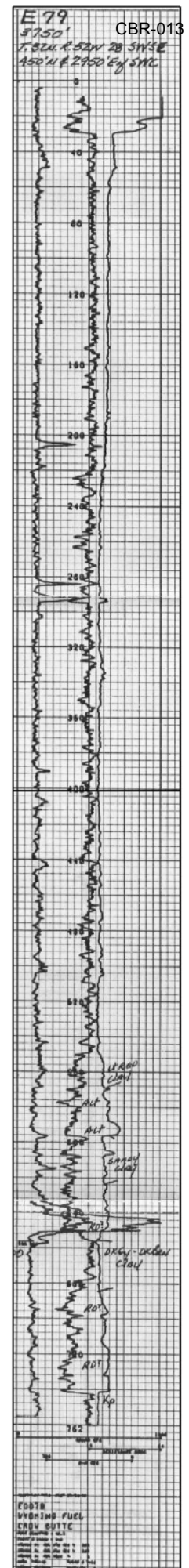
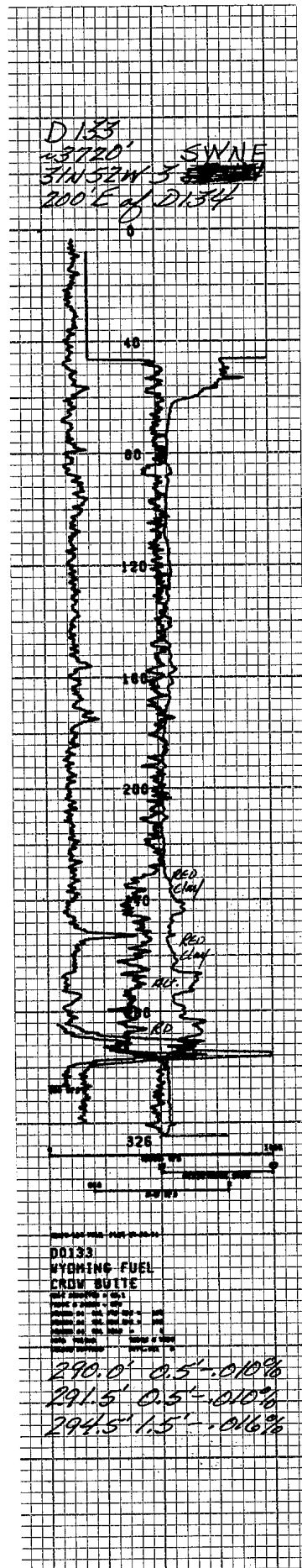
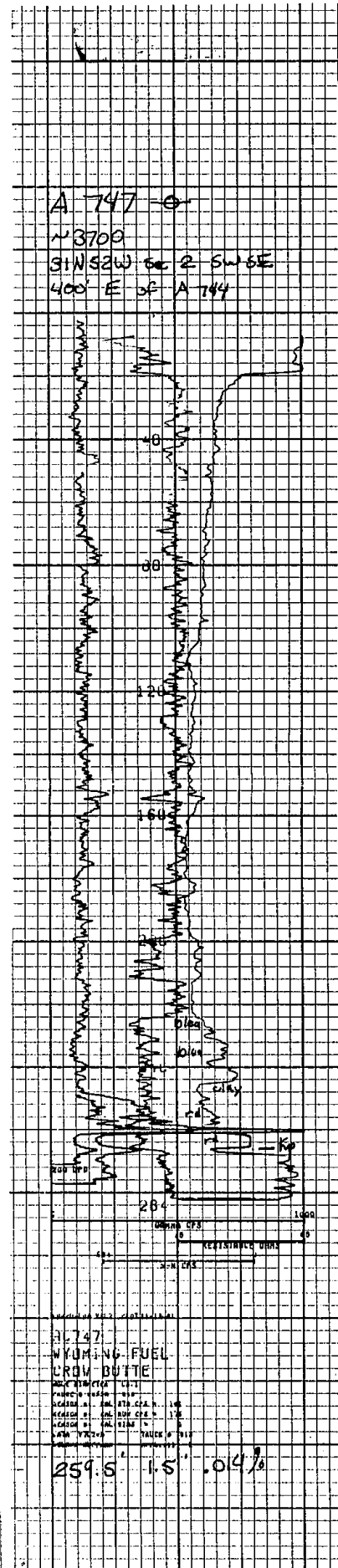
ADP-100 7310 PLOT 08-27-81
A0686
WYOMING FUEL
CROW BUTTE
SOIL DIAMETER 1.05"
CAL. 500-000-0100 CAL. 500-000-0100
ADRE 10050-0100 ADRE 10050-0100
RUCK 10050-0100 RUCK 10050-0100
APPL. 611 6
CLARK HOFFMAN
308.0 2.5' .0809
313.5 1.5' .0730

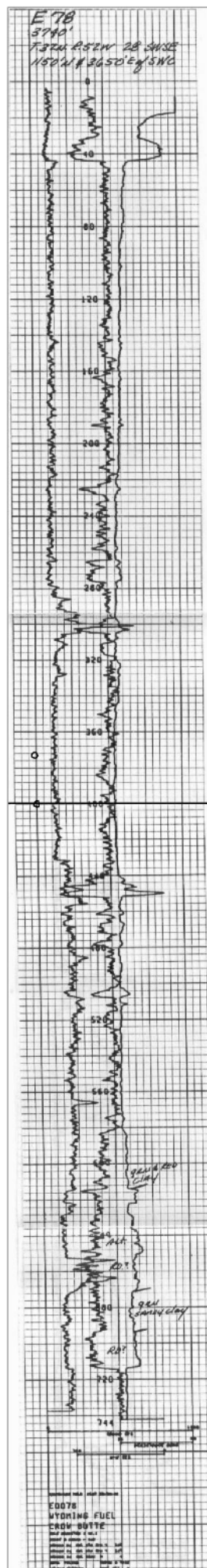
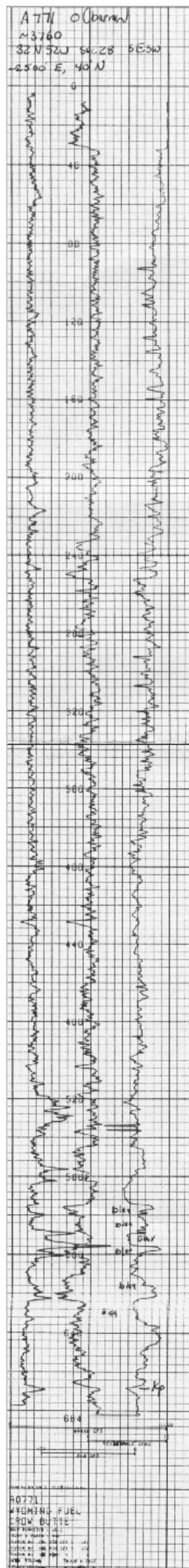
A 693

~3715 3712.2
31N 52W Sec 11 NW NW
200' W of R 37



ADP-100 7310 PLOT 08-27-81
A0693
WYOMING FUEL
CROW BUTTE
SOIL DIAMETER 1.05"
CAL. 500-000-0100 CAL. 500-000-0100
ADRE 10050-0100 ADRE 10050-0100
RUCK 10050-0100 RUCK 10050-0100
APPL. 611 6
CLARK HOFFMAN
274.5 3.0' .7198
283.5 1.0' .2260





April 3, 2008

Matt Spurlin
ARCADIS
2960 Center Green Court, Suite 202
Boulder, CO 80301

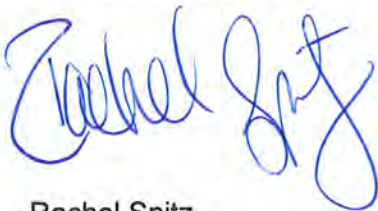
Re: North Trend; T-775
PTS File No: 38200

Dear Mr. Spurlin:

Enclosed are final data for samples submitted from your North Trend; T-775 Project. All analyses were performed by applicable ASTM, EPA or API methodology. An electronic version of the report has previously been sent to your attention. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal or return of the samples.

We appreciate the opportunity to be of service and trust these data will prove beneficial in the development of this project. Please call me at (562) 907-3607 with any questions or if you require additional information.

Sincerely,
PTS Laboratories, Inc.



Rachel Spitz
Project Manager

Encl.

PTS File No: 38200
Client: Arcadis

X-RAY DIFFRACTION MINERALOGICAL ANALYSIS DATA

PROJECT NAME: North Trend
PROJECT NO: T-775

	SAMPLE ID:	T-775 Sample 1	T-775 Sample 3	T-775 Sample 5	T-775 Sample 7
	DEPTH, ft.:	380-385	390-395	480-485	490-495
MINERAL CONSTITUENTS	CHEMICAL FORMULA	RELATIVE ABUNDANCE, percent			
Quartz	SiO ₂	26	12	8	10
Cristobalite	SiO ₂			5	2
Plagioclase Feldspar	(Na,Ca)AlSi ₃ O ₈	6	6	5	7
K-Feldspar	KAlSi ₃ O ₈	3	4	2	2
Calcite	CaCO ₃	1	2	18	17
Dolomite	(Ca,Mg)CO ₃	trc	8	7	5
Gypsum	CaSO ₄ . 2H ₂ O		trc	2	3
Pyrite	FeS ₂				
Hornblende	Ca ₂ (Mg,Fe) ₅ (Si,Al) ₈ O ₂₂ (OH) ₆				trc
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄	trc			
Chlorite	(Mg,Al) ₆ (Si,Al) ₄ O ₁₀ (OH) ₈	1			
Illite/Mica	KAl ₂ (Si ₃ AlO ₁₀)(OH) ₂	5	4	3	2
Mixed-Layered Illite/Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂ . 2H2O	58	64	50	52
% Illite Layers in M. L. Illite/Smectite		10-30%	0-10%	0-10%	0-10%
TOTAL		100	100	100	100

PTS File No: 38200
Client: Arcadis

X-RAY DIFFRACTION MINERALOGICAL ANALYSIS DATA

PROJECT NAME: North Trend
PROJECT NO: T-775

		SAMPLE ID:	T-775 Sample 9	T-775 Sample 11	T-775 Sample 13	T-775 Sample 14
		DEPTH, ft.:	580-585	590-595	700-710	690-700
MINERAL CONSTITUENTS	CHEMICAL FORMULA	RELATIVE ABUNDANCE, percent				
Quartz	SiO ₂	8	13	24	25	
Cristobalite	SiO ₂	9	12			
Plagioclase Feldspar	(Na,Ca)AlSi ₃ O ₈	4	3	11	8	
K-Feldspar	KAlSi ₃ O ₈	2	2	5	4	
Calcite	CaCO ₃	20	2	2	trc	
Dolomite	(Ca,Mg)CO ₃		1	1	trc	
Gypsum	CaSO ₄ . 2H ₂ O					
Pyrite	FeS ₂			1		
Hornblende	Ca ₂ (Mg,Fe) ₅ (Si,Al) ₈ O ₂₂ (OH) ₆	trc				
Kaolinite	Al ₂ Si ₂ O ₅ (OH) ₄			2	2	
Chlorite	(Mg,Al) ₆ (Si,Al) ₄ O ₁₀ (OH) ₈			1	1	
Illite/Mica	KAl ₂ (Si ₃ AlO ₁₀)(OH) ₂	1	trc	5	8	
Mixed-Layered Illite/Smectite	K _{0.5} Al ₂ (Si,Al) ₄ O ₁₀ (OH) ₂ . 2H ₂ O	56	67	48	52	
% Illite Layers in M. L. Illite/Smectite		5-15%	0-10%	10-20%	20-30%	
TOTAL		100	100	100	100	

PARTICLE SIZE SUMMARY
(METHODOLOGY: ASTM D422/D4464M)

PROJECT NAME: North Trend
PROJECT NO: T-775

Sample ID	Depth, ft.	Mean Grain Size Description (1)	Median Grain Size mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
T-775 Sample 1	380-385	Clay	0.004	0.00	0.00	0.00	38.74	61.26	100.00	
T-775 Sample 3	390-395	Silt	0.006	0.00	0.00	0.00	54.47	45.53	100.00	
T-775 Sample 5	480-485	Silt	0.006	0.00	0.00	0.00	54.49	45.51	100.00	
T-775 Sample 7	490-495	Silt	0.005	0.00	0.00	0.00	47.67	52.33	100.00	
T-775 Sample 9	580-585	Silt	0.006	0.00	0.00	0.00	60.57	39.43	100.00	
T-775 Sample 11	590-595	Silt	0.005	0.00	0.00	0.00	48.26	51.74	100.00	
T-775 Sample 13	700-710	Silt	0.004	0.00	0.00	0.00	42.05	57.95	100.00	
T-775 Sample 14	690-700	Clay	0.003	0.00	0.00	0.00	32.06	67.94	100.00	

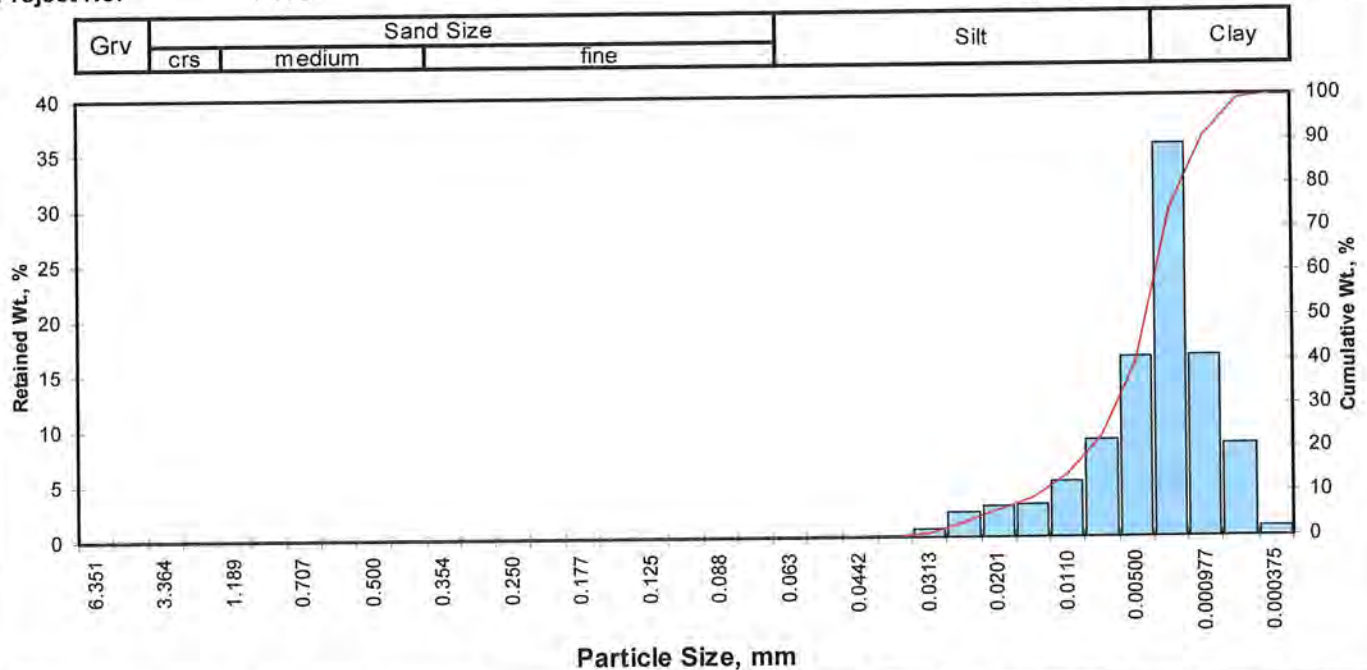
(1) Based on Mean from Trask

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 1
Depth, ft: 380-385



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.00	0.00	0.00
0.0070	0.177	2.50	80	0.00	0.00	0.00
0.0059	0.149	2.75	100	0.00	0.00	0.00
0.0049	0.125	3.00	120	0.00	0.00	0.00
0.0041	0.105	3.25	140	0.00	0.00	0.00
0.0035	0.088	3.50	170	0.00	0.00	0.00
0.0029	0.074	3.75	200	0.00	0.00	0.00
0.0025	0.063	4.00	230	0.00	0.00	0.00
0.0021	0.053	4.25	270	0.00	0.00	0.00
0.00174	0.0442	4.50	325	0.00	0.00	0.00
0.00146	0.0372	4.75	400	0.06	0.06	0.06
0.00123	0.0313	5.00	450	0.72	0.72	0.78
0.000986	0.0250	5.32	500	2.24	2.24	3.02
0.000790	0.0201	5.64	635	2.83	2.83	5.85
0.000615	0.0156	6.00		2.91	2.91	8.76
0.000435	0.0110	6.50		4.98	4.98	13.75
0.000308	0.00781	7.00		8.79	8.79	22.54
0.000197	0.00500	7.65		16.20	16.20	38.74
0.000077	0.00195	9.00		35.60	35.61	74.35
0.000038	0.000977	10.00		16.40	16.40	90.76
0.000019	0.000488	11.00		8.37	8.37	99.13
0.000015	0.000375	11.38		0.87	0.87	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	5.54	0.0008	0.021
10	6.12	0.0006	0.014
16	6.63	0.0004	0.010
25	7.10	0.0003	0.007
40	7.69	0.0002	0.005
50	8.07	0.0001	0.004
60	8.45	0.0001	0.003
75	9.04	0.0001	0.002
84	9.59	0.0001	0.001
90	9.95	0.0000	0.001
95	10.51	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	8.07	8.07	8.07
Median, in.	0.0001	0.0001	0.0001
Median, mm	0.004	0.004	0.004
Mean, phi	7.76	8.11	8.10
Mean, in.	0.0002	0.0001	0.0001
Mean, mm	0.005	0.004	0.004
Sorting	1.960	1.480	1.492
Skewness	1.003	0.024	0.002
Kurtosis	0.203	0.677	1.048

Grain Size Description	Clay
(ASTM-USCS Scale)	(based on Mean from Trask)

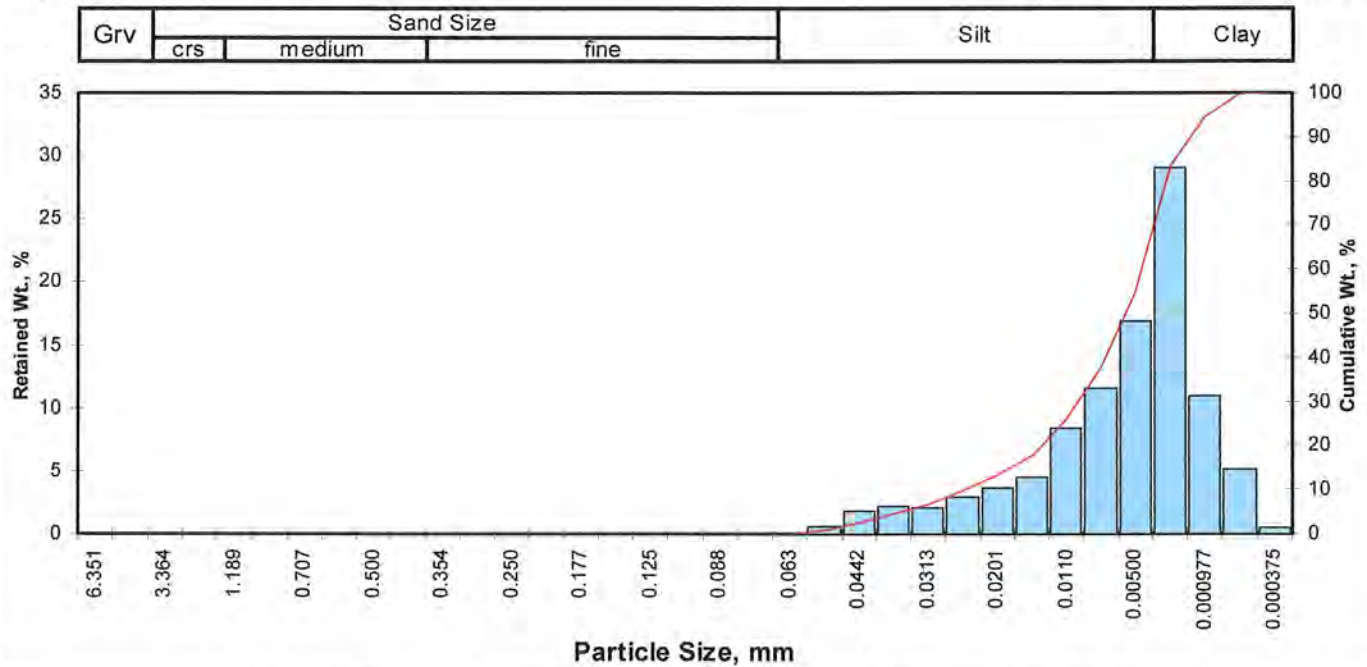
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	38.74
Clay	<0.005 mm	61.26
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 3
Depth, ft: 390-395



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent	Cumulative Weight Percent greater than			
Inches	Millimeters						Weight percent	Phi Value	Particle Size	
								Inches	Millimeters	
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00	5	4.80	0.0014	0.036
0.1873	4.757	-2.25	4	0.00	0.00	0.00	10	5.36	0.0010	0.024
0.1324	3.364	-1.75	6	0.00	0.00	0.00	16	5.86	0.0007	0.017
0.0787	2.000	-1.00	10	0.00	0.00	0.00	25	6.44	0.0005	0.012
0.0468	1.189	-0.25	16	0.00	0.00	0.00	40	7.09	0.0003	0.007
0.0331	0.841	0.25	20	0.00	0.00	0.00	50	7.47	0.0002	0.006
0.0278	0.707	0.50	25	0.00	0.00	0.00	60	7.90	0.0002	0.004
0.0234	0.595	0.75	30	0.00	0.00	0.00	75	8.60	0.0001	0.003
0.0197	0.500	1.00	35	0.00	0.00	0.00	84	9.05	0.0001	0.002
0.0166	0.420	1.25	40	0.00	0.00	0.00	90	9.60	0.0001	0.001
0.0139	0.354	1.50	45	0.00	0.00	0.00	95	10.12	0.0000	0.001
0.0117	0.297	1.75	50	0.00	0.00	0.00				
0.0098	0.250	2.00	60	0.00	0.00	0.00				
0.0083	0.210	2.25	70	0.00	0.00	0.00				
0.0070	0.177	2.50	80	0.00	0.00	0.00				
0.0059	0.149	2.75	100	0.00	0.00	0.00				
0.0049	0.125	3.00	120	0.00	0.00	0.00				
0.0041	0.105	3.25	140	0.00	0.00	0.00				
0.0035	0.088	3.50	170	0.00	0.00	0.00				
0.0029	0.074	3.75	200	0.00	0.00	0.00				
0.0025	0.063	4.00	230	0.03	0.03	0.03				
0.0021	0.053	4.25	270	0.55	0.55	0.58				
0.00174	0.0442	4.50	325	1.86	1.86	2.44				
0.00146	0.0372	4.75	400	2.16	2.16	4.60				
0.00123	0.0313	5.00	450	2.07	2.07	6.67				
0.000986	0.0250	5.32	500	2.90	2.90	9.57				
0.000790	0.0201	5.64	635	3.60	3.60	13.17				
0.000615	0.0156	6.00		4.55	4.55	17.72				
0.000435	0.0110	6.50		8.35	8.35	26.07				
0.000308	0.00781	7.00		11.50	11.50	37.57				
0.000197	0.00500	7.65		16.90	16.90	54.47				
0.000077	0.00195	9.00		29.00	29.00	83.47				
0.000038	0.000977	10.00		10.90	10.90	94.37				
0.000019	0.000488	11.00		5.11	5.11	99.48				
0.000015	0.000375	11.38		0.52	0.52	100.00				
TOTALS				100.00	100.00	100.00				

Measure	Trask	Inman	Folk-Ward
Median, phi	7.47	7.47	7.47
Median, in.	0.0002	0.0002	0.0002
Median, mm	0.006	0.006	0.006
Mean, phi	7.15	7.46	7.46
Mean, in.	0.0003	0.0002	0.0002
Mean, mm	0.007	0.006	0.006
Sorting	2.120	1.592	1.603
Skewness	0.969	-0.011	-0.008
Kurtosis	0.194	0.672	1.006

Grain Size Description		Silt	
(ASTM-USCS Scale)		(based on Mean from Trask)	

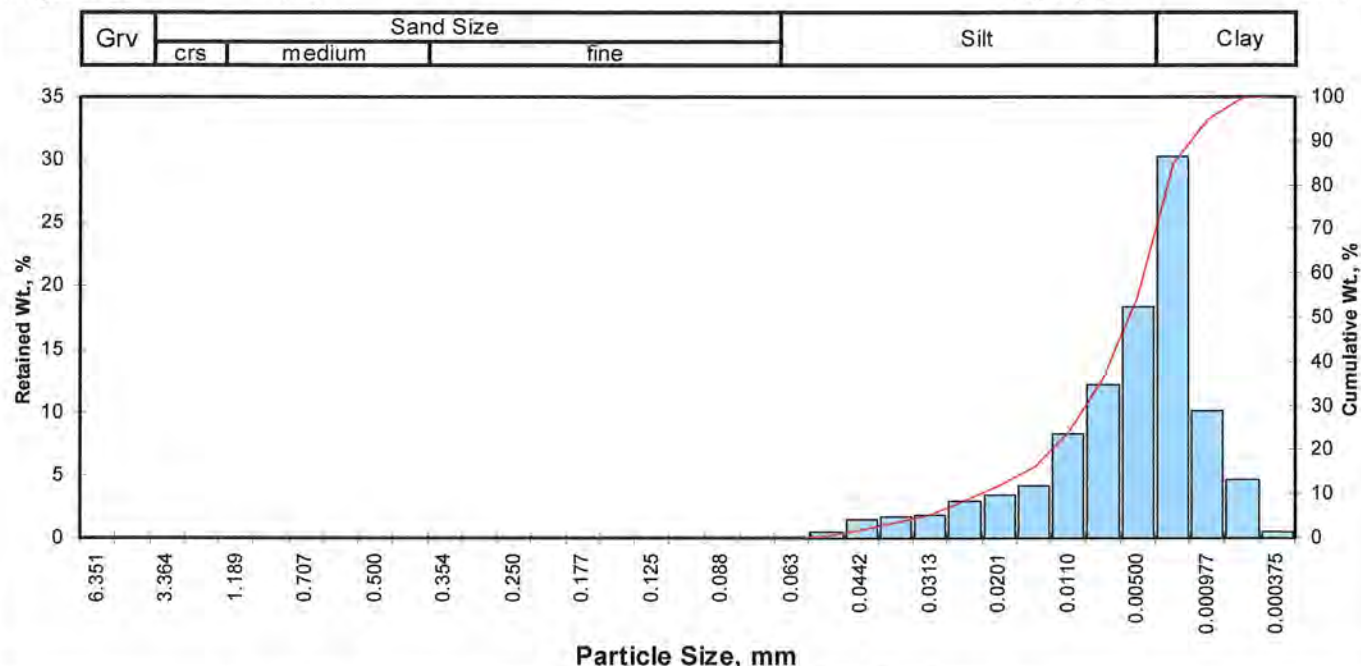
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	54.47
Clay	<0.005 mm	45.53
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 5
Depth, ft: 480-485



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.00	0.00	0.00
0.0070	0.177	2.50	80	0.00	0.00	0.00
0.0059	0.149	2.75	100	0.00	0.00	0.00
0.0049	0.125	3.00	120	0.00	0.00	0.00
0.0041	0.105	3.25	140	0.00	0.00	0.00
0.0035	0.088	3.50	170	0.00	0.00	0.00
0.0029	0.074	3.75	200	0.00	0.00	0.00
0.0025	0.063	4.00	230	0.02	0.02	0.02
0.0021	0.053	4.25	270	0.45	0.45	0.47
0.00174	0.0442	4.50	325	1.41	1.41	1.88
0.00146	0.0372	4.75	400	1.65	1.65	3.53
0.00123	0.0313	5.00	450	1.84	1.84	5.37
0.000986	0.0250	5.32	500	2.88	2.88	8.25
0.000790	0.0201	5.64	635	3.42	3.42	11.67
0.000615	0.0156	6.00		4.18	4.18	15.85
0.000435	0.0110	6.50		8.25	8.25	24.10
0.000308	0.00781	7.00		12.10	12.10	36.20
0.000197	0.00500	7.65		18.30	18.30	54.49
0.000077	0.00195	9.00		30.30	30.29	84.78
0.000038	0.000977	10.00		10.10	10.10	94.88
0.000019	0.000488	11.00		4.64	4.64	99.52
0.000015	0.000375	11.38		0.48	0.48	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	4.95	0.0013	0.032
10	5.48	0.0009	0.022
16	6.01	0.0006	0.016
25	6.54	0.0004	0.011
40	7.13	0.0003	0.007
50	7.49	0.0002	0.006
60	7.89	0.0002	0.004
75	8.56	0.0001	0.003
84	8.96	0.0001	0.002
90	9.52	0.0001	0.001
95	10.03	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	7.49	7.49	7.49
Median, in.	0.0002	0.0002	0.0002
Median, mm	0.006	0.006	0.006
Mean, phi	7.22	7.49	7.49
Mean, in.	0.0003	0.0002	0.0002
Mean, mm	0.007	0.006	0.006
Sorting	2.017	1.478	1.508
Skewness	0.957	0.000	0.000
Kurtosis	0.194	0.717	1.027

Grain Size Description	Silt
(ASTM-USCS Scale)	(based on Mean from Trask)

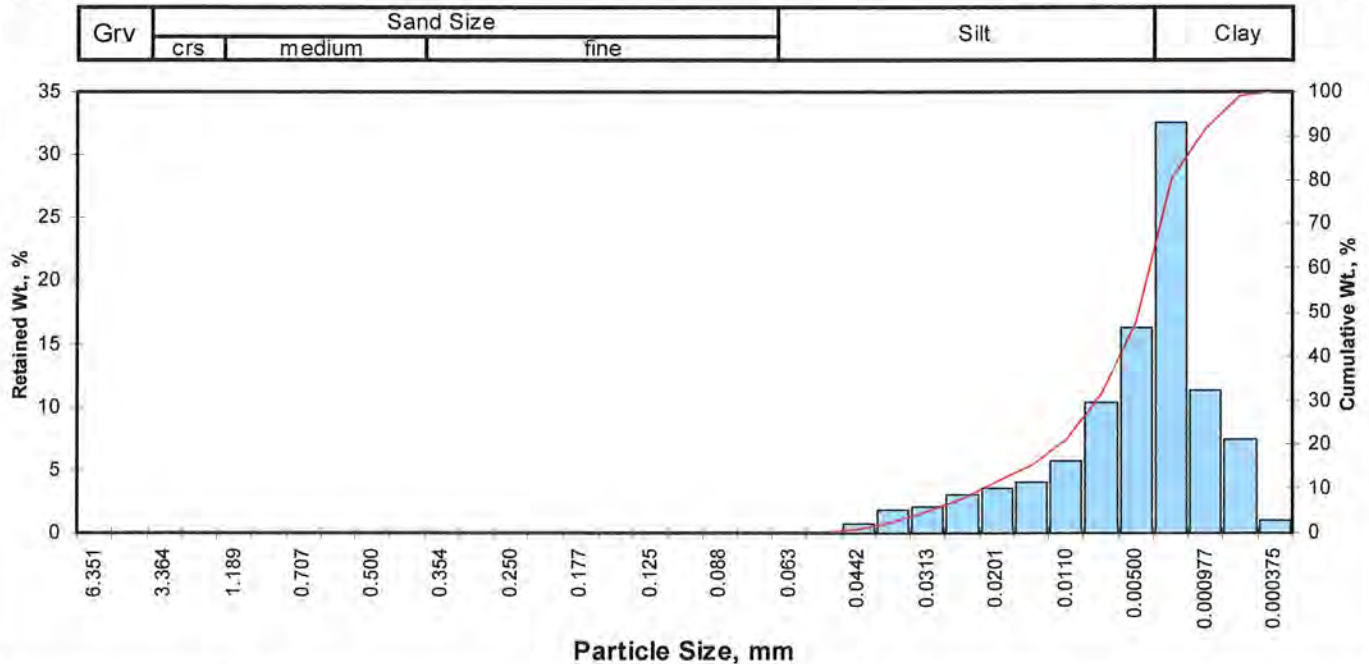
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	54.49
Clay	<0.005 mm	45.51
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 7
Depth, ft: 490-495



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.00	0.00	0.00
0.0070	0.177	2.50	80	0.00	0.00	0.00
0.0059	0.149	2.75	100	0.00	0.00	0.00
0.0049	0.125	3.00	120	0.00	0.00	0.00
0.0041	0.105	3.25	140	0.00	0.00	0.00
0.0035	0.088	3.50	170	0.00	0.00	0.00
0.0029	0.074	3.75	200	0.00	0.00	0.00
0.0025	0.063	4.00	230	0.00	0.00	0.00
0.0021	0.053	4.25	270	0.00	0.00	0.00
0.00174	0.0442	4.50	325	0.71	0.71	0.71
0.00146	0.0372	4.75	400	1.86	1.86	2.57
0.00123	0.0313	5.00	450	2.12	2.12	4.69
0.000986	0.0250	5.32	500	3.10	3.10	7.79
0.000790	0.0201	5.64	635	3.54	3.54	11.33
0.000615	0.0156	6.00		4.06	4.06	15.38
0.000435	0.0110	6.50		5.70	5.70	21.08
0.000308	0.00781	7.00		10.30	10.30	31.38
0.000197	0.00500	7.65		16.30	16.29	47.67
0.000077	0.00195	9.00		32.60	32.59	80.26
0.000038	0.000977	10.00		11.30	11.30	91.55
0.000019	0.000488	11.00		7.46	7.46	99.01
0.000015	0.000375	11.38		0.99	0.99	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	5.03	0.0012	0.031
10	5.52	0.0009	0.022
16	6.05	0.0006	0.015
25	6.69	0.0004	0.010
40	7.34	0.0002	0.006
50	7.74	0.0002	0.005
60	8.16	0.0001	0.004
75	8.78	0.0001	0.002
84	9.33	0.0001	0.002
90	9.86	0.0000	0.001
95	10.46	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	7.74	7.74	7.74
Median, in.	0.0002	0.0002	0.0002
Median, mm	0.005	0.005	0.005
Mean, phi	7.39	7.69	7.71
Mean, in.	0.0002	0.0002	0.0002
Mean, mm	0.006	0.005	0.005
Sorting	2.064	1.639	1.642
Skewness	1.004	-0.030	-0.014
Kurtosis	0.179	0.657	1.064

Grain Size Description	Silt
(ASTM-USCS Scale)	(based on Mean from Trask)

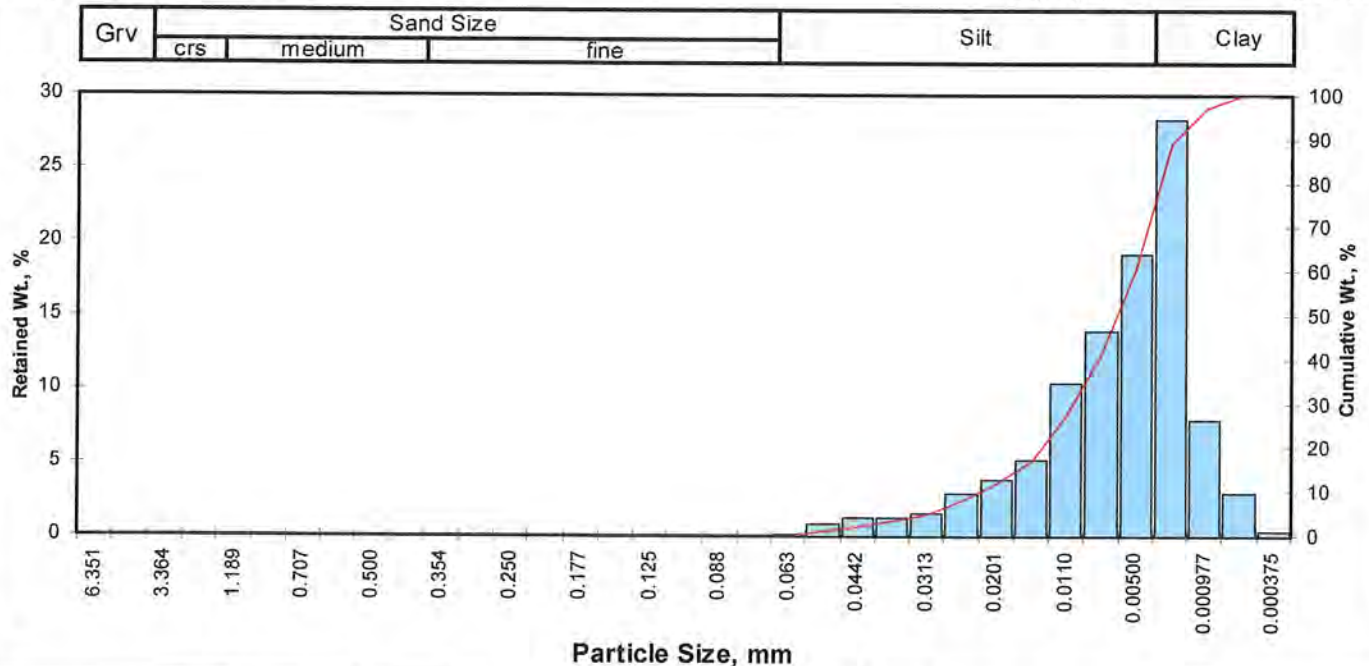
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	47.67
Clay	<0.005 mm	52.33
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 9
Depth, ft: 580-585



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.00	0.00	0.00
0.0070	0.177	2.50	80	0.00	0.00	0.00
0.0059	0.149	2.75	100	0.00	0.00	0.00
0.0049	0.125	3.00	120	0.00	0.00	0.00
0.0041	0.105	3.25	140	0.00	0.00	0.00
0.0035	0.088	3.50	170	0.00	0.00	0.00
0.0029	0.074	3.75	200	0.00	0.00	0.00
0.0025	0.063	4.00	230	0.12	0.12	0.12
0.0021	0.053	4.25	270	0.79	0.79	0.91
0.00174	0.0442	4.50	325	1.26	1.26	2.17
0.00146	0.0372	4.75	400	1.26	1.26	3.43
0.00123	0.0313	5.00	450	1.57	1.57	5.00
0.000986	0.0250	5.32	500	2.87	2.87	7.88
0.000790	0.0201	5.64	635	3.84	3.84	11.72
0.000615	0.0156	6.00		5.23	5.23	16.95
0.000435	0.0110	6.50		10.40	10.40	27.36
0.000308	0.00781	7.00		14.00	14.01	41.36
0.000197	0.00500	7.65		19.20	19.21	60.57
0.000077	0.00195	9.00		28.30	28.31	88.88
0.000038	0.000977	10.00		7.89	7.89	96.78
0.000019	0.000488	11.00		2.94	2.94	99.72
0.000015	0.000375	11.38		0.28	0.28	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	5.00	0.0012	0.031
10	5.50	0.0009	0.022
16	5.93	0.0006	0.016
25	6.39	0.0005	0.012
40	6.95	0.0003	0.008
50	7.29	0.0003	0.006
60	7.63	0.0002	0.005
75	8.34	0.0001	0.003
84	8.77	0.0001	0.002
90	9.14	0.0001	0.002
95	9.77	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	7.29	7.29	7.29
Median, in.	0.0003	0.0003	0.0003
Median, mm	0.006	0.006	0.006
Mean, phi	7.05	7.35	7.33
Mean, in.	0.0003	0.0002	0.0002
Mean, mm	0.008	0.006	0.006
Sorting	1.965	1.416	1.431
Skewness	0.952	0.043	0.042
Kurtosis	0.217	0.686	1.004

Grain Size Description	Silt
(ASTM-USCS Scale)	(based on Mean from Trask)

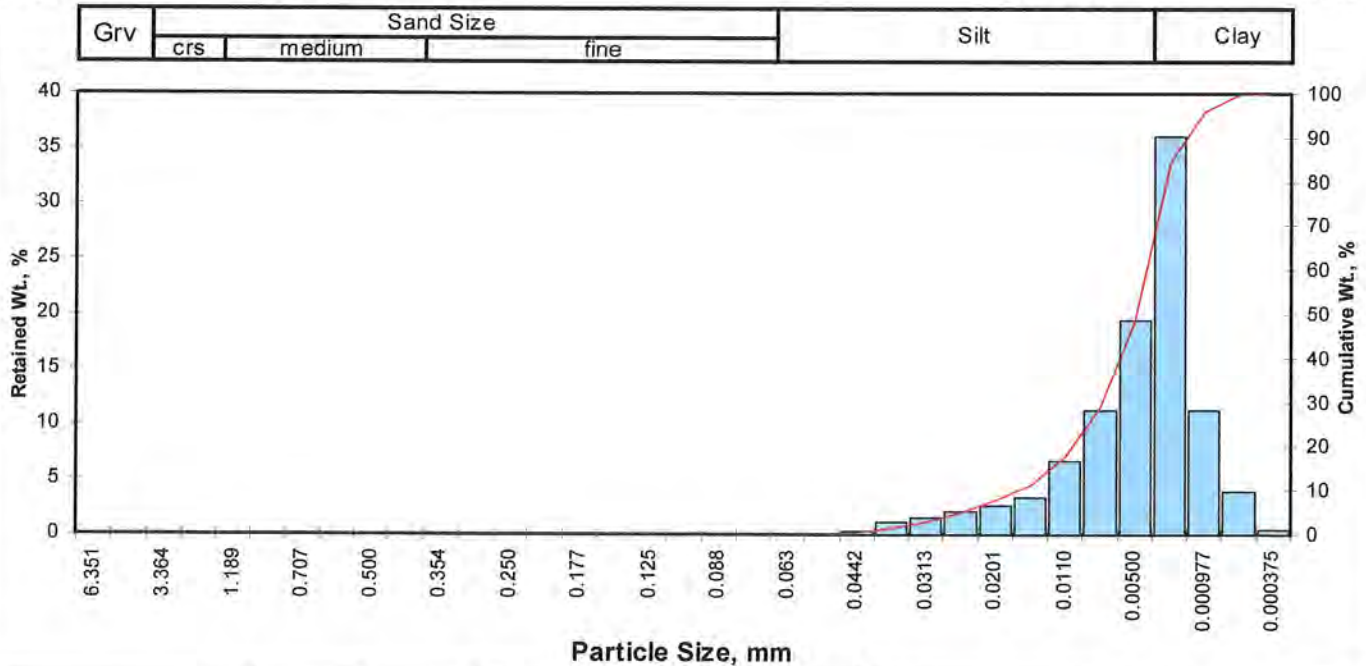
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	60.57
Clay	<0.005 mm	39.43
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 11
Depth, ft: 590-595



Particle Size, mm

Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent	Cumulative Weight Percent greater than			
Inches	Millimeters						Weight percent	Phi Value	Particle Size	
								Inches	Millimeters	
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00	5	5.32	0.0010	0.025
0.1873	4.757	-2.25	4	0.00	0.00	0.00	10	5.89	0.0007	0.017
0.1324	3.364	-1.75	6	0.00	0.00	0.00	16	6.38	0.0005	0.012
0.0787	2.000	-1.00	10	0.00	0.00	0.00	25	6.83	0.0003	0.009
0.0468	1.189	-0.25	16	0.00	0.00	0.00	40	7.37	0.0002	0.006
0.0331	0.841	0.25	20	0.00	0.00	0.00	50	7.71	0.0002	0.005
0.0278	0.707	0.50	25	0.00	0.00	0.00	60	8.09	0.0001	0.004
0.0234	0.595	0.75	30	0.00	0.00	0.00	75	8.65	0.0001	0.002
0.0197	0.500	1.00	35	0.00	0.00	0.00	84	8.99	0.0001	0.002
0.0166	0.420	1.25	40	0.00	0.00	0.00	90	9.50	0.0001	0.001
0.0139	0.354	1.50	45	0.00	0.00	0.00	95	9.94	0.0000	0.001
0.0117	0.297	1.75	50	0.00	0.00	0.00				
0.0098	0.250	2.00	60	0.00	0.00	0.00				
0.0083	0.210	2.25	70	0.00	0.00	0.00				
0.0070	0.177	2.50	80	0.00	0.00	0.00				
0.0059	0.149	2.75	100	0.00	0.00	0.00				
0.0049	0.125	3.00	120	0.00	0.00	0.00				
0.0041	0.105	3.25	140	0.00	0.00	0.00				
0.0035	0.088	3.50	170	0.00	0.00	0.00				
0.0029	0.074	3.75	200	0.00	0.00	0.00				
0.0025	0.063	4.00	230	0.00	0.00	0.00				
0.0021	0.053	4.25	270	0.01	0.01	0.01				
0.00174	0.0442	4.50	325	0.28	0.28	0.29				
0.00146	0.0372	4.75	400	1.09	1.09	1.38				
0.00123	0.0313	5.00	450	1.51	1.51	2.89				
0.000986	0.0250	5.32	500	2.12	2.12	5.01				
0.000790	0.0201	5.64	635	2.60	2.60	7.61				
0.000615	0.0156	6.00		3.38	3.38	11.00				
0.000435	0.0110	6.50		6.63	6.64	17.63				
0.000308	0.00781	7.00		11.20	11.21	28.84				
0.000197	0.00500	7.65		19.40	19.42	48.26				
0.000077	0.00195	9.00		36.10	36.13	84.39				
0.000038	0.000977	10.00		11.30	11.31	95.70				
0.000019	0.000488	11.00		3.94	3.94	99.64				
0.000015	0.000375	11.38		0.36	0.36	100.00				
TOTALS				99.90	100.00	100.00				

Measure	Trask	Inman	Folk-Ward
Median, phi	7.71	7.71	7.71
Median, in.	0.0002	0.0002	0.0002
Median, mm	0.005	0.005	0.005
Mean, phi	7.47	7.68	7.69
Mean, in.	0.0002	0.0002	0.0002
Mean, mm	0.006	0.005	0.005
Sorting	1.879	1.304	1.352
Skewness	0.981	-0.022	-0.029
Kurtosis	0.204	0.771	1.041

Grain Size Description		Silt	
(ASTM-USCS Scale)		(based on Mean from Trask)	

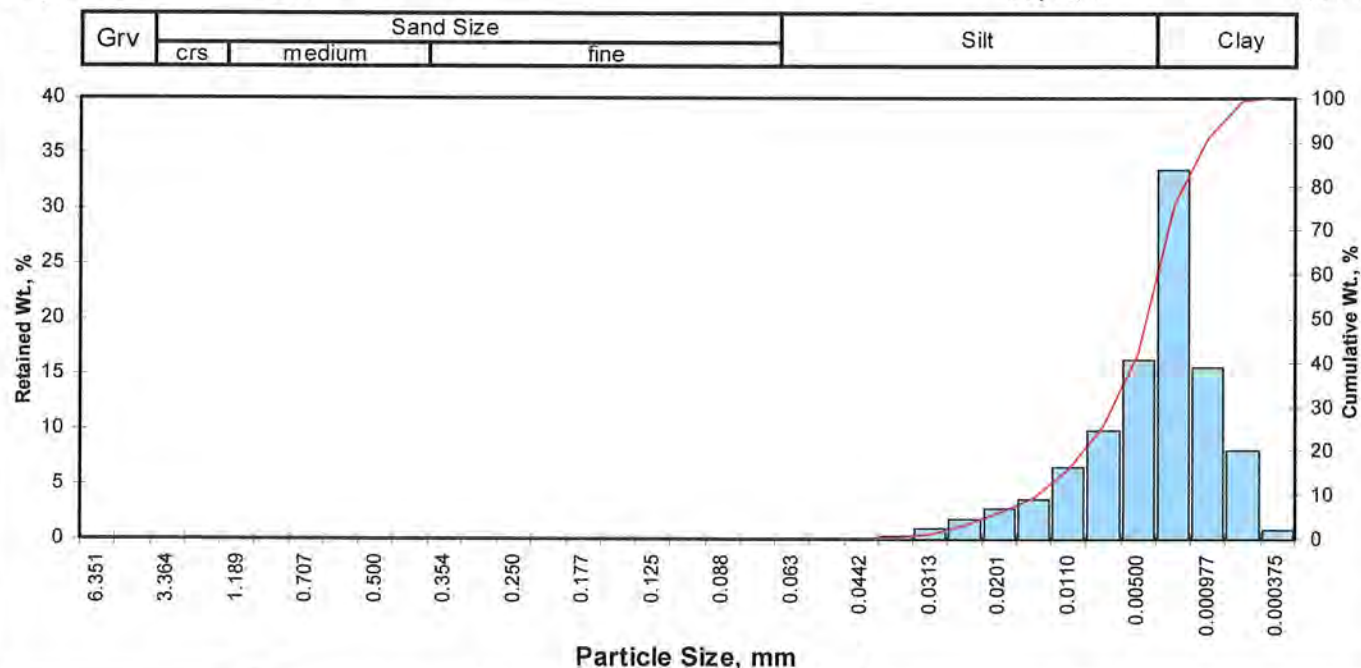
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	48.26
Clay	<0.005 mm	51.74
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 13
Depth, ft: 700-710



Particle Size, mm

Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.00	0.00	0.00
0.0070	0.177	2.50	80	0.00	0.00	0.00
0.0059	0.149	2.75	100	0.00	0.00	0.00
0.0049	0.125	3.00	120	0.00	0.00	0.00
0.0041	0.105	3.25	140	0.00	0.00	0.00
0.0035	0.088	3.50	170	0.00	0.00	0.00
0.0029	0.074	3.75	200	0.00	0.00	0.00
0.0025	0.063	4.00	230	0.00	0.00	0.00
0.0021	0.053	4.25	270	0.00	0.00	0.00
0.00174	0.0442	4.50	325	0.01	0.01	0.01
0.00146	0.0372	4.75	400	0.26	0.26	0.27
0.00123	0.0313	5.00	450	0.93	0.93	1.20
0.000986	0.0250	5.32	500	1.84	1.84	3.04
0.000790	0.0201	5.64	635	2.74	2.74	5.78
0.000615	0.0156	6.00		3.63	3.63	9.41
0.000435	0.0110	6.50		6.47	6.47	15.89
0.000308	0.00781	7.00		9.85	9.86	25.74
0.000197	0.00500	7.65		16.30	16.31	42.05
0.000077	0.00195	9.00		33.50	33.52	75.57
0.000038	0.000977	10.00		15.50	15.51	91.08
0.000019	0.000488	11.00		8.07	8.08	99.16
0.000015	0.000375	11.38		0.84	0.84	100.00
TOTALS				99.90	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	5.55	0.0008	0.021
10	6.05	0.0006	0.015
16	6.51	0.0004	0.011
25	6.96	0.0003	0.008
40	7.56	0.0002	0.005
50	7.97	0.0002	0.004
60	8.37	0.0001	0.003
75	8.98	0.0001	0.002
84	9.54	0.0001	0.001
90	9.93	0.0000	0.001
95	10.48	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	7.97	7.97	7.97
Median, in.	0.0002	0.0002	0.0002
Median, mm	0.004	0.004	0.004
Mean, phi	7.64	8.02	8.01
Mean, in.	0.0002	0.0002	0.0002
Mean, mm	0.005	0.004	0.004
Sorting	2.010	1.519	1.507
Skewness	0.998	0.038	0.029
Kurtosis	0.214	0.625	1.004

Grain Size Description	Silt
(ASTM-USCS Scale)	(based on Mean from Trask)

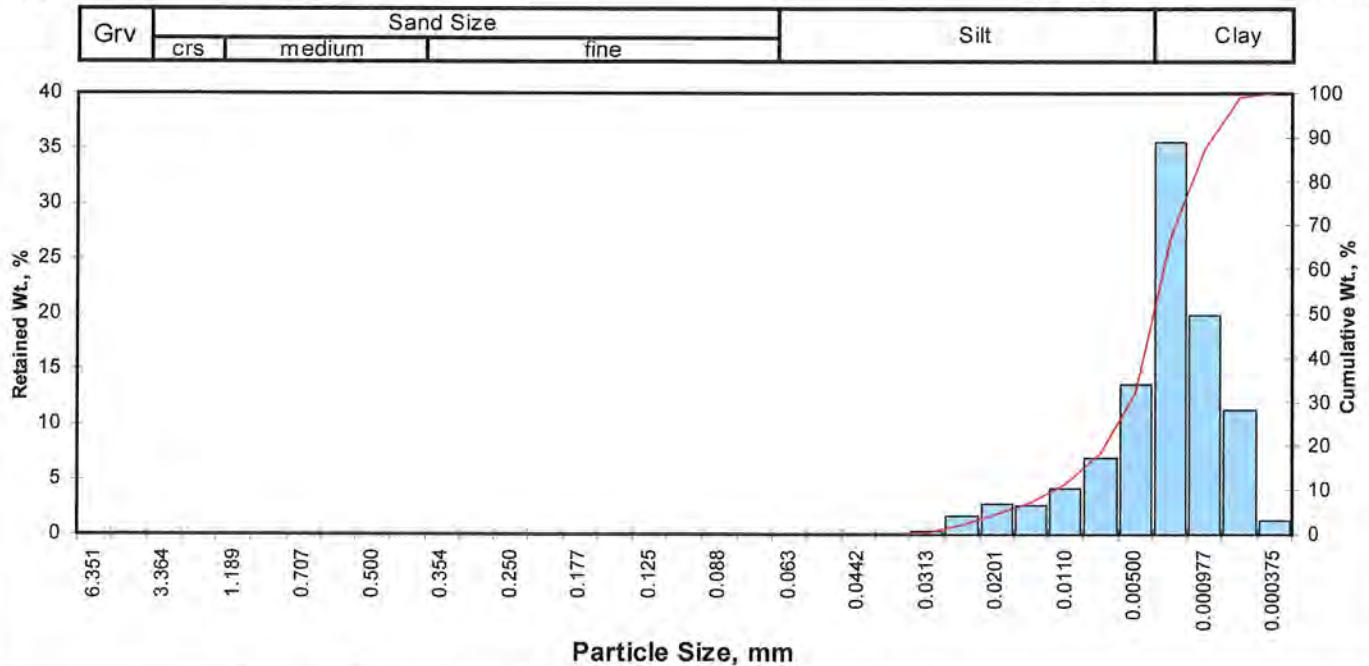
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	42.05
Clay	<0.005 mm	57.95
Total		100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Arcadis
Project: North Trend
Project No: T-775

PTS File No: 38200
Sample ID: T-775 Sample 14
Depth, ft: 690-700



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
Inches	Millimeters					
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.00	0.00	0.00
0.0070	0.177	2.50	80	0.00	0.00	0.00
0.0059	0.149	2.75	100	0.00	0.00	0.00
0.0049	0.125	3.00	120	0.00	0.00	0.00
0.0041	0.105	3.25	140	0.00	0.00	0.00
0.0035	0.088	3.50	170	0.00	0.00	0.00
0.0029	0.074	3.75	200	0.00	0.00	0.00
0.0025	0.063	4.00	230	0.00	0.00	0.00
0.0021	0.053	4.25	270	0.00	0.00	0.00
0.00174	0.0442	4.50	325	0.00	0.00	0.00
0.00146	0.0372	4.75	400	0.00	0.00	0.00
0.00123	0.0313	5.00	450	0.24	0.24	0.24
0.000986	0.0250	5.32	500	1.69	1.69	1.93
0.000790	0.0201	5.64	635	2.75	2.75	4.68
0.000615	0.0156	6.00		2.70	2.70	7.38
0.000435	0.0110	6.50		4.13	4.13	11.50
0.000308	0.00781	7.00		6.97	6.96	18.47
0.000197	0.00500	7.65		13.60	13.59	32.06
0.000077	0.00195	9.00		35.60	35.57	67.63
0.000038	0.000977	10.00		19.90	19.88	87.51
0.000019	0.000488	11.00		11.30	11.29	98.80
0.000015	0.000375	11.38		1.20	1.20	100.00
TOTALS				100.10	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	5.68	0.0008	0.019
10	6.32	0.0005	0.013
16	6.82	0.0003	0.009
25	7.31	0.0002	0.006
40	7.95	0.0002	0.004
50	8.33	0.0001	0.003
60	8.71	0.0001	0.002
75	9.37	0.0001	0.002
84	9.82	0.0000	0.001
90	10.22	0.0000	0.001
95	10.66	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	8.33	8.33	8.33
Median, in.	0.0001	0.0001	0.0001
Median, mm	0.003	0.003	0.003
Mean, phi	8.00	8.32	8.32
Mean, in.	0.0002	0.0001	0.0001
Mean, mm	0.004	0.003	0.003
Sorting	2.043	1.500	1.505
Skewness	0.992	-0.004	-0.033
Kurtosis	0.205	0.660	0.991

Grain Size Description	Clay
(ASTM-USCS Scale)	(based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	0.00
Silt	>0.005 mm	32.06
Clay	<0.005 mm	67.94
Total		100

CHAIN OF CUSTODY RECORD

COMPANY Arcadis - Arranged with PTS Crow Butte Resources, Inc. ADDRESS: 86 Crow Butte Rd, Crawford, NE 69339 CITY: ZIP CODE: 69339 PROJECT MANAGER: Wade Beins PROJECT NAME: North Trend PROJECT NUMBER: 308 665 2215 ext 113 T-775 PHONE NUMBER: 308 665 2341 FAX NUMBER: SITE LOCATION: Section 22 T 32N R 52W SAMPLER SIGNATURE: <i>Wade Beins</i>				ANALYSIS REQUEST TURNAROUND TIME: 24 HOURS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> 72 HOURS <input type="checkbox"/> OTHER: <input checked="" type="checkbox"/> 5 DAYS NORMAL SAMPLE INTEGRITY (CHECK): INTACT <input checked="" type="checkbox"/> ON ICE <input type="checkbox"/> PTS QUOTE NO. 38200 PTS FILE: COMMENTS:														PO# 8305	
NUMBER OF SAMPLES SOLID PROPERTIES PACKAGE HYDRAULIC CONDUCTIVITY PACKAGE PORE FLUID SATURATIONS PACKAGE TCEO/INRGC PROPERTIES PACKAGE CAPILLARITY PACKAGE FLUID PROPERTIES PACKAGE PHOTOLOG: CORE PHOTOGRAPHY MOISTURE CONTENT, ASTM D2216 POROSITY: TOTAL, API RP40 POROSITY: EFFECTIVE, ASTM D425M SPECIFIC GRAVITY, ASTM D854 BULK DENSITY (DRY), API RP40 or ASTM D2937 AIR PERMEABILITY, API RP40 HYDRAULIC CONDUCTIVITY, EPA8100, API RP40, D5094 GRAIN SIZE DISTRIBUTION, ASTM D422/464M TOC: WALKLEY-BLACK ATTERBERG LIMITS, ASTM D4318 X-Ray diffraction																			
SAMPLE ID NUMBER T-775 Sample 1 T-775 Sample 3 T-775 Sample 5 T-775 Sample 7 T-775 Sample 9 T-775 Sample 11 T-775 Sample 13 T-775 Sample 14				DATE 3-6-08 3-6-08 3-6-08 3-6-08 3-6-08 3-6-08 3-6-08				TIME 380'-385' 390'-395' 480'-485' 490'-495' 580'-585' 590'-595' 700'-710' 690'-700'				DEPTH, FT 380'-385' 390'-395' 480'-485' 490'-495' 580'-585' 590'-595' 700'-710' 690'-700'							
1. RELINQUISHED BY Wade Beins COMPANY: Crow Butte Resources DATE: 3-7-08 TIME:				2. RECEIVED BY A-R COMPANY: PTS DATE: 3-10-08 TIME: 1455				3. RELINQUISHED BY COMPANY: DATE: TIME:				4. RECEIVED BY COMPANY: DATE: TIME:							

Well Completion Report

Company: Crow Butte Resources, Inc.

Project: Crow Butte

Well Type: Production/Injection _____ Monitor X

Well No. COW-2004-6

Ground Elevation: 3668 ft.

Wellhead Elevation: 3670 ft.

Drilling Contractor: Landrill Exploration

Driller: S. Osmotherly

Mud Products: 2 Bags Super Gel 2 Quart Polymer

Bit Size: 8 Inch

Drilling Begun: 2/11/2008

Drilling Completed On: 2/13/2008

Completed Formation: 0

Depth Drilled: 510 ft.

Casing Diameter: 4.95 inch O.D.

Casing Type: White Certalok

Casing Depth: 449 ft.

Basket Depth: N/A ft.

Packer Type: Johnson K-packer

Packer Depth: 416 ft.

Centralizer Depths: 20, 40, 100, 160, 220, 280, 340, 400

ft.

ft.

Screen Size: 3 inch by .020 inch

Gravel Size:

Screened Interval(s): 449 ft. - 476 ft.

ft. - 694 ft. 709

ft. - ft.

ft. - ft.

Completed Formation Upper Boundary: 447 ft.

Lower Boundary: 498 ft.

Cement Contractor: Crow Butte Resources

Operator: Jordan

Estimated Cement Volume: 17.3 bbls.

Actual Cement Volume Used: 26.0 bbls.

Cement Density: 12.1 lbs/gal

Water Volume Used: 18.6 bbls.

Cement Type/Class: I/II API

Additives: 500 lbs. Salt 500 lbs. Bentonite

Cement Circulated to Surface: 0 bbls.

Density At Surface: 9 lbs/gal

Logging Contractor: Century Geophysical Corp.

Operator: Dunn

Unit No.: 0001

Probe No.: 9055C

Log Type: Gamma, SP, Resistance, Deviation

Well Deviation: 1.4 ft. at 40.8 degrees

Remarks: Filled outer borehole to surface with bentonite chips

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins

Title : Senior Geologist

Date:

March 25, 2008



ANALYTICAL SUMMARY REPORT

June 04, 2008

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C08030343

Quote ID: C1125 - Crow Butte Uranium Project

Project Name: North Trend Baseline

Energy Laboratories, Inc. received the following 11 samples from Crow Butte Resources on 3/10/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08030343-001	97	03/03/08 15:22	03/10/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate
C08030343-002	123	03/03/08 14:42	03/10/08	Aqueous	Same As Above
C08030343-003	RC-1	03/04/08 15:30	03/10/08	Aqueous	Same As Above
C08030343-004	RC-2	03/04/08 16:06	03/10/08	Aqueous	Same As Above
C08030343-005	Cow 1	03/04/08 09:43	03/10/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate



C08030343-006 Cow 3	03/04/08 15:48 03/10/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate
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C08030343-007 Cow 4	03/04/08 13:12 03/10/08	Aqueous	Same As Above
C08030343-008 Cow 2	03/05/08 16:35 03/10/08	Aqueous	Same As Above
C08030343-009 Cow 5	03/05/08 14:23 03/10/08	Aqueous	Same As Above
C08030343-010 CPW-2	03/05/08 10:04 03/10/08	Aqueous	Same As Above
C08030343-011 Cow 6	03/06/08 13:14 03/10/08	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: 
STEVE CARLSTON



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-001
Client Sample ID: 97

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/03/08 15:22
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	315	mg/L		1		A2320 B	03/11/08 13:08 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 13:08 / bas
Bicarbonate as HCO ₃	384	mg/L		1		A2320 B	03/11/08 13:08 / bas
Calcium	17	mg/L		1		E200.7	03/12/08 12:17 / cp
Chloride	152	mg/L		1		A4500-Cl B	03/25/08 08:52 / ljl
Fluoride	1.1	mg/L		0.1		A4500-F C	03/11/08 09:31 / bas
Magnesium	1	mg/L		1		E200.7	03/12/08 12:17 / cp
Nitrogen, Ammonia as N	0.39	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:19 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 10:37 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:03 / jal
Potassium	15	mg/L		1		E200.7	03/12/08 12:17 / cp
Silica	10.0	mg/L		0.1		E200.7	03/12/08 12:17 / cp
Sodium	502	mg/L	D	4		E200.7	03/12/08 12:17 / cp
Sulfate	576	mg/L	D	10		A4500-SO ₄ E	03/24/08 15:47 / ljl
PHYSICAL PROPERTIES							
Conductivity	2410	umhos/cm		1.0		A2510 B	03/11/08 11:10 / dd
pH	8.17	s.u.	H	0.01		A4500-H B	03/11/08 11:10 / dd
Solids, Total Dissolved TDS @ 180 C	1390	mg/L	H	10		A2540 C	03/11/08 15:05 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/12/08 05:30 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/12/08 05:30 / ts
Barium	ND	mg/L		0.1		E200.8	03/12/08 05:30 / ts
Boron	1.5	mg/L		0.1		E200.7	03/12/08 12:17 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/12/08 05:30 / ts
Chromium	ND	mg/L		0.05		E200.8	03/12/08 05:30 / ts
Copper	ND	mg/L		0.01		E200.8	03/12/08 05:30 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:17 / cp
Lead	ND	mg/L		0.001		E200.8	03/12/08 05:30 / ts
Manganese	ND	mg/L		0.01		E200.8	03/12/08 05:30 / ts
Mercury	ND	mg/L		0.001		E200.8	03/12/08 05:30 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/12/08 05:30 / ts
Nickel	ND	mg/L		0.05		E200.8	03/12/08 05:30 / ts
Selenium	0.005	mg/L		0.001		E200.8	03/13/08 05:20 / ts
Uranium	ND	mg/L		0.0003		E200.8	03/12/08 05:30 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/12/08 05:30 / ts
Zinc	ND	mg/L		0.01		E200.8	03/12/08 05:30 / ts

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-001
Client Sample ID: 97

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/03/08 15:22
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.8		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	1.8	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	ND	pCi/L	U	0.8		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	0.8	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	0.4	pCi/L		0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	1.20	%				Calculation	03/31/08 12:15 / sw
Anions	22.6	meq/L				Calculation	03/31/08 12:15 / sw
Cations	23.2	meq/L				Calculation	03/31/08 12:15 / sw
Solids, Total Dissolved Calculated	1460	mg/L				Calculation	03/31/08 12:15 / sw
TDS Balance (0.80 - 1.20)	0.950	dec. %				Calculation	03/31/08 12:15 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-002
Client Sample ID: 123

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/03/08 14:42
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	313	mg/L		1		A2320 B	03/11/08 13:15 / bas
Carbonate as CO ₃	3	mg/L		1		A2320 B	03/11/08 13:15 / bas
Bicarbonate as HCO ₃	375	mg/L		1		A2320 B	03/11/08 13:15 / bas
Calcium	10	mg/L		1		E200.7	03/12/08 12:27 / cp
Chloride	170	mg/L		1		A4500-Cl B	03/25/08 08:55 / ljl
Fluoride	0.8	mg/L		0.1		A4500-F C	03/11/08 09:34 / bas
Magnesium	ND	mg/L		1		E200.7	03/12/08 12:27 / cp
Nitrogen, Ammonia as N	0.27	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:21 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 10:40 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:04 / jal
Potassium	10	mg/L		1		E200.7	03/12/08 12:27 / cp
Silica	10.6	mg/L		0.1		E200.7	03/12/08 12:27 / cp
Sodium	452	mg/L	D	4		E200.7	03/12/08 12:27 / cp
Sulfate	435	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:24 / ljl
PHYSICAL PROPERTIES							
Conductivity	2170	umhos/cm		1.0		A2510 B	03/11/08 11:11 / dd
pH	8.26	s.u.	H	0.01		A4500-H B	03/11/08 11:11 / dd
Solids, Total Dissolved TDS @ 180 C	1200	mg/L	H	10		A2540 C	03/11/08 15:05 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/12/08 05:37 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/12/08 05:37 / ts
Barium	ND	mg/L		0.1		E200.8	03/12/08 05:37 / ts
Boron	1.4	mg/L		0.1		E200.7	03/12/08 12:27 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/12/08 05:37 / ts
Chromium	ND	mg/L		0.05		E200.8	03/12/08 05:37 / ts
Copper	ND	mg/L		0.01		E200.8	03/12/08 05:37 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:27 / cp
Lead	ND	mg/L		0.001		E200.8	03/12/08 05:37 / ts
Manganese	ND	mg/L		0.01		E200.8	03/12/08 05:37 / ts
Mercury	ND	mg/L		0.001		E200.8	03/12/08 05:37 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/12/08 05:37 / ts
Nickel	ND	mg/L		0.05		E200.8	03/12/08 05:37 / ts
Selenium	0.005	mg/L		0.001		E200.8	03/13/08 05:26 / ts
Uranium	ND	mg/L		0.0003		E200.8	03/12/08 05:37 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/12/08 05:37 / ts
Zinc	ND	mg/L		0.01		E200.8	03/12/08 05:37 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-002
Client Sample ID: 123

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/03/08 14:42
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.0		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	2.0	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	ND	pCi/L	U	0.4		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	0.4	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	ND	pCi/L	U	0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	0.1	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	ND	pCi/L	U	0.2		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.2	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.940	%				Calculation	03/31/08 12:16 / sw
Anions	20.2	meq/L				Calculation	03/31/08 12:16 / sw
Cations	20.5	meq/L				Calculation	03/31/08 12:16 / sw
Solids, Total Dissolved Calculated	1280	mg/L				Calculation	03/31/08 12:16 / sw
TDS Balance (0.80 - 1.20)	0.940	dec. %				Calculation	03/31/08 12:16 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-003
Client Sample ID: RC-1

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 15:30
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	315	mg/L		1		A2320 B	03/11/08 13:24 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 13:24 / bas
Bicarbonate as HCO ₃	384	mg/L		1		A2320 B	03/11/08 13:24 / bas
Calcium	20	mg/L		1		E200.7	03/12/08 12:30 / cp
Chloride	170	mg/L		1		A4500-Cl B	03/25/08 08:59 / ljl
Fluoride	1.0	mg/L		0.1		A4500-F C	03/11/08 09:36 / bas
Magnesium	2	mg/L		1		E200.7	03/12/08 12:30 / cp
Nitrogen, Ammonia as N	0.40	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:23 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 10:42 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:04 / jal
Potassium	17	mg/L		1		E200.7	03/12/08 12:30 / cp
Silica	10.3	mg/L		0.1		E200.7	03/12/08 12:30 / cp
Sodium	502	mg/L	D	4		E200.7	03/12/08 12:30 / cp
Sulfate	590	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:26 / ljl

PHYSICAL PROPERTIES

Conductivity	2480	umhos/cm		1.0		A2510 B	03/11/08 11:13 / dd
pH	8.10	s.u.		0.01		A4500-H B	03/11/08 11:13 / dd
Solids, Total Dissolved TDS @ 180 C	1420	mg/L		10		A2540 C	03/11/08 15:05 / dd

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/13/08 23:13 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/13/08 23:13 / ts
Barium	ND	mg/L		0.1		E200.8	03/13/08 23:13 / ts
Boron	1.4	mg/L		0.1		E200.7	03/12/08 12:30 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/13/08 23:13 / ts
Chromium	ND	mg/L		0.05		E200.8	03/13/08 23:13 / ts
Copper	ND	mg/L		0.01		E200.8	03/13/08 23:13 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:30 / cp
Lead	ND	mg/L		0.001		E200.8	03/13/08 23:13 / ts
Manganese	ND	mg/L		0.01		E200.8	03/13/08 23:13 / ts
Mercury	ND	mg/L		0.001		E200.8	03/13/08 23:13 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/13/08 23:13 / ts
Nickel	ND	mg/L		0.05		E200.8	03/13/08 23:13 / ts
Selenium	0.005	mg/L		0.001		E200.8	03/13/08 23:13 / ts
Uranium	ND	mg/L		0.0003		E200.8	03/13/08 23:13 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/13/08 23:13 / ts
Zinc	ND	mg/L		0.01		E200.8	03/13/08 23:13 / ts

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

D - RL increased due to sample matrix interference.

U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-003
Client Sample ID: RC-1

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 15:30
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.6		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	1.6	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	1.3	pCi/L		1.1		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	1.1	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	0.9	pCi/L		0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	-0.029	%				Calculation	03/31/08 12:17 / sw
Anions	23.4	meq/L				Calculation	03/31/08 12:17 / sw
Cations	23.4	meq/L				Calculation	03/31/08 12:17 / sw
Solids, Total Dissolved Calculated	1500	mg/L				Calculation	03/31/08 12:17 / sw
TDS Balance (0.80 - 1.20)	0.950	dec. %				Calculation	03/31/08 12:17 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-004
Client Sample ID: RC-2

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 16:06
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	312	mg/L		1		A2320 B	03/11/08 13:39 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 13:39 / bas
Bicarbonate as HCO ₃	381	mg/L		1		A2320 B	03/11/08 13:39 / bas
Calcium	13	mg/L		1		E200.7	03/12/08 12:33 / cp
Chloride	142	mg/L		1		A4500-Cl B	03/25/08 09:02 / ljl
Fluoride	1.4	mg/L		0.1		A4500-F C	03/11/08 09:39 / bas
Magnesium	ND	mg/L		1		E200.7	03/12/08 12:33 / cp
Nitrogen, Ammonia as N	0.52	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:25 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 10:45 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:04 / jal
Potassium	15	mg/L		1		E200.7	03/12/08 12:33 / cp
Silica	11.8	mg/L		0.1		E200.7	03/12/08 12:33 / cp
Sodium	494	mg/L	D	4		E200.7	03/12/08 12:33 / cp
Sulfate	579	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:30 / ljl
PHYSICAL PROPERTIES							
Conductivity	2370	umhos/cm		1.0		A2510 B	03/11/08 11:28 / dd
pH	8.18	s.u.		0.01		A4500-H B	03/11/08 11:28 / dd
Solids, Total Dissolved TDS @ 180 C	1360	mg/L		10		A2540 C	03/11/08 15:06 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/13/08 23:20 / ts
Arsenic	0.001	mg/L		0.001		E200.8	03/13/08 23:20 / ts
Barium	ND	mg/L		0.1		E200.8	03/13/08 23:20 / ts
Boron	1.8	mg/L		0.1		E200.7	03/12/08 12:33 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/13/08 23:20 / ts
Chromium	ND	mg/L		0.05		E200.8	03/13/08 23:20 / ts
Copper	ND	mg/L		0.01		E200.8	03/13/08 23:20 / ts
Iron	0.07	mg/L		0.03		E200.7	03/12/08 12:33 / cp
Lead	ND	mg/L		0.001		E200.8	03/13/08 23:20 / ts
Manganese	0.02	mg/L		0.01		E200.8	03/13/08 23:20 / ts
Mercury	ND	mg/L		0.001		E200.8	03/13/08 23:20 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/13/08 23:20 / ts
Nickel	ND	mg/L		0.05		E200.8	03/13/08 23:20 / ts
Selenium	0.005	mg/L		0.001		E200.8	03/13/08 23:20 / ts
Uranium	0.0029	mg/L		0.0003		E200.8	03/13/08 23:20 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/13/08 23:20 / ts
Zinc	ND	mg/L		0.01		E200.8	03/13/08 23:20 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-004
Client Sample ID: RC-2

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 16:06
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.2		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	1.2	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	ND	pCi/L	U	0.8		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	0.8	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	1.0	pCi/L		0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	ND	pCi/L	U	0.2		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.2	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.538	%				Calculation	03/31/08 12:17 / sw
Anions	22.4	meq/L				Calculation	03/31/08 12:17 / sw
Cations	22.6	meq/L				Calculation	03/31/08 12:17 / sw
Solids, Total Dissolved Calculated	1440	mg/L				Calculation	03/31/08 12:17 / sw
TDS Balance (0.80 - 1.20)	0.940	dec. %				Calculation	03/31/08 12:17 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-005
Client Sample ID: Cow 1

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 09:43
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	292	mg/L		1		A2320 B	03/11/08 14:03 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 14:03 / bas
Bicarbonate as HCO ₃	357	mg/L		1		A2320 B	03/11/08 14:03 / bas
Calcium	55	mg/L		1		E200.7	03/12/08 12:37 / cp
Chloride	259	mg/L		1		A4500-Cl B	03/25/08 09:08 / ljl
Fluoride	1.1	mg/L		0.1		A4500-F C	03/11/08 09:42 / bas
Magnesium	6	mg/L		1		E200.7	03/12/08 12:37 / cp
Nitrogen, Ammonia as N	0.99	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:27 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 10:47 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:04 / jal
Potassium	26	mg/L		1		E200.7	03/12/08 12:37 / cp
Silica	11.7	mg/L		0.1		E200.7	03/12/08 12:37 / cp
Sodium	775	mg/L	D	4		E200.7	03/12/08 12:37 / cp
Sulfate	1180	mg/L	D	30		A4500-SO ₄ E	03/24/08 16:33 / ljl
PHYSICAL PROPERTIES							
Conductivity	3810	umhos/cm		1.0		A2510 B	03/11/08 11:30 / dd
pH	7.92	s.u.		0.01		A4500-H B	03/11/08 11:30 / dd
Solids, Total Dissolved TDS @ 180 C	2300	mg/L		10		A2540 C	03/11/08 15:06 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/13/08 23:27 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/13/08 23:27 / ts
Barium	ND	mg/L		0.1		E200.8	03/13/08 23:27 / ts
Boron	2.0	mg/L		0.1		E200.7	03/12/08 12:37 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/13/08 23:27 / ts
Chromium	ND	mg/L		0.05		E200.8	03/13/08 23:27 / ts
Copper	ND	mg/L		0.01		E200.8	03/13/08 23:27 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:37 / cp
Lead	ND	mg/L		0.001		E200.8	03/13/08 23:27 / ts
Manganese	0.03	mg/L		0.01		E200.8	03/13/08 23:27 / ts
Mercury	ND	mg/L		0.001		E200.8	03/13/08 23:27 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/13/08 23:27 / ts
Nickel	ND	mg/L		0.05		E200.8	03/13/08 23:27 / ts
Selenium	0.008	mg/L		0.001		E200.8	03/13/08 23:27 / ts
Uranium	0.0008	mg/L		0.0003		E200.8	03/13/08 23:27 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/13/08 23:27 / ts
Zinc	ND	mg/L		0.01		E200.8	03/13/08 23:27 / ts

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-005
Client Sample ID: Cow 1

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 09:43
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.1		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	1.1	pCi/L				E909.0M	04/28/08 11:15 / dm
Radium 226	22.5	pCi/L		0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	0.9	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	ND	pCi/L	U	0.2		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.2	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.011	%				Calculation	03/31/08 12:36 / sw
Anions	37.7	meq/L				Calculation	03/31/08 12:36 / sw
Cations	37.7	meq/L				Calculation	03/31/08 12:36 / sw
Solids, Total Dissolved Calculated	2480	mg/L				Calculation	03/31/08 12:36 / sw
TDS Balance (0.80 - 1.20)	0.930	dec. %				Calculation	03/31/08 12:36 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-006
Client Sample ID: Cow 3

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 15:48
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	337	mg/L		1		A2320 B	03/11/08 14:12 / bas
Carbonate as CO ₃	10	mg/L		1		A2320 B	03/11/08 14:12 / bas
Bicarbonate as HCO ₃	391	mg/L		1		A2320 B	03/11/08 14:12 / bas
Calcium	9	mg/L		1		E200.7	03/12/08 12:40 / cp
Chloride	163	mg/L		1		A4500-Cl B	03/25/08 09:12 / ljl
Fluoride	1.6	mg/L		0.1		A4500-F C	03/11/08 09:44 / bas
Magnesium	2	mg/L		1		E200.7	03/12/08 12:40 / cp
Nitrogen, Ammonia as N	0.76	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:35 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 10:57 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:04 / jal
Potassium	20	mg/L		1		E200.7	03/12/08 12:40 / cp
Silica	12.5	mg/L		0.1		E200.7	03/12/08 12:40 / cp
Sodium	519	mg/L	D	4		E200.7	03/12/08 12:40 / cp
Sulfate	588	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:35 / ljl
PHYSICAL PROPERTIES							
Conductivity	2520	umhos/cm		1.0		A2510 B	03/11/08 11:31 / dd
pH	8.03	s.u.		0.01		A4500-H B	03/11/08 11:31 / dd
Solids, Total Dissolved TDS @ 180 C	1430	mg/L		10		A2540 C	03/11/08 15:06 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/13/08 23:34 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/13/08 23:34 / ts
Barium	ND	mg/L		0.1		E200.8	03/13/08 23:34 / ts
Boron	1.9	mg/L		0.1		E200.7	03/12/08 12:40 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/13/08 23:34 / ts
Chromium	ND	mg/L		0.05		E200.8	03/13/08 23:34 / ts
Copper	ND	mg/L		0.01		E200.8	03/13/08 23:34 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:40 / cp
Lead	0.001	mg/L		0.001		E200.8	03/13/08 23:34 / ts
Manganese	ND	mg/L		0.01		E200.8	03/13/08 23:34 / ts
Mercury	ND	mg/L		0.001		E200.8	03/13/08 23:34 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/13/08 23:34 / ts
Nickel	ND	mg/L		0.05		E200.8	03/13/08 23:34 / ts
Selenium	0.004	mg/L		0.001		E200.8	03/13/08 23:34 / ts
Uranium	0.0087	mg/L		0.0003		E200.8	03/13/08 23:34 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/13/08 23:34 / ts
Zinc	ND	mg/L		0.01		E200.8	03/13/08 23:34 / ts

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-006
Client Sample ID: Cow 3

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 15:48
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.4		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	1.4	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	1.4	pCi/L		1.2		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	1.2	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	0.5	pCi/L		0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	0.1	pCi/L	U	0.1		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.107	%				Calculation	03/31/08 12:36 / sw
Anions	23.7	meq/L				Calculation	03/31/08 12:36 / sw
Cations	23.7	meq/L				Calculation	03/31/08 12:36 / sw
Solids, Total Dissolved Calculated	1520	mg/L				Calculation	03/31/08 12:36 / sw
TDS Balance (0.80 - 1.20)	0.940	dec. %				Calculation	03/31/08 12:36 / sw

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-007
Client Sample ID: Cow 4

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 13:12
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	270	mg/L		1		A2320 B	03/11/08 14:20 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 14:20 / bas
Bicarbonate as HCO ₃	329	mg/L		1		A2320 B	03/11/08 14:20 / bas
Calcium	31	mg/L		1		E200.7	03/12/08 12:43 / cp
Chloride	227	mg/L		1		A4500-Cl B	03/25/08 09:17 / ljl
Fluoride	1.2	mg/L		0.1		A4500-F C	03/11/08 09:47 / bas
Magnesium	6	mg/L		1		E200.7	03/12/08 12:43 / cp
Nitrogen, Ammonia as N	0.93	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:37 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 11:00 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:05 / jal
Potassium	17	mg/L		1		E200.7	03/12/08 12:43 / cp
Silica	12.2	mg/L		0.1		E200.7	03/12/08 12:43 / cp
Sodium	670	mg/L	D	4		E200.7	03/12/08 12:43 / cp
Sulfate	947	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:37 / ljl
PHYSICAL PROPERTIES							
Conductivity	3290	umhos/cm		1.0		A2510 B	03/11/08 11:33 / dd
pH	8.08	s.u.		0.01		A4500-H B	03/11/08 11:33 / dd
Solids, Total Dissolved TDS @ 180 C	2020	mg/L		10		A2540 C	03/11/08 15:06 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/14/08 00:08 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/14/08 00:08 / ts
Barium	ND	mg/L		0.1		E200.8	03/14/08 00:08 / ts
Boron	1.8	mg/L		0.1		E200.7	03/12/08 12:43 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/14/08 00:08 / ts
Chromium	ND	mg/L		0.05		E200.8	03/14/08 00:08 / ts
Copper	ND	mg/L		0.01		E200.8	03/14/08 00:08 / ts
Iron	0.04	mg/L		0.03		E200.7	03/12/08 12:43 / cp
Lead	0.005	mg/L		0.001		E200.8	03/14/08 00:08 / ts
Manganese	0.02	mg/L		0.01		E200.8	03/14/08 00:08 / ts
Mercury	ND	mg/L		0.001		E200.8	03/14/08 00:08 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/14/08 00:08 / ts
Nickel	ND	mg/L		0.05		E200.8	03/14/08 00:08 / ts
Selenium	0.007	mg/L		0.001		E200.8	03/14/08 00:08 / ts
Uranium	0.0348	mg/L		0.0003		E200.8	03/14/08 00:08 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/14/08 00:08 / ts
Zinc	0.01	mg/L		0.01		E200.8	03/14/08 00:08 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-007
Client Sample ID: Cow 4

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/04/08 13:12
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	23.3	pCi/L		3.1		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	3.1	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	ND	pCi/L	U	1.2		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	1.2	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	38.8	pCi/L		0.2		E903.0	03/17/08 15:14 / taj
Radium 226 precision (±)	1.1	pCi/L				E903.0	03/17/08 15:14 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 15:14 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.197	%				Calculation	03/31/08 12:37 / sw
Anions	31.6	meq/L				Calculation	03/31/08 12:37 / sw
Cations	31.7	meq/L				Calculation	03/31/08 12:37 / sw
Solids, Total Dissolved Calculated	2070	mg/L				Calculation	03/31/08 12:37 / sw
TDS Balance (0.80 - 1.20)	0.980	dec. %				Calculation	03/31/08 12:37 / sw

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-008
Client Sample ID: Cow 2

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/05/08 16:35
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	336	mg/L		1		A2320 B	03/11/08 14:28 / bas
Carbonate as CO ₃	11	mg/L		1		A2320 B	03/11/08 14:28 / bas
Bicarbonate as HCO ₃	387	mg/L		1		A2320 B	03/11/08 14:28 / bas
Calcium	8	mg/L		1		E200.7	03/12/08 12:53 / cp
Chloride	149	mg/L		1		A4500-Cl B	03/25/08 09:21 / ljl
Fluoride	1.5	mg/L		0.1		A4500-F C	03/11/08 09:50 / bas
Magnesium	ND	mg/L		1		E200.7	03/12/08 12:53 / cp
Nitrogen, Ammonia as N	0.48	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:39 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 11:02 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:05 / jal
Potassium	18	mg/L		1		E200.7	03/12/08 12:53 / cp
Silica	13.0	mg/L		0.1		E200.7	03/12/08 12:53 / cp
Sodium	496	mg/L	D	4		E200.7	03/12/08 12:53 / cp
Sulfate	566	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:41 / ljl
PHYSICAL PROPERTIES							
Conductivity	2410	umhos/cm		1.0		A2510 B	03/11/08 11:35 / dd
pH	8.45	s.u.		0.01		A4500-H B	03/11/08 11:35 / dd
Solids, Total Dissolved TDS @ 180 C	1400	mg/L		10		A2540 C	03/11/08 15:08 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/14/08 00:15 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/14/08 00:15 / ts
Barium	ND	mg/L		0.1		E200.8	03/14/08 00:15 / ts
Boron	1.9	mg/L		0.1		E200.7	03/12/08 12:53 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/14/08 00:15 / ts
Chromium	ND	mg/L		0.05		E200.8	03/14/08 00:15 / ts
Copper	ND	mg/L		0.01		E200.8	03/14/08 00:15 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:53 / cp
Lead	ND	mg/L		0.001		E200.8	03/14/08 00:15 / ts
Manganese	ND	mg/L		0.01		E200.8	03/14/08 00:15 / ts
Mercury	ND	mg/L		0.001		E200.8	03/14/08 00:15 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/14/08 00:15 / ts
Nickel	ND	mg/L		0.05		E200.8	03/14/08 00:15 / ts
Selenium	0.005	mg/L		0.001		E200.8	03/14/08 00:15 / ts
Uranium	0.0133	mg/L		0.0003		E200.8	03/14/08 00:15 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/14/08 00:15 / ts
Zinc	ND	mg/L		0.01		E200.8	03/14/08 00:15 / ts

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-008
Client Sample ID: Cow 2

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/05/08 16:35
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.9	E909.0M		04/28/08 11:15 / dm
Lead 210 precision (±)	1.9	pCi/L			E909.0M		04/28/08 11:15 / dm
Polonium 210	ND	pCi/L	U	0.8	RMO-3008		04/28/08 15:00 / plj
Polonium 210 precision (±)	0.8	pCi/L			RMO-3008		04/28/08 15:00 / plj
Radium 226	7.7	pCi/L		0.2	E903.0		03/17/08 17:01 / taj
Radium 226 precision (±)	0.5	pCi/L			E903.0		03/17/08 17:01 / taj
Radium 226 MDC	0.2	pCi/L			E903.0		03/17/08 17:01 / taj
Thorium 230	ND	pCi/L	U	0.1	E907.0		04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L			E907.0		04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	-0.626	%			Calculation		03/31/08 12:37 / sw
Anions	22.8	meq/L			Calculation		03/31/08 12:37 / sw
Cations	22.5	meq/L			Calculation		03/31/08 12:37 / sw
Solids, Total Dissolved Calculated	1450	mg/L			Calculation		03/31/08 12:37 / sw
TDS Balance (0.80 - 1.20)	0.970	dec. %			Calculation		03/31/08 12:37 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-009
Client Sample ID: Cow 5

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/05/08 14:23
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	331	mg/L		1		A2320 B	03/11/08 14:44 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 14:44 / bas
Bicarbonate as HCO ₃	403	mg/L		1		A2320 B	03/11/08 14:44 / bas
Calcium	30	mg/L		1		E200.7	03/12/08 12:56 / cp
Chloride	227	mg/L		1		A4500-Cl B	03/25/08 09:28 / ljl
Fluoride	1.2	mg/L		0.1		A4500-F C	03/11/08 09:54 / bas
Magnesium	5	mg/L		1		E200.7	03/12/08 12:56 / cp
Nitrogen, Ammonia as N	0.74	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:41 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 11:05 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:05 / jal
Potassium	13	mg/L		1		E200.7	03/12/08 12:56 / cp
Silica	12.1	mg/L		0.1		E200.7	03/12/08 12:56 / cp
Sodium	643	mg/L	D	4		E200.7	03/12/08 12:56 / cp
Sulfate	832	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:43 / ljl
PHYSICAL PROPERTIES							
Conductivity	3160	umhos/cm		1.0		A2510 B	03/11/08 11:37 / dd
pH	8.00	s.u.		0.01		A4500-H B	03/11/08 11:37 / dd
Solids, Total Dissolved TDS @ 180 C	1890	mg/L		10		A2540 C	03/11/08 15:08 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/14/08 00:21 / ts
Arsenic	0.001	mg/L		0.001		E200.8	03/14/08 00:21 / ts
Barium	ND	mg/L		0.1		E200.8	03/14/08 00:21 / ts
Boron	2.0	mg/L		0.1		E200.7	03/12/08 12:56 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/14/08 00:21 / ts
Chromium	ND	mg/L		0.05		E200.8	03/14/08 00:21 / ts
Copper	ND	mg/L		0.01		E200.8	03/14/08 00:21 / ts
Iron	ND	mg/L		0.03		E200.7	03/12/08 12:56 / cp
Lead	ND	mg/L		0.001		E200.8	03/14/08 00:21 / ts
Manganese	0.01	mg/L		0.01		E200.8	03/14/08 00:21 / ts
Mercury	ND	mg/L		0.001		E200.8	03/14/08 00:21 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/14/08 00:21 / ts
Nickel	ND	mg/L		0.05		E200.8	03/14/08 00:21 / ts
Selenium	0.006	mg/L		0.001		E200.8	03/14/08 00:21 / ts
Uranium	0.0149	mg/L		0.0003		E200.8	03/14/08 00:21 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/14/08 00:21 / ts
Zinc	0.01	mg/L		0.01		E200.8	03/14/08 00:21 / ts

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-009
Client Sample ID: Cow 5

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/05/08 14:23
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.0		E909.0M	04/28/08 11:15 / dm
Lead 210 precision (±)	2.0	pCi/L				E909.0M	04/28/08 11:15 / dm
Polonium 210	1.6	pCi/L		1.2		RMO-3008	04/28/08 15:00 / plj
Polonium 210 precision (±)	1.2	pCi/L				RMO-3008	04/28/08 15:00 / plj
Radium 226	38.7	pCi/L		0.2		E903.0	03/17/08 17:01 / taj
Radium 226 precision (±)	1.1	pCi/L				E903.0	03/17/08 17:01 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	03/17/08 17:01 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	-0.143	%				Calculation	03/31/08 12:37 / sw
Anions	30.4	meq/L				Calculation	03/31/08 12:37 / sw
Cations	30.3	meq/L				Calculation	03/31/08 12:37 / sw
Solids, Total Dissolved Calculated	1960	mg/L				Calculation	03/31/08 12:37 / sw
TDS Balance (0.80 - 1.20)	0.960	dec. %				Calculation	03/31/08 12:37 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-010
Client Sample ID: CPW-2

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/05/08 10:04
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	339	mg/L		1		A2320 B	03/11/08 14:52 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 14:52 / bas
Bicarbonate as HCO ₃	414	mg/L		1		A2320 B	03/11/08 14:52 / bas
Calcium	22	mg/L		1		E200.7	03/12/08 13:37 / cp
Chloride	156	mg/L		1		A4500-Cl B	03/25/08 09:32 / ljl
Fluoride	1.5	mg/L		0.1		A4500-F C	03/11/08 09:59 / bas
Magnesium	4	mg/L		1		E200.7	03/12/08 13:37 / cp
Nitrogen, Ammonia as N	0.84	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:45 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 11:07 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:05 / jal
Potassium	14	mg/L		1		E200.7	03/12/08 13:37 / cp
Silica	11.9	mg/L		0.1		E200.7	03/12/08 13:37 / cp
Sodium	546	mg/L	D	4		E200.7	03/12/08 13:37 / cp
Sulfate	631	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:44 / ljl
PHYSICAL PROPERTIES							
Conductivity	2560	umhos/cm		1.0		A2510 B	03/11/08 11:39 / dd
pH	8.06	s.u.		0.01		A4500-H B	03/11/08 11:39 / dd
Solids, Total Dissolved TDS @ 180 C	1510	mg/L		10		A2540 C	03/11/08 15:08 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/14/08 00:28 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/14/08 00:28 / ts
Barium	ND	mg/L		0.1		E200.8	03/14/08 00:28 / ts
Boron	1.7	mg/L		0.1		E200.7	03/12/08 13:37 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/14/08 00:28 / ts
Chromium	ND	mg/L		0.05		E200.8	03/14/08 00:28 / ts
Copper	ND	mg/L		0.01		E200.8	03/14/08 00:28 / ts
Iron	0.16	mg/L		0.03		E200.7	03/12/08 13:37 / cp
Lead	0.001	mg/L		0.001		E200.8	03/14/08 00:28 / ts
Manganese	ND	mg/L		0.01		E200.8	03/14/08 00:28 / ts
Mercury	ND	mg/L		0.001		E200.8	03/14/08 00:28 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/14/08 00:28 / ts
Nickel	ND	mg/L		0.05		E200.8	03/14/08 00:28 / ts
Selenium	0.005	mg/L		0.001		E200.8	03/14/08 00:28 / ts
Uranium	0.0361	mg/L		0.0003		E200.8	03/14/08 00:28 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/14/08 00:28 / ts
Zinc	ND	mg/L		0.01		E200.8	03/14/08 00:28 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-010
Client Sample ID: CPW-2

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/05/08 10:04
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.7	E909.0M		04/28/08 11:15 / dm
Lead 210 precision (±)	2.7	pCi/L			E909.0M		04/28/08 11:15 / dm
Polonium 210	1.7	pCi/L		1.4	RMO-3008		04/28/08 15:00 / plj
Polonium 210 precision (±)	1.4	pCi/L			RMO-3008		04/28/08 15:00 / plj
Radium 226	11.7	pCi/L		0.2	E903.0		03/17/08 17:01 / taj
Radium 226 precision (±)	0.6	pCi/L			E903.0		03/17/08 17:01 / taj
Radium 226 MDC	0.2	pCi/L			E903.0		03/17/08 17:01 / taj
Thorium 230	0.1	pCi/L	U	0.1	E907.0		04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L			E907.0		04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	2.32	%			Calculation		03/31/08 12:38 / sw
Anions	24.4	meq/L			Calculation		03/31/08 12:38 / sw
Cations	25.6	meq/L			Calculation		03/31/08 12:38 / sw
Solids, Total Dissolved Calculated	1590	mg/L			Calculation		03/31/08 12:38 / sw
TDS Balance (0.80 - 1.20)	0.950	dec. %			Calculation		03/31/08 12:38 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-011
Client Sample ID: Cow 6

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/06/08 13:14
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	310	mg/L		1		A2320 B	03/11/08 15:00 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/11/08 15:00 / bas
Bicarbonate as HCO ₃	378	mg/L		1		A2320 B	03/11/08 15:00 / bas
Calcium	58	mg/L		1		E200.7	03/12/08 13:40 / cp
Chloride	305	mg/L		1		A4500-Cl B	03/25/08 09:42 / ljl
Fluoride	0.8	mg/L		0.1		A4500-F C	03/11/08 10:07 / bas
Magnesium	11	mg/L		1		E200.7	03/12/08 13:40 / cp
Nitrogen, Ammonia as N	1.09	mg/L		0.05		A4500-NH ₃ G	03/14/08 15:51 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/12/08 11:15 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/11/08 09:06 / jal
Potassium	30	mg/L		1		E200.7	03/12/08 13:40 / cp
Silica	12.2	mg/L		0.1		E200.7	03/12/08 13:40 / cp
Sodium	826	mg/L	D	4		E200.7	03/12/08 13:40 / cp
Sulfate	1190	mg/L	D	10		A4500-SO ₄ E	03/24/08 16:46 / ljl
PHYSICAL PROPERTIES							
Conductivity	2560	umhos/cm		1.0		A2510 B	03/11/08 11:41 / dd
pH	8.05	s.u.		0.01		A4500-H B	03/11/08 11:41 / dd
Solids, Total Dissolved TDS @ 180 C	2550	mg/L		10		A2540 C	03/11/08 15:08 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	03/14/08 00:35 / ts
Arsenic	0.003	mg/L		0.001		E200.8	03/14/08 00:35 / ts
Barium	ND	mg/L		0.1		E200.8	03/14/08 00:35 / ts
Boron	1.7	mg/L		0.1		E200.7	03/12/08 13:40 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/14/08 00:35 / ts
Chromium	ND	mg/L		0.05		E200.8	03/14/08 00:35 / ts
Copper	ND	mg/L		0.01		E200.8	03/14/08 00:35 / ts
Iron	0.08	mg/L		0.03		E200.7	03/12/08 13:40 / cp
Lead	0.006	mg/L		0.001		E200.8	03/14/08 00:35 / ts
Manganese	0.02	mg/L		0.01		E200.7	03/12/08 13:40 / cp
Mercury	ND	mg/L		0.001		E200.8	03/14/08 00:35 / ts
Molybdenum	ND	mg/L		0.1		E200.7	03/12/08 13:40 / cp
Nickel	ND	mg/L		0.05		E200.7	03/12/08 13:40 / cp
Selenium	0.009	mg/L		0.001		E200.8	03/14/08 00:35 / ts
Uranium	0.0017	mg/L		0.0003		E200.8	03/14/08 00:35 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/14/08 00:35 / ts
Zinc	0.04	mg/L		0.01		E200.8	03/14/08 00:35 / ts

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030343-011
Client Sample ID: Cow 6

Revised Date: 06/02/08
Report Date: 04/01/08
Collection Date: 03/06/08 13:14
Date Received: 03/10/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	0.5	E909.0M		04/28/08 11:15 / dm
Lead 210 precision (±)	0.5	pCi/L			E909.0M		04/28/08 11:15 / dm
Polonium 210	1.4	pCi/L		1.2	RMO-3008		04/28/08 15:00 / plj
Polonium 210 precision (±)	1.2	pCi/L			RMO-3008		04/28/08 15:00 / plj
Radium 226	1.8	pCi/L		0.2	E903.0		03/17/08 17:01 / taj
Radium 226 precision (±)	0.3	pCi/L			E903.0		03/17/08 17:01 / taj
Radium 226 MDC	0.2	pCi/L			E903.0		03/17/08 17:01 / taj
Thorium 230	0.1	pCi/L	U	0.1	E907.0		04/22/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L			E907.0		04/22/08 15:00 / dmf
DATA QUALITY							
A/C Balance (± 5)	1.11	%				Calculation	03/31/08 12:38 / sw
Anions	39.6	meq/L				Calculation	03/31/08 12:38 / sw
Cations	40.5	meq/L				Calculation	03/31/08 12:38 / sw
Solids, Total Dissolved Calculated	2620	mg/L				Calculation	03/31/08 12:38 / sw
TDS Balance (0.80 - 1.20)	0.970	dec. %				Calculation	03/31/08 12:38 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B									Batch: R97947
Sample ID: MBLK-1	Method Blank						Run: MANTECH_080311B		03/11/08 11:36
Alkalinity, Total as CaCO ₃	ND	mg/L	0.2						
Carbonate as CO ₃	ND	mg/L	1						
Bicarbonate as HCO ₃	ND	mg/L	1						
Sample ID: LCS-1									Batch: R97947
Alkalinity, Total as CaCO ₃	Laboratory Control Sample						Run: MANTECH_080311B		03/11/08 11:44
	4990	mg/L	1.0	100	90	110			
Sample ID: C08030343-004AMS									Batch: R97947
Alkalinity, Total as CaCO ₃	Sample Matrix Spike						Run: MANTECH_080311B		03/11/08 13:48
	428	mg/L	1.0	100	90	110			
Sample ID: C08030343-004AMSD									Batch: R97947
Alkalinity, Total as CaCO ₃	Sample Matrix Spike Duplicate						Run: MANTECH_080311B		03/11/08 13:56
	427	mg/L	1.0	99	90	110	0.2	10	
Sample ID: C08030354-002AMS									Batch: R97947
Alkalinity, Total as CaCO ₃	Sample Matrix Spike						Run: MANTECH_080311B		03/11/08 15:52
	251	mg/L	1.0	103	90	110			
Sample ID: C08030354-002AMSD									Batch: R97947
Alkalinity, Total as CaCO ₃	Sample Matrix Spike Duplicate						Run: MANTECH_080311B		03/11/08 16:00
	253	mg/L	1.0	104	90	110	0.6	10	
Method: A2510 B									Analytical Run: ORION555A_080311A
Sample ID: ICV2_080311_1									Batch: 080311_1_PH-W
Conductivity	Initial Calibration Verification Standard								03/11/08 10:33
	1470	umhos/cm	1.0	104	90	110			
Method: A2510 B									Batch: 080311_1_PH-W
Sample ID: MBLK1_080311_1									Batch: 080311_1_PH-W
Conductivity	Method Blank						Run: ORION555A_080311A		03/11/08 10:30
	0.4	umhos/cm	0.2						
Sample ID: C08030343-003ADUP									Batch: 080311_1_PH-W
Conductivity	Sample Duplicate						Run: ORION555A_080311A		03/11/08 11:15
	2480	umhos/cm	1.0					0.2	10
Sample ID: C08030343-011ADUP									Batch: 080311_1_PH-W
Conductivity	Sample Duplicate						Run: ORION555A_080311A		03/11/08 11:43
	2560	umhos/cm	1.0					0.1	10

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C		Batch: 080311_1_SLDS-TDS-W							
Sample ID: MBLK1_080311	Method Blank					Run: BAL-1_080311A			03/11/08 14:59
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	6						
Sample ID: LCS1_080311	Laboratory Control Sample					Run: BAL-1_080311A			03/11/08 14:59
Solids, Total Dissolved TDS @ 180 C	986	mg/L	10	99	90	110			
Sample ID: C08030327-004AMS	Sample Matrix Spike					Run: BAL-1_080311A			03/11/08 15:04
Solids, Total Dissolved TDS @ 180 C	1890	mg/L	10	100	90	110			
Sample ID: C08030327-004AMSD	Sample Matrix Spike Duplicate					Run: BAL-1_080311A			03/11/08 15:04
Solids, Total Dissolved TDS @ 180 C	1880	mg/L	10	99	90	110	0.5	10	
Sample ID: C08030343-007AMS	Sample Matrix Spike					Run: BAL-1_080311A			03/11/08 15:07
Solids, Total Dissolved TDS @ 180 C	4010	mg/L	10	100	90	110			
Sample ID: C08030343-007AMSD	Sample Matrix Spike Duplicate					Run: BAL-1_080311A			03/11/08 15:28
Solids, Total Dissolved TDS @ 180 C	3980	mg/L	10	98	90	110	0.8	10	
Sample ID: C08030294-002AMS	Sample Matrix Spike					Run: BAL-1_080311A			03/11/08 15:10
Solids, Total Dissolved TDS @ 180 C	2750	mg/L	10	101	90	110			
Sample ID: C08030294-002AMSD	Sample Matrix Spike Duplicate					Run: BAL-1_080311A			03/11/08 15:10
Solids, Total Dissolved TDS @ 180 C	2850	mg/L	10	101	90	110	3.6	10	
Method: A4500-Cl B		Batch: 080325A-CL-TTR-W							
Sample ID: MBLK9-080325A	Method Blank					Run: TITRATION_080325A			03/25/08 08:34
Chloride	ND	mg/L	0.4						
Sample ID: C08030343-010AMS	Sample Matrix Spike					Run: TITRATION_080325A			03/25/08 09:39
Chloride	507	mg/L	1.0	99	90	110			
Sample ID: C08030343-010AMSD	Sample Matrix Spike Duplicate					Run: TITRATION_080325A			03/25/08 09:40
Chloride	507	mg/L	1.0	99	90	110	0.0	10	
Sample ID: LCS35-080325A	Laboratory Control Sample					Run: TITRATION_080325A			03/25/08 11:27
Chloride	3550	mg/L	1.0	100	90	110			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C									Batch: R97912
Sample ID: MBLK-1	Method Blank					Run: MANTECH_080311A			03/11/08 09:15
Fluoride	ND	mg/L	0.05						
Sample ID: LCS-1	Laboratory Control Sample					Run: MANTECH_080311A			03/11/08 09:18
Fluoride	1.00	mg/L	0.10	100	90	110			
Sample ID: C08030342-001CMS	Sample Matrix Spike					Run: MANTECH_080311A			03/11/08 09:26
Fluoride	1.19	mg/L	0.10	106	90	110			
Sample ID: C08030342-001CMSD	Sample Matrix Spike Duplicate					Run: MANTECH_080311A			03/11/08 09:28
Fluoride	1.19	mg/L	0.10	106	90	110	0.0	10	
Sample ID: C08030343-010AMS	Sample Matrix Spike					Run: MANTECH_080311A			03/11/08 10:02
Fluoride	2.57	mg/L	0.10	105	90	110			
Sample ID: C08030343-010AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_080311A			03/11/08 10:05
Fluoride	2.57	mg/L	0.10	105	90	110	0.0	10	
Method: A4500-H B									Analytical Run: ORION555A_080311A
Sample ID: ICV1_080311_1	Initial Calibration Verification Standard								03/11/08 10:31
pH	6.90	s.u.	0.010	101	98	102			
Sample ID: CCV1_080311_1	Continuing Calibration Verification Standard								03/11/08 11:18
pH	7.11	s.u.	0.010	102	98	102			
Method: A4500-H B									Batch: 080311_1_PH-W
Sample ID: C08030343-003ADUP	Sample Duplicate					Run: ORION555A_080311A			03/11/08 11:15
pH	8.09	s.u.	0.010				0.1	10	
Sample ID: C08030343-011ADUP	Sample Duplicate					Run: ORION555A_080311A			03/11/08 11:43
pH	8.06	s.u.	0.010				0.1	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G									Batch: R98143
Sample ID: MBLK-1	Method Blank								Run: TECHNICON_080314B 03/14/08 15:14
Nitrogen, Ammonia as N	0.03	mg/L	0.02						
Sample ID: LCS-2	Laboratory Control Sample								Run: TECHNICON_080314B 03/14/08 15:17
Nitrogen, Ammonia as N	18.2	mg/L	0.20	91	80	120			
Sample ID: C08030343-005DMS	Sample Matrix Spike								Run: TECHNICON_080314B 03/14/08 15:29
Nitrogen, Ammonia as N	2.78	mg/L	0.050	90	80	120			
Sample ID: C08030343-005DMSD	Sample Matrix Spike Duplicate								Run: TECHNICON_080314B 03/14/08 15:55
Nitrogen, Ammonia as N	3.04	mg/L	0.050	103	80	120	8.9	20	
Sample ID: C08030356-001CMS	Sample Matrix Spike								Run: TECHNICON_080314B 03/14/08 16:03
Nitrogen, Ammonia as N	2.08	mg/L	0.050	103	80	120			
Sample ID: C08030356-001CMSD	Sample Matrix Spike Duplicate								Run: TECHNICON_080314B 03/14/08 16:05
Nitrogen, Ammonia as N	2.03	mg/L	0.050	100	80	120	2.4	20	
Method: A4500-NO2 B									Batch: A2008-03-11_6_NO2_01
Sample ID: MBLK-1	Method Blank								Run: HACH DR3000_080311A 03/11/08 08:56
Nitrogen, Nitrite as N	ND	mg/L	0.003						
Sample ID: C08030342-001CMS	Sample Matrix Spike								Run: HACH DR3000_080311A 03/11/08 09:03
Nitrogen, Nitrite as N	0.0495	mg/L	0.10	104	80	120			
Sample ID: C08030342-001CMSD	Sample Matrix Spike Duplicate								Run: HACH DR3000_080311A 03/11/08 09:03
Nitrogen, Nitrite as N	0.0506	mg/L	0.10	106	80	120	0.0	10	
Sample ID: C08030343-010AMS	Sample Matrix Spike								Run: HACH DR3000_080311A 03/11/08 09:05
Nitrogen, Nitrite as N	0.0498	mg/L	0.10	105	80	120			
Sample ID: C08030343-010AMSD	Sample Matrix Spike Duplicate								Run: HACH DR3000_080311A 03/11/08 09:06
Nitrogen, Nitrite as N	0.0498	mg/L	0.10	105	80	120	0.0	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources
Project: North Trend Baseline

Revised Date: 06/02/08
Report Date: 04/01/08
Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-SO4 E							Batch: 080324_1_SO4-TURB-W		
Sample ID: LCS-1_080324	Laboratory Control Sample				Run: TURB-2_080324A			03/24/08 09:48	
Sulfate	5000	mg/L	59	104	90	110			
Sample ID: MBLK-1_080324	Method Blank				Run: TURB-2_080324A			03/24/08 09:50	
Sulfate	ND	mg/L	0.6						
Sample ID: C08030820-002AMS	Sample Matrix Spike				Run: TURB-2_080324A			03/24/08 15:06	
Sulfate	3720	mg/L	59	101	90	110			
Sample ID: C08030820-002AMSD	Sample Matrix Spike Duplicate				Run: TURB-2_080324A			03/24/08 15:08	
Sulfate	3680	mg/L	59	99	90	110	1.0	10	
Sample ID: C08030343-007AMS	Sample Matrix Spike				Run: TURB-2_080324A			03/24/08 16:38	
Sulfate	1950	mg/L	30	104	90	110			
Sample ID: C08030343-007AMSD	Sample Matrix Spike Duplicate				Run: TURB-2_080324A			03/24/08 16:40	
Sulfate	1940	mg/L	30	103	90	110	0.5	10	
Sample ID: C08030430-001DMS	Sample Matrix Spike				Run: TURB-2_080324A			03/24/08 16:52	
Sulfate	127	mg/L	2.0	103	90	110			
Sample ID: C08030430-001DMSD	Sample Matrix Spike Duplicate				Run: TURB-2_080324A			03/24/08 16:54	
Sulfate	126	mg/L	2.0	101	90	110	0.8	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources
Project: North Trend Baseline

Revised Date: 06/02/08
Report Date: 04/01/08
Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: R98034		
Sample ID: MB-080312A	Method Blank		Run: ICP2-C_080312A				03/12/08 11:47		
Boron	0.01	mg/L	0.008						
Calcium	ND	mg/L	0.1						
Iron	0.01	mg/L	0.005						
Magnesium	ND	mg/L	0.04						
Manganese	ND	mg/L	0.0003						
Molybdenum	ND	mg/L	0.003						
Nickel	ND	mg/L	0.004						
Potassium	0.03	mg/L	0.02						
Silica	ND	mg/L	0.02						
Sodium	ND	mg/L	0.8						
Sample ID: LFB-080312A	Laboratory Fortified Blank		Run: ICP2-C_080312A				03/12/08 11:51		
Boron	1.02	mg/L	0.10	101	85	125			
Calcium	48.6	mg/L	0.50	97	85	125			
Iron	0.982	mg/L	0.030	97	85	125			
Magnesium	47.5	mg/L	0.50	95	85	125			
Manganese	0.996	mg/L	0.010	100	85	125			
Molybdenum	1.01	mg/L	0.10	101	85	125			
Nickel	0.989	mg/L	0.050	99	85	125			
Potassium	46.8	mg/L	0.50	93	85	125			
Silica	1.01	mg/L	0.10	101	85	125			
Sodium	47.6	mg/L	0.77	95	85	125			
Sample ID: C08030311-001AMS2	Sample Matrix Spike		Run: ICP2-C_080312A				03/12/08 11:57		
Boron	2.38	mg/L	0.10	101	70	130			
Iron	2.00	mg/L	0.030	100	70	130			
Manganese	2.04	mg/L	0.010	102	70	130			
Molybdenum	2.04	mg/L	0.10	101	70	130			
Nickel	2.03	mg/L	0.050	102	70	130			
Silica	17.5	mg/L	0.10		70	130			A
Sample ID: C08030311-001AMSD2	Sample Matrix Spike Duplicate		Run: ICP2-C_080312A				03/12/08 12:01		
Boron	2.38	mg/L	0.10	101	70	130	0.0	20	
Iron	1.95	mg/L	0.030	98	70	130	2.3	20	
Manganese	1.98	mg/L	0.010	99	70	130	2.7	20	
Molybdenum	2.05	mg/L	0.10	102	70	130	0.6	20	
Nickel	1.96	mg/L	0.050	98	70	130	3.7	20	
Silica	17.0	mg/L	0.10		0	0	2.7	20	A
Sample ID: C08030343-007BMS2	Sample Matrix Spike		Run: ICP2-C_080312A				03/12/08 12:47		
Boron	6.68	mg/L	0.10	97	70	130			
Calcium	265	mg/L	0.53	93	70	130			
Iron	4.75	mg/L	0.030	94	70	130			
Magnesium	233	mg/L	0.50	91	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: R98034		
Sample ID: C08030343-007BMS2	Sample Matrix Spike			Run: ICP2-C_080312A			03/12/08 12:47		
Manganese	4.88	mg/L	0.010	97	70	130			
Molybdenum	4.87	mg/L	0.10	97	70	130			
Nickel	4.78	mg/L	0.050	96	70	130			
Potassium	245	mg/L	0.50	91	70	130			
Silica	16.7	mg/L	0.10	90	70	130			
Sodium	882	mg/L	3.9	85	70	130			
Sample ID: C08030343-007BMSD2	Sample Matrix Spike Duplicate			Run: ICP2-C_080312A			03/12/08 12:50		
Boron	6.86	mg/L	0.10	101	70	130	2.7	20	
Calcium	267	mg/L	0.53	94	70	130	1.0	20	
Iron	4.81	mg/L	0.030	95	70	130	1.2	20	
Magnesium	235	mg/L	0.50	92	70	130	0.8	20	
Manganese	4.99	mg/L	0.010	100	70	130	2.4	20	
Molybdenum	5.03	mg/L	0.10	101	70	130	3.3	20	
Nickel	4.80	mg/L	0.050	96	70	130	0.3	20	
Potassium	243	mg/L	0.50	90	70	130	1.2	20	
Silica	16.7	mg/L	0.10	90	70	130	0.1	20	
Sodium	880	mg/L	3.9	84	70	130	0.2	20	
Sample ID: C08030261-001BMS2	Sample Matrix Spike			Run: ICP2-C_080312A			03/12/08 13:50		
Boron	1.06	mg/L	0.10	104	70	130			
Calcium	89.6	mg/L	0.50	97	70	130			
Iron	0.993	mg/L	0.030	99	70	130			
Magnesium	54.0	mg/L	0.50	98	70	130			
Manganese	1.03	mg/L	0.010	103	70	130			
Molybdenum	1.03	mg/L	0.10	103	70	130			
Nickel	1.00	mg/L	0.050	100	70	130			
Potassium	52.7	mg/L	0.50	92	70	130			
Silica	57.6	mg/L	0.10		70	130			A
Sodium	60.7	mg/L	0.54	100	70	130			
Sample ID: C08030261-001BMSD2	Sample Matrix Spike Duplicate			Run: ICP2-C_080312A			03/12/08 13:53		
Boron	1.05	mg/L	0.10	103	70	130	1.3	20	
Calcium	90.5	mg/L	0.50	98	70	130	1.0	20	
Iron	0.978	mg/L	0.030	98	70	130	1.6	20	
Magnesium	53.9	mg/L	0.50	98	70	130	0.2	20	
Manganese	1.02	mg/L	0.010	102	70	130	1.4	20	
Molybdenum	1.11	mg/L	0.10	111	70	130	7.3	20	
Nickel	0.977	mg/L	0.050	98	70	130	2.4	20	
Potassium	53.6	mg/L	0.50	94	70	130	1.5	20	
Silica	58.3	mg/L	0.10		70	130	1.2	20	A
Sodium	61.2	mg/L	0.54	101	70	130	0.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.



QA/QC Summary Report

Client: Crow Butte Resources
Project: North Trend Baseline

Revised Date: 06/02/08
Report Date: 04/01/08
Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8							Batch: R97946		
Sample ID: LFB	Laboratory Fortified Blank				Run: ICPMS2-C_080311A		03/11/08 17:44		
Aluminum	0.0539	mg/L	0.0010	108	85	115			
Arsenic	0.0524	mg/L	0.0010	105	85	115			
Barium	0.0529	mg/L	0.0010	106	85	115			
Cadmium	0.0534	mg/L	0.0010	107	85	115			
Chromium	0.0530	mg/L	0.0010	106	85	115			
Copper	0.0527	mg/L	0.0010	105	85	115			
Lead	0.0540	mg/L	0.0010	108	85	115			
Manganese	0.0530	mg/L	0.0010	106	85	115			
Mercury	0.00553	mg/L	0.0010	111	85	115			
Molybdenum	0.0545	mg/L	0.0010	109	85	115			
Nickel	0.0529	mg/L	0.0010	106	85	115			
Uranium	0.0540	mg/L	0.00030	108	85	115			
Vanadium	0.0530	mg/L	0.0010	106	85	115			
Zinc	0.0546	mg/L	0.0010	107	85	115			
Sample ID: C08020504-010AMS	Sample Matrix Spike				Run: ICPMS2-C_080311A		03/11/08 21:01		
Aluminum	0.208	mg/L	0.10	117	70	130			
Arsenic	0.176	mg/L	0.0010	113	70	130			
Barium	0.786	mg/L	0.10		70	130			A
Cadmium	0.162	mg/L	0.010	108	70	130			
Chromium	0.173	mg/L	0.050	112	70	130			
Copper	0.155	mg/L	0.010	101	70	130			
Lead	0.179	mg/L	0.050	119	70	130			
Manganese	0.242	mg/L	0.010	111	70	130			
Mercury	0.0178	mg/L	0.0010	119	70	130			
Molybdenum	0.187	mg/L	0.10	123	70	130			
Nickel	0.159	mg/L	0.050	106	70	130			
Uranium	0.196	mg/L	0.00030	127	70	130			
Vanadium	0.177	mg/L	0.10	116	70	130			
Zinc	0.165	mg/L	0.010	101	70	130			
Sample ID: C08020504-010AMSD	Sample Matrix Spike Duplicate				Run: ICPMS2-C_080311A		03/11/08 21:08		
Aluminum	0.209	mg/L	0.10	118	70	130	0.8	20	
Arsenic	0.176	mg/L	0.0010	112	70	130	0.2	20	
Barium	0.771	mg/L	0.10		70	130	1.9	20	A
Cadmium	0.157	mg/L	0.010	105	70	130	3.1	20	
Chromium	0.172	mg/L	0.050	112	70	130	0.6	20	
Copper	0.154	mg/L	0.010	101	70	130	0.8	20	
Lead	0.174	mg/L	0.050	116	70	130	2.4	20	
Manganese	0.242	mg/L	0.010	111	70	130	0.0	20	
Mercury	0.0178	mg/L	0.0010	118	70	130	0.3	20	
Molybdenum	0.184	mg/L	0.10	121	70	130	2.1	20	
Nickel	0.158	mg/L	0.050	106	70	130	0.3	20	

Qualifiers:

RL - Analyte reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R97946
Sample ID: C08020504-010AMSD	Sample Matrix Spike Duplicate			Run: ICPMS2-C_080311A			03/11/08 21:08		
Uranium	0.193	mg/L	0.00030	126	70	130	1.5	20	
Vanadium	0.177	mg/L	0.10	115	70	130	0.4	20	
Zinc	0.166	mg/L	0.010	101	70	130	0.3	20	
Method: E200.8									Batch: R98030
Sample ID: LRB	Method Blank			Run: ICPMS2-C_080312B			03/12/08 18:36		
Selenium	ND	mg/L	0.0002						
Sample ID: LFB	Laboratory Fortified Blank			Run: ICPMS2-C_080312B			03/12/08 18:41		
Selenium	0.0510	mg/L	0.0010	102	85	115			
Sample ID: C08030286-010AMS	Sample Matrix Spike			Run: ICPMS2-C_080312B			03/13/08 03:56		
Selenium	0.0527	mg/L	0.0010	105	70	130			
Sample ID: C08030286-010AMSD	Sample Matrix Spike Duplicate			Run: ICPMS2-C_080312B			03/13/08 04:22		
Selenium	0.0518	mg/L	0.0010	103	70	130	1.8	20	
Sample ID: C08030343-002BMS	Sample Matrix Spike			Run: ICPMS2-C_080312B			03/13/08 05:31		
Selenium	0.0570	mg/L	0.0010	105	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R98117
Sample ID: LRB	Method Blank								Run: ICPMS2-C_080313A 03/13/08 13:21
Aluminum	0.0002	mg/L	0.0001						
Arsenic	ND	mg/L	6E-05						
Barium	ND	mg/L	3E-05						
Cadmium	9E-05	mg/L	1E-05						
Chromium	ND	mg/L	4E-05						
Copper	ND	mg/L	7E-05						
Lead	ND	mg/L	3E-05						
Manganese	ND	mg/L	5E-05						
Mercury	ND	mg/L	8E-05						
Molybdenum	ND	mg/L	5E-05						
Nickel	ND	mg/L	0.0007						
Selenium	ND	mg/L	0.0002						
Uranium	ND	mg/L	1E-05						
Vanadium	ND	mg/L	3E-05						
Zinc	0.0009	mg/L	0.0003						
Sample ID: LFB	Laboratory Fortified Blank								Run: ICPMS2-C_080313A 03/13/08 13:27
Aluminum	0.0517	mg/L	0.0010	103	85	115			
Arsenic	0.0518	mg/L	0.0010	104	85	115			
Barium	0.0512	mg/L	0.0010	102	85	115			
Cadmium	0.0521	mg/L	0.0010	104	85	115			
Chromium	0.0506	mg/L	0.0010	101	85	115			
Copper	0.0525	mg/L	0.0010	105	85	115			
Lead	0.0518	mg/L	0.0010	104	85	115			
Manganese	0.0505	mg/L	0.0010	101	85	115			
Mercury	0.00540	mg/L	0.0010	108	85	115			
Molybdenum	0.0545	mg/L	0.0010	109	85	115			
Nickel	0.0520	mg/L	0.0010	104	85	115			
Selenium	0.0517	mg/L	0.0010	103	85	115			
Uranium	0.0516	mg/L	0.00030	103	85	115			
Vanadium	0.0510	mg/L	0.0010	102	85	115			
Zinc	0.0554	mg/L	0.0010	109	85	115			
Sample ID: C08030354-001CMS	Sample Matrix Spike								Run: ICPMS2-C_080313A 03/14/08 00:49
Aluminum	0.0913	mg/L	0.10	97	70	130			
Arsenic	0.0703	mg/L	0.0010	102	70	130			
Barium	0.0953	mg/L	0.10	102	70	130			
Cadmium	0.0517	mg/L	0.010	103	70	130			
Chromium	0.0441	mg/L	0.050	87	70	130			
Copper	0.0491	mg/L	0.010	98	70	130			
Lead	0.0543	mg/L	0.050	101	70	130			
Manganese	0.0452	mg/L	0.010	90	70	130			
Mercury	0.00537	mg/L	0.0010	107	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R98117
Sample ID: C08030354-001CMS	Sample Matrix Spike				Run: ICPMS2-C_080313A			03/14/08 00:49	
Molybdenum	0.0547	mg/L	0.10	106	70	130			
Nickel	0.0498	mg/L	0.050	100	70	130			
Selenium	0.0520	mg/L	0.0010	102	70	130			
Uranium	0.0652	mg/L	0.00030	98	70	130			
Vanadium	0.0486	mg/L	0.10	89	70	130			
Zinc	0.0518	mg/L	0.010	101	70	130			
Sample ID: C08030354-001CMSD	Sample Matrix Spike Duplicate				Run: ICPMS2-C_080313A			03/14/08 00:55	
Aluminum	0.0867	mg/L	0.10	88	70	130	0.0	20	
Arsenic	0.0688	mg/L	0.0010	99	70	130	2.2	20	
Barium	0.0948	mg/L	0.10	101	70	130	0.0	20	
Cadmium	0.0501	mg/L	0.010	100	70	130	3.3	20	
Chromium	0.0422	mg/L	0.050	83	70	130	0.0	20	
Copper	0.0482	mg/L	0.010	96	70	130	2.0	20	
Lead	0.0528	mg/L	0.050	98	70	130	2.8	20	
Manganese	0.0425	mg/L	0.010	85	70	130	6.2	20	
Mercury	0.00517	mg/L	0.0010	103	70	130	3.7	20	
Molybdenum	0.0531	mg/L	0.10	103	70	130	0.0	20	
Nickel	0.0493	mg/L	0.050	99	70	130	0.0	20	
Selenium	0.0509	mg/L	0.0010	99	70	130	2.1	20	
Uranium	0.0631	mg/L	0.00030	94	70	130	3.4	20	
Vanadium	0.0469	mg/L	0.10	86	70	130	0.0	20	
Zinc	0.0508	mg/L	0.010	99	70	130	2.0	20	
Method: E353.2									Batch: R97968
Sample ID: MBLK-1	Method Blank				Run: TECHNICON_080312A			03/12/08 10:32	
Nitrogen, Nitrate+Nitrite as N	ND	mg/L	0.03						
Sample ID: LCS-2	Laboratory Control Sample				Run: TECHNICON_080312A			03/12/08 10:35	
Nitrogen, Nitrate+Nitrite as N	2.49	mg/L	0.10	98	90	110			
Sample ID: C08030343-005DMS	Sample Matrix Spike				Run: TECHNICON_080312A			03/12/08 10:50	
Nitrogen, Nitrate+Nitrite as N	2.01	mg/L	0.10	100	90	110			
Sample ID: C08030343-005DMSD	Sample Matrix Spike Duplicate				Run: TECHNICON_080312A			03/12/08 10:52	
Nitrogen, Nitrate+Nitrite as N	2.01	mg/L	0.10	100	90	110	0.0	10	
Sample ID: C08030371-004CMS	Sample Matrix Spike				Run: TECHNICON_080312A			03/12/08 11:27	
Nitrogen, Nitrate+Nitrite as N	2.88	mg/L	0.10	103	90	110			
Sample ID: C08030371-004CMSD	Sample Matrix Spike Duplicate				Run: TECHNICON_080312A			03/12/08 11:30	
Nitrogen, Nitrate+Nitrite as N	2.90	mg/L	0.10	104	90	110	0.7	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/02/08

Report Date: 04/01/08

Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0		Batch: RA226-2668							
Sample ID: C08030343-005CMS Radium 226	Sample Matrix Spike 29	pCi/L	0.20	96	70	130			03/17/08 15:14
Run: BERTHOLD 770_080311A									
Sample ID: C08030343-005CMSD Radium 226	Sample Matrix Spike Duplicate 28	pCi/L	0.20	89	70	130	1.6		03/17/08 15:14 16.7
Run: BERTHOLD 770_080311A									
Sample ID: MB-RA226-2668 Radium 226	Method Blank ND	pCi/L	0.2						03/17/08 17:01
Run: BERTHOLD 770_080311A									
Sample ID: LCS-RA226-2668 Radium 226	Laboratory Control Sample 6.3	pCi/L	0.20	99	70	130			03/17/08 17:01
Run: BERTHOLD 770_080311A									
Method: E907.0		Batch: R100560							
Sample ID: LCS-R100560 Thorium 230	Laboratory Control Sample 7.40pCi/L		0.20	106	70	130			04/22/08 15:00
Run: EGG-ORTEC_080422A									
Sample ID: C08030343-008CMS Thorium 230	Sample Matrix Spike 16.1pCi/L		0.20	98	70	130			04/22/08 15:00
Run: EGG-ORTEC_080422A									
Sample ID: C08030343-008CMSD Thorium 230	Sample Matrix Spike Duplicate 16.5pCi/L		0.20	101	70	130	2.5		04/22/08 15:00 30
Run: EGG-ORTEC_080422A									
Sample ID: MB-R100560 Thorium 230	Method Blank ND	pCi/L							04/22/08 15:00 U
Run: EGG-ORTEC_080422A									
Method: E909.0M		Batch: R101313							
Sample ID: C08030343-003CDUP Lead 210	Sample Duplicate ND	pCi/L	1.0				0.0		04/28/08 11:15 30 U
Run: PACKARD 3100TR_080428B									
Sample ID: C08030343-008CMS Lead 210	Sample Matrix Spike 460	pCi/L	1.0	77	70	130			04/28/08 11:15
Run: PACKARD 3100TR_080428B									
Sample ID: C08030343-008CMSD Lead 210	Sample Matrix Spike Duplicate 570	pCi/L	1.0	97	70	130	23		04/28/08 11:15 30
Run: PACKARD 3100TR_080428B									
Sample ID: MB-R101313 Lead 210	Method Blank ND	pCi/L							04/28/08 11:15
Run: PACKARD 3100TR_080428B									
Sample ID: LCS-R101313 Lead 210	Laboratory Control Sample 120	pCi/L	1.0	98	70	130			04/28/08 11:15
Run: PACKARD 3100TR_080428B									

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources
Project: North Trend Baseline

Revised Date: 06/02/08
Report Date: 04/01/08
Work Order: C08030343

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RMO-3008									Batch: R100702
Sample ID: C08040928-002AMS	Sample Matrix Spike				Run: EGG-ORTEC_080428A				04/28/08 15:00
Polonium 210	160	pCi/L	1.0	90	70	130			
Sample ID: C08040928-002AMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080428A				04/28/08 15:00
Polonium 210	170	pCi/L	1.0	95	70	130	4.5	30	
Sample ID: LCS-R100702	Laboratory Control Sample				Run: EGG-ORTEC_080428A				04/28/08 15:00
Polonium 210	81	pCi/L	1.0	92	70	130			
Sample ID: MB-R100702	Method Blank				Run: EGG-ORTEC_080428A				04/28/08 15:00
Polonium 210	1	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



Date: 04-Jun-08

CLIENT: Crow Butte Resources
Project: North Trend Baseline
Sample Delivery Group: C08030343

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Per client request, results less than zero are reported as ND. Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)

All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS

Method 900.0 for gross alpha and gross beta is intended as a drinking water screen for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

RADON IN AIR ANALYSIS

The desired exposure time is 48 hours (2 days). The time delay in returning the canister to the laboratory for processing should be as short as possible to avoid excessive decay. Maximum recommended delay between end of exposure to beginning of counting should not exceed 8 days.

SOIL/SOLID SAMPLES

All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505

Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:

USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:

The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER, WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.



ANALYTICAL SUMMARY REPORT

June 04, 2008

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C08030430

Quote ID: C1125 - Crow Butte Uranium Project

Project Name: North Trend Baseline

Energy Laboratories, Inc. received the following 1 sample from Crow Butte Resources on 3/12/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08030430-001	Bow-1	03/07/08 12:30	03/12/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:


STEVE CARLSTON



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030430-001
Client Sample ID: Bow-1

Revised Date: 06/04/08
Report Date: 04/17/08
Collection Date: 03/07/08 12:30
Date Received: 03/12/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	207	mg/L		1		A2320 B	03/12/08 20:12 / bas
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/12/08 20:12 / bas
Bicarbonate as HCO ₃	252	mg/L		1		A2320 B	03/12/08 20:12 / bas
Calcium	61	mg/L		1		E200.7	03/17/08 18:31 / cp
Chloride	35	mg/L		1		A4500-Cl B	03/25/08 09:49 / ljl
Fluoride	0.3	mg/L		0.1		A4500-F C	03/17/08 09:57 / bas
Magnesium	7	mg/L		1		E200.7	03/17/08 18:31 / cp
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH ₃ G	03/17/08 11:27 / jal
Nitrogen, Nitrate+Nitrite as N	7.5	mg/L		0.2		E353.2	03/14/08 12:01 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/13/08 10:51 / jal
Potassium	19	mg/L		1		E200.7	03/17/08 18:31 / cp
Silica	68.1	mg/L	D	0.2		E200.7	03/24/08 18:21 / cp
Sodium	65	mg/L		1		E200.7	03/17/08 18:31 / cp
Sulfate	62	mg/L		1		A4500-SO ₄ E	03/24/08 16:48 / ljl
PHYSICAL PROPERTIES							
Conductivity	691	umhos/cm		1		A2510 B	03/14/08 14:22 / dd
pH	7.77	s.u.		0.01		A4500-H B	03/14/08 14:22 / dd
Solids, Total Dissolved TDS @ 180 C	472	mg/L	H	10		A2540 C	03/18/08 12:56 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.7	03/24/08 18:21 / cp
Arsenic	0.010	mg/L		0.001		E200.8	03/28/08 15:29 / ts
Barium	0.1	mg/L		0.1		E200.7	03/17/08 18:31 / cp
Boron	ND	mg/L		0.1		E200.7	03/17/08 18:31 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/28/08 15:29 / ts
Chromium	ND	mg/L		0.05		E200.7	03/24/08 18:21 / cp
Copper	ND	mg/L		0.01		E200.7	03/20/08 13:08 / cp
Iron	ND	mg/L		0.03		E200.7	03/17/08 18:31 / cp
Lead	0.003	mg/L		0.001		E200.8	03/28/08 15:29 / ts
Manganese	ND	mg/L		0.01		E200.7	03/17/08 18:31 / cp
Mercury	ND	mg/L		0.001		E200.8	03/28/08 15:29 / ts
Molybdenum	ND	mg/L		0.1		E200.7	03/24/08 18:21 / cp
Nickel	ND	mg/L		0.05		E200.7	03/24/08 18:21 / cp
Selenium	0.027	mg/L		0.001		E200.8	03/28/08 15:29 / ts
Uranium	0.0256	mg/L		0.0003		E200.8	03/28/08 15:29 / ts
Vanadium	ND	mg/L		0.1		E200.7	03/24/08 18:21 / cp
Zinc	0.48	mg/L		0.01		E200.7	03/17/08 18:31 / cp

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030430-001
Client Sample ID: Bow-1

Revised Date: 06/04/08
Report Date: 04/17/08
Collection Date: 03/07/08 12:30
Date Received: 03/12/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	0.3		E909.0M	03/17/08 05:45 / dm
Lead 210 precision (±)	0.3	pCi/L				E909.0M	03/17/08 05:45 / dm
Polonium 210	ND	pCi/L	U	0.5		RMO-3008	03/25/08 15:00 / dmf
Polonium 210 precision (±)	0.5	pCi/L				RMO-3008	03/25/08 15:00 / dmf
Radium 226	ND	pCi/L	U	0.1		E903.0	03/24/08 10:58 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	03/24/08 10:58 / trs
Radium 226 MDC	0.1	pCi/L				E903.0	03/24/08 10:58 / trs
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	-0.001	%				Calculation	03/26/08 10:38 / sw
Anions	6.94	meq/L				Calculation	03/26/08 10:38 / sw
Cations	6.94	meq/L				Calculation	03/26/08 10:38 / sw
Solids, Total Dissolved Calculated	473	mg/L				Calculation	03/26/08 10:38 / sw
TDS Balance (0.80 - 1.20)	1.00	dec. %				Calculation	03/26/08 10:38 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B									Batch: R98154
Sample ID: MBLK-1	Method Blank						Run: MANTECH_080312B		03/12/08 16:12
Alkalinity, Total as CaCO ₃	ND	mg/L	0.2						
Carbonate as CO ₃	ND	mg/L	1						
Bicarbonate as HCO ₃	ND	mg/L	1						
Sample ID: LCS-1									03/12/08 16:20
Laboratory Control Sample							Run: MANTECH_080312B		
Alkalinity, Total as CaCO ₃	5040	mg/L	1.0	101	90	110			
Sample ID: C08030430-001DMS									03/12/08 20:20
Sample Matrix Spike							Run: MANTECH_080312B		
Alkalinity, Total as CaCO ₃	326	mg/L	1.0	104	90	110			
Sample ID: C08030430-001DMSD									03/12/08 20:28
Sample Matrix Spike Duplicate							Run: MANTECH_080312B		
Alkalinity, Total as CaCO ₃	325	mg/L	1.0	103	90	110	0.3	10	
Method: A2510 B									Analytical Run: ORION555A_080314B
Sample ID: ICV2_080314_1									03/14/08 14:17
Initial Calibration Verification Standard									
Conductivity	1410	umhos/cm	1.0	99	90	110			
Method: A2510 B									Batch: 080314_1_PH-W
Sample ID: MBLK1_080314_1									03/14/08 14:14
Method Blank							Run: ORION555A_080314B		
Conductivity	0.3	umhos/cm	0.2						
Sample ID: C08030442-002ADUP									03/14/08 14:31
Sample Duplicate							Run: ORION555A_080314B		
Conductivity	1040	umhos/cm	1.0				0.4	10	
Method: A2540 C									Batch: 080317_1_SLDS-TDS-W
Sample ID: MBLK1_080317									03/18/08 12:55
Method Blank							Run: BAL-1_080318B		
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	6						
Sample ID: LCS1_080317									03/18/08 12:55
Laboratory Control Sample							Run: BAL-1_080318B		
Solids, Total Dissolved TDS @ 180 C	1000	mg/L	10	100	90	110			
Sample ID: C08030408-001AMS									03/18/08 12:56
Sample Matrix Spike							Run: BAL-1_080318B		
Solids, Total Dissolved TDS @ 180 C	4220	mg/L	10	107	90	110			
Sample ID: C08030408-001AMSD									03/18/08 12:56
Sample Matrix Spike Duplicate							Run: BAL-1_080318B		
Solids, Total Dissolved TDS @ 180 C	4010	mg/L	10	97	90	110	5.0	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-Cl B							Batch: 080325A-CL-TTR-W		
Sample ID: MBLK9-080325A	Method Blank					Run: TITRATION_080325A			03/25/08 08:34
Chloride	ND	mg/L	0.4						
Sample ID: C08030343-010AMS	Sample Matrix Spike					Run: TITRATION_080325A			03/25/08 09:39
Chloride	507	mg/L	1.0	99	90	110			
Sample ID: C08030343-010AMSD	Sample Matrix Spike Duplicate					Run: TITRATION_080325A			03/25/08 09:40
Chloride	507	mg/L	1.0	99	90	110	0.0	10	
Sample ID: LCS35-080325A	Laboratory Control Sample					Run: TITRATION_080325A			03/25/08 11:27
Chloride	3550	mg/L	1.0	100	90	110			
Method: A4500-F C							Batch: R98187		
Sample ID: MBLK-1	Method Blank					Run: MANTECH_080317A			03/17/08 09:49
Fluoride	ND	mg/L	0.05						
Sample ID: LCS-1	Laboratory Control Sample					Run: MANTECH_080317A			03/17/08 09:52
Fluoride	1.00	mg/L	0.10	100	90	110			
Sample ID: C08030430-001DMS	Sample Matrix Spike					Run: MANTECH_080317A			03/17/08 10:00
Fluoride	1.41	mg/L	0.10	107	90	110			
Sample ID: C08030430-001DMSD	Sample Matrix Spike Duplicate					Run: MANTECH_080317A			03/17/08 10:03
Fluoride	1.38	mg/L	0.10	104	90	110	2.2	10	
Method: A4500-H B							Analytical Run: ORION555A_080314B		
Sample ID: ICV1_080314_1	Initial Calibration Verification Standard								03/14/08 14:15
pH	7.04	s.u.	0.010	103	98	102			S
The run ICV was outside QC advisory limits. Sample run CCV's showed acceptable recoveries, therefore the batch was approved.									
Sample ID: CCV1_080314_1	Continuing Calibration Verification Standard								03/14/08 14:50
pH	7.17	s.u.	0.010	102	98	102			
Method: A4500-H B							Batch: 080314_1_PH-W		
Sample ID: C08030442-002ADUP	Sample Duplicate					Run: ORION555A_080314B			03/14/08 14:31
pH	7.73	s.u.	0.010				0.3	10	

Qualifiers:

RL - Analyte reporting limit.

S - Spike recovery outside of advisory limits.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G Batch: R98193									
Sample ID: MBLK-1	Method Blank								
Nitrogen, Ammonia as N	ND	mg/L	0.02						03/17/08 10:51
Run: TECHNICON_080317A									
Sample ID: LCS-2	Laboratory Control Sample								
Nitrogen, Ammonia as N	20.2	mg/L	0.20	101	80	120			03/17/08 10:53
Run: TECHNICON_080317A									
Sample ID: C08030442-003BMS	Sample Matrix Spike								
Nitrogen, Ammonia as N	2.15	mg/L	0.050	107	80	120			03/17/08 11:35
Run: TECHNICON_080317A									
Sample ID: C08030442-003BMSD	Sample Matrix Spike Duplicate								
Nitrogen, Ammonia as N	2.14	mg/L	0.050	107	80	120	0.5	20	03/17/08 11:37
Run: TECHNICON_080317A									
Method: A4500-NO2 B Analytical Run: HACH DR3000_080313C									
Sample ID: ICV-2	Initial Calibration Verification Standard								
Nitrogen, Nitrite as N	1.02	mg/L	0.10	102	90	110			03/13/08 10:51
Sample ID: CCV-8	Continuing Calibration Verification Standard								
Nitrogen, Nitrite as N	1.02	mg/L	0.10	102	90	110			03/13/08 11:05
Method: A4500-NO2 B Batch: A2008-03-13_6_NO2_01									
Sample ID: MBLK-1	Method Blank								
Nitrogen, Nitrite as N	ND	mg/L	0.003						03/13/08 10:51
Run: HACH DR3000_080313C									
Sample ID: C08030443-002BMS	Sample Matrix Spike								
Nitrogen, Nitrite as N	0.0507	mg/L	0.10	107	80	120			03/13/08 11:05
Run: HACH DR3000_080313C									
Sample ID: C08030443-002BMSD	Sample Matrix Spike Duplicate								
Nitrogen, Nitrite as N	0.0505	mg/L	0.10	106	80	120	0.0	10	03/13/08 11:05
Run: HACH DR3000_080313C									
Method: A4500-SO4 E Batch: 080324_1_SO4-TURB-W									
Sample ID: LCS-1_080324	Laboratory Control Sample								
Sulfate	5000	mg/L	59	104	90	110			03/24/08 09:48
Run: TURB-2_080324A									
Sample ID: MBLK-1_080324	Method Blank								
Sulfate	ND	mg/L	0.6						03/24/08 09:50
Run: TURB-2_080324A									
Sample ID: C08030430-001DMS	Sample Matrix Spike								
Sulfate	127	mg/L	2.0	103	90	110			03/24/08 16:52
Run: TURB-2_080324A									
Sample ID: C08030430-001DMSD	Sample Matrix Spike Duplicate								
Sulfate	126	mg/L	2.0	101	90	110	0.8	10	03/24/08 16:54
Run: TURB-2_080324A									

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: R98220		
Sample ID: MB-080317A	Method Blank		Run: ICP2-C_080317A				03/17/08 14:34		
Barium	ND	mg/L	0.006						
Calcium	ND	mg/L	0.1						
Iron	ND	mg/L	0.005						
Magnesium	ND	mg/L	0.04						
Manganese	ND	mg/L	0.0003						
Potassium	0.03	mg/L	0.02						
Sodium	ND	mg/L	0.8						
Zinc	ND	mg/L	0.002						
Sample ID: LFB-080317A	Laboratory Fortified Blank		Run: ICP2-C_080317A				03/17/08 14:37		
Barium	0.970	mg/L	0.10	97	85	125			
Boron	0.966	mg/L	0.10	97	85	125			
Calcium	47.3	mg/L	0.50	95	85	125			
Iron	0.931	mg/L	0.030	93	85	125			
Magnesium	47.4	mg/L	0.50	95	85	125			
Manganese	0.965	mg/L	0.010	96	85	125			
Potassium	47.3	mg/L	0.50	94	85	125			
Sodium	46.0	mg/L	0.77	92	85	125			
Zinc	0.938	mg/L	0.010	94	85	125			
Sample ID: C08030433-001CMS2	Sample Matrix Spike		Run: ICP2-C_080317A				03/17/08 18:47		
Barium	2.03	mg/L	0.10	96	70	130			
Boron	2.09	mg/L	0.10	98	70	130			
Calcium	156	mg/L	0.50	93	70	130			
Iron	1.92	mg/L	0.030	94	70	130			
Magnesium	100	mg/L	0.50	92	70	130			
Manganese	1.98	mg/L	0.010	97	70	130			
Potassium	109	mg/L	0.50	88	70	130			
Sodium	210	mg/L	1.1	93	70	130			
Zinc	1.94	mg/L	0.010	95	70	130			
Sample ID: C08030433-001CMSD2	Sample Matrix Spike Duplicate		Run: ICP2-C_080317A				03/17/08 18:51		
Barium	2.03	mg/L	0.10	96	70	130	0.1	20	
Boron	2.11	mg/L	0.10	98	70	130	0.9	20	
Calcium	157	mg/L	0.50	94	70	130	0.7	20	
Iron	1.91	mg/L	0.030	94	70	130	0.6	20	
Magnesium	101	mg/L	0.50	93	70	130	0.9	20	
Manganese	1.98	mg/L	0.010	97	70	130	0.1	20	
Potassium	110	mg/L	0.50	88	70	130	0.7	20	
Sodium	208	mg/L	1.1	92	70	130	0.6	20	
Zinc	1.92	mg/L	0.010	94	70	130	0.9	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R98431
Sample ID: MB-080320A	Method Blank								Run: ICP2-C_080320A 03/20/08 13:01
Copper	0.006	mg/L	0.005						
Sample ID: LFB-080320A	Laboratory Fortified Blank								Run: ICP2-C_080320A 03/20/08 13:04
Copper	0.958	mg/L	0.010	95	85	125			
Sample ID: C08030430-001BMS2	Sample Matrix Spike								Run: ICP2-C_080320A 03/20/08 13:11
Copper	0.974	mg/L	0.010	95	70	130			
Sample ID: C08030430-001BMSD2	Sample Matrix Spike Duplicate								Run: ICP2-C_080320A 03/20/08 13:14
Copper	0.982	mg/L	0.010	95	70	130	0.8	20	
Method: E200.7									Batch: R98541
Sample ID: MB-080324A	Method Blank								Run: ICP2-C_080324A 03/24/08 15:06
Aluminum	ND	mg/L	0.004						
Chromium	ND	mg/L	0.002						
Molybdenum	ND	mg/L	0.003						
Nickel	ND	mg/L	0.004						
Silica	0.1	mg/L	0.02						
Vanadium	0.005	mg/L	0.003						
Sample ID: LFB-080324A	Laboratory Fortified Blank								Run: ICP2-C_080324A 03/24/08 15:09
Aluminum	0.962	mg/L	0.10	96	85	125			
Chromium	0.960	mg/L	0.050	96	85	125			
Molybdenum	0.950	mg/L	0.10	95	85	125			
Nickel	0.989	mg/L	0.050	99	85	125			
Silica	1.04	mg/L	0.10	94	85	125			
Vanadium	0.971	mg/L	0.10	97	85	125			
Sample ID: C08030820-001BMS	Sample Matrix Spike								Run: ICP2-C_080324A 03/24/08 17:52
Aluminum	9.76	mg/L	0.10	98	70	130			
Chromium	9.85	mg/L	0.050	99	70	130			
Molybdenum	10.1	mg/L	0.10	101	70	130			
Nickel	10.0	mg/L	0.050	100	70	130			
Silica	25.7	mg/L	0.20	101	70	130			
Vanadium	9.94	mg/L	0.10	99	70	130			
Sample ID: C08030820-001BMSD	Sample Matrix Spike Duplicate								Run: ICP2-C_080324A 03/24/08 17:55
Aluminum	9.97	mg/L	0.10	100	70	130	2.1	20	
Chromium	10.1	mg/L	0.050	101	70	130	2.1	20	
Molybdenum	10.1	mg/L	0.10	101	70	130	0.1	20	
Nickel	10.1	mg/L	0.050	101	70	130	1.0	20	
Silica	25.8	mg/L	0.20	102	70	130	0.5	20	
Vanadium	10.1	mg/L	0.10	101	70	130	1.7	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R98784
Sample ID: LRB	Method Blank						Run: ICPMS2-C_080328A		03/28/08 12:09
Arsenic	ND	mg/L	6E-05						
Cadmium	ND	mg/L	1E-05						
Lead	ND	mg/L	3E-05						
Mercury	ND	mg/L	8E-05						
Selenium	ND	mg/L	0.0002						
Uranium	ND	mg/L	1E-05						
Sample ID: LFB	Laboratory Fortified Blank						Run: ICPMS2-C_080328A		03/28/08 12:15
Arsenic	0.0503	mg/L	0.0010	101	85	115			
Cadmium	0.0511	mg/L	0.0010	102	85	115			
Lead	0.0501	mg/L	0.0010	100	85	115			
Mercury	0.00511	mg/L	0.0010	102	85	115			
Selenium	0.0514	mg/L	0.0010	103	85	115			
Uranium	0.0502	mg/L	0.00030	100	85	115			
Sample ID: LFB	Laboratory Fortified Blank						Run: ICPMS2-C_080328A		03/28/08 12:56
Arsenic	0.0522	mg/L	0.0010	104	85	115			
Cadmium	0.0519	mg/L	0.0010	104	85	115			
Lead	0.0509	mg/L	0.0010	102	85	115			
Mercury	0.00526	mg/L	0.0010	105	85	115			
Selenium	0.0514	mg/L	0.0010	103	85	115			
Sample ID: C08030583-001AMS4	Post Digestion Spike						Run: ICPMS2-C_080328A		03/28/08 16:50
Arsenic	0.0513	mg/L	0.0010	103	70	130			
Cadmium	0.0480	mg/L	0.010	96	70	130			
Lead	0.0511	mg/L	0.050	102	70	130			
Mercury	0.00513	mg/L	0.0010	103	70	130			
Selenium	0.167	mg/L	0.0010	108	70	130			
Uranium	0.100	mg/L	0.00030	104	70	130			
Sample ID: C08030583-001AMSD4	Post Digestion Spike Duplicate						Run: ICPMS2-C_080328A		03/28/08 16:57
Arsenic	0.0498	mg/L	0.0010	100	70	130	3.0	20	
Cadmium	0.0470	mg/L	0.010	94	70	130	2.1	20	
Lead	0.0492	mg/L	0.050	98	70	130	0.0	20	
Mercury	0.00499	mg/L	0.0010	100	70	130	2.8	20	
Selenium	0.165	mg/L	0.0010	103	70	130	1.4	20	
Uranium	0.0979	mg/L	0.00030	99	70	130	2.5	20	
Sample ID: C08030595-010AMS	Sample Matrix Spike						Run: ICPMS2-C_080328A		03/28/08 21:20
Lead	0.0458	mg/L	0.0010	91	70	130			
Sample ID: C08030595-010AMSD	Sample Matrix Spike Duplicate						Run: ICPMS2-C_080328A		03/28/08 21:27
Lead	0.0460	mg/L	0.0010	92	70	130	0.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2							Batch: R98116		
Sample ID: MBLK-1	Method Blank				Run: TECHNICON_080314A		03/14/08 11:28		
Nitrogen, Nitrate+Nitrite as N	ND	mg/L	0.03						
Sample ID: LCS-2	Laboratory Control Sample				Run: TECHNICON_080314A		03/14/08 11:31		
Nitrogen, Nitrate+Nitrite as N	2.49	mg/L	0.10	100	90	110			
Sample ID: C08030419-001AMS	Sample Matrix Spike				Run: TECHNICON_080314A		03/14/08 11:46		
Nitrogen, Nitrate+Nitrite as N	3.14	mg/L	0.10	105	90	110			
Sample ID: C08030419-001AMSD	Sample Matrix Spike Duplicate				Run: TECHNICON_080314A		03/14/08 11:48		
Nitrogen, Nitrate+Nitrite as N	3.11	mg/L	0.10	103	90	110	1.0	10	
Method: E903.0							Batch: RA226-2672		
Sample ID: C08030442-001DMS	Sample Matrix Spike				Run: BERTHOLD 770_080314A		03/24/08 12:43		
Radium 226	6.9	pCi/L		95	70	130			
Sample ID: C08030442-001DMSD	Sample Matrix Spike Duplicate				Run: BERTHOLD 770_080314A		03/24/08 12:43		
Radium 226	9.9	pCi/L		141	70	130	35	21.6	SR
- Spike response is outside of the acceptance range for this analysis. Since the LCS, MB, and MS are acceptable, the batch is approved.									
Sample ID: MB-RA226-2672	Method Blank				Run: BERTHOLD 770_080314A		03/24/08 14:23		
Radium 226	ND	pCi/L	0.2						
Sample ID: LCS-RA226-2672	Laboratory Control Sample				Run: BERTHOLD 770_080314A		03/24/08 14:23		
Radium 226	6.7	pCi/L		108	70	130			
Method: E907.0							Batch: R98861		
Sample ID: LCS-R98861	Laboratory Control Sample				Run: EGG-ORTEC_080325B		03/25/08 16:30		
Thorium 230	8.00pCi/L		0.20	98	70	130			
Sample ID: C08030408-001DMS	Sample Matrix Spike				Run: EGG-ORTEC_080325B		03/25/08 16:30		
Thorium 230	16.3pCi/L		0.20	99	70	130			
Sample ID: C08030408-001DMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080325B		03/25/08 16:30		
Thorium 230	15.1pCi/L		0.20	92	70	130	7.6	30	
Sample ID: MB-R98861	Method Blank				Run: EGG-ORTEC_080325B		03/25/08 16:30		
Thorium 230	ND	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

R - RPD exceeds advisory limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/17/08

Work Order: C08030430

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E909.0M									Batch: R98516
Sample ID: C08030354-001DMS	Sample Matrix Spike								Run: PACKARD 3100TR_080317A 03/17/08 05:45
Lead 210	500	pCi/L	1.0	84	70	130			
Sample ID: C08030354-001DMSD	Sample Matrix Spike Duplicate								Run: PACKARD 3100TR_080317A 03/17/08 05:45
Lead 210	710	pCi/L	1.0	120	70	130	36	30	R
- The RPD for the MSD is high. The individual spike recoveries are within range, the MB is acceptable, and the LCS is within range, therefore the batch is approved.									
Sample ID: C08030568-003ADUP	Sample Duplicate								Run: PACKARD 3100TR_080317A 03/17/08 05:45
Lead 210	ND	pCi/L	1.0				0.0	30	U
Sample ID: MB-R98516	Method Blank								Run: PACKARD 3100TR_080317A 03/17/08 05:45
Lead 210	ND	pCi/L							
Sample ID: LCS-R98516	Laboratory Control Sample								Run: PACKARD 3100TR_080317A 03/17/08 05:45
Lead 210	100	pCi/L	1.0	88	70	130			
Method: RMO-3008									Batch: R98834
Sample ID: C08030555-002HMS	Sample Matrix Spike								Run: EGG-ORTEC_080325A 03/25/08 15:00
Polonium 210	96	pCi/L	1.0	85	70	130			
Sample ID: C08030555-002HMSD	Sample Matrix Spike Duplicate								Run: EGG-ORTEC_080325A 03/25/08 15:00
Polonium 210	78	pCi/L	1.0	70	70	130	20	30	
Sample ID: LCS-R98834	Laboratory Control Sample								Run: EGG-ORTEC_080325A 03/25/08 15:00
Polonium 210	84	pCi/L	1.0	75	70	130			
Sample ID: MB-R98834	Method Blank								Run: EGG-ORTEC_080325A 03/25/08 15:00
Polonium 210	1	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

R - RPD exceeds advisory limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



Date: 04-Jun-08

CLIENT: Crow Butte Resources
Project: North Trend Baseline
Sample Delivery Group: C08030430

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Per client request, results less than zero are reported as ND. Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)

All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS

Method 900.0 for gross alpha and gross beta is intended as a drinking water screen for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

RADON IN AIR ANALYSIS

The desired exposure time is 48 hours (2 days). The time delay in returning the canister to the laboratory for processing should be as short as possible to avoid excessive decay. Maximum recommended delay between end of exposure to beginning of counting should not exceed 8 days.

SOIL/SOLID SAMPLES

All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505

Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:

USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:

The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER, WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.



ANALYTICAL SUMMARY REPORT

June 04, 2008

Crow Butte Resources

86 Crow Butte Rd

Crawford, NE 69339

Workorder No.: C08030949

Quote ID: C1125 - Crow Butte Uranium Project

Project Name: North Trend Baseline

Energy Laboratories, Inc. received the following 11 samples from Crow Butte Resources on 3/24/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08030949-001	123	03/17/08 12:14	03/24/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate
C08030949-002	97	03/17/08 13:23	03/24/08	Aqueous	Same As Above
C08030949-003	COW-1	03/18/08 08:33	03/24/08	Aqueous	Same As Above
C08030949-004	COW-4	03/18/08 09:52	03/24/08	Aqueous	Same As Above
C08030949-005	COW-3	03/18/08 12:17	03/24/08	Aqueous	Same As Above
C08030949-006	RC-2	03/18/08 16:35	03/24/08	Aqueous	Same As Above
C08030949-007	COW-5	03/19/08 08:33	03/24/08	Aqueous	Same As Above
C08030949-008	CPW-2	03/19/08 10:39	03/24/08	Aqueous	Same As Above
C08030949-009	COW-2	03/19/08 12:14	03/24/08	Aqueous	Same As Above
C08030949-010	RC-1	03/19/08 12:40	03/24/08	Aqueous	Same As Above
C08030949-011	COW-6	03/20/08 08:23	03/24/08	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:


STEVE CARLSTON



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-001
Client Sample ID: 123

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/17/08 12:14
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	310	mg/L		1		A2320 B	03/25/08 22:06 / dnp
Carbonate as CO ₃	5	mg/L		1		A2320 B	03/25/08 22:06 / dnp
Bicarbonate as HCO ₃	367	mg/L		1		A2320 B	03/25/08 22:06 / dnp
Calcium	11	mg/L		1		E200.7	03/28/08 13:03 / cp
Chloride	160	mg/L		1		A4500-Cl B	04/03/08 15:28 / jal
Fluoride	0.7	mg/L		0.1		A4500-F C	04/01/08 19:50 / ljl
Magnesium	1	mg/L		1		E200.7	03/28/08 13:03 / cp
Nitrogen, Ammonia as N	0.26	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:31 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 14:20 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:57 / jal
Potassium	11	mg/L		1		E200.7	03/28/08 13:03 / cp
Silica	10.4	mg/L		0.1		E200.7	03/28/08 13:03 / cp
Sodium	462	mg/L	D	2		E200.7	03/28/08 13:03 / cp
Sulfate	460	mg/L	D	10		A4500-SO ₄ E	03/31/08 13:41 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2070	umhos/cm		1		A2510 B	03/26/08 17:54 / dnp
pH	8.65	s.u.	H	0.01		A4500-H B	03/26/08 17:54 / dnp
Solids, Total Dissolved TDS @ 180 C	1250	mg/L	H	10		A2540 C	03/26/08 19:35 / dd

- TDS, pH sample received from client past recommended hold time.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 18:12 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/27/08 18:12 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 18:12 / ts
Boron	1.3	mg/L		0.1		E200.7	03/28/08 13:03 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 18:12 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 18:12 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 18:12 / ts
Iron	0.72	mg/L		0.03		E200.7	03/28/08 13:03 / cp
Lead	0.001	mg/L		0.001		E200.8	03/27/08 18:12 / ts
Manganese	ND	mg/L		0.01		E200.8	03/27/08 18:12 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 18:12 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 18:12 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 18:12 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 18:12 / ts
Uranium	ND	mg/L		0.0003		E200.8	03/27/08 18:12 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 18:12 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 18:12 / ts

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-001
Client Sample ID: 123

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/17/08 12:14
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	39.2	pCi/L		3.5		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	3.5	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	ND	pCi/L	U	0.5		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	0.5	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	ND	pCi/L	U	0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	1.79	%				Calculation	04/07/08 13:47 / sw
Anions	20.3	meq/L				Calculation	04/07/08 13:47 / sw
Cations	21.1	meq/L				Calculation	04/07/08 13:47 / sw
Solids, Total Dissolved Calculated	1300	mg/L				Calculation	04/07/08 13:47 / sw
TDS Balance (0.80 - 1.20)	0.960	dec. %				Calculation	04/07/08 13:47 / sw

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-002
Client Sample ID: 97

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/17/08 13:23
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	438	mg/L		1		A2320 B	03/25/08 22:29 / dnp
Carbonate as CO ₃	2	mg/L		1		A2320 B	03/25/08 22:29 / dnp
Bicarbonate as HCO ₃	531	mg/L		1		A2320 B	03/25/08 22:29 / dnp
Calcium	18	mg/L		1		E200.7	03/28/08 13:13 / cp
Chloride	157	mg/L		1		A4500-Cl B	04/03/08 15:30 / jal
Fluoride	1.0	mg/L		0.1		A4500-F C	04/01/08 19:53 / ljl
Magnesium	2	mg/L		1		E200.7	03/28/08 13:13 / cp
Nitrogen, Ammonia as N	0.36	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:33 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 14:23 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:57 / jal
Potassium	14	mg/L		1		E200.7	03/28/08 13:13 / cp
Silica	10.2	mg/L		0.1		E200.7	03/28/08 13:13 / cp
Sodium	498	mg/L	D	2		E200.7	03/28/08 13:13 / cp
Sulfate	595	mg/L	D	10		A4500-SO ₄ E	03/31/08 13:42 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2270	umhos/cm		1		A2510 B	03/26/08 17:56 / dnp
pH	8.52	s.u.	H	0.01		A4500-H B	03/26/08 17:56 / dnp
Solids, Total Dissolved TDS @ 180 C	1370	mg/L	H	10		A2540 C	03/26/08 19:35 / dd

- TDS, pH sample received from client past recommended hold time.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 18:39 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 18:39 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 18:39 / ts
Boron	1.6	mg/L		0.1		E200.7	03/28/08 13:13 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 18:39 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 18:39 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 18:39 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 13:13 / cp
Lead	0.001	mg/L		0.001		E200.8	03/27/08 18:39 / ts
Manganese	ND	mg/L		0.01		E200.8	03/27/08 18:39 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 18:39 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 18:39 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 18:39 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 18:39 / ts
Uranium	ND	mg/L		0.0003		E200.8	03/27/08 18:39 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 18:39 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 18:39 / ts

Report RL - Analyte reporting limit.

MCL - Maximum contaminant level.

Definitions: QCL - Quality control limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

D - RL Increased due to sample matrix interference.

H - Analysis performed past recommended holding time.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-002
Client Sample ID: 97

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/17/08 13:23
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	17.8	pCi/L		2.3		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	2.3	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	1.6	pCi/L		1.1		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	1.1	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	0.3	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	-5.24	%				Calculation	04/11/08 13:53 / sw
Anions	25.6	meq/L				Calculation	04/11/08 13:53 / sw
Cations	23.1	meq/L				Calculation	04/11/08 13:53 / sw
Solids, Total Dissolved Calculated	1560	mg/L				Calculation	04/11/08 13:53 / sw
TDS Balance (0.80 - 1.20)	0.880	dec. %				Calculation	04/11/08 13:53 / sw

- The Anion / Cation balance was confirmed by re-analysis.

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-003
Client Sample ID: COW-1

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 08:33
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	291	mg/L		1		A2320 B	03/25/08 22:36 / dnp
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/25/08 22:36 / dnp
Bicarbonate as HCO ₃	355	mg/L		1		A2320 B	03/25/08 22:36 / dnp
Calcium	58	mg/L		1		E200.7	03/28/08 13:20 / cp
Chloride	260	mg/L		1		A4500-Cl B	04/03/08 15:33 / jai
Fluoride	1.0	mg/L		0.1		A4500-F C	04/01/08 19:56 / ljl
Magnesium	7	mg/L		1		E200.7	03/28/08 13:20 / cp
Nitrogen, Ammonia as N	0.98	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:35 / jai
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 14:25 / jai
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jai
Potassium	27	mg/L		1		E200.7	03/28/08 13:20 / cp
Silica	11.5	mg/L		0.1		E200.7	03/28/08 13:20 / cp
Sodium	800	mg/L	D	2		E200.7	03/28/08 13:20 / cp
Sulfate	1180	mg/L	D	10		A4500-SO ₄ E	03/31/08 13:44 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	3600	umhos/cm		1		A2510 B	03/26/08 17:57 / dnp
pH	8.38	s.u.	H	0.01		A4500-H B	03/26/08 17:57 / dnp
Solids, Total Dissolved TDS @ 180 C	2290	mg/L	H	10		A2540 C	03/26/08 19:36 / dd

- TDS, pH sample received from client past recommended hold time.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 18:46 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 18:46 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 18:46 / ts
Boron	1.9	mg/L		0.1		E200.7	03/28/08 13:20 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 18:46 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 18:46 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 18:46 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 13:20 / cp
Lead	0.002	mg/L		0.001		E200.8	03/27/08 18:46 / ts
Manganese	0.03	mg/L		0.01		E200.8	03/27/08 18:46 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 18:46 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 18:46 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 18:46 / ts
Selenium	0.004	mg/L		0.001		E200.8	03/27/08 18:46 / ts
Uranium	0.0004	mg/L		0.0003		E200.8	03/27/08 18:46 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 18:46 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 18:46 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-003
Client Sample ID: COW-1

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 08:33
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.2		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	2.2	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	5.4	pCi/L		2.1		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	2.1	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	21.8	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.8	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	0.1	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	1.59	%				Calculation	04/07/08 13:48 / sw
Anions	37.8	meq/L				Calculation	04/07/08 13:48 / sw
Cations	39.0	meq/L				Calculation	04/07/08 13:48 / sw
Solids, Total Dissolved Calculated	2520	mg/L				Calculation	04/07/08 13:48 / sw
TDS Balance (0.80 - 1.20)	0.910	dec. %				Calculation	04/07/08 13:48 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-004
Client Sample ID: COW-4

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 09:52
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	273	mg/L		1		A2320 B	03/25/08 22:43 / dnp
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/25/08 22:43 / dnp
Bicarbonate as HCO ₃	334	mg/L		1		A2320 B	03/25/08 22:43 / dnp
Calcium	30	mg/L		1		E200.7	03/28/08 13:23 / cp
Chloride	228	mg/L		1		A4500-Cl B	04/03/08 15:34 / jal
Fluoride	1.1	mg/L		0.1		A4500-F C	04/01/08 20:01 / ljl
Magnesium	6	mg/L		1		E200.7	03/28/08 13:23 / cp
Nitrogen, Ammonia as N	0.77	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:37 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 14:28 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	19	mg/L		1		E200.7	03/28/08 13:23 / cp
Silica	12.1	mg/L		0.1		E200.7	03/28/08 13:23 / cp
Sodium	694	mg/L	D	2		E200.7	03/28/08 13:23 / cp
Sulfate	979	mg/L	D	10		A4500-SO ₄ E	03/31/08 13:46 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	3160	umhos/cm		1		A2510 B	03/26/08 17:58 / dnp
pH	8.16	s.u.	H	0.01		A4500-H B	03/26/08 17:58 / dnp
Solids, Total Dissolved TDS @ 180 C	1950	mg/L	H	10		A2540 C	03/26/08 19:36 / dd

- TDS, pH sample received from client past recommended hold time.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 18:53 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 18:53 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 18:53 / ts
Boron	1.8	mg/L		0.1		E200.7	03/28/08 13:23 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 18:53 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 18:53 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 18:53 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 13:23 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 18:53 / ts
Manganese	0.01	mg/L		0.01		E200.8	03/27/08 18:53 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 18:53 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 18:53 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 18:53 / ts
Selenium	0.003	mg/L		0.001		E200.8	03/27/08 18:53 / ts
Uranium	0.0355	mg/L		0.0003		E200.8	03/27/08 18:53 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 18:53 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 18:53 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-004
Client Sample ID: COW-4

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 09:52
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	17.2	pCi/L		2.3		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	2.3	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	1.1	pCi/L		1.1		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	1.1	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	25.1	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.9	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	0.1	pCi/L		0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.613	%				Calculation	04/07/08 13:49 / sw
Anions	32.3	meq/L				Calculation	04/07/08 13:49 / sw
Cations	32.7	meq/L				Calculation	04/07/08 13:49 / sw
Solids, Total Dissolved Calculated	2130	mg/L				Calculation	04/07/08 13:49 / sw
TDS Balance (0.80 - 1.20)	0.920	dec. %				Calculation	04/07/08 13:49 / sw

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-005
Client Sample ID: COW-3

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 12:17
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	340	mg/L		1		A2320 B	03/25/08 22:50 / dnp
Carbonate as CO ₃	10	mg/L		1		A2320 B	03/25/08 22:50 / dnp
Bicarbonate as HCO ₃	396	mg/L		1		A2320 B	03/25/08 22:50 / dnp
Calcium	10	mg/L		1		E200.7	03/28/08 13:26 / cp
Chloride	164	mg/L		1		A4500-Cl B	04/03/08 15:48 / jal
Fluoride	1.4	mg/L		0.1		A4500-F C	04/01/08 20:10 / ljl
Magnesium	2	mg/L		1		E200.7	03/28/08 13:26 / cp
Nitrogen, Ammonia as N	0.56	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:45 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 15:38 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	20	mg/L		1		E200.7	03/28/08 13:26 / cp
Silica	12.7	mg/L		0.1		E200.7	03/28/08 13:26 / cp
Sodium	538	mg/L	D	2		E200.7	03/28/08 13:26 / cp
Sulfate	612	mg/L	D	10		A4500-SO ₄ E	03/31/08 13:58 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2400	umhos/cm		1		A2510 B	03/26/08 17:59 / dnp
pH	8.62	s.u.	H	0.01		A4500-H B	03/26/08 17:59 / dnp
Solids, Total Dissolved TDS @ 180 C	1460	mg/L	H	10		A2540 C	03/26/08 19:36 / dd

- TDS, pH sample received from client past recommended hold time.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 18:59 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/27/08 18:59 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 18:59 / ts
Boron	1.9	mg/L		0.1		E200.7	03/28/08 13:26 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 18:59 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 18:59 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 18:59 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 13:26 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 18:59 / ts
Manganese	ND	mg/L		0.01		E200.8	03/27/08 18:59 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 18:59 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 18:59 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 18:59 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 18:59 / ts
Uranium	0.0090	mg/L		0.0003		E200.8	03/27/08 18:59 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 18:59 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 18:59 / ts

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-005
Client Sample ID: COW-3

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 12:17
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.8		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	1.8	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	4.4	pCi/L		2.0		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	2.0	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	0.6	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	ND	pCi/L	U	0.2		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.2	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	0.903	%				Calculation	04/07/08 13:49 / sw
Anions	24.2	meq/L				Calculation	04/07/08 13:49 / sw
Cations	24.7	meq/L				Calculation	04/07/08 13:49 / sw
Solids, Total Dissolved Calculated	1560	mg/L				Calculation	04/07/08 13:49 / sw
TDS Balance (0.80 - 1.20)	0.940	dec. %				Calculation	04/07/08 13:49 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-006
Client Sample ID: RC-2

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 16:35
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	313	mg/L		1		A2320 B	03/25/08 22:58 / dnp
Carbonate as CO ₃	5	mg/L		1		A2320 B	03/25/08 22:58 / dnp
Bicarbonate as HCO ₃	373	mg/L		1		A2320 B	03/25/08 22:58 / dnp
Calcium	14	mg/L		1		E200.7	03/28/08 13:30 / cp
Chloride	142	mg/L		1		A4500-Cl B	04/03/08 16:10 / jal
Fluoride	1.3	mg/L		0.1		A4500-F C	04/01/08 20:13 / ljl
Magnesium	1	mg/L		1		E200.7	03/28/08 13:30 / cp
Nitrogen, Ammonia as N	0.59	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:47 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 15:40 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	15	mg/L		1		E200.7	03/28/08 13:30 / cp
Silica	11.7	mg/L		0.1		E200.7	03/28/08 13:30 / cp
Sodium	508	mg/L	D	2		E200.7	03/28/08 13:30 / cp
Sulfate	602	mg/L	D	10		A4500-SO ₄ E	03/31/08 14:08 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2270	umhos/cm		1		A2510 B	03/26/08 18:02 / dnp
pH	8.53	s.u.	H	0.01		A4500-H B	03/26/08 18:02 / dnp
Solids, Total Dissolved TDS @ 180 C	1400	mg/L	H	10		A2540 C	03/26/08 19:37 / dd

- TDS, pH sample received from client past recommended hold time.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 19:06 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 19:06 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 19:06 / ts
Boron	1.8	mg/L		0.1		E200.7	03/28/08 13:30 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 19:06 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 19:06 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 19:06 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 13:30 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 19:06 / ts
Manganese	0.01	mg/L		0.01		E200.8	03/27/08 19:06 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 19:06 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 19:06 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 19:06 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 19:06 / ts
Uranium	0.0032	mg/L		0.0003		E200.8	03/27/08 19:06 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 19:06 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 19:06 / ts

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-006
Client Sample ID: RC-2

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/18/08 16:35
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.0		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	2.0	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	4.6	pCi/L		1.8		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	1.8	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	1.4	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	1.02	%				Calculation	04/07/08 13:49 / sw
Anions	22.9	meq/L				Calculation	04/07/08 13:49 / sw
Cations	23.3	meq/L				Calculation	04/07/08 13:49 / sw
Solids, Total Dissolved Calculated	1480	mg/L				Calculation	04/07/08 13:49 / sw
TDS Balance (0.80 - 1.20)	0.950	dec. %				Calculation	04/07/08 13:49 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-007
Client Sample ID: COW-5

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 08:33
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	352	mg/L		1		A2320 B	03/25/08 23:05 / dnp
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/25/08 23:05 / dnp
Bicarbonate as HCO ₃	429	mg/L		1		A2320 B	03/25/08 23:05 / dnp
Calcium	30	mg/L		1		E200.7	03/28/08 15:19 / cp
Chloride	213	mg/L		1		A4500-Cl B	04/03/08 16:21 / jal
Fluoride	1.2	mg/L		0.1		A4500-F C	04/01/08 20:15 / ljl
Magnesium	6	mg/L		1		E200.7	03/28/08 15:19 / cp
Nitrogen, Ammonia as N	0.72	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:49 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 15:42 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	13	mg/L		1		E200.7	03/28/08 15:19 / cp
Silica	12.5	mg/L		0.1		E200.7	03/28/08 15:19 / cp
Sodium	607	mg/L	D	2		E200.7	03/28/08 15:19 / cp
Sulfate	858	mg/L	D	10		A4500-SO ₄ E	03/31/08 14:12 / ljl

- NO2 sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2930	umhos/cm		1		A2510 B	03/26/08 14:59 / dd
pH	8.17	s.u.		0.01		A4500-H B	03/26/08 14:59 / dd
Solids, Total Dissolved TDS @ 180 C	1880	mg/L		10		A2540 C	03/26/08 19:37 / dd

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 19:13 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 19:13 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 19:13 / ts
Boron	1.9	mg/L		0.1		E200.7	03/28/08 15:19 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 19:13 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 19:13 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 19:13 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 15:19 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 19:13 / ts
Manganese	0.02	mg/L		0.01		E200.8	03/27/08 19:13 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 19:13 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 19:13 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 19:13 / ts
Selenium	0.003	mg/L		0.001		E200.8	03/27/08 19:13 / ts
Uranium	0.0172	mg/L		0.0003		E200.8	03/27/08 19:13 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 19:13 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 19:13 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-007
Client Sample ID: COW-5

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 08:33
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	20.1	pCi/L		2.5		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	2.5	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	1.3	pCi/L		1.2		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	1.2	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	42.0	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	1.2	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	0.2	pCi/L		0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	-3.72	%				Calculation	04/07/08 13:50 / sw
Anions	31.0	meq/L				Calculation	04/07/08 13:50 / sw
Cations	28.8	meq/L				Calculation	04/07/08 13:50 / sw
Solids, Total Dissolved Calculated	1950	mg/L				Calculation	04/07/08 13:50 / sw
TDS Balance (0.80 - 1.20)	0.960	dec. %				Calculation	04/07/08 13:50 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-008
Client Sample ID: CPW-2

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 10:39
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	341	mg/L		1		A2320 B	03/25/08 23:13 / dnp
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/25/08 23:13 / dnp
Bicarbonate as HCO ₃	416	mg/L		1		A2320 B	03/25/08 23:13 / dnp
Calcium	21	mg/L		1		E200.7	03/28/08 15:22 / cp
Chloride	157	mg/L		1		A4500-Cl B	04/03/08 16:22 / jal
Fluoride	1.5	mg/L		0.1		A4500-F C	04/01/08 20:18 / ljl
Magnesium	4	mg/L		1		E200.7	03/28/08 15:22 / cp
Nitrogen, Ammonia as N	0.59	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:51 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 15:45 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	13	mg/L		1		E200.7	03/28/08 15:22 / cp
Silica	12.2	mg/L		0.1		E200.7	03/28/08 15:22 / cp
Sodium	500	mg/L	D	2		E200.7	03/28/08 15:22 / cp
Sulfate	649	mg/L	D	10		A4500-SO ₄ E	03/31/08 14:14 / ljl

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2370	umhos/cm		1		A2510 B	03/26/08 15:00 / dd
pH	8.24	s.u.		0.01		A4500-H B	03/26/08 15:00 / dd
Solids, Total Dissolved TDS @ 180 C	1530	mg/L		10		A2540 C	03/26/08 19:40 / dd

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 19:20 / ts
Arsenic	0.001	mg/L		0.001		E200.8	03/27/08 19:20 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 19:20 / ts
Boron	1.8	mg/L		0.1		E200.7	03/28/08 15:22 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 19:20 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 19:20 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 19:20 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 15:22 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 19:20 / ts
Manganese	ND	mg/L		0.01		E200.8	03/27/08 19:20 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 19:20 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 19:20 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 19:20 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 19:20 / ts
Uranium	0.0341	mg/L		0.0003		E200.8	03/27/08 19:20 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 19:20 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 19:20 / ts

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-008
Client Sample ID: CPW-2

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 10:39
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.6		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	1.6	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	1.3	pCi/L		1.2		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	1.2	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	12.5	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.7	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	-2.81	%				Calculation	04/07/08 13:50 / sw
Anions	24.8	meq/L				Calculation	04/07/08 13:50 / sw
Cations	23.5	meq/L				Calculation	04/07/08 13:50 / sw
Solids, Total Dissolved Calculated	1560	mg/L				Calculation	04/07/08 13:50 / sw
TDS Balance (0.80 - 1.20)	0.980	dec. %				Calculation	04/07/08 13:50 / sw

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-009
Client Sample ID: COW-2

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 12:14
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	340	mg/L		1		A2320 B	03/25/08 23:20 / dnp
Carbonate as CO ₃	11	mg/L		1		A2320 B	03/25/08 23:20 / dnp
Bicarbonate as HCO ₃	392	mg/L		1		A2320 B	03/25/08 23:20 / dnp
Calcium	9	mg/L		1		E200.7	03/28/08 15:26 / cp
Chloride	157	mg/L		1		A4500-Cl B	04/03/08 16:29 / jal
Fluoride	1.4	mg/L		0.1		A4500-F C	04/01/08 20:21 / ljl
Magnesium	1	mg/L		1		E200.7	03/28/08 15:26 / cp
Nitrogen, Ammonia as N	0.53	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:53 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 15:48 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	18	mg/L		1		E200.7	03/28/08 15:26 / cp
Silica	13.1	mg/L		0.1		E200.7	03/28/08 15:26 / cp
Sodium	487	mg/L	D	2		E200.7	03/28/08 15:26 / cp
Sulfate	596	mg/L	D	10		A4500-SO ₄ E	04/01/08 17:47 / jal

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2260	umhos/cm		1		A2510 B	03/26/08 15:02 / dd
pH	8.49	s.u.		0.01		A4500-H B	03/26/08 15:02 / dd
Solids, Total Dissolved TDS @ 180 C	1470	mg/L	H	10		A2540 C	04/09/08 18:53 / dd

- H-Original analysis was done within hold time. Data is from recheck analysis.

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 19:27 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 19:27 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 19:27 / ts
Boron	1.8	mg/L		0.1		E200.7	03/28/08 15:26 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 19:27 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 19:27 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 19:27 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 15:26 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 19:27 / ts
Manganese	ND	mg/L		0.01		E200.8	03/27/08 19:27 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 19:27 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 19:27 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 19:27 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 19:27 / ts
Uranium	0.0146	mg/L		0.0003		E200.8	03/27/08 19:27 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 19:27 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 19:27 / ts

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-009
Client Sample ID: COW-2

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 12:14
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.6		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	1.6	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	ND	pCi/L	U	1.0		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	1.0	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	8.1	pCi/L		0.2		E903.0	04/02/08 13:16 / taj
Radium 226 precision (±)	0.5	pCi/L				E903.0	04/02/08 13:16 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 13:16 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	-3.18	%				Calculation	04/11/08 13:54 / sw
Anions	23.7	meq/L				Calculation	04/11/08 13:54 / sw
Cations	22.2	meq/L				Calculation	04/11/08 13:54 / sw
Solids, Total Dissolved Calculated	1490	mg/L				Calculation	04/11/08 13:54 / sw
TDS Balance (0.80 - 1.20)	0.990	dec. %				Calculation	04/11/08 13:54 / sw

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

MDC - Minimum detectable concentration

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-010
Client Sample ID: RC-1

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 12:40
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	313	mg/L		1		A2320 B	03/25/08 23:27 / dnp
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/25/08 23:27 / dnp
Bicarbonate as HCO ₃	382	mg/L		1		A2320 B	03/25/08 23:27 / dnp
Calcium	19	mg/L		1		E200.7	03/28/08 15:29 / cp
Chloride	185	mg/L		1		A4500-Cl B	04/03/08 16:45 / jal
Fluoride	0.9	mg/L		0.1		A4500-F C	04/01/08 20:24 / ljl
Magnesium	2	mg/L		1		E200.7	03/28/08 15:29 / cp
Nitrogen, Ammonia as N	0.36	mg/L		0.05		A4500-NH ₃ G	03/26/08 11:59 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 15:58 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	17	mg/L		1		E200.7	03/28/08 15:29 / cp
Silica	10.1	mg/L		0.1		E200.7	03/28/08 15:29 / cp
Sodium	486	mg/L	D	2		E200.7	03/28/08 15:29 / cp
Sulfate	604	mg/L	D	10		A4500-SO ₄ E	04/01/08 17:53 / jal

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	2340	umhos/cm		1		A2510 B	03/31/08 16:15 / dnp
pH	8.35	s.u.		0.01		A4500-H B	03/26/08 15:04 / dd
Solids, Total Dissolved TDS @ 180 C	1550	mg/L	H	10		A2540 C	03/31/08 18:41 / dd

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 19:33 / ts
Arsenic	ND	mg/L		0.001		E200.8	03/27/08 19:33 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 19:33 / ts
Boron	1.3	mg/L		0.1		E200.7	03/28/08 15:29 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 19:33 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 19:33 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 19:33 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 15:29 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 19:33 / ts
Manganese	0.01	mg/L		0.01		E200.8	03/27/08 19:33 / ts
Mercury	ND	mg/L		0.001		E200.8	03/27/08 19:33 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 19:33 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 19:33 / ts
Selenium	0.002	mg/L		0.001		E200.8	03/27/08 19:33 / ts
Uranium	ND	mg/L		0.0003		E200.8	03/27/08 19:33 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 19:33 / ts
Zinc	ND	mg/L		0.01		E200.8	03/27/08 19:33 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-010
Client Sample ID: RC-1

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/19/08 12:40
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.2		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	1.2	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	ND	pCi/L	U	0.9		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	0.9	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	0.8	pCi/L		0.2		E903.0	04/02/08 15:17 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/02/08 15:17 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 15:17 / taj
Thorium 230	0.1	pCi/L		0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	-3.01	%				Calculation	04/07/08 13:52 / sw
Anions	24.1	meq/L				Calculation	04/07/08 13:52 / sw
Cations	22.7	meq/L				Calculation	04/07/08 13:52 / sw
Solids, Total Dissolved Calculated	1510	mg/L				Calculation	04/07/08 13:52 / sw
TDS Balance (0.80 - 1.20)	1.03	dec. %				Calculation	04/07/08 13:52 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-011
Client Sample ID: COW-6

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/20/08 08:23
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	325	mg/L		1		A2320 B	03/25/08 23:41 / dnp
Carbonate as CO ₃	ND	mg/L		1		A2320 B	03/25/08 23:41 / dnp
Bicarbonate as HCO ₃	396	mg/L		1		A2320 B	03/25/08 23:41 / dnp
Calcium	55	mg/L		1		E200.7	03/28/08 15:32 / cp
Chloride	338	mg/L		1		A4500-Cl B	04/03/08 16:54 / jal
Fluoride	0.7	mg/L		0.1		A4500-F C	04/01/08 20:27 / ljl
Magnesium	11	mg/L		1		E200.7	03/28/08 15:32 / cp
Nitrogen, Ammonia as N	1.02	mg/L		0.05		A4500-NH ₃ G	03/26/08 12:01 / jal
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.1		E353.2	03/26/08 16:00 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/26/08 08:58 / jal
Potassium	30	mg/L		1		E200.7	03/28/08 15:32 / cp
Silica	12.5	mg/L		0.1		E200.7	03/28/08 15:32 / cp
Sodium	773	mg/L	D	2		E200.7	03/28/08 15:32 / cp
Sulfate	628	mg/L	D	10		A4500-SO ₄ E	04/01/08 18:01 / jal

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	3860	umhos/cm		1		A2510 B	03/31/08 16:17 / dnp
pH	8.12	s.u.		0.01		A4500-H B	03/26/08 15:06 / dd
Solids, Total Dissolved TDS @ 180 C	2440	mg/L	H	10		A2540 C	03/31/08 18:42 / dd

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 20:14 / ts
Arsenic	0.002	mg/L		0.001		E200.8	03/27/08 20:14 / ts
Barium	ND	mg/L		0.1		E200.8	03/27/08 20:14 / ts
Boron	1.7	mg/L		0.1		E200.7	03/28/08 15:32 / cp
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 20:14 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 20:14 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 20:14 / ts
Iron	ND	mg/L		0.03		E200.7	03/28/08 15:32 / cp
Lead	ND	mg/L		0.001		E200.8	03/27/08 20:14 / ts
Manganese	0.03	mg/L		0.01		E200.7	03/28/08 15:32 / cp
Mercury	ND	mg/L		0.001		E200.8	03/27/08 20:14 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 20:14 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 20:14 / ts
Selenium	0.004	mg/L		0.001		E200.8	03/27/08 20:14 / ts
Uranium	0.0018	mg/L		0.0003		E200.8	03/27/08 20:14 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 20:14 / ts
Zinc	0.02	mg/L		0.01		E200.8	03/27/08 20:14 / ts

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08030949-011
Client Sample ID: COW-6

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/20/08 08:23
Date Received: 03/24/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	0.4		E909.0M	03/27/08 07:30 / dm
Lead 210 precision (±)	0.4	pCi/L				E909.0M	03/27/08 07:30 / dm
Polonium 210	7.6	pCi/L		2.4		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	2.4	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	1.0	pCi/L		0.2		E903.0	04/02/08 15:17 / taj
Radium 226 precision (±)	0.2	pCi/L				E903.0	04/02/08 15:17 / taj
Radium 226 MDC	0.2	pCi/L				E903.0	04/02/08 15:17 / taj
Thorium 230	ND	pCi/L	U	0.1		E907.0	03/25/08 16:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	03/25/08 16:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	13.3	%				Calculation	04/11/08 13:56 / sw
Anions	29.1	meq/L				Calculation	04/11/08 13:56 / sw
Cations	38.1	meq/L				Calculation	04/11/08 13:56 / sw
Solids, Total Dissolved Calculated	2040	mg/L				Calculation	04/11/08 13:56 / sw
TDS Balance (0.80 - 1.20)	1.20	dec. %				Calculation	04/11/08 13:56 / sw

- The Anion / Cation balance was confirmed by re-analysis.

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B Batch: R98606									
Sample ID: MBLK-1	Method Blank				Run: MANTECH_080325A				03/25/08 21:46
Alkalinity, Total as CaCO ₃	ND	mg/L	0.2						
Carbonate as CO ₃	ND	mg/L	1						
Bicarbonate as HCO ₃	ND	mg/L	1						
Sample ID: LCS-1 Laboratory Control Sample Run: MANTECH_080325A 03/25/08 21:52									
Alkalinity, Total as CaCO ₃	8220	mg/L	1.0	164	90	110			S
- The LCS was outside of the recommended acceptance range. The Continuing Calibration Verification samples (CCV's) for the run were acceptable, so the batch is approved.									
Sample ID: C08030949-001AMS Sample Matrix Spike Run: MANTECH_080325A 03/25/08 22:13									
Alkalinity, Total as CaCO ₃	484	mg/L	1.0	140	90	110			S
Sample ID: C08030949-001AMSD Sample Matrix Spike Duplicate Run: MANTECH_080325A 03/25/08 22:20									
Alkalinity, Total as CaCO ₃	431	mg/L	1.0	97	90	110	12	10	R
Sample ID: C08030949-011AMS Sample Matrix Spike Run: MANTECH_080325A 03/25/08 23:48									
Alkalinity, Total as CaCO ₃	426	mg/L	1.0	81	90	110			S
Sample ID: C08030949-011AMSD Sample Matrix Spike Duplicate Run: MANTECH_080325A 03/25/08 23:55									
Alkalinity, Total as CaCO ₃	426	mg/L	1.0	81	90	110	0.0	10	S
Method: A2510 B Analytical Run: ORION555A_080326A									
Sample ID: ICV2_080326_1 Initial Calibration Verification Standard 03/26/08 16:56									
Conductivity	1420	umhos/cm	1.0	100	90	110			
Method: A2510 B Batch: 080326_1_PH-W									
Sample ID: MBLK1_080326_1 Method Blank Run: ORION555A_080326A 03/26/08 16:52									
Conductivity	1	umhos/cm	0.2						
Sample ID: C08030949-005BDUP Sample Duplicate Run: ORION555A_080326A 03/26/08 18:01									
Conductivity	2410	umhos/cm	1.0				0.2	10	
Method: A2510 B Analytical Run: ORION555A_080326C									
Sample ID: ICV2_080326_2 Initial Calibration Verification Standard 03/26/08 14:57									
Conductivity	1400	umhos/cm	1.0	99	90	110			
Method: A2510 B Batch: 080326_2_PH-W									
Sample ID: MBLK1_080326_2 Method Blank Run: ORION555A_080326C 03/26/08 14:55									
Conductivity	0.6	umhos/cm	0.2						

Qualifiers:

RL - Analyte reporting limit.

R - RPD exceeds advisory limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2510 B			Analytical Run: ORION555A_080331C						
Sample ID: ICV2_080331_1	Initial Calibration Verification Standard								03/31/08 16:03
Conductivity	1400	umhos/cm	1.0	99	90	110			
Method: A2510 B			Batch: 080331_1_PH-W_555A-2						
Sample ID: MBLK1_080331_1	Method Blank								03/31/08 15:59
Conductivity	0.9	umhos/cm	0.2						
Method: A2540 C			Batch: 080326_1_SLDS-TDS-W						
Sample ID: MBLK1_080326	Method Blank								03/26/08 16:30
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	6						
Sample ID: LCS1_080326	Laboratory Control Sample								03/26/08 16:30
Solids, Total Dissolved TDS @ 180 C	988	mg/L	10	98	90	110			
Sample ID: C08030539-004AMS	Sample Matrix Spike								03/26/08 19:08
Solids, Total Dissolved TDS @ 180 C	2500	mg/L	10	101	90	110			
Sample ID: C08030539-004AMSD	Sample Matrix Spike Duplicate								03/26/08 19:08
Solids, Total Dissolved TDS @ 180 C	2490	mg/L	10	102	90	110	0.3	10	
Sample ID: C08030949-008BMS	Sample Matrix Spike								03/26/08 19:40
Solids, Total Dissolved TDS @ 180 C	3440	mg/L	10	99	90	110			
Sample ID: C08030949-008BMSD	Sample Matrix Spike Duplicate								03/26/08 19:41
Solids, Total Dissolved TDS @ 180 C	3420	mg/L	10	98	90	110	0.5	10	
Method: A2540 C			Batch: 080331_1_SLDS-TDS-W						
Sample ID: MBLK1_080331	Method Blank								03/31/08 18:18
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	6						
Sample ID: LCS1_080331	Laboratory Control Sample								03/31/08 18:18
Solids, Total Dissolved TDS @ 180 C	969	mg/L	10	97	90	110			
Sample ID: C08030949-010BMS	Sample Matrix Spike								03/31/08 18:58
Solids, Total Dissolved TDS @ 180 C	3200	mg/L	10	92	90	110			
Sample ID: C08030949-010BMSD	Sample Matrix Spike Duplicate								04/01/08 00:00
Solids, Total Dissolved TDS @ 180 C	3280	mg/L	10	97	90	110	2.4	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C			Batch: 080409_1_SLDS-TDS-W						
Sample ID: MBLK1_080409	Method Blank					Run: BAL-1_080410A			04/09/08 18:50
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	6						
Sample ID: LCS1_080409	Laboratory Control Sample					Run: BAL-1_080410A			04/09/08 18:50
Solids, Total Dissolved TDS @ 180 C	1000	mg/L	10	100	90	110			
Sample ID: C08010225-025AMS	Sample Matrix Spike					Run: BAL-1_080410A			04/09/08 18:51
Solids, Total Dissolved TDS @ 180 C	3620	mg/L	10	102	90	110			
Sample ID: C08010225-025AMSD	Sample Matrix Spike Duplicate					Run: BAL-1_080410A			04/09/08 18:51
Solids, Total Dissolved TDS @ 180 C	3580	mg/L	10	101	90	110	1.2	10	
Method: A4500-Cl B			Batch: 080403A-CL-TTR-W						
Sample ID: MBLK9-080403A	Method Blank					Run: TITRATION_080403B			04/03/08 10:39
Chloride	ND	mg/L	0.4						
Sample ID: LCS35-080403A	Laboratory Control Sample					Run: TITRATION_080403B			04/03/08 12:48
Chloride	3490	mg/L	1.0	98	90	110			
Sample ID: C08030949-004AMS	Sample Matrix Spike					Run: TITRATION_080403B			04/03/08 15:37
Chloride	583	mg/L	1.0	100	90	110			
Sample ID: C08030949-004AMSD	Sample Matrix Spike Duplicate					Run: TITRATION_080403B			04/03/08 15:37
Chloride	583	mg/L	1.0	100	90	110	0.0	10	
Sample ID: C08030949-011AMS	Sample Matrix Spike					Run: TITRATION_080403B			04/03/08 16:57
Chloride	1250	mg/L	1.0	102	90	110			
Sample ID: C08030949-011AMSD	Sample Matrix Spike Duplicate					Run: TITRATION_080403B			04/03/08 17:06
Chloride	1240	mg/L	1.0	101	90	110	0.7	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C									Batch: R98931
Sample ID: MBLK-1	Method Blank					Run: MANTECH_080402A			04/01/08 18:12
Fluoride	ND	mg/L	0.05						
Sample ID: LCS-1	Laboratory Control Sample					Run: MANTECH_080402A			04/01/08 18:15
Fluoride	1.00	mg/L	0.10	100	90	110			
Sample ID: C08030949-004AMS	Sample Matrix Spike					Run: MANTECH_080402A			04/01/08 20:04
Fluoride	2.06	mg/L	0.10	98	90	110			
Sample ID: C08030949-004AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_080402A			04/01/08 20:07
Fluoride	2.06	mg/L	0.10	98	90	110	0.0	10	
Sample ID: C08030965-002AMS	Sample Matrix Spike					Run: MANTECH_080402A			04/01/08 20:49
Fluoride	13.6	mg/L	0.10	25	90	110			S
- Matrix spike recoveries outside the acceptance range may be considered matrix-related.									
Sample ID: C08030965-002AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_080402A			04/01/08 20:56
Fluoride	13.6	mg/L	0.10	25	90	110	0.0	10	S
- Matrix spike recoveries outside the acceptance range may be considered matrix-related.									
Method: A4500-H B									Analytical Run: ORION555A_080326A
Sample ID: ICV1_080326_1	Initial Calibration Verification Standard								03/26/08 16:55
pH	7.00	s.u.	0.010	102	98	102			
Sample ID: CCV1_080326_1	Continuing Calibration Verification Standard								03/26/08 17:38
pH	7.16	s.u.	0.010	102	98	102			
Method: A4500-H B									Batch: 080326_1_PH-W
Sample ID: C08030949-005BDUP	Sample Duplicate					Run: ORION555A_080326A			03/26/08 18:01
pH	8.59	s.u.	0.010				0.3	10	
Method: A4500-H B									Analytical Run: ORION555A_080326C
Sample ID: ICV1_080326_2	Initial Calibration Verification Standard								03/26/08 14:56
pH	6.87	s.u.	0.010	100	98	102			
Method: A4500-H B									Analytical Run: ORION555A_080331C
Sample ID: ICV1_080331_1	Initial Calibration Verification Standard								03/31/08 16:01
pH	6.88	s.u.	0.010	100	98	102			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G									Batch: R98643
Sample ID: MBLK-1	Method Blank								Run: TECHNICON_080326A 03/26/08 10:21
Nitrogen, Ammonia as N	ND	mg/L	0.02						
Sample ID: LCS-2	Laboratory Control Sample								Run: TECHNICON_080326A 03/26/08 10:23
Nitrogen, Ammonia as N	20.2	mg/L	0.20	101	80	120			
Sample ID: C08030949-004EMS	Sample Matrix Spike								Run: TECHNICON_080326A 03/26/08 11:39
Nitrogen, Ammonia as N	2.90	mg/L	0.050	107	80	120			
Sample ID: C08030949-004EMSD	Sample Matrix Spike Duplicate								Run: TECHNICON_080326A 03/26/08 11:41
Nitrogen, Ammonia as N	2.93	mg/L	0.050	109	80	120	1.0	20	
Sample ID: C07071195-030DMS	Sample Matrix Spike								Run: TECHNICON_080326A 03/26/08 12:09
Nitrogen, Ammonia as N	2.12	mg/L	0.050	106	80	120			
Sample ID: C07071195-030DMSD	Sample Matrix Spike Duplicate								Run: TECHNICON_080326A 03/26/08 12:11
Nitrogen, Ammonia as N	2.10	mg/L	0.050	105	80	120	0.9	20	
Method: A4500-NO2 B									Batch: A2008-03-26_6_NO2_01
Sample ID: MBLK-1	Method Blank								Run: HACH DR3000_080326A 03/26/08 08:57
Nitrogen, Nitrite as N	ND	mg/L	0.003						
Sample ID: C08030949-001AMS	Sample Matrix Spike								Run: HACH DR3000_080326A 03/26/08 08:57
Nitrogen, Nitrite as N	0.0481	mg/L	0.10	101	80	120			
Sample ID: C08030949-001AMSD	Sample Matrix Spike Duplicate								Run: HACH DR3000_080326A 03/26/08 08:57
Nitrogen, Nitrite as N	0.0505	mg/L	0.10	106	80	120	0.0	10	
Sample ID: C08030949-011AMS	Sample Matrix Spike								Run: HACH DR3000_080326A 03/26/08 08:59
Nitrogen, Nitrite as N	0.0515	mg/L	0.10	108	80	120			
Sample ID: C08030949-011AMSD	Sample Matrix Spike Duplicate								Run: HACH DR3000_080326A 03/26/08 08:59
Nitrogen, Nitrite as N	0.0471	mg/L	0.10	99	80	120	0.0	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-SO4 E			Batch: 080331_1_SO4-TURB-W						
Sample ID: LCS-1_080331	Laboratory Control Sample				Run: TURB-2_080331A				03/31/08 09:46
Sulfate	4980	mg/L	59	104	90	110			
Sample ID: MBLK-1_080331	Method Blank				Run: TURB-2_080331A				03/31/08 09:48
Sulfate	ND	mg/L	0.6						
Sample ID: C08030933-041FMS	Sample Matrix Spike				Run: TURB-2_080331A				03/31/08 13:15
Sulfate	3330	mg/L	59	106	90	110			
Sample ID: C08030933-041FMSD	Sample Matrix Spike Duplicate				Run: TURB-2_080331A				03/31/08 13:16
Sulfate	3290	mg/L	59	104	90	110	1.2	10	
Sample ID: C08030949-008AMS	Sample Matrix Spike				Run: TURB-2_080331A				03/31/08 14:16
Sulfate	1670	mg/L	30	107	90	110			
Sample ID: C08030949-008AMSD	Sample Matrix Spike Duplicate				Run: TURB-2_080331A				03/31/08 14:17
Sulfate	1650	mg/L	30	105	90	110	1.2	10	
Method: A4500-SO4 E			Batch: 080401_1_SO4-TURB-W						
Sample ID: LCS-1_080401	Laboratory Control Sample				Run: TURB-2_080401A				04/01/08 17:28
Sulfate	4920	mg/L	59	102	90	110			
Sample ID: MBLK-1_080401	Method Blank				Run: TURB-2_080401A				04/01/08 17:28
Sulfate	ND	mg/L	0.6						
Sample ID: C08030949-010AMS	Sample Matrix Spike				Run: TURB-2_080401A				04/01/08 17:58
Sulfate	1110	mg/L	15	106	90	110			
Sample ID: C08030949-010AMSD	Sample Matrix Spike Duplicate				Run: TURB-2_080401A				04/01/08 17:58
Sulfate	1130	mg/L	15	109	90	110	1.1	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: R98824		
Sample ID: MB-080328A	Method Blank		Run: ICP2-C_080328A				03/28/08 12:17		
Boron	ND	mg/L	0.008						
Calcium	ND	mg/L	0.1						
Iron	ND	mg/L	0.005						
Magnesium	ND	mg/L	0.04						
Manganese	ND	mg/L	0.0003						
Potassium	0.03	mg/L	0.02						
Silica	0.03	mg/L	0.02						
Sodium	ND	mg/L	0.8						
Sample ID: LFB-080328A	Laboratory Fortified Blank		Run: ICP2-C_080328A				03/28/08 12:21		
Boron	1.04	mg/L	0.10	104	85	125			
Calcium	49.4	mg/L	0.50	99	85	125			
Iron	1.01	mg/L	0.030	101	85	125			
Magnesium	48.2	mg/L	0.50	96	85	125			
Manganese	1.04	mg/L	0.010	104	85	125			
Potassium	48.3	mg/L	0.50	97	85	125			
Silica	1.03	mg/L	0.10	99	85	125			
Sodium	48.4	mg/L	0.77	97	85	125			
Sample ID: C08030949-001CMS2	Sample Matrix Spike		Run: ICP2-C_080328A				03/28/08 13:07		
Boron	3.38	mg/L	0.10	104	70	130			
Calcium	111	mg/L	0.50	99	70	130			
Iron	2.06	mg/L	0.030	66	70	130			S
Magnesium	99.7	mg/L	0.50	96	70	130			
Manganese	2.02	mg/L	0.010	96	70	130			
Potassium	107	mg/L	0.50	95	70	130			
Silica	12.2	mg/L	0.10		70	130			A
Sodium	552	mg/L	1.5		70	130			A
Sample ID: C08030949-001CMSD2	Sample Matrix Spike Duplicate		Run: ICP2-C_080328A				03/28/08 13:10		
Boron	3.34	mg/L	0.10	102	70	130	1.3	20	
Calcium	104	mg/L	0.50	92	70	130	6.2	20	
Iron	2.02	mg/L	0.030	64	70	130	2.1	20	S
Magnesium	93.5	mg/L	0.50	90	70	130	6.4	20	
Manganese	2.01	mg/L	0.010	96	70	130	0.2	20	
Potassium	103	mg/L	0.50	91	70	130	4.1	20	
Silica	12.2	mg/L	0.10		70	130	0.3	20	A
Sodium	531	mg/L	1.5		70	130	3.9	20	A
Sample ID: C08030949-011CMS2	Sample Matrix Spike		Run: ICP2-C_080328A				03/28/08 15:35		
Boron	3.74	mg/L	0.10	98	70	130			
Calcium	236	mg/L	0.50	89	70	130			
Iron	1.98	mg/L	0.030	96	70	130			
Magnesium	192	mg/L	0.50	89	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: R98824		
Sample ID: C08030949-011CMS2	Sample Matrix Spike		Run: ICP2-C_080328A				03/28/08 15:35		
Manganese	2.06	mg/L	0.010	100	70	130			
Potassium	187	mg/L	0.50	77	70	130			
Silica	13.8	mg/L	0.10		70	130			A
Sodium	925	mg/L	1.5	74	70	130			
Sample ID: C08030949-011CMSD2	Sample Matrix Spike Duplicate		Run: ICP2-C_080328A				03/28/08 15:39		
Boron	3.80	mg/L	0.10	101	70	130	1.5	20	
Calcium	147	mg/L	0.50	90	70	130	46	20	R
Iron	2.02	mg/L	0.030	98	70	130	2.1	20	
Magnesium	102	mg/L	0.50	89	70	130	61	20	R
Manganese	2.09	mg/L	0.010	101	70	130	1.3	20	
Potassium	118	mg/L	0.50	86	70	130	46	20	R
Silica	14.1	mg/L	0.10		70	130	2.3	20	A
Sodium	850	mg/L	1.5		70	130	8.4	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

R - RPD exceeds advisory limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8							Batch: R98767		
Sample ID: LRB	Method Blank		Run: ICPMS2-C_080327A				03/27/08 12:48		
Aluminum	ND	mg/L	0.0001						
Arsenic	7E-05	mg/L	6E-05						
Barium	ND	mg/L	3E-05						
Cadmium	ND	mg/L	1E-05						
Chromium	5E-05	mg/L	4E-05						
Copper	ND	mg/L	7E-05						
Lead	ND	mg/L	3E-05						
Manganese	ND	mg/L	5E-05						
Mercury	ND	mg/L	8E-05						
Molybdenum	ND	mg/L	3E-05						
Nickel	ND	mg/L	0.0007						
Selenium	ND	mg/L	0.0002						
Uranium	ND	mg/L	1E-05						
Vanadium	ND	mg/L	3E-05						
Zinc	ND	mg/L	0.0003						
Sample ID: LFB	Laboratory Fortified Blank		Run: ICPMS2-C_080327A				03/27/08 12:55		
Aluminum	0.0526	mg/L	0.0010	104	85	115			
Arsenic	0.0527	mg/L	0.0010	105	85	115			
Barium	0.0530	mg/L	0.0010	106	85	115			
Cadmium	0.0530	mg/L	0.0010	106	85	115			
Chromium	0.0525	mg/L	0.0010	105	85	115			
Copper	0.0533	mg/L	0.0010	106	85	115			
Lead	0.0534	mg/L	0.0010	107	85	115			
Manganese	0.0521	mg/L	0.0010	103	85	115			
Mercury	0.00529	mg/L	0.0010	106	85	115			
Molybdenum	0.0525	mg/L	0.0010	105	85	115			
Nickel	0.0523	mg/L	0.0010	105	85	115			
Selenium	0.0524	mg/L	0.0010	105	85	115			
Uranium	0.0533	mg/L	0.00030	106	85	115			
Vanadium	0.0523	mg/L	0.0010	104	85	115			
Zinc	0.0533	mg/L	0.0010	105	85	115			
Sample ID: C08030741-001AMS	Sample Matrix Spike		Run: ICPMS2-C_080327A				03/27/08 15:10		
Aluminum	0.158	mg/L	0.0010	80	70	130			
Arsenic	0.109	mg/L	0.0010	108	70	130			
Barium	0.145	mg/L	0.0010	107	70	130			
Cadmium	0.107	mg/L	0.0010	107	70	130			
Chromium	0.109	mg/L	0.0010	109	70	130			
Copper	0.103	mg/L	0.0010	95	70	130			
Lead	0.107	mg/L	0.0010	107	70	130			
Manganese	0.356	mg/L	0.0010	105	70	130			
Mercury	0.00966	mg/L	0.0010	97	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R98767
Sample ID: C08030741-001AMS	Sample Matrix Spike		Run: ICPMS2-C_080327A				03/27/08 15:10		
Molybdenum	0.114	mg/L	0.0010	107	70	130			
Nickel	0.101	mg/L	0.0010	98	70	130			
Selenium	0.112	mg/L	0.0010	107	70	130			
Uranium	0.111	mg/L	0.00030	102	70	130			
Vanadium	0.110	mg/L	0.0010	106	70	130			
Zinc	0.117	mg/L	0.0010	84	70	130			
Sample ID: C08030741-001AMSD	Sample Matrix Spike Duplicate		Run: ICPMS2-C_080327A				03/27/08 15:17		
Aluminum	0.162	mg/L	0.0010	84	70	130	2.6	20	
Arsenic	0.109	mg/L	0.0010	108	70	130	0.1	20	
Barium	0.146	mg/L	0.0010	108	70	130	0.2	20	
Cadmium	0.108	mg/L	0.0010	108	70	130	0.9	20	
Chromium	0.110	mg/L	0.0010	110	70	130	1.0	20	
Copper	0.106	mg/L	0.0010	98	70	130	3.0	20	
Lead	0.109	mg/L	0.0010	108	70	130	1.2	20	
Manganese	0.352	mg/L	0.0010	101	70	130	1.1	20	
Mercury	0.00978	mg/L	0.0010	98	70	130	1.2	20	
Molybdenum	0.115	mg/L	0.0010	108	70	130	0.7	20	
Nickel	0.102	mg/L	0.0010	99	70	130	0.8	20	
Selenium	0.111	mg/L	0.0010	107	70	130	0.4	20	
Uranium	0.112	mg/L	0.00030	104	70	130	1.3	20	
Vanadium	0.111	mg/L	0.0010	106	70	130	0.3	20	
Zinc	0.119	mg/L	0.0010	86	70	130	1.0	20	
Sample ID: C08030949-010CMS4	Post Digestion Spike		Run: ICPMS2-C_080327A				03/27/08 19:40		
Aluminum	0.0535	mg/L	0.10	101	70	130			
Arsenic	0.0538	mg/L	0.0010	107	70	130			
Barium	0.0618	mg/L	0.10	103	70	130			
Cadmium	0.0499	mg/L	0.010	100	70	130			
Chromium	0.0532	mg/L	0.050	101	70	130			
Copper	0.0475	mg/L	0.010	94	70	130			
Lead	0.0524	mg/L	0.050	105	70	130			
Manganese	0.0611	mg/L	0.010	101	70	130			
Mercury	0.00530	mg/L	0.0010	106	70	130			
Molybdenum	0.0583	mg/L	0.10	105	70	130			
Nickel	0.0480	mg/L	0.050	96	70	130			
Selenium	0.0554	mg/L	0.0010	107	70	130			
Uranium	0.0541	mg/L	0.00030	108	70	130			
Vanadium	0.0528	mg/L	0.10	104	70	130			
Zinc	0.0545	mg/L	0.010	97	70	130			
Sample ID: C08030949-010CMSD4	Post Digestion Spike Duplicate		Run: ICPMS2-C_080327A				03/27/08 20:07		
Aluminum	0.0526	mg/L	0.10	99	70	130	0.0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources
Project: North Trend Baseline

Revised Date: 06/04/08
Report Date: 04/23/08
Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R98767
Sample ID: C08030949-010CMSD4	Post Digestion Spike Duplicate			Run: ICPMS2-C_080327A			03/27/08 20:07		
Arsenic	0.0532	mg/L	0.0010	106	70	130	1.1	20	
Barium	0.0627	mg/L	0.10	105	70	130	0.0	20	
Cadmium	0.0500	mg/L	0.010	100	70	130	0.1	20	
Chromium	0.0524	mg/L	0.050	99	70	130	1.4	20	
Copper	0.0477	mg/L	0.010	94	70	130	0.4	20	
Lead	0.0525	mg/L	0.050	105	70	130	0.1	20	
Mercury	0.00534	mg/L	0.0010	107	70	130	0.7	20	
Molybdenum	0.0583	mg/L	0.10	105	70	130	0.0	20	
Nickel	0.0478	mg/L	0.050	96	70	130	0.0	20	
Selenium	0.0548	mg/L	0.0010	105	70	130	1.1	20	
Uranium	0.0543	mg/L	0.00030	109	70	130	0.3	20	
Vanadium	0.0525	mg/L	0.10	104	70	130	0.0	20	
Zinc	0.0547	mg/L	0.010	97	70	130	0.2	20	
Method: E353.2									Batch: R98666
Sample ID: MBLK-1	Method Blank			Run: TECHNICON_080326B			03/26/08 14:13		
Nitrogen, Nitrate+Nitrite as N	ND	mg/L	0.03						
Sample ID: LCS-2	Laboratory Control Sample			Run: TECHNICON_080326B			03/26/08 14:15		
Nitrogen, Nitrate+Nitrite as N	2.58	mg/L	0.10	103	90	110			
Sample ID: C08030949-004EMS	Sample Matrix Spike			Run: TECHNICON_080326B			03/26/08 14:30		
Nitrogen, Nitrate+Nitrite as N	2.07	mg/L	0.10	103	90	110			
Sample ID: C08030949-004EMSD	Sample Matrix Spike Duplicate			Run: TECHNICON_080326B			03/26/08 14:33		
Nitrogen, Nitrate+Nitrite as N	2.09	mg/L	0.10	104	90	110	1.0	10	
Sample ID: C08030949-009EMS	Sample Matrix Spike			Run: TECHNICON_080326B			03/26/08 16:03		
Nitrogen, Nitrate+Nitrite as N	2.12	mg/L	0.10	106	90	110			
Sample ID: C08030949-009EMSD	Sample Matrix Spike Duplicate			Run: TECHNICON_080326B			03/26/08 16:05		
Nitrogen, Nitrate+Nitrite as N	2.16	mg/L	0.10	108	90	110	1.9	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0							Batch: RA226-2689		
Sample ID: C08030896-001DMS Radium 226	Sample Matrix Spike 6.0	pCi/L		97	70	130			04/02/08 15:17
Sample ID: C08030896-001DMSD Radium 226	Sample Matrix Spike Duplicate 6.1	pCi/L		98	70	130	1.9	26.4	04/02/08 15:17
Sample ID: MB-RA226-2689 Radium 226	Method Blank ND	pCi/L	0.2						04/02/08 15:17 U
Sample ID: LCS-RA226-2689 Radium 226	Laboratory Control Sample 6.5	pCi/L		103	70	130			04/02/08 15:17
Method: E907.0							Batch: R98861		
Sample ID: LCS-R98861 Thorium 230	Laboratory Control Sample 8.00pCi/L		0.20	98	70	130			03/25/08 16:30
Sample ID: C08030408-001DMS Thorium 230	Sample Matrix Spike 16.3pCi/L		0.20	99	70	130			03/25/08 16:30
Sample ID: C08030408-001DMSD Thorium 230	Sample Matrix Spike Duplicate 15.1pCi/L		0.20	92	70	130	7.6	30	03/25/08 16:30
Sample ID: MB-R98861 Thorium 230	Method Blank ND	pCi/L							03/25/08 16:30
Method: E909.0M							Batch: R99105		
Sample ID: C08030949-003DMS Lead 210	Sample Matrix Spike 200	pCi/L	1.0	99	70	130			03/27/08 07:30
Sample ID: C08030949-003DMSD Lead 210	Sample Matrix Spike Duplicate 170	pCi/L	1.0	86	70	130	14	30	03/27/08 07:30
Sample ID: C08030949-011DDUP Lead 210	Sample Duplicate ND	pCi/L	1.0				0.0	30	03/27/08 07:30 U
Sample ID: MB-R99105 Lead 210	Method Blank ND	pCi/L							03/27/08 07:30
Sample ID: LCS-R99105 Lead 210	Laboratory Control Sample 130	pCi/L	1.0	112	70	130			03/27/08 07:30

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08030949

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RMO-3008									Batch: R99720
Sample ID: C08030949-011DMS	Sample Matrix Spike		Run: EGG-ORTEC_080402B			04/02/08 14:00			
Polonium 210	15	pCi/L	1.0	42	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the MS are acceptable the batch is approved.									
Sample ID: C08030949-011DMSD	Sample Matrix Spike Duplicate		Run: EGG-ORTEC_080402B			04/02/08 14:00			
Polonium 210	21	pCi/L	1.0	79	70	130	36	30	R
Sample ID: LCS-R99720	Laboratory Control Sample		Run: EGG-ORTEC_080402B			04/02/08 14:00			
Polonium 210	14	pCi/L	1.0	73	70	130			
Sample ID: MB-R99720	Method Blank		Run: EGG-ORTEC_080402B			04/02/08 14:00			
Polonium 210	0.8	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

R - RPD exceeds advisory limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



Date: 04-Jun-08

CLIENT: Crow Butte Resources
Project: North Trend Baseline
Sample Delivery Group: C08030949

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Per client request, results less than zero are reported as ND. Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)

All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS

Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

RADON IN AIR ANALYSIS

The desired exposure time is 48 hours (2 days). The time delay in returning the canister to the laboratory for processing should be as short as possible to avoid excessive decay. Maximum recommended delay between end of exposure to beginning of counting should not exceed 8 days.

SOIL/SOLID SAMPLES

All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505

Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:

USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:

The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER, WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.



ANALYTICAL SUMMARY REPORT

June 04, 2008

Crow Butte Resources

86 Crow Butte Rd

Crawford, NE 69339

Workorder No.: C08031112

Quote ID: C1125 - Crow Butte Uranium Project

Project Name: North Trend Baseline

Energy Laboratories, Inc. received the following 1 sample from Crow Butte Resources on 3/27/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08031112-001	Bow 1	03/24/08 13:18	03/27/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:


STEVE CARLSTON



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08031112-001
Client Sample ID: Bow 1

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/24/08 13:18
Date Received: 03/27/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO ₃	208	mg/L		1		A2320 B	04/01/08 12:24 / ljl
Carbonate as CO ₃	ND	mg/L		1		A2320 B	04/01/08 12:24 / ljl
Bicarbonate as HCO ₃	253	mg/L		1		A2320 B	04/01/08 12:24 / ljl
Calcium	67	mg/L		1		E200.7	04/09/08 16:10 / eli-b
Chloride	35	mg/L		1		A4500-Cl B	04/10/08 15:15 / ljl
Fluoride	0.3	mg/L		0.1		A4500-F C	04/01/08 09:26 / ljl
Magnesium	9	mg/L		1		E200.7	04/09/08 16:10 / eli-b
Nitrogen, Ammonia as N	ND	mg/L		0.05		A4500-NH ₃ G	03/31/08 14:19 / jal
Nitrogen, Nitrate+Nitrite as N	7.8	mg/L		0.2		E353.2	04/02/08 10:06 / jal
Nitrogen, Nitrite as N	ND	mg/L	H	0.1		A4500-NO ₂ B	03/29/08 08:50 / jal
Potassium	18	mg/L		1		E200.7	04/09/08 16:10 / eli-b
Silica	93	mg/L		0.2		E200.7	04/09/08 16:10 / eli-b
Sodium	65	mg/L		1		E200.7	04/09/08 16:10 / eli-b
Sulfate	59	mg/L		1		A4500-SO ₄ E	04/14/08 13:49 / jal

- NO₂ sample received from client past recommended hold time.

PHYSICAL PROPERTIES

Conductivity	676	umhos/cm		1		A2510 B	03/31/08 15:13 / dnp
pH	7.92	s.u.		0.01		A4500-H B	03/31/08 15:13 / dnp
Solids, Total Dissolved TDS @ 180 C	429	mg/L	H	10		A2540 C	04/01/08 17:47 / dd

METALS - DISSOLVED

Aluminum	ND	mg/L		0.1		E200.8	03/27/08 20:21 / ts
Arsenic	0.010	mg/L		0.001		E200.8	03/27/08 20:21 / ts
Barium	0.1	mg/L		0.1		E200.8	03/27/08 20:21 / ts
Boron	ND	mg/L		0.1		E200.7	04/09/08 16:10 / eli-b
Cadmium	ND	mg/L		0.005		E200.8	03/27/08 20:21 / ts
Chromium	ND	mg/L		0.05		E200.8	03/27/08 20:21 / ts
Copper	ND	mg/L		0.01		E200.8	03/27/08 20:21 / ts
Iron	ND	mg/L		0.03		E200.7	04/09/08 16:10 / eli-b
Lead	0.001	mg/L		0.001		E200.8	03/27/08 20:21 / ts
Manganese	ND	mg/L		0.01		E200.7	04/09/08 16:10 / eli-b
Mercury	ND	mg/L		0.001		E200.8	03/27/08 20:21 / ts
Molybdenum	ND	mg/L		0.1		E200.8	03/27/08 20:21 / ts
Nickel	ND	mg/L		0.05		E200.8	03/27/08 20:21 / ts
Selenium	0.028	mg/L		0.001		E200.8	03/27/08 20:21 / ts
Uranium	0.0250	mg/L		0.0003		E200.8	03/27/08 20:21 / ts
Vanadium	ND	mg/L		0.1		E200.8	03/27/08 20:21 / ts
Zinc	0.32	mg/L		0.01		E200.8	03/27/08 20:21 / ts

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline
Lab ID: C08031112-001
Client Sample ID: Bow 1

Revised Date: 06/04/08
Report Date: 04/23/08
Collection Date: 03/24/08 13:18
Date Received: 03/27/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.4		E909.0M	04/02/08 10:10 / dm
Lead 210 precision (±)	1.4	pCi/L				E909.0M	04/02/08 10:10 / dm
Polonium 210	0.9	pCi/L		0.8		RMO-3008	04/02/08 14:00 / dmf
Polonium 210 precision (±)	0.8	pCi/L				RMO-3008	04/02/08 14:00 / dmf
Radium 226	ND	pCi/L	U	0.2		E903.0	04/07/08 17:42 / trs
Radium 226 precision (±)	0.1	pCi/L				E903.0	04/07/08 17:42 / trs
Radium 226 MDC	0.2	pCi/L				E903.0	04/07/08 17:42 / trs
Thorium 230	ND	pCi/L	U	0.08		E907.0	04/03/08 15:30 / dmf
Thorium 230 precision (±)	0.08	pCi/L				E907.0	04/03/08 15:30 / dmf
DATA QUALITY							
A/C Balance (± 5)	2.97	%				Calculation	04/16/08 12:10 / sw
Anions	6.93	meq/L				Calculation	04/16/08 12:10 / sw
Cations	7.36	meq/L				Calculation	04/16/08 12:10 / sw
Solids, Total Dissolved Calculated	505	mg/L				Calculation	04/16/08 12:10 / sw
TDS Balance (0.80 - 1.20)	0.850	dec. %				Calculation	04/16/08 12:10 / sw

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B									Batch: R98913
Sample ID: MBLK-1	Method Blank						Run: MANTECH_080401A		04/01/08 12:03
Alkalinity, Total as CaCO ₃	ND	mg/L	0.2						
Carbonate as CO ₃	ND	mg/L	1						
Bicarbonate as HCO ₃	ND	mg/L	1						
Sample ID: LCS-1									Batch: R98913
Laboratory Control Sample							Run: MANTECH_080401A		04/01/08 12:11
Alkalinity, Total as CaCO ₃	4980	mg/L	1.0	100	90	110			
Sample ID: C08031112-001AMS									Batch: R98913
Sample Matrix Spike							Run: MANTECH_080401A		04/01/08 12:31
Alkalinity, Total as CaCO ₃	326	mg/L	1.0	95	90	110			
Sample ID: C08031112-001AMSD									Batch: R98913
Sample Matrix Spike Duplicate							Run: MANTECH_080401A		04/01/08 12:38
Alkalinity, Total as CaCO ₃	321	mg/L	1.0	91	90	110	1.7	10	
Method: A2510 B									Analytical Run: ORION555A_080331B
Sample ID: ICV2_080331_1	Initial Calibration Verification Standard						Run: ORION555A_080331B		03/31/08 13:43
Conductivity	1390	umhos/cm	1.0	98	90	110			
Method: A2510 B									Batch: 080331_1_PH-W_555A-1
Sample ID: MBLK1_080331_1	Method Blank						Run: ORION555A_080331B		03/31/08 13:36
Conductivity	0.9	umhos/cm	0.2						
Sample ID: C08030933-051GDUP	Sample Duplicate						Run: ORION555A_080331B		03/31/08 14:06
Conductivity	3320	umhos/cm	1.0				0.3	10	
Method: A2540 C									Batch: 080401_1_SLDS-TDS-W
Sample ID: MBLK1_080401	Method Blank						Run: BAL-1_080401D		04/01/08 16:20
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	6						
Sample ID: LCS1_080401									Batch: 080401_1_SLDS-TDS-W
Laboratory Control Sample							Run: BAL-1_080401D		04/01/08 16:20
Solids, Total Dissolved TDS @ 180 C	986	mg/L	10	99	90	110			
Sample ID: C08031110-001AMS									Batch: 080401_1_SLDS-TDS-W
Sample Matrix Spike							Run: BAL-1_080401D		04/01/08 17:45
Solids, Total Dissolved TDS @ 180 C	2430	mg/L	10	100	90	110			
Sample ID: C08031110-001AMSD									Batch: 080401_1_SLDS-TDS-W
Sample Matrix Spike Duplicate							Run: BAL-1_080401D		04/01/08 17:45
Solids, Total Dissolved TDS @ 180 C	2340	mg/L	10	99	90	110	3.9	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-Cl B							Batch: 080410A-CL-TTR-W		
Sample ID: MBLK9-080410A	Method Blank					Run: TITRATION_080410A			04/10/08 13:26
Chloride	ND	mg/L	0.4						
Sample ID: C08031248-001AMS	Sample Matrix Spike					Run: TITRATION_080410A			04/10/08 15:26
Chloride	459	mg/L	1.0	98	90	110			
Sample ID: C08031248-001AMSD	Sample Matrix Spike Duplicate					Run: TITRATION_080410A			04/10/08 15:28
Chloride	466	mg/L	1.0	100	90	110	1.5	10	
Sample ID: LCS35-080410A	Laboratory Control Sample					Run: TITRATION_080410A			04/10/08 15:32
Chloride	3560	mg/L	1.0	100	90	110			
Method: A4500-F C							Batch: R98891		
Sample ID: LCS	Laboratory Control Sample					Run: MANTECH_080401B			04/01/08 09:18
Fluoride	1.04	mg/L	0.10	104	90	110			
Sample ID: MBLK	Method Blank					Run: MANTECH_080401B			04/01/08 09:21
Fluoride	ND	mg/L	0.05						
Sample ID: C08031112-001AMS	Sample Matrix Spike					Run: MANTECH_080401B			04/01/08 09:29
Fluoride	1.36	mg/L	0.10	103	90	110			
Sample ID: C08031112-001AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_080401B			04/01/08 09:32
Fluoride	1.36	mg/L	0.10	103	90	110	0.0	10	
Method: A4500-H B							Analytical Run: ORION555A_080331B		
Sample ID: ICV1_080331_1	Initial Calibration Verification Standard								03/31/08 13:39
pH	6.92	s.u.	0.010	101	98	102			
Sample ID: CCV1_080331_1	Continuing Calibration Verification Standard								03/31/08 14:47
pH	7.12	s.u.	0.010	102	98	102			
Method: A4500-H B							Batch: 080331_1_PH-W_555A-1		
Sample ID: C08030933-051GDUP	Sample Duplicate					Run: ORION555A_080331B			03/31/08 14:06
pH	8.95	s.u.	0.010				0.2	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-NH3 G Batch: R98855									
Sample ID: MBLK-1	Method Blank								
Nitrogen, Ammonia as N	0.03	mg/L	0.02						03/31/08 14:13
Run: TECHNICON_080331B									
Sample ID: LCS-2	Laboratory Control Sample								
Nitrogen, Ammonia as N	20.2	mg/L	0.20	101	80	120			03/31/08 14:15
Run: TECHNICON_080331B									
Sample ID: C08031177-001BMS	Sample Matrix Spike								
Nitrogen, Ammonia as N	3.32	mg/L	0.050	109	80	120			03/31/08 14:27
Run: TECHNICON_080331B									
Sample ID: C08031177-001BMSD	Sample Matrix Spike Duplicate								
Nitrogen, Ammonia as N	3.31	mg/L	0.050	109	80	120	0.3	20	03/31/08 14:29
Run: TECHNICON_080331B									
Method: A4500-NO2 B Analytical Run: HACH DR3000_080329A									
Sample ID: ICV-2	Initial Calibration Verification Standard								
Nitrogen, Nitrite as N	1.04	mg/L	0.10	104	90	110			03/29/08 08:49
Method: A4500-NO2 B Batch: A2008-03-29_6_NO2_01									
Sample ID: MBLK-1	Method Blank								
Nitrogen, Nitrite as N	ND	mg/L	0.003						03/29/08 08:49
Run: HACH DR3000_080329A									
Sample ID: C08031112-001AMS	Sample Matrix Spike								
Nitrogen, Nitrite as N	0.0440	mg/L	0.10	92	80	120			03/29/08 08:50
Run: HACH DR3000_080329A									
Sample ID: C08031112-001AMSD	Sample Matrix Spike Duplicate								
Nitrogen, Nitrite as N	0.0443	mg/L	0.10	93	80	120	0.0	10	03/29/08 08:50
Run: HACH DR3000_080329A									
Method: A4500-SO4 E Batch: 080414_1_SO4-TURB-W									
Sample ID: LCS-1_080414	Laboratory Control Sample								
Sulfate	4750	mg/L	59	99	90	110			04/14/08 13:46
Run: TURB-2_080414A									
Sample ID: MBLK-1_080414	Method Blank								
Sulfate	ND	mg/L	0.6						04/14/08 13:46
Run: TURB-2_080414A									
Sample ID: C08031137-003BMS	Sample Matrix Spike								
Sulfate	48.0	mg/L	1.0	101	90	110			04/14/08 13:52
Run: TURB-2_080414A									
Sample ID: C08031137-003BMSD	Sample Matrix Spike Duplicate								
Sulfate	48.4	mg/L	1.0	103	90	110	1.0	10	04/14/08 13:53
Run: TURB-2_080414A									

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7			Batch: B_R108994						
Sample ID: MB-SPDIS080409A	Method Blank		Run: SUB-B108994				04/09/08 15:09		
Mercury	ND	mg/L	0.007						
Silicon	ND	mg/L	0.03						
Aluminum	ND	mg/L	0.007						
Arsenic	0.02	mg/L	0.01						
Barium	0.001	mg/L	0.0001						
Boron	0.02	mg/L	0.005						
Cadmium	0.0008	mg/L	0.0003						
Calcium	0.08	mg/L	0.009						
Chromium	ND	mg/L	0.002						
Copper	ND	mg/L	0.001						
Iron	ND	mg/L	0.002						
Lead	ND	mg/L	0.007						
Magnesium	0.01	mg/L	0.01						
Manganese	0.0009	mg/L	0.0002						
Molybdenum	ND	mg/L	0.008						
Nickel	ND	mg/L	0.001						
Potassium	ND	mg/L	0.02						
Selenium	0.02	mg/L	0.009						
Sodium	ND	mg/L	0.2						
Vanadium	0.002	mg/L	0.001						
Zinc	0.004	mg/L	0.0004						
Sample ID: LFB-SPDIS080409A	Laboratory Fortified Blank		Run: SUB-B108994				04/09/08 15:14		
Mercury	ND	mg/L	0.010		85	115			S
Silicon	10.4	mg/L	0.10	104	85	115			
Aluminum	4.89	mg/L	0.10	98	85	115			
Arsenic	1.01	mg/L	0.10	101	85	115			
Barium	0.991	mg/L	0.10	99	85	115			
Boron	0.998	mg/L	0.10	100	85	115			
Cadmium	0.485	mg/L	0.010	97	85	115			
Calcium	47.9	mg/L	1.0	96	85	115			
Chromium	0.981	mg/L	0.050	98	85	115			
Copper	0.960	mg/L	0.010	96	85	115			
Iron	5.04	mg/L	0.030	101	85	115			
Lead	1.01	mg/L	0.050	100	85	115			
Magnesium	49.3	mg/L	1.0	99	85	115			
Manganese	4.79	mg/L	0.010	96	85	115			
Molybdenum	0.983	mg/L	0.10	98	85	115			
Nickel	0.997	mg/L	0.050	100	85	115			
Potassium	45.2	mg/L	1.0	90	85	115			
Selenium	0.974	mg/L	0.10	97	85	115			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: B_R108994		
Sample ID: LFB-SPDIS080409A	Laboratory Fortified Blank		Run: SUB-B108994				04/09/08 15:14		
Sodium	50.2	mg/L	1.0	100	85	115			
Vanadium	0.975	mg/L	0.10	97	85	115			
Zinc	1.01	mg/L	0.010	100	85	115			
Sample ID: MB-080402A	Method Blank		Run: SUB-B108994				04/09/08 15:18		
Mercury	ND	mg/L	0.007						
Silicon	ND	mg/L	0.03						
Aluminum	ND	mg/L	0.007						
Arsenic	ND	mg/L	0.01						
Barium	ND	mg/L	0.0001						
Boron	ND	mg/L	0.005						
Cadmium	ND	mg/L	0.0003						
Calcium	0.6	mg/L	0.009						
Chromium	ND	mg/L	0.002						
Copper	ND	mg/L	0.001						
Iron	ND	mg/L	0.002						
Lead	ND	mg/L	0.007						
Magnesium	0.02	mg/L	0.01						
Manganese	ND	mg/L	0.0002						
Molybdenum	ND	mg/L	0.008						
Nickel	ND	mg/L	0.001						
Potassium	0.05	mg/L	0.02						
Selenium	ND	mg/L	0.009						
Sodium	ND	mg/L	0.2						
Vanadium	ND	mg/L	0.001						
Zinc	0.004	mg/L	0.0004						
Sample ID: LFB-080402A	Laboratory Fortified Blank		Run: SUB-B108994				04/09/08 15:22		
Mercury	ND	mg/L	0.010		85	115			S
Silicon	0.411	mg/L	0.10	103	85	115			
Aluminum	0.993	mg/L	0.10	99	85	115			
Arsenic	1.01	mg/L	0.10	101	85	115			
Barium	0.999	mg/L	0.10	100	85	115			
Boron	0.968	mg/L	0.10	97	85	115			
Cadmium	0.970	mg/L	0.010	97	85	115			
Calcium	49.3	mg/L	1.0	98	85	115			
Chromium	0.971	mg/L	0.050	97	85	115			
Copper	0.974	mg/L	0.010	97	85	115			
Iron	0.999	mg/L	0.030	100	85	115			
Lead	0.998	mg/L	0.050	100	85	115			
Magnesium	49.6	mg/L	1.0	99	85	115			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7			Batch: B_R108994						
Sample ID: LFB-080402A	Laboratory Fortified Blank		Run: SUB-B108994				04/09/08 15:22		
Manganese	0.981	mg/L	0.010	98	85	115			
Molybdenum	0.970	mg/L	0.10	97	85	115			
Nickel	0.999	mg/L	0.050	100	85	115			
Potassium	44.3	mg/L	1.0	89	85	115			
Selenium	0.969	mg/L	0.10	97	85	115			
Sodium	49.8	mg/L	1.0	100	85	115			
Vanadium	0.973	mg/L	0.10	97	85	115			
Zinc	1.02	mg/L	0.010	102	85	115			
Sample ID: C08031132-001B	Sample Matrix Spike		Run: SUB-B108994				04/09/08 16:22		
Silicon	6.53	mg/L	0.10	133	70	130			S
Aluminum	1.02	mg/L	0.10	102	70	130			
Arsenic	1.08	mg/L	0.10	105	70	130			
Barium	1.13	mg/L	0.10	100	70	130			
Boron	1.01	mg/L	0.10	101	70	130			
Cadmium	1.01	mg/L	0.010	101	70	130			
Calcium	144	mg/L	1.0	79	70	130			
Chromium	1.02	mg/L	0.050	102	70	130			
Copper	1.01	mg/L	0.010	101	70	130			
Iron	1.00	mg/L	0.030	100	70	130			
Lead	1.05	mg/L	0.050	105	70	130			
Magnesium	112	mg/L	1.0	95	70	130			
Manganese	1.03	mg/L	0.010	103	70	130			
Molybdenum	0.807	mg/L	0.10	81	70	130			
Nickel	1.05	mg/L	0.050	105	70	130			
Potassium	44.9	mg/L	1.0	86	70	130			
Selenium	0.992	mg/L	0.10	99	70	130			
Sodium	57.0	mg/L	1.0	99	70	130			
Vanadium	1.02	mg/L	0.10	101	70	130			
Zinc	1.08	mg/L	0.010	106	70	130			
Sample ID: C08031132-001B	Sample Matrix Spike Duplicate		Run: SUB-B108994				04/09/08 16:26		
Silicon	6.53	mg/L	0.10	133	70	130	0.0	20	S
Aluminum	1.02	mg/L	0.10	102	70	130	0.1	20	
Arsenic	1.07	mg/L	0.10	104	70	130	0.5	20	
Barium	1.14	mg/L	0.10	102	70	130	1.3	20	
Boron	1.00	mg/L	0.10	100	70	130	0.9	20	
Cadmium	1.01	mg/L	0.010	101	70	130	0.1	20	
Calcium	144	mg/L	1.0	80	70	130	0.1	20	
Chromium	1.01	mg/L	0.050	101	70	130	0.7	20	
Copper	1.02	mg/L	0.010	102	70	130	0.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7							Batch: B_R108994		
Sample ID: C08031132-001B	Sample Matrix Spike Duplicate			Run: SUB-B108994			04/09/08 16:26		
Iron	1.00	mg/L	0.030	100	70	130	0.1	20	
Lead	1.04	mg/L	0.050	103	70	130	1.4	20	
Magnesium	111	mg/L	1.0	94	70	130	0.7	20	
Manganese	1.03	mg/L	0.010	103	70	130	0.4	20	
Molybdenum	0.822	mg/L	0.10	82	70	130	1.9	20	
Nickel	1.05	mg/L	0.050	105	70	130	0.6	20	
Potassium	45.1	mg/L	1.0	86	70	130	0.4	20	
Selenium	1.00	mg/L	0.10	100	70	130	1.0	20	
Sodium	56.6	mg/L	1.0	98	70	130	0.7	20	
Vanadium	1.01	mg/L	0.10	101	70	130	0.1	20	
Zinc	1.08	mg/L	0.010	106	70	130	0.7	20	
Sample ID: LCS-18114	Laboratory Control Sample			Run: SUB-B108994			04/09/08 18:06		
Boron	0.477	mg/L	0.10	95	85	115			
Calcium	50.8	mg/L	1.0	102	85	115			
Iron	0.525	mg/L	0.030	105	85	115			
Magnesium	51.7	mg/L	1.0	103	85	115			
Manganese	0.503	mg/L	0.010	101	85	115			
Potassium	45.1	mg/L	1.0	90	85	115			
Sodium	50.1	mg/L	1.0	100	85	115			
Silica	0.446	mg/L	0.21	91	85	115			
Sample ID: C08030994-001F	Sample Matrix Spike			Run: SUB-B108994			04/09/08 18:18		
Boron	0.603	mg/L	0.10	97	70	130			
Calcium	122	mg/L	1.0	92	70	130			
Iron	3.93	mg/L	0.030		70	130			A
Magnesium	73.7	mg/L	1.0	103	70	130			
Manganese	0.623	mg/L	0.010	101	70	130			
Potassium	51.2	mg/L	1.0	87	70	130			
Sodium	99.5	mg/L	1.0	104	70	130			
Sample ID: C08030994-001F	Sample Matrix Spike Duplicate			Run: SUB-B108994			04/09/08 18:22		
Boron	0.606	mg/L	0.10	97	70	130	0.5	20	
Calcium	123	mg/L	1.0	95	70	130	1.0	20	
Iron	4.10	mg/L	0.030		70	130	4.3	20	A
Magnesium	73.3	mg/L	1.0	102	70	130	0.5	20	
Manganese	0.624	mg/L	0.010	101	70	130	0.2	20	
Potassium	51.2	mg/L	1.0	87	70	130	0.0	20	
Sodium	100	mg/L	1.0	105	70	130	0.5	20	

Qualifiers:

RL - Analyte reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8							Batch: R98767		
Sample ID: LRB	Method Blank		Run: ICPMS2-C_080327A				03/27/08 12:48		
Aluminum	ND	mg/L	0.0001						
Arsenic	7E-05	mg/L	6E-05						
Barium	ND	mg/L	3E-05						
Cadmium	ND	mg/L	1E-05						
Chromium	5E-05	mg/L	4E-05						
Copper	ND	mg/L	7E-05						
Lead	ND	mg/L	3E-05						
Mercury	ND	mg/L	8E-05						
Molybdenum	ND	mg/L	3E-05						
Nickel	ND	mg/L	0.0007						
Selenium	ND	mg/L	0.0002						
Uranium	ND	mg/L	1E-05						
Vanadium	ND	mg/L	3E-05						
Zinc	ND	mg/L	0.0003						
Sample ID: LFB	Laboratory Fortified Blank		Run: ICPMS2-C_080327A				03/27/08 12:55		
Aluminum	0.0526	mg/L	0.0010	104	85	115			
Arsenic	0.0527	mg/L	0.0010	105	85	115			
Barium	0.0530	mg/L	0.0010	106	85	115			
Cadmium	0.0530	mg/L	0.0010	106	85	115			
Chromium	0.0525	mg/L	0.0010	105	85	115			
Copper	0.0533	mg/L	0.0010	106	85	115			
Lead	0.0534	mg/L	0.0010	107	85	115			
Mercury	0.00529	mg/L	0.0010	106	85	115			
Molybdenum	0.0525	mg/L	0.0010	105	85	115			
Nickel	0.0523	mg/L	0.0010	105	85	115			
Selenium	0.0524	mg/L	0.0010	105	85	115			
Uranium	0.0533	mg/L	0.00030	106	85	115			
Vanadium	0.0523	mg/L	0.0010	104	85	115			
Zinc	0.0533	mg/L	0.0010	105	85	115			
Sample ID: C08030741-001AMS	Sample Matrix Spike		Run: ICPMS2-C_080327A				03/27/08 15:10		
Aluminum	0.158	mg/L	0.0010	80	70	130			
Arsenic	0.109	mg/L	0.0010	108	70	130			
Barium	0.145	mg/L	0.0010	107	70	130			
Cadmium	0.107	mg/L	0.0010	107	70	130			
Chromium	0.109	mg/L	0.0010	109	70	130			
Copper	0.103	mg/L	0.0010	95	70	130			
Lead	0.107	mg/L	0.0010	107	70	130			
Mercury	0.00966	mg/L	0.0010	97	70	130			
Molybdenum	0.114	mg/L	0.0010	107	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8							Batch: R98767		
Sample ID: C08030741-001AMS	Sample Matrix Spike		Run: ICPMS2-C_080327A				03/27/08 15:10		
Nickel	0.101	mg/L	0.0010	98	70	130			
Selenium	0.112	mg/L	0.0010	107	70	130			
Uranium	0.111	mg/L	0.00030	102	70	130			
Vanadium	0.110	mg/L	0.0010	106	70	130			
Zinc	0.117	mg/L	0.0010	84	70	130			
Sample ID: C08030741-001AMSD	Sample Matrix Spike Duplicate		Run: ICPMS2-C_080327A				03/27/08 15:17		
Aluminum	0.162	mg/L	0.0010	84	70	130	2.6	20	
Arsenic	0.109	mg/L	0.0010	108	70	130	0.1	20	
Barium	0.146	mg/L	0.0010	108	70	130	0.2	20	
Cadmium	0.108	mg/L	0.0010	108	70	130	0.9	20	
Chromium	0.110	mg/L	0.0010	110	70	130	1.0	20	
Copper	0.106	mg/L	0.0010	98	70	130	3.0	20	
Lead	0.109	mg/L	0.0010	108	70	130	1.2	20	
Mercury	0.00978	mg/L	0.0010	98	70	130	1.2	20	
Molybdenum	0.115	mg/L	0.0010	108	70	130	0.7	20	
Nickel	0.102	mg/L	0.0010	99	70	130	0.8	20	
Selenium	0.111	mg/L	0.0010	107	70	130	0.4	20	
Uranium	0.112	mg/L	0.00030	104	70	130	1.3	20	
Vanadium	0.111	mg/L	0.0010	106	70	130	0.3	20	
Zinc	0.119	mg/L	0.0010	86	70	130	1.0	20	
Sample ID: C08030949-010CMS4	Post Digestion Spike		Run: ICPMS2-C_080327A				03/27/08 19:40		
Aluminum	0.0535	mg/L	0.10	101	70	130			
Arsenic	0.0538	mg/L	0.0010	107	70	130			
Barium	0.0618	mg/L	0.10	103	70	130			
Cadmium	0.0499	mg/L	0.010	100	70	130			
Chromium	0.0532	mg/L	0.050	101	70	130			
Copper	0.0475	mg/L	0.010	94	70	130			
Lead	0.0524	mg/L	0.050	105	70	130			
Mercury	0.00530	mg/L	0.0010	106	70	130			
Molybdenum	0.0583	mg/L	0.10	105	70	130			
Nickel	0.0480	mg/L	0.050	96	70	130			
Selenium	0.0554	mg/L	0.0010	107	70	130			
Uranium	0.0541	mg/L	0.00030	108	70	130			
Vanadium	0.0528	mg/L	0.10	104	70	130			
Zinc	0.0545	mg/L	0.010	97	70	130			
Sample ID: C08030949-010CMSD4	Post Digestion Spike Duplicate		Run: ICPMS2-C_080327A				03/27/08 20:07		
Aluminum	0.0526	mg/L	0.10	99	70	130	0.0	20	
Arsenic	0.0532	mg/L	0.0010	106	70	130	1.1	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R98767
Sample ID: C08030949-010CMSD4	Post Digestion Spike Duplicate				Run: ICPMS2-C_080327A			03/27/08 20:07	
Barium	0.0627	mg/L	0.10	105	70	130	0.0	20	
Cadmium	0.0500	mg/L	0.010	100	70	130	0.1	20	
Chromium	0.0524	mg/L	0.050	99	70	130	1.4	20	
Copper	0.0477	mg/L	0.010	94	70	130	0.4	20	
Lead	0.0525	mg/L	0.050	105	70	130	0.1	20	
Mercury	0.00534	mg/L	0.0010	107	70	130	0.7	20	
Molybdenum	0.0583	mg/L	0.10	105	70	130	0.0	20	
Nickel	0.0478	mg/L	0.050	96	70	130	0.0	20	
Selenium	0.0548	mg/L	0.0010	105	70	130	1.1	20	
Uranium	0.0543	mg/L	0.00030	109	70	130	0.3	20	
Vanadium	0.0525	mg/L	0.10	104	70	130	0.0	20	
Zinc	0.0547	mg/L	0.010	97	70	130	0.2	20	
Method: E353.2									Batch: R99035
Sample ID: C08040031-001DMS	Sample Matrix Spike				Run: TECHNICON_080402A			04/02/08 10:11	
Nitrogen, Nitrate+Nitrite as N	2.16	mg/L	0.10	108	90	110			
Sample ID: C08040031-001DMSD	Sample Matrix Spike Duplicate				Run: TECHNICON_080402A			04/02/08 10:14	
Nitrogen, Nitrate+Nitrite as N	2.11	mg/L	0.10	105	90	110	2.3	10	
Method: E903.0									Batch: RA226-2696
Sample ID: MB-RA226-2696	Method Blank				Run: BERTHOLD 770_080331A			04/07/08 15:04	
Radium 226	ND	pCi/L	0.2						U
Sample ID: C08031105-001IMS	Sample Matrix Spike				Run: BERTHOLD 770_080331A			04/07/08 17:42	
Radium 226	24	pCi/L		91	70	130			
Sample ID: C08031105-001IMSD	Sample Matrix Spike Duplicate				Run: BERTHOLD 770_080331A			04/07/08 17:42	
Radium 226	24	pCi/L		94	70	130	1.1	18.6	
Sample ID: LCS-RA226-2696	Laboratory Control Sample				Run: BERTHOLD 770_080331A			04/07/08 23:55	
Radium 226	5.9	pCi/L		96	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline

Revised Date: 06/04/08

Report Date: 04/23/08

Work Order: C08031112

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E907.0 Batch: R99552									
Sample ID: LCS-R99552	Laboratory Control Sample				Run: EGG-ORTEC_080403A				04/03/08 15:30
Thorium 230	7.17pCi/L		0.20	103	70	130			
Sample ID: C08031112-001BMS	Sample Matrix Spike				Run: EGG-ORTEC_080403A				04/03/08 15:30
Thorium 230	9.01pCi/L		0.20	92	70	130			
Sample ID: C08031112-001BMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080403A				04/03/08 15:30
Thorium 230	9.66pCi/L		0.20	99	70	130	7.0	30	
Sample ID: MB-R99552	Method Blank				Run: EGG-ORTEC_080403A				04/03/08 15:30
Thorium 230	ND	pCi/L	0.2						U
Method: E909.0M Batch: R99229									
Sample ID: C08031120-001HMS	Sample Matrix Spike				Run: PACKARD 3100TR_080402B				04/02/08 10:10
Lead 210	200	pCi/L	1.0	102	70	130			
Sample ID: C08031120-001HMSD	Sample Matrix Spike Duplicate				Run: PACKARD 3100TR_080402B				04/02/08 10:10
Lead 210	210	pCi/L	1.0	105	70	130	2.9	30	
Sample ID: C08031265-004DDUP	Sample Duplicate				Run: PACKARD 3100TR_080402B				04/02/08 10:10
Lead 210	ND	pCi/L	1.0				0.0	30	
Sample ID: MB-R99229	Method Blank				Run: PACKARD 3100TR_080402B				04/02/08 10:10
Lead 210	ND	pCi/L							
Sample ID: LCS-R99229	Laboratory Control Sample				Run: PACKARD 3100TR_080402B				04/02/08 10:10
Lead 210	130	pCi/L	1.0	112	70	130			
Method: RMO-3008 Batch: R99720									
Sample ID: C08030949-011DMS	Sample Matrix Spike				Run: EGG-ORTEC_080402B				04/02/08 14:00
Polonium 210	15	pCi/L	1.0	42	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the MS are acceptable the batch is approved.									
Sample ID: C08030949-011DMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080402B				04/02/08 14:00
Polonium 210	21	pCi/L	1.0	79	70	130	36	30	R
Sample ID: LCS-R99720	Laboratory Control Sample				Run: EGG-ORTEC_080402B				04/02/08 14:00
Polonium 210	14	pCi/L	1.0	73	70	130			
Sample ID: MB-R99720	Method Blank				Run: EGG-ORTEC_080402B				04/02/08 14:00
Polonium 210	0.8	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

R - RPD exceeds advisory limit.

U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



Date: 04-Jun-08

CLIENT: Crow Butte Resources
Project: North Trend Baseline
Sample Delivery Group: C08031112

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Per client request, results less than zero are reported as ND. Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)

All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS

Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

RADON IN AIR ANALYSIS

The desired exposure time is 48 hours (2 days). The time delay in returning the canister to the laboratory for processing should be as short as possible to avoid excessive decay. Maximum recommended delay between end of exposure to beginning of counting should not exceed 8 days.

SOIL/SOLID SAMPLES

All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505

Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:

USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:

The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER, WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.



ANALYTICAL SUMMARY REPORT

June 05, 2008

Crow Butte Resources

86 Crow Butte Rd

Crawford, NE 69339

Workorder No.: C08040254

Quote ID: C1125 - Crow Butte Uranium Project

Project Name: North Trend Baseline Third Round

Energy Laboratories, Inc. received the following 11 samples from Crow Butte Resources on 4/4/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08040254-001	97	03/31/08 12:30	04/04/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate
C08040254-002	123	03/31/08 11:52	04/04/08	Aqueous	Same As Above
C08040254-003	Cow 1	04/01/08 09:28	04/04/08	Aqueous	Same As Above
C08040254-004	Cow 4	04/01/08 11:13	04/04/08	Aqueous	Same As Above
C08040254-005	Cow 3	04/01/08 15:38	04/04/08	Aqueous	Same As Above
C08040254-006	RC-2	04/01/08 16:48	04/04/08	Aqueous	Same As Above
C08040254-007	Cow 5	04/03/08 08:18	04/04/08	Aqueous	Same As Above
C08040254-008	CPW-2	04/03/08 09:48	04/04/08	Aqueous	Same As Above
C08040254-009	Cow 2	04/03/08 11:20	04/04/08	Aqueous	Same As Above
C08040254-010	Cow 6	04/03/08 13:12	04/04/08	Aqueous	Same As Above
C08040254-011	RC-1	04/03/08 13:52	04/04/08	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:


STEVE CARLSTON



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-001
Client Sample ID: 97

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 03/31/08 12:30
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.1		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	2.1	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	2.1	pCi/L		1.3		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.3	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	1.6	pCi/L		0.4		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	0.5	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.4	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	0.1	pCi/L	U	0.1		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-002
Client Sample ID: 123

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 03/31/08 11:52
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	2.0		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	2.0	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.2	pCi/L		1.0		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.0	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	0.6	pCi/L		0.5		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	0.4	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.5	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	ND	pCi/L	U	0.05		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.05	pCi/L				E907.0	04/11/08 15:30 / dmf

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-003
Client Sample ID: Cow 1

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/01/08 09:28
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.0		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	1.0	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.0	pCi/L		1.0		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.0	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	23.3	pCi/L		0.4		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	1.6	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.4	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-004
Client Sample ID: Cow 4

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/01/08 11:13
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.2		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	1.2	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	ND	pCi/L	U	1.0		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.0	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	19.3	pCi/L		0.3		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	1.4	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.3	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/11/08 15:30 / dmf

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-005
Client Sample ID: Cow 3

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/01/08 15:38
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.8		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	1.8	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.3	pCi/L		1.1		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.1	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	1.1	pCi/L		0.40		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	0.41	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.40	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	ND	pCi/L	U	0.1		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/11/08 15:30 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-006
Client Sample ID: RC-2

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/01/08 16:48
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.9	E909.0M		04/11/08 09:45 / dm
Lead 210 precision (±)	1.9	pCi/L			E909.0M		04/11/08 09:45 / dm
Polonium 210	ND	pCi/L	U	0.70	RMO-3008		04/08/08 13:00 / dmf
Polonium 210 precision (±)	0.70	pCi/L			RMO-3008		04/08/08 13:00 / dmf
Radium 226	1.5	pCi/L		0.40	E903.0		04/29/08 14:03 / trs
Radium 226 precision (±)	0.46	pCi/L			E903.0		04/29/08 14:03 / trs
Radium 226 MDC	0.40	pCi/L			E903.0		04/29/08 14:03 / trs
Thorium 230	0.1	pCi/L	U	0.1	E907.0		04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L			E907.0		04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-007
Client Sample ID: Cow 5

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/03/08 08:18
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	0.6		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	0.6	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	ND	pCi/L	U	0.90		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	0.90	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	44.6	pCi/L		0.40		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	2.2	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.40	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	0.2	pCi/L	U	0.1		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.1	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-008
Client Sample ID: CPW-2

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/03/08 09:48
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	0.7		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	0.7	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.4	pCi/L		1.3		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.3	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	12.8	pCi/L		0.40		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	1.2	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.40	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	ND	pCi/L	U	0.2		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.2	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-009
Client Sample ID: Cow 2

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/03/08 11:20
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.4		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	1.4	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.6	pCi/L		1.4		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.4	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	9.7	pCi/L		0.41		E903.0	04/29/08 14:03 / trs
Radium 226 precision (±)	1.1	pCi/L				E903.0	04/29/08 14:03 / trs
Radium 226 MDC	0.41	pCi/L				E903.0	04/29/08 14:03 / trs
Thorium 230	ND	pCi/L	U	0.06		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.06	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-010
Client Sample ID: Cow 6

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/03/08 13:12
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.9		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	1.9	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.0	pCi/L		1.0		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	1.0	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	1.9	pCi/L		0.41		E903.0	04/29/08 17:23 / trs
Radium 226 precision (±)	0.51	pCi/L				E903.0	04/29/08 17:23 / trs
Radium 226 MDC	0.41	pCi/L				E903.0	04/29/08 17:23 / trs
Thorium 230	ND	pCi/L	U	0.09		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.09	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040254-011
Client Sample ID: RC-1

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/03/08 13:52
Date Received: 04/04/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	1.2		E909.0M	04/11/08 09:45 / dm
Lead 210 precision (±)	1.2	pCi/L				E909.0M	04/11/08 09:45 / dm
Polonium 210	1.1	pCi/L		0.90		RMO-3008	04/08/08 13:00 / dmf
Polonium 210 precision (±)	0.90	pCi/L				RMO-3008	04/08/08 13:00 / dmf
Radium 226	1.3	pCi/L		0.41		E903.0	04/29/08 17:23 / trs
Radium 226 precision (±)	0.44	pCi/L				E903.0	04/29/08 17:23 / trs
Radium 226 MDC	0.41	pCi/L				E903.0	04/29/08 17:23 / trs
Thorium 230	ND	pCi/L	U	0.05		E907.0	04/11/08 15:30 / dmf
Thorium 230 precision (±)	0.05	pCi/L				E907.0	04/11/08 15:30 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline Third Round

Revised Date: 05/27/08

Report Date: 05/10/08

Work Order: C08040254

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0							Batch: RA226-2743		
Sample ID: C08040699-001AMS Radium 226	Sample Matrix Spike 47	pCi/L		81	70	130			04/29/08 14:03
Sample ID: C08040699-001AMSD Radium 226	Sample Matrix Spike Duplicate 47	pCi/L		83	70	130	0.4	19.5	04/29/08 14:03
Sample ID: MB-RA226-2743 Radium 226	Method Blank 0.5	pCi/L							04/29/08 17:23
Sample ID: LCS-RA226-2743 Radium 226	Laboratory Control Sample 7.0	pCi/L		104	70	130			04/29/08 17:23
Method: E907.0							Batch: R99824		
Sample ID: LCS-R99824 Thorium 230	Laboratory Control Sample 6.50pCi/L		0.20	93	70	130			04/11/08 15:30
Sample ID: C08040254-001BMS Thorium 230	Sample Matrix Spike 14.1pCi/L		0.20	88	70	130			04/11/08 15:30
Sample ID: C08040254-001BMDS Thorium 230	Sample Matrix Spike Duplicate 18.8pCi/L		0.20	115	70	130	29	30	04/11/08 15:30
Sample ID: MB-R99824 Thorium 230	Method Blank 0.02pCi/L								04/11/08 15:30 U
Method: E909.0M							Batch: R100194		
Sample ID: C08040254-004BDUP Lead 210	Sample Duplicate ND	pCi/L	1.0				0.0	30	04/11/08 09:45 U
Sample ID: C08040255-001HMS Lead 210	Sample Matrix Spike 600	pCi/L	1.0	101	70	130			04/11/08 09:45
Sample ID: C08040255-001HMDS Lead 210	Sample Matrix Spike Duplicate 590	pCi/L	1.0	100	70	130	1.2	30	04/11/08 09:45
Sample ID: MB-R100194 Lead 210	Method Blank pCi/L								04/11/08 09:45 U
Sample ID: LCS-R100194 Lead 210	Laboratory Control Sample 120	pCi/L	1.0	104	70	130			04/11/08 09:45

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline Third Round

Revised Date: 05/27/08

Report Date: 05/10/08

Work Order: C08040254

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RMO-3008									Batch: R99716
Sample ID: C08040255-001HMS	Sample Matrix Spike					Run: EGG-ORTEC_080408B			04/08/08 13:00
Polonium 210	190	pCi/L	1.0	108	70	130			
Sample ID: C08040255-001HMSD	Sample Matrix Spike Duplicate					Run: EGG-ORTEC_080408B			04/08/08 13:00
Polonium 210	180	pCi/L	1.0	101	70	130	6.2	30	
Sample ID: LCS-R99716	Laboratory Control Sample					Run: EGG-ORTEC_080408B			04/08/08 13:00
Polonium 210	91	pCi/L	1.0	104	70	130			
Sample ID: MB-R99716	Method Blank					Run: EGG-ORTEC_080408B			04/08/08 13:00
Polonium 210	0.8	pCi/L							U

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



Date: 05-Jun-08

CLIENT: Crow Butte Resources
Project: North Trend Baseline Third Round
Sample Delivery Group: C08040254

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

REVISED/SUPPLEMENTAL REPORT 2

EDD considerations coupled with reporting requirements have resulted in a change to the format of the Radiochemical data report.

REVISED/SUPPLEMENTAL REPORT

Per client request, radiochemistry results less than zero are reported as ND. Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)

All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

SOIL/SOLID SAMPLES

All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505

Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:

USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:

The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER, WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.



ANALYTICAL SUMMARY REPORT

June 05, 2008

Crow Butte Resources

86 Crow Butte Rd

Crawford, NE 69339

Workorder No.: C08040444

Quote ID: C1125 - Crow Butte Uranium Project

Project Name: North Trend Baseline Third Round

Energy Laboratories, Inc. received the following 1 sample from Crow Butte Resources on 4/9/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08040444-001	Bow 1	04/07/08 12:38	04/09/08	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Chloride Conductivity Fluoride Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Nitrate + Nitrite pH Lead 210, Dissolved Polonium 210, Dissolved Radium 226, Dissolved Thorium, Isotopic Solids, Total Dissolved Sulfate

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:


STEVE CARLSTON



LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: North Trend Baseline Third Round
Lab ID: C08040444-001
Client Sample ID: Bow 1

Revised Date: 06/05/08
Report Date: 05/10/08
Collection Date: 04/07/08 12:38
Date Received: 04/09/08
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - DISSOLVED							
Lead 210	ND	pCi/L	U	0.9	E909.0M		04/18/08 08:00 / dm
Lead 210 precision (±)	0.9	pCi/L			E909.0M		04/18/08 08:00 / dm
Polonium 210	1.0	pCi/L		0.90	RMO-3008		04/21/08 12:10 / plj
Polonium 210 precision (±)	0.90	pCi/L			RMO-3008		04/21/08 12:10 / plj
Radium 226	ND	pCi/L	U	0.17	E903.0		04/28/08 13:17 / trs
Radium 226 precision (±)	0.11	pCi/L			E903.0		04/28/08 13:17 / trs
Radium 226 MDC	0.17	pCi/L			E903.0		04/28/08 13:17 / trs
Thorium 230	ND	pCi/L	U	0.1	E907.0		04/18/08 15:00 / dmf
Thorium 230 precision (±)	0.1	pCi/L			E907.0		04/18/08 15:00 / dmf

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources
Project: North Trend Baseline Third Round

Revised Date: 06/05/08
Report Date: 05/10/08
Work Order: C08040444

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0							Batch: RA226-2739		
Sample ID: C08040461-001AMS Radium 226	Sample Matrix Spike 13	pCi/L		100	70	130			Run: BERTHOLD 770_080421A 04/28/08 13:17
Sample ID: C08040461-001AMSD Radium 226	Sample Matrix Spike Duplicate 13	pCi/L		104	70	130	3.7	25.2	Run: BERTHOLD 770_080421A 04/28/08 13:17
Sample ID: MB-RA226-2739 Radium 226	Method Blank ND	pCi/L	0.2						Run: BERTHOLD 770_080421A 04/28/08 16:37 U
Sample ID: LCS-RA226-2739 Radium 226	Laboratory Control Sample 4.6	pCi/L		74	70	130			Run: BERTHOLD 770_080421A 04/28/08 16:37
Method: E907.0							Batch: R100260		
Sample ID: LCS-R100260 Thorium 230	Laboratory Control Sample 7.40pCi/L		0.20	104	70	130			Run: EGG-ORTEC_080418A 04/18/08 15:00
Sample ID: C08040471-001DMS Thorium 230	Sample Matrix Spike 20	pCi/L	0.20	97	70	130			Run: EGG-ORTEC_080418A 04/18/08 15:00
Sample ID: C08040471-001DMSD Thorium 230	Sample Matrix Spike Duplicate 20	pCi/L	0.20	103	70	130	6.2	30	Run: EGG-ORTEC_080418A 04/18/08 15:00
Sample ID: MB-R100260 Thorium 230	Method Blank 0.1	pCi/L							Run: EGG-ORTEC_080418A 04/18/08 15:00
Method: E909.0M							Batch: R100651		
Sample ID: C08040396-002FMS Lead 210	Sample Matrix Spike 420	pCi/L	1.0	71	70	130			Run: PACKARD 3100TR_080418C 04/18/08 08:00
Sample ID: C08040396-002FMSD Lead 210	Sample Matrix Spike Duplicate 540	pCi/L	1.0	92	70	130	25	30	Run: PACKARD 3100TR_080418C 04/18/08 08:00
Sample ID: MB-R100651 Lead 210	Method Blank	pCi/L							Run: PACKARD 3100TR_080418C 04/18/08 08:00
Sample ID: LCS-R100651 Lead 210	Laboratory Control Sample 93	pCi/L	1.0	78	70	130			Run: PACKARD 3100TR_080418C 04/18/08 08:00

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



QA/QC Summary Report

Client: Crow Butte Resources

Project: North Trend Baseline Third Round

Revised Date: 06/05/08

Report Date: 05/10/08

Work Order: C08040444

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RMO-3008							Batch: R100273		
Sample ID: C08040444-001CMS	Sample Matrix Spike				Run: EGG-ORTEC_080421A		04/21/08 12:10		
Polonium 210	190	pCi/L	1.0	110	70	130			
Sample ID: C08040444-001CMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080421A		04/21/08 12:10		
Polonium 210	170	pCi/L	1.0	99	70	130	10	30	
Sample ID: LCS-R100273	Laboratory Control Sample				Run: EGG-ORTEC_080421A		04/21/08 12:10		
Polonium 210	90	pCi/L	1.0	102	70	130			
Sample ID: MB-R100273	Method Blank				Run: EGG-ORTEC_080421A		04/21/08 12:10		
Polonium 210	0.6	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



Date: 05-Jun-08

CLIENT: Crow Butte Resources
Project: North Trend Baseline Third Round
Sample Delivery Group: C08040444

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL

REPORTREVISED/SUPPLEMENTAL REPORT 2

EDD considerations coupled with reporting requirements have resulted in a change to the format of the Radiochemical data report.

REVISED/SUPPLEMENTAL REPORT

Per client request, radiochemistry results less than zero are reported as ND. Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)

All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)

Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

SOIL/SOLID SAMPLES

All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505

Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS

Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS

eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:

USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:

The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER, WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

Company Name: Crow Butte Resources, Inc.		Project Name, PWS, Permit, Etc. North Trend Baseline		Sample Origin State: _____		EPA/State Compliance: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Report Mail Address: P.O. Box 169 Crawford, NE 69339		Contact Name: Larry Teahon		Phone/Fax: 308-665-2341		Sampler: (Please Print) Brooke Bass Rhonda Pelton	
Invoice Address: P.O. Box 169 Crawford, NE 69339		Invoice Contact & Phone: Larry Teahon 308-665-2215 ext 114		Purchase Order: 1125		Quote/Bottle Order:	
Special Report/Formats - ELI must be notified prior to sample submittal for the following: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/WWTP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____ </div> <div> <input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC </div> </div>		ANALYSIS REQUESTED SEE ATTACHED Normal Turnaround (TAT)		Contact ELI prior to RUSH sample submittal for charges and scheduling - See instruction Page Comments: NDEQ parameters for baseline sampling.		Shipped by: RETURN UPS 2nd Day 03022, 03022 03023, 03084 Receipt Temp: 4 °C On Ice: <input checked="" type="radio"/> Yes <input type="radio"/> No Custody Seal: Y N Intact: Y N Signature Match: Y N	
Number of Containers Air/Water/Solids Vegetation/Biossay/Other		MATRIX HNO ₃ Metals, U, Ra ²²⁸ RAW-F, Common Ions RAW-UF, Alkalinity H ₂ SO ₄ -F, NO ₂ , NO ₃ , NH ₄ PO ₂₁₀ , Th ²³⁰ , Pb ²¹⁰		LABORATORY USE ONLY 03022, 03022 03023, 03084			
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date		Collection Time		Received by (print): Brooke Bass	
1 97		3-3-08		3:22		Date/Time: 3-6-08 14:52	
2 123		3-3-08		2:42		Date/Time:	
3 RC-1		3-4-08		3:30		Date/Time:	
4 RC-2		3-4-08		4:06		Date/Time:	
5 Cow-1		3-4-08		9:43		Date/Time:	
6 Cow-3		3-4-08		3:48		Date/Time:	
7 Cow-4		3-4-08		1:12		Date/Time:	
8 Cow-2		3-5-08		4:35		Date/Time:	
9 Cow-5		3-5-08		2:23		Date/Time:	
10 CPW-2		3-5-08		10:04		Date/Time:	
Custody Record MUST be Signed		Signature: Brooke Bass		Signature: UPS		Signature:	
Sample Disposal:		Return to Client: No		Lab Disposal: YES		Signature:	

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Chain of Custody and Analytical Request Record

Company Name: Crow Butte Resources, Inc.		Project Name, PWS, Permit, Etc. North Trend Baseline		Sample Origin State:		EPA/State Compliance: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Report Mail Address: P.O. Box 169 Crawford, NE 69339		Contact Name: Larry Teahon		Phone/Fax: 308-665-2341		Sampler: (Please Print) Brooke Bass Rhonda Pelton	
Invoice Address: P.O. Box 169 Crawford, NE 69339		Invoice Contact & Phone: Larry Teahon 308-665-2215 ext 114		Purchase Order: 1125		Quote/Bottle Order:	
Special Report/Formats - ELI must be notified prior to sample submittal for the following:				ANALYSIS REQUESTED			
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/MWTP State: _____ Other: _____		<input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: _____ <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC		Number of Containers Sample Type: AWSVB Air Water Solids Vegetation Bioassay Other		Matrix	
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date	Collection Time	SEE ATTACHED			
1. C.D.W-6		3-6-08	1:14	Normal Turnaround (TA)			
2.				R U S H			
3.				Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page			
4.				Comments: NDEQ parameters for baseline sampling.			
5.				Shipped by: RUSH LUX 2nd Day			
6.				Cooler Info: C3023, C3024			
7.				Receipt Temp: 4 °C			
8.				On Ice: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
9.				Custody Seal Intact Y <input checked="" type="checkbox"/> N <input type="checkbox"/>			
10.				Signature Match Y <input checked="" type="checkbox"/> N <input type="checkbox"/>			
Custody Record MUST be Signed		Requisitioned by (print): Brooke Bass		Date / time: 3-6-08 14:52		Received by (print): UPS	
		Requisitioned by (print):		Date / time:		Received by (print):	
		Signature:		Date / time:		Received by (print):	
		Signature:		Date / time:		Received by (print):	
Sample Disposal: Return to Client: No		Lab Disposal: YES		Date / time: 3/10/08		Date / time: 03/15	

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Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.
Project Name, PWS, Permit, Etc.
North Trend Baseline

Page 1 of 1

Company Name:
Crow Butte Resources, Inc.

Report Mail Address:
P.O. Box 169
Crawford, NE 69339

Invoice Address:
P.O. Box 169
Crawford, NE 69339

Special Report/Formats - ELI must be notified
prior to sample submittal for the following:

☐ DW
☐ GSA
☐ POTW/MWTP
☐ State: _____
☐ Other: _____

☐ A2LA
☐ EDD/EDT (Electronic Data)
Format: _____
☐ LEVEL IV
☐ NELAC

Sample Origin

State: NE

Contact Name:
Larry Teahon

Phone/Fax:
308-685-2341

EPA/State Compliance:
Yes ☐ No ☐

Sampler: (Please Print)
Brooke Bass
Rhonda Patton

Quote/Bottle Order:

ANALYSIS REQUESTED

Number of Containers
Sample Type: AW8VBO
Vegetation Blossom
Soils/Solids Other

Normal Turnaround (TAT)
SEE ATTACHED

RAW-F, Common Ions
RAW-UF, Alkalinity
H2SO4-F, NO2, NO3, NH4
PO210, TH230, PO210

Contact ELI prior to
RUSH sample submittal
for charges and
scheduling - See
Instruction Page

Comments:
NDEQ parameters for
baseline sampling.

SAMPLE IDENTIFICATION
(Name, Location, Interval, etc.)

Collection Date

Collection Time

MATRIX

1 Row 1
2 water
3 40
4 11
5 11
6 50
7 50
8 50
9 50
10 50

LABORATORY USE ONLY

Custody
Record
MUST be
Signed

Received by (print):
Rhonda Patton
Received by (print):
Rhonda Patton

Date/Time:
3-7-08 12:30
Date/Time:
3-10-08 11:06

Signature:
Rhonda Patton
Signature:
Rhonda Patton

Received by (print):
UPS
Received by (print):
UPS

Date/Time:
3-12-08 9:40
Date/Time:
3-12-08 9:40

Signature:
Emelany
Signature:
Emelany

Sample Disposed: _____ Return to Client: No

Lab Disposed: YES

Received by Laboratory:

Date/Time:

Signature:

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Chain of Custody and Analytical Request Record

Company Name: Crow Butte Resources, Inc.		Project Name, PWS, Permit, Etc. North Trend Baseline		Sample Origin State: <u>NE</u>		EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Report Mail Address: P.O. Box 169 Crawford, NE 69339		Contact Name: Larry Teahon		Phone/Fax: 308-665-2341		Email: daxmynus@msn.com	
Invoice Address: P.O. Box 169 Crawford, NE 69339		Invoice Contact & Phone: Larry Teahon 308-665-2215 ext 114		Purchase Order: 1125		Quote/Bottle Order:	
Special Report/Formats - ELI must be notified prior to sample submittal for the following: <input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/WWTP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____ <input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: _____ <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC		ANALYSIS REQUESTED Number of Containers: _____ Sample Type: AWSVB Air/Water/Solids/Other: _____ Vegetation/Biossey/Other: _____		SEE ATTACHED Normal Turnaround (TAT): _____		Contact ELI prior to RUSH sample submittal for charges and scheduling - See instruction Page	
Shipped by: UPS NDA Crate # <u>1-2247</u>		Receipt Temp: <u>4</u> °C		On lot: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Custody Seal Intact <input checked="" type="checkbox"/> Y N Signature Match <input checked="" type="checkbox"/> Y N	
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date		Collection Time		MATRIX	
1 <u>123</u>		3-17-08		12:14		Water	
2 <u>97</u>		3-17-08		1:23		()	
3 <u>COW-1</u>		3-18-08		8:33		()	
4 <u>COW-4</u>		3-18-08		9:52		()	
5 <u>COW-3</u>		3-18-08		12:17		()	
6 <u>RC-2</u>		3-18-08		4:35		()	
7 <u>COW-5</u>		3-19-08		8:33		()	
8 <u>CPW-2</u>		3-19-08		10:39		()	
9 <u>COW-2</u>		3-19-08		12:14		()	
10 <u>RC-1</u>		3-19-08		12:40		()	
Custody Record MUST be Signed		Received by (print): <u>Brooke Bass</u>		Date/Time: 3-20-08 10:44 AM		Signature: <u>Brooke Bass</u>	
		Received by (print): <u>Ashley Haynes</u>		Date/Time: 3-24-08 7:20 AM		Signature: <u>Ashley Haynes</u>	
		Received by Laboratory:		Date/Time:		Signature:	
Sample Disposal:		Return to Client: No		Lab Disposal: YES			

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Chain of Custody and Analytical Request Record

Page of

PLEASE PRINT- Provide as much information as possible.

Company Name: Crow Butte Resources, Inc.		Project Name, PWS, Permit, Etc. North Trend Baseline		Sample Origin State: <u> </u>		EPA/State Compliance: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Report Mail Address: P.O. Box 169 Crawford, NE 69339		Contact Name: Larry Teahon		Phone/Fax: 308-665-2341		Sampler: (Please Print) Brooke Bass Rhonda Pelton	
Invoice Address: P.O. Box 169 Crawford, NE 69339		Invoice Contact & Phone: Larry Teahon 308-665-2215 ext 114		Purchase Order: 1125		Quote/Bottle Order:	
Special Report/Formats - ELI must be notified prior to sample submittal for the following:							
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTWWWTP <input type="checkbox"/> State: <u> </u> <input type="checkbox"/> Other: <u> </u>		<input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: <u> </u> <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC		ANALYSIS REQUESTED			
Number of Containers Sample Type: A W S V B D Air Water Solids/Other Vegetation Blossary Other		MATRIX		HNO3, Metals, U, Ra226 RAW-F, Common Ions RAW-UF, Alkalinity H2SO4-F, NO2, NO3, NH4 P210, TH20, Pb20		SEE ATTACHED	
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.) 1 Cow-6		Collection Date 3-20-08		Collection Time 8:23		Normal Turnaround (TAT)	
2		3		4		5	
6		7		8		9	
10							
Custody Record MUST be Signed		Received by (print): Brooke Bass		Signature: Brooke Bass		Date/Time: 3-20-08 10:14 AM	
Received by (print): Ashlynn Haynes		Signature: Ashlynn Haynes		Date/Time: 3-24-08 7:20 AM		Signature: Ashlynn Haynes	
Sample Disposal:		Return to Client: No		Lab Disposal: YES		Signature:	

LABORATORY USE ONLY

00030949

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Chain of Custody and Analytical Request Record

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Company Name: Crow Butte Resources, Inc.		Project Name, PWS, Permit, Etc. North Trend Baseline Third Round		Sample Origin State:		EPA/State Compliance: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Report Mail Address: P.O. Box 169 Crawford, NE 69339		Contact Name: Larry Teahon		Phone/Fax: 308-665-2341		Email: daxmynus@msn.com	
Invoice Address: P.O. Box 169 Crawford, NE 69339		Invoice Contact & Phone: Larry Teahon 308-665-2215 ext 114		Purchase Order: 1125		Quote/Bottle Order:	

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☐ POTWWWTP
☐ State: _____
☐ Other: _____

☐ A2LA
☐ EDD/EDT (Electronic Data)
 Format: _____
☐ LEVEL IV
☐ NELAC

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	ANALYSIS REQUESTED						Normal Turnaround (TAT)	Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page	Shipped by: Cooler Etc: C-3016 C-611 C-424 C-411
				Number of Containers Sample Type: AWSVB Air Water Soils Solids Vegetation Biorassay Other	HNO ₃ , Metals, U, Ra ²²⁶	RAW-F, Common Ions	RAW-UF, Alkalinity	H ₂ SO ₄ -F, NO ₂ , NO ₃ , NH ₄	Pb ²¹⁰ , Th ²³⁰ , Pb ²¹⁰			
1 97	3-31-08	12:30	Water	20	10	10	50	50				
2 123	3-31-08	11:52										
3 Cow-1	4-1-08	9:28										
4 Cow-4	4-1-08	11:13										
5 Cow-3	4-1-08	3:38										
6 RC-2	4-1-08	4:48										
7 Cow-5	4-3-08	8:18										
8 CPW-2	4-3-08	9:48										
9 Cow-2	4-3-08	11:20										
10 Cow-6	4-3-08	1:12										

Custody Record
MUST be Signed

Signature: Rhonda L. Pelton
 Date: 4/4/08
 Signature: Rhonda L. Pelton
 Date: 4/4/08

LABORATORY USE ONLY

Signature: Rhonda L. Pelton
 Date: 4/4/08
 Signature: Rhonda L. Pelton
 Date: 4/4/08

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Chain of Custody and Analytical Request Record

Page 1 of 1

Company Name: Crow Butte Resources, Inc.		Project Name, PWS, Permit, Etc. North Trend Baseline Third Round		Sample Origin State: <u>NE</u>		EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																																																																																																																																																													
Report Mail Address: P.O. Box 169 Crawford, NE 69339		Contact Name: Larry Teahon		Phone/Fax: 308-665-2341		Sampler: (Please Print) Brooke Bass Rhonda Pelton																																																																																																																																																													
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Special Report/Formats - ELI must be notified prior to sample submittal for the following: <input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/MWTP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____ <input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: _____ <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC		ANALYSIS REQUESTED <table border="1"><thead><tr><th>Sample Type: AWSVB Air/Water/Solids/Other</th><th>NO3, Metals, U, Ra 226</th><th>RAW-F, Common Ions</th><th>RAW-UF, Alkalinity</th><th>H2SO4-F, NO2, NO3, NH4</th><th>Pb210, Th230, Pb210</th><th>SEE ATTACHED</th><th>Normal Turnaround (TAT)</th><th>Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page</th><th>Comments:</th><th>On Ice: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></th><th>Receipt Temp: _____ °C</th><th>Shipped by: UPSARS 2nd</th></tr></thead><tbody><tr><td>Number of Containers</td><td>MATRIX</td><td>4-12-10</td><td>50.5</td><td></td><td></td><td></td><td></td><td>RUSH</td><td>NDEQ parameters for baseline sampling.</td><td></td><td></td><td></td></tr><tr><td>1 Bow-1</td><td>W</td><td>4-7-08 12:38</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>						Sample Type: AWSVB Air/Water/Solids/Other	NO3, Metals, U, Ra 226	RAW-F, Common Ions	RAW-UF, Alkalinity	H2SO4-F, NO2, NO3, NH4	Pb210, Th230, Pb210	SEE ATTACHED	Normal Turnaround (TAT)	Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page	Comments:	On Ice: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Receipt Temp: _____ °C	Shipped by: UPSARS 2nd	Number of Containers	MATRIX	4-12-10	50.5					RUSH	NDEQ parameters for baseline sampling.				1 Bow-1	W	4-7-08 12:38											2													3													4													5													6													7													8													9													10												
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Number of Containers	MATRIX	4-12-10	50.5					RUSH	NDEQ parameters for baseline sampling.																																																																																																																																																										
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Custody Record MUST be Signed		Requisitioned by (print): Rhonda Pelton Requisitioned by (print): Rhonda Pelton		Date / time: 4-02-08 13:44		Signature: Rhonda Pelton		Received by (print): UPSARS Received by (print): Aspen Hayes		Date / time: 4-09-08 9:30		Signature: Aspen Hayes																																																																																																																																																							
Sample Disposal: _____		Return to Client: No		Lab Disposal: YES																																																																																																																																																															

CBR-013

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

PETITION FOR AQUIFER EXEMPTION – NORTH TREND EXPANSION AREA
CROW BUTTE RESOURCES - CRAWFORD, NEBRASKA

CBR-013

Well ID	DNR Registration No.	Township	Range	Section	Easting	Northing	Water Quality	Owner	Street Address	City	State	Zip Code	Interview Date	Contact Person	Telephone	Interviewer	Supply Source	Screen Interval	Estimated Extraction Rate	Pump test results	Total Depth	Static Level	Drill Date	Casing Depth	Casing Type	Diameter	Pumping Method	Driller	History	Remarks	Remarks 2	Remarks 3	
3		31N	S2W	15	2650E	4200N	good	Lorentz Raben	Box 463	Crawford	NE	68339	24-Aug-81		665-2673		Well		30 gpm		100	50	01-Jan-70	50	Steel	5.5	Windmill	Haag	stock well, relatively new well, no trouble	windmill 16' 3"			
4		31N	S2W	15	5200E	5100N	good	Lorentz Raben	Box 463	Crawford	NE	68339	24-Aug-81		665-2673		Well		30 gpm		100	est 50	01-Jan-70	50	Steel	5.5	submersible	Chubb	also agricultural, est 500 gal/day usage	drill date approx.	relatively new well	house well with pitless adaptor	
20		31N	S2W	1	2950E	100N	good	Lester W. Taggart		Crawford	NE	68339	25-Aug-81		665-1792		Well				50	8		50	Plastic	5.5			Taggart unwilling to supply further information	or have well tested			
52		31N	S2W	10	2100E	2400N	salty	Lulu Bauersachs	Box 11	Crawford	NE	68339	27-Aug-81		665-1380		Well		70-75 gpm when first drilled		420		01-Jan-56		Steel	4		John Carle	drill date approx.				
55		31N	S2W	11	1100E	4600N		Ricardo Rei	E Highway 20	Crawford	NE	68339	31-Aug-81		665-1618		Well				320	5.5		320	Plastic	4			garden use- used only in summer				
56		31N	S2W	2	1100E	2850N		Dave Zellinger	Burlington Railroad - Crawford Depot	Crawford	NE	68339	31-Aug-81		665-1360 (Crawford Depot)		Well		2 gpm estimated		200	112	01-Jan-29	200	Steel	10		Chubb	domestic, stock, veterinary clinic	drill date approx.	will run dry if run major appliances (washer etc.)		
60		31N	S2W	2	1300E	1000N		Francis Anders	Box 455	Crawford	NE	68339	31-Aug-81		665-1920		Well		~150		312		01-Jan-62	312	Steel	5		7 Haag	drilled, had to be plugged twice by a Hal Burton		firm from Casper, artesian, ran 4' pump, dried up		
61		31N	S2W	2	1100E	600N		Francis Anders	Box 455	Crawford	NE	68339	31-Aug-81		665-1920		Well				280		01-Jan-80	280	Steel	5		Wyo Fuel	domestic, stock, veterinary clinic	drill date approx.	artesian		
65		31N	S2W	1	800E	3150N		Rubi H. McDowell	Box 461	Crawford	NE	68339			665-1191		Well		240-260	33 gpm	260		01-Jan-80	260	Plastic	5		Wyo Fuel-Chubb	irrigation - terraced, subirrigation	drill date approx., artesian, drilled by Wyo Fuel	as a test hole, reamed and cased by Chubb		
66		31N	S2W	12	1900E	5050N		Rubi H. McDowell	Box 461	Crawford	NE	68339	03-Sep-81		665-1191		Well				60	20	01-Jan-60	60	Steel			Peilon	drill date approx. (to 60')	drilled first at 20', then 40', then 60'	need to let pit dry out as water above pump		
74		32N	S2W	34	3600E	800N		Ronald & Cassandra Olson	#10 W. Bethel Rd / PO Box 505	Crawford	NE	68339	02-Jul-04		665-1599		Miller	Well			60		01-Jan-76	60	Plastic	6		Chubb	stock	drill date approx.	doesn't like big companies... profit over people	very concerned about impact on water table	
75		32N	S2W	21	3900E	850N		Dave Dodd		Crawford	NE	68339	05-Nov-81		665-1516		Well				60-70		01-Jan-78	20		6	Windmill	Chubb	drill date approx.	10' stock tank			
76		32N	S2W	21	5050E	4150N		Dave Dodd	451 Dodd Rd.	Crawford	NE	68339	18-Jul-96		665-2012		Dave Dunn	Well			48	40.5		20		6	Windmill	7 Chubb	old well	old hand pump broke, windmil			
77		32N	S2W	22	200E	4000N		Dave Dodd	451 Dodd Rd.	Crawford	NE	68339	18-Jul-96		665-2012		Dave Dunn	Well			61		24-Nov-81	61	cement	36	submersible	Bice of Rapid City	sampled in 1996				
78		32N	S2W	27	4900E	3900N		Jerald Wallace	RR 3 Box 2A	Crawford	NE	68339	30-Jul-96		665-1981		Dave Dunn	Well			98		01-Jan-60	98	Steel Galvanized	6	submersible	Haag	drill date approx.	electric, house water, sampled in 1996			
79		32N	S2W	27	4800E	3900N		Jerald Wallace	RR 3 Box 2A	Crawford	NE	68339	30-Jul-96		665-1981		Dave Dunn	Well			98			98	Steel Galvanized		Windmill		old well	windmill broke			
81		32N	S2W	27	4600E	3800N		Jerald Wallace	RR 3 Box 2A	Crawford	NE	68339	30-Jul-96		665-1981		Dave Dunn	Well			630		01-Jan-85			3		Chub	water yard	drill date approx., artesian, sampled in 1996			
82		32N	S2W	22	4600E	300N		Earl Soester	RR	Crawford	NE	68339	05-Aug-96		665-2616		Dave Dunn	Well			120		01-Jan-45	120	Steel Galvanized				Haag	windmil		not visible	
83		32N	S2W	27	2850E	100N		Earl Soester	RR	Crawford	NE	68339	05-Aug-96		665-2616		Dave Dunn	Well			50		01-Jan-50	50	Steel Galvanized	6	submersible			drill date approx., electric, sampled in 1996	cant measure		
84		32N	S2W	34	3200E	5200N		Earl Soester	RR	Crawford	NE	68339	05-Aug-96		665-2616		Dave Dunn	Well			50	38	01-Jan-50	50	Steel Galvanized	6		Jet Pump	drill date approx.	electric			
85		32N	S2W	33	4750E	1400N		Sharon Finley	RR 3	Crawford	NE	68339	05-Aug-96		665-1228		Dave Dunn	Well			80			80	Plastic	5.25	submersible			old well at mothers place	old well		
86		31N	S1W	4	2300E	3105E		Fort Robinson		Crawford	NE	68339	18-Nov-81		665-1175		Well		280-300		300	7.180	01-Jan-60	300	Steel	6		Chubb	drill date approx., technically abd for ~10 yrs.	previously used when Beef Exp. Station was @ fort	but not used since it moved out about 10 yrs ago		
87		32N	S2W	29	4650E	3750N		Lloyd Moody	RR	Crawford	NE	68339	18-Nov-81		665-1368		Well				50		01-Jan-30	20	Steel Galvanized	5.25	Windmill			drill date approx.	10' stock tank	winter so couldn't measure	
88		32N	S2W	35	1300E	5000N		Willoughby (Bob Pickering)	221 Mill Rd	Crawford	NE	68339	07-Jul-04		665-3674		Miller	Well			60	22	01-Jan-58	20	Steel Galvanized	5.25	submersible	Chubb	not in use				
89		32N	S2W	26	1400E	100N		Willoughby (Bob Pickering)	221 Mill Rd	Crawford	NE	68339	07-Jul-04		665-3674		Clark Miller	Well			35		01-Jan-58	10	Steel Galvanized	5.25	Windmill	Chubb	drill date approx., 8' stock tank	was packed with manure for winter so couldn't	measure at the time		
90		32N	S2W	26	3400E	3650N		Ed Trucks	RR	Crawford	NE	68339	19-Nov-81		665-2608		Well				35	15.5	01-Jan-60	10	Plastic	5.25	Windmill	Chubb	drill date approx.				
91		32N	S2W	26	3400E	300N		Joe Roos	RR	Crawford	NE	68339	29-Jul-96		665-1620		Dave Dunn	Well			est 80		01-Jan-18	20	Steel Galvanized	5.25	submersible			agricultural also	cant measure		
92		32N	S2W	26	4400E	2800N		Marvin & Anne Hamar	142 Old Hw 20PO Box 348	Crawford	NE	68339	06-Jul-04		665-1436		Miller	Well			54	14	01-Jan-72	40	Steel	6	submersible	Chubb	drill date approx.				
93		32N	S2W	26	3900E	2400N		Barton Kreider (Ferguson Place Now)	Box 506	Crawford	NE	68339	19-Nov-81		665-2620 (2602)		Well				85	12+10 = 22	01-Jan-61	40	Steel Galvanized	5.25	submersible	Chubb	drill date approx., well in basement 10' below	ground level, runs thru softner to dispel odor	(Hydrogen Sulfide)?		
94		32N	S2W	26	4800E	1900N		A. A. Ahl	Box 225	Crawford	NE	68339	19-Nov-81				Well				52			50	Steel Galvanized	6		Jet Pump	drill date early 1900's				
95		32N	S2W	35	200E	5100N		Gary Fairbanks		Tacuma	MI		18-Jul-96		517-451-9632		Dave Dunn	Well			100	34.5	01-Jan-72	100	Plastic	5.25	submersible	Chubb	drill date approx.				
96		32N	S2W	35	650E	2600N		Kerry Clark	HC 92	Crawford	NE	68339	16-Aug-96		665-2509		Dave Dunn	Well			86		01-Jan-30	86	Plastic	5.25	submersible			drill date approx.			
97		32N	S2W	35	150E	2200N		Kerry Clark	HC 92	Crawford	NE	68339			665-2509		Dave Dunn	Well			380		01-Jan-76	380	Plastic	2.5			drill date approx.				
98		32N	S2W	25	5200E	2600N		Merle Mansfield	PO Box 389	Crawford	NE	68339	19-Nov-81	Merle Mansfield	665-1927		R. Grantham	Well			100	100	01-Jan-70	100	Plastic	5.25		Chubb	irrigation- lawn, garden, alpha/pa field, etc.	drill date approx.	artesian well		
99		32N	S2W	24	50E	1500N		Ron Raben	RR 3 Box 2B	Crawford	NE	68339	19-Nov-81		665-1763		Well				50	20 est.	01-Jan-68		concrete	36	submersible	Chubb	agricultural also- supplies pipeline	drill date approx.	offset old well - 12'		
100		32N	S2W	35	1700E	3800N		Betty Beaver	229 Annen St.	Crawford	NE	68339	26-Jul-96		665-1453		Dave Dunn	Well			25-35			35	Steel Galvanized		submersible		agricultural also	flooded out			
101		32N	S2W	36	300E	900N		Gordon Moore	Box 388	Crawford	NE	68339	19-Nov-81		665-2352		Well				75		01-Jan-74	75	plastic	5.25	submersible			drill date approx.			
102		32N	S2W	35	2500E	200N		Gordon Moore	Box 388	Crawford	NE	68339	19-Nov-81		665-2352		Well				100		01-Jan-20	100	Steel	5.5	Jet Pump		also agricultural	drill date approx.	must pull to measure		
103		32N	S2W	35	2800E	2200N		Gordon Moore	Box 388	Crawford	NE	68339	19-Nov-81		665-2352		Well				125		01-Jan-55	125	Steel Galvanized	5.25	Windmill	Jack Carley	drill date approx.	must pull to measure			
104		32N	S2W	35	1900E	3500N		Dannie Barcal	60 Old Hwy 20	Crawford	NE	68339	07-Jul-04		665-1354		Miller	Well			24	10	01-Jan-48	24	Steel	6	Jet Pump	Chubb or Peirun	also agricultural	drill date approx.			
105		32N	S2W	34	4700E	1800N		Hagemester	905 3rd	Crawford	NE	68339	22-Jul-96		665-2434		Dave Dunn	Well			70		01-Jan-61	70	Steel	8	Windmill	Haag	drill date approx.				
106		31N	S2W	3	2000E	4800N		George Moody	21 Mill Road	Crawford	NE	68339	01-Aug-96		665-1404		Dave Dunn	Well			100		01-Jan-72	100	Steel Galvanized	5.25	submersible	Chubb	also agricultural	drill date approx.	drilled in 50s and redrilled in 1972	could pump, dry well redrilled	
107		32N	S2W	34	3200E	2350N		Laure Sinn	91 Mill Road	Crawford	NE	68339	14-Jul-04		665-1665		Clark Miller	Well			45							submersible			sampled 1996		
108		32N	S2W	34	4850E	650N		Hagemester	905 3rd	Crawford	NE	68339	22-Jul-96		665-2434		Dave Dunn	Well			75	43	01-Jan-70	75	Plastic	5.25		Haag	drill date approx., undeveloped well	not presently in use... planned to build a house	there but never got it built.		
109		32N	S2W	34	3400E	2050N		Theda Clarke		Crawford	NE	68339	08-Aug-96		665-1415		Dave Dunn	Well			55		01-Jan-75	55	Plastic	5.25	submersible	Chubb	also agricultural	drill date approx.			
110		32N	S2W	33	100E	200N		Alan Holmgren	RR	Crawford	NE	68339	25-Nov-81		665-1430		Well				100		01-Jan-74	20	Plastic	5.25	submersible	Chubb	also agricultural	drill date approx.			
111		32N	S2W	32	250E	1000N		Alan Holmgren	RR	Crawford	NE	68339	25-Nov-81		665-1430		Well		2 gpm		90		01-Jan-64	20	Steel Galvanized	5.25	submersible	Chubb	also agricultural	drill date approx.			
112		31N	S2W	3	5200E	3200N		Leonard Chubb	11 W Ash Creek Rd	Crawford	NE	68339			665-2587		Dave Dunn	Well			110					5.25	submersible			can get info later			
113		31N	S2W	3	5050E	2900N		Leonard Chubb	11 W Ash Creek Rd	Crawford	NE	68339			665-2587		Dave Dunn	Well			110	57				5.25	submersible			can get info later			
114		32N	S2W	34	4400E	2400N		Virlyn Norgard	920 4th	Crawford	NE	68																					

Well ID	DNR Registration No.	Township	Range	Section	Easting	Northing	Water Quality	Owner	Street Address	City	State	Zip Code	Interview Date	Contact Person	Telephone	Interviewer	Supply Source	Screen Interval	Estimated Extraction Rate	Pump test results	Total Depth	Static Level	Drill Date	Casing Depth	Casing Type	Diameter	Pumping Method	Driller	History	Remarks	Remarks_2	Remarks_3						
245		32N	52W	23				Greg Raben	51 Raben Rd	Crawford	NE	69339	07-Jul-04		665-1261	Miller	Well				25	12		25	Steel	6	Windmill											
246		32N	52W	17				John Dodd	451 Dodd Rd	Crawford	NE	69339	08-Jul-04		665-2012	Miller	Well				40	9		40		6	submersible	Chubb	also agricultural									
247		32N	52W	16				State (Dodd Lease)	451 Dodd Rd (Dodd)	Crawford	NE	69339	08-Jul-04		665-2012 (Dodd)	Miller	Well				30			30	Steel	6	Windmill											
248		32N	52W	13				Reed/Galbreath (Bruce Wohlers)	14051 Hwy 71 (Wohlers)	Crawford	NE	69339	08-Jul-04		665-1104	Miller	Well				30			30		6	submersible					in well pit						
249		32N	52W	14				Bruce Wohlers	14051 Hwy 71	Crawford	NE	69339	08-Jul-04		665-1104	Miller	Well				30			30	Steel	6	Pump Jack											
250		32N	52W	24				Pat Drinkwater	211 Mansfield Rd	Crawford	NE	69339	09-Jul-04		665-1818	Miller	Well				30	20		01-Jan-50	30	Steel	6	submersible					drill date aprox.					
251		32N	52W	19				Bill Eberspacher	3 Rim Rock Rd	Crawford	NE	69339	09-Jul-04		665-2054	Miller	Well				100					Steel	6	Windmill										
252		32N	52W	8				Jerry Golden	1941 Cottonwood Rd	Crawford	NE	69339	09-Jul-04		665-1835	Miller	Well									Stone		Centrifigul		also agricultural			asked about CBR paying for pump test on wells					
253		32N	52W	8				Jerry Golden	1941 Cottonwood Rd	Crawford	NE	69339	09-Jul-04		665-1835	Miller	Well											Pump Jack					asked about CBR paying for pump test on wells					
254		32N	52W	8				Jerry Golden	1941 Cottonwood Rd	Crawford	NE	69339	09-Jul-04		665-1835	Miller	Well											Centrifigul										
255		32N	52W	11				Kath Nixon	232 Paddock St	Crawford	NE	69339	13-Jul-04		665-2897	Miller	Well				30	20		30	Steel		Windmill						alkalai water					
256		32N	52W	9				Willis Hoffman	254 Toadstool Rd	Crawford	NE	69339	13-Jul-04		665-2646	Miller	Well				40	15		01-Jan-70	40	Steel Galvanized	6	Jet Pump	Chubb	Not in use				drill date aprox.				
257		32N	52W	7				Allen Raum	150 Rim Rock Rd	Crawford	NE	69339	13-Jul-04		665-1419	Miller	Well				50	20				Steel	6	Windmit										
258		32N	52W	8				Diane Norman	1934 Cottonwood Rd	Crawford	NE	69339	13-Jul-04		665-1613	Miller	Well																					
259		32N	52W	8				Diane Norman	1934 Cottonwood Rd	Crawford	NE	69339	13-Jul-04		665-1613	Miller	Well																					
262		32N	52W	15				Rusty Riggs	14121 Hwy 2-71	Crawford	NE	69339	14-Jul-04		665-1663	Miller	Well				30	20		01-Jan-80	3	Concrete	3'	submersible	Slice		also agricultural			drill date aprox.				
263		32N	52W	15				Rusty Riggs	14121 Hwy 2-71	Crawford	NE	69339	14-Jul-04		665-1663	Miller	Well									Concrete	3'							old well				
425		32N	52W	27				City of Crawford (Cemetery)	209 Elm Street	Crawford	NE	69339	06-Jun-08	Leonard Chubb	665-1462	Granham	Well				-700	4.8		-1983		Steel		4.5		Chubb	Well never placed into service			Well pumped sand when it was drilled	Referred to historically as CEMETERY well			
436	G-149482	32N	52W	35				Dennis Barcal	60 Old Hwy 20	Crawford	NE	69339	08-Jul-08					9-32	10gpm		37	12		02-Jun-08	0-9 & 32-37	PVC	4.5	submersible	Chubb					DNR Database				
437	G-149270	31N	52W	3				Jon Erickson	Box 546	Crawford	NE	69339	08-Jul-08					140-200	10gpm		200	54		04-May-07	140	PVC	4.5	submersible	Chubb					DNR Database				
438	G-128947	32N	52W	34				Laurie Sinn	91 Mill Rd.	Crawford	NE	69339	08-Jul-08			Granham		40-60	20gpm		60	15		06-Jun-03	40	PVC	6	tempster pump	Chubb					DNR Web site lists 55-60 as Chadron Clay				
439	G-142918	32N	52W	14	755	1427		Bruce Wohlers	14051 Hwy 71	Crawford	NE	69339	08-Jul-08					40pm	4gpm		60	20		19-Nov-06	20		4	Gould Pump	Jim's Well Service					DNR Database				
440	G-139698	32N	52W	22	395	879		Bruce Wohlers	14051 Hwy 71	Crawford	NE	69339	08-Jul-08					40pm	4gpm		240	35		04-Mar-06	240		4	Gould Pump	Jim's Well Service					DNR Database				
441	G-139697	32N	52W	22	399	876		Bruce Wohlers	14051 Hwy 71	Crawford	NE	69339	08-Jul-08					40pm	4gpm		240	35		01-Mar-06	240	PVC	4'	Gould Pump	Jim Prosser					DNR Database				
442	G-094931	32N	52W	11				Eldon Wohlers	190 Wohlers Dr.	Crawford	NE	69339	08-Jul-08					40-60	30pm		60	25		03-Nov-97				Chubb					DNR Database					
443	G-147453	32N	52W	8				Larry Rising	HC 92	Crawford	NE	69339	08-Jul-08					120-140	10gpm		140	18		29-Oct-07	120		4.5'	submersible	Chubb					DNR Database				
5001								Mrs. Cecil Chubb	701 Main	Crawford	Ne	69339	12-Sep-83		665-1243	RG	Well				280			01-Jan-72	280	Plastic	3		C. Chubb	water lawn and for well drilling	drill date aprox. 40' cemented surface casing	artesian well	C01					
5002								Don Garner	409 Main	Crawford	Ne	69339	12-Sep-83		665-1749	RG	Well				25	10				Steel Galvanized	5.25	Jet Pump			water lawn	outside back door			C02			
5003								Herb Courtain	618 Main	Crawford	Ne	69339	12-Sep-83			RG	Well				280			01-Jan-64	280	Steel	5		Chubb	some lawn and garden	drill date aprox.	@NW corner of house	artesian well, C03					
5004								John Limbach	1100 1st St	Crawford	Ne	69339	12-Sep-83		665-2309	RG	Well				85		est 45				5	submersible			lawn and garden	south side of house			C04			
5005								Wright Lathrop	302 Linn	Crawford	Ne	69339	12-Sep-83			RG	Well				40					Steel Galvanized	5	submersible				old well located in basement	reamed and cleaned May 1983			C05		
5006								Tillie Thomas	141 Linn St	Crawford	Ne	69339	12-Sep-83		665-1271	RG	Well				100			01-Jan-60	100	Steel Galvanized	5.25	Jet Pump	Peiun			drill date aprox.			C06			
5007								Earl Ball	136 Linn	Crawford	Ne	69339	12-Sep-83		665-2378	RG	Well			est 20	50		01-Jan-20	50	Steel Galvanized	6	submersible			water lawn	drill date aprox.			located backyard	no draw down, C07			
5008								Ed Peterson	796 and Coates	Crawford	Ne	69339	12-Sep-83		665-1753		Well			est 24	48		01-Jan-77	48	Plastic	6	submersible	Peterson			lawn	drill date aprox.			located backyard	good recharge, C08		
5009								Bob Scoggan	119 Linn	Crawford	Ne	69339	12-Sep-83		665-2657		Well			est 22	60		01-Jan-79	60	Plastic	6	submersible	Chubb				drill date aprox.			located backyard	C09		
5010								C. A. Hamman	113 Linn	Crawford	Ne	69339	12-Sep-83				Well			est 12	30		01-Jan-27	30	Steel	6					lawn	drill date aprox. located backyard	hand drilled no pump by Bob Scoggan			C10		
5011								Calvin Hiner	142 Ash	Crawford	Ne	69339	12-Sep-83		665-2410	RG	Well				110	27		01-Jan-60	110	Steel	6	submersible	Peiun			lawn and garden	drill date aprox.			located at side of house	submersible by Bob Scoggan, C11	
5012								Cecil Avey	311 Anvin	Crawford	Ne	69339	12-Sep-83		665-2517	RG	Well				80		est 40	01-Jan-81	80	Plastic	4	submersible	Chubb			lawn and minnows	drill date aprox.			located in backyard	also one abandon well, C12	
5013								Cecil Avey	311 Anvin	Crawford	Ne	69339	12-Sep-83		665-2517	RG	Well				45	18.5		01-Jun-83	45	Plastic	4	submersible	Chubb			garden	drill date aprox.			located 200' SW of Mason's Laundramat		
5014								Guy Mason	723 E Elm Box 287	Crawford	Ne	69339	12-Sep-83		665-1850	RG	Well				50	14		01-Jan-70	no casing		4	submersible	Chubb			lawn	drill date aprox.			located backyard	C14	
5015								Ed Rhoads	502 Anvin	Crawford	Ne	69339	12-Sep-83		665-1150	RG	Well				50				50		6	submersible			also agricultural	>50 yrs old			north of house	doesn't pump dry, C15		
5016								Jerry Piper	1109 6th St	Crawford	Ne	69339	12-Sep-83		665-2317	RG	Well				38	18				Steel Galvanized	6				garden	>20 yrs old			located backyard	hand pump and pumpjack, C16		
5017								Arthur L. Anderson	406 Linn	Crawford	Ne	69339	12-Sep-83		665-2366	RG	Well				60	19		01-Jan-74	60	Plastic	5.25	submersible	Chubb			lawn and garden	drill date aprox.			located east of house		
5018								Clarence Moffet	5th and Ash	Crawford	Ne	69339	12-Sep-83		665-1732		Well				40	28		01-Jan-80	28	Steel Galvanized	6	Jet Pump	Carley?			lawn	drill date aprox.			N of house	C18	
5019								Joe Wellinq	418 Anvin	Crawford	NE	69339	12-Sep-83		665-1834	RG	Well		6 gpm		60	30		01-Jan-78	60	Plastic	5	submersible	Chubb				drill date aprox.			located backyard	C19	
5020								James Benson	14 Paddock	Crawford	Ne	69339	12-Sep-83		665-2039	RG	Well				100			01-Jan-78	100	Steel Galvanized	6	submersible	Jack Carley?				drill date aprox.			east side of house	C20	
5021								Leonard Prosser	216 Paddock	Crawford	Ne	69339	12-Sep-83		665-1154	RG	Well		2.5 gpm		50	30		01-Jan-80	50	Plastic	4.5	submersible	Chubb			lawn	drill date aprox.			located backyard	C21	
5022								Jackson Rice	233 Paddock	Crawford	Ne	699339	12-Sep-83		665-2259	RG	Well				50	25			50	Steel Galvanized					no use			>50 yrs old			located backyard	hand pump, not hooked up, C22
5023								Lee Hallstead	314 Paddock	Crawford	Ne	69339	12-Sep-83		665-2306		Well				50	30		01-Jan-31	20	Steel Galvanized	6	submersible	Peiun				drill date aprox.			located backyard	C23	
5024		31N	52W	3				Alvia Leeth	105 E Oak	Crawford	Ne	69339	13-Sep-83		665-2003		Well			40	est 30		01-Jan-79	40	Plastic	6		submersible	Chubb			lawn	drill date aprox.			located backyard	C24	
5025		31N	52W	3				Grace McNett	119 Pine	Crawford	Ne	69339	13-Sep-83		665-2081	RG	Well				60											>20 yrs old			located backyard	no pump - no use, C25		
5026								Lloyd Pipher	1019 2nd St	Crawford	Ne	69339	13-Sep-83		665-2686	RG																						