# Technical Report North Rolling Pin Property Campbell County, Wyoming, U.S.A.

NI 43-101 Technical Report Prepared for:

#### **Uranerz Energy Corporation**

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# 3. SUMMARY

This technical report ("Technical Report") was prepared by Douglass Graves, P.E. of TREC, Inc. The Author was retained by Uranerz Energy Corporation ("Uranerz") to prepare an independent technical report in Form 43-101F1 of the Canadian Securities Administrators' National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") for the area comprising the North Rolling Pin Property ("Property") located in Campbell County, Wyoming, U.S.A. The Author is an independent "qualified person" as defined by NI 43-101.

#### **Property Location, Description and Ownership**

This Technical Report addresses the uranium mineralization of Uranerz' North Rolling Pin Property which is located in the Pumpkin Buttes region of the Powder River Basin in the state of Wyoming, approximately 62 air miles northeast of the city of Casper (see Figure 1). The North Rolling Pin Property is located within Campbell County, Wyoming in Township 43N, Range 76W, in the SE<sup>1</sup>/<sub>4</sub> of SE<sup>1</sup>/<sub>4</sub> Section 10, Section 11, NW <sup>1</sup>/<sub>4</sub> Section 14, and NE<sup>1</sup>/<sub>4</sub>, NW<sup>1</sup>/<sub>4</sub> of SE<sup>1</sup>/<sub>4</sub> Section 15, of the 6<sup>th</sup> Prime Meridian. Within the report area, which is outlined by the boundary illustrated in Figures 1, 2 and 3, Uranerz has 55 unpatented lode mining claims and one Surface Use Agreement ("SUA"). There are no mineral fee leases associated with the North Rolling Pin Property and the claims and unclaimed area encompass approximately 1,180 acres (see Figures 2 and 3).

#### **Geology and Mineralization**

The host for uranium mineralization within the North Rolling Pin Property is the Eocene Wasatch Formation. The Wasatch is a fluvial deposit composed of sandstones interbedded with claystones, siltstones, carbonaceous shale, and thin coal beds. The uranium mineralization at North Rolling Pin is typical of the Wyoming type roll-front deposits, and the mineral resources occur within the "F" host sand as designated by the Cleveland Cliffs Iron Company ("CCI") in the 1970s. The F Sand ranges in thickness from about 30 feet to approximately 60 feet and generally increases in thickness in the southwest portion of Section 11. Further, the F Sand can be divided into two horizons, with the "Upper" horizon and the "Lower" horizon with mineralization occurring in both horizons in the project area, as seen in Figure 5. Depths to the mineralized zones occur from 51 to 403 feet below surface level depending on the topography and changes in the stratigraphic horizon within the F Sand. The F Sand is equivalent to the 150 Sand noted within other properties in the Pumpkin Buttes Mining District.

The drilling data demonstrate that mineralization occurs along a roll front that generally trends northeast-southwest at North Rolling Pin. This mineralization occurs primarily in two limbs of the main roll front within the Upper and Lower horizons of the host F Sand. The Lower F Sand mineralization trend contains three main mineral resource bodies in the project area while the Upper F Sand contains several discontinuous mineral resource bodies and a shorter overall trend length than the Lower F horizon. Drilling data also indicate minor discontinuous mineralization occurring in the shallower "G" Sand which was not included in the mineral resource estimate.

#### Exploration

Mining claims were first staked in the North Rolling Pin Project area by Mountain West Mines ("MWM") sometime before 1968. Exploration drilling was conducted in the North Rolling Pin Project area Sections 11, 14 and 15, T43N, R76W, between 1968 and 1982 by CCI. A total of 476 exploration holes were drilled including 10 core holes. CCI was reported to be investigating the project area for open pit mining potential but never carried those plans past the exploration phase. In 2008 and 2009 Uranerz drilled 18 exploration holes in Sections 11 and 14. This drilling was performed to evaluate the potential for mineralization below the zones explored by CCI and for confirmation of the previously identified mineralization in the F Sand.

#### **Mineral Resource Estimate**

This Technical Report presents an independent estimate of measured, indicated, and inferred mineral resources as defined in Section 1.2 of NI 43-101. Mineral resources are not mineral reserves and do not have demonstrated economic viability. The estimated mineral quantity and grade described in this NI 43-101 Technical Report are calculated using accepted protocols. Therefore, these estimates meet the NI 43-101 classification of "measured", "indicated" or "inferred" mineral resources as defined by NI 43-101 and the Canadian Institute of Mining, Metallurgy and Petroleum Definitions Standards incorporated by reference therein.

Data available for the resource estimate presented in this Technical Report include information from 368 historical exploration holes and 18 recent exploration holes, for a total of 386 exploration holes from drilling described above including scanned electronic copies of lithologic and geophysical logs, gamma count print outs of anomalous zones, mineralization intercept grade calculations, drill hole maps and electronic and hard copies of stratigraphic cross-sections constructed from historic geophysical logs. In addition, data from an unpublished report (Berglund 2007) was evaluated and used in developing the mineral resource estimate at North Rolling Pin.

The mineral resource estimates shown below were calculated using a GT (Grade x Thickness) contour method using a minimum grade cutoff of 0.03% eU<sub>3</sub>O<sub>8</sub> and a minimum mineralization thickness of 1.0 feet. The GT values of the subject sand intervals for each hole were plotted on a drill hole map and contour lines were drawn along the general mineralization trend. The areas within the GT contour boundaries were used for calculating resource estimates. Measured resources were determined within the area of influence of recent drill hole locations. The mineral resources are reported based on GT cutoffs of 0.20 and 0.50. The 0.20 GT cutoff is recommended for reporting purposes and is presented in the following table.

The current stated estimate of mineral resources for the North Rolling Pin Property follows:

#### **Table 3-1 Mineral Resource Estimate Summary**

# North Rolling Pin: Upper and Lower F Sand

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	386,898	310,051	.062
0.50	255,163	153,712	.083

# Measured Resource

#### **Indicated Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	277,623	271,881	.052
0.50	135,161	97,513	.070

#### **Measured + Indicated Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	664,521	581,932	.058
0.50	390,324	251,225	.078

#### **Inferred Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	32,522	38,874	.042

#### **Conclusions and Recommendations**

In the opinion of the Author, the North Rolling Pin Property represents a potentially viable mineral resource for future development. The Author has the following recommendations for moving the Property towards development:

- Install additional monitor wells and conduct hydrologic studies including pumping tests, determination of current groundwater levels and the impact on possible ISR mining, and for the determination of groundwater quality. Approximate cost: \$100,000 to \$150,000.
- Conduct additional radiological disequilibrium with additional uranium spectral analysis logging or coring to develop a site-specific model, and conduct bench scale leach tests to determine amenability to in-situ extraction. Approximate cost: \$100,000 to \$200,000.
- Complete an economic evaluation of the project. Approximate cost: \$70,000 to \$100,000.
- Conduct environmental baseline studies for preparation of state and federal permit/license applications. Approximate cost: \$600,000 to \$800,000.

# 4. INTRODUCTION AND TERMS OF REFERENCE

# 4.1 Report Preparation

The following Technical Report was prepared by Douglass Graves, P.E. of TREC, Inc. The Author was retained by the Issuer, Uranerz Energy Corporation ("Uranerz"), to prepare an independent technical report in Form 43-101F1 of the Canadian Securities Administrators' National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") for the North Rolling Pin Property located in Campbell County, Wyoming, U.S.A. (see Figures 1 and 2). The Author is an independent "qualified person" as defined by NI 43-101.

# 4.2 Property Ownership

In February 2007, Uranerz Energy Corporation ("Uranerz") purchased the North Rolling Pin claims group from Robert Shook as part of a larger 138 Federal claims acquisition. Uranerz subsequently expanded the properties by staking additional claims in the immediate area.

Uranerz is a "pure play" uranium exploration company based in Casper, Wyoming, U.S.A., incorporated in Nevada. It is listed on the NYSE Amex Equities Exchange (formerly called the American Stock Exchange) and the Toronto Stock Exchange (TSX) under the symbol "URZ". Uranerz is also listed on the Frankfurt Stock Exchange under the symbol "U9E." Uranerz' major activities are focused on its properties in the Powder River Basin of Wyoming, U.S.A., an area well known for hosting uranium-mineralized roll fronts that are amenable to in-situ recovery ("ISR") mining techniques. Uranerz controls approximately 119,291 acres, including 88,367 acres held by Arkose Mining Venture (a joint venture with United Nuclear, LLC, of which Uranerz has eighty-one percent working interest), in the Powder River Basin and has submitted ISR license and mine permit applications for the Nichols Ranch Uranium In-Situ Recovery Project (the "Nichols Ranch ISR Project") located west and northeast of the North Rolling Pin Property.

# 4.3 Purpose of Report

The purpose of this Technical Report is to review the available data for the North Rolling Pin Property and develop an estimate of mineral resources. This Technical Report conforms to NI 43-101 - Standards of Disclosure for Mineral Projects.

# 4.4 Terms of Reference

Units of measurement unless otherwise indicated are feet (ft), miles, acres, pounds avoirdupois (lbs.), and short tons (2,000 lbs.). Uranium grade is expressed as weight percent  $U_3O_8$ , the standard market unit. Grade is reported for historical resources and the mineral resources reported here as percent  $eU_3O_8$ .  $eU_3O_8$  refers to an assay or grade of equivalent uranium as determined from a gamma ray log. ISR refers to in-situ recovery, also termed ISL or in-situ leach.

# 4.5 Sources of Information and Data

CCI performed exploratory drilling in the North Rolling Pin Property area from 1968 through 1982, as detailed in Section 8.2, and the results of the historic drilling program are the primary source of information and data for this Technical Report. In addition, Uranerz conducted exploratory drilling at North Rolling Pin during 2008 and 2009 and the grade calculations from the geophysical logs of holes drilled by Uranerz were used to supplement the historic data. The findings of this Technical Report are based upon published and unpublished data including:

- Lithologic and geophysical logs, and gamma count readouts for historic drilling completed by CCI from 1968 through 1982, and subsequent intercept grade calculations;
- Lithologic and geophysical logs and intercept grade calculations for drilling of 18 holes by Uranerz in 2008-2009;
- Drill hole location data for historic drilling and 2008-2009 Uranerz drilling;
- Cross sections constructed from geophysical logs of historical drilling; and
- Drill hole maps including recent and historic drill hole locations and mineral body outlines.

A more detailed summary pertaining to the drilling program for the North Rolling Pin Property is provided in Section 12.

In addition, three reports were evaluated for drill hole locations, the identification and relative position of the host sand (F Sand) and the mineralization trend. These include:

Berglund, A.'s unpublished report "North Rolling Pin Project, Uranium Resource Estimation" prepared for Uranerz Energy Corporation in March, 2007 (Berglund, 2007);

TREC, Inc.'s NI 43-101 compliant report "Technical Report, Hank Property, Campbell County, Wyoming, USA" prepared for Uranerz Energy Corporation in May, 2008 (TREC, 2008a);

TREC, Inc.'s NI 43-101 compliant report "Technical Report, West North Butte Satellite Properties, Campbell County, Wyoming, USA" prepared for Uranerz Energy Corporation, in December, 2008 (TREC, 2008b).

#### 4.6 Extent of Author's Field Involvement

Douglass Graves, P.E. visited the site on November 19, 2008 to tour the North Rolling Pin Property Area with Kurt Brown, Vice President of Exploration, Uranerz. The site visit was conducted to observe the on-going uranium exploration activities being conducted by Uranerz in the North Rolling Pin area. Mr. Graves subsequently visited the Casper, Wyoming office of Uranerz where relevant data were obtained for development of this mineral resource estimate.

# 5. RELIANCE ON OTHER EXPERTS

The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to TREC, Inc. at the time of preparation of this Technical Report as provided by Kurtis Brown (Uranerz) and Dave Tenney (Uranerz);
- Assumptions, conditions, and qualifications as set forth in this Technical Report;
- Data, reports, and other information supplied by Uranerz and third party sources (to the extent identified and as referenced herein).

For this Technical Report, the Author has relied on property ownership information provided by Uranerz and has not researched property title or mineral rights for the North Rolling Pin Property. The Author expresses no legal opinion as to the ownership status of the North Rolling Pin Property.

# 6. PROPERTY DESCRIPTION AND LOCATION

# 6.1 Location and Size

The North Rolling Pin Property is located in the Pumpkin Buttes region of the Powder River Basin, in Campbell County, Wyoming at a latitude and longitude of 43 degrees, 41 minutes, North by 105 degrees, 58 minutes, West which is located within the SE<sup>1</sup>/<sub>4</sub> of SE<sup>1</sup>/<sub>4</sub> Section 10, Section 11, NW <sup>1</sup>/<sub>4</sub> Section 14, and NE<sup>1</sup>/<sub>4</sub>, NW<sup>1</sup>/<sub>4</sub> of SE<sup>1</sup>/<sub>4</sub> Section 15 of T43N, R76W. The primary mineralization is located within Sections 11, 14, and 15 of T43N, R76W. The property (in road miles) is approximately 47 miles east of Kaycee, 67 miles southwest of Gillette, and 83 miles northeast of Casper, Wyoming. See Figure 1.

For reference purposes, a normal township consists of 36 sections with each section being one square mile, or six sections by six sections or approximately 36 square miles.

# 6.2 Mining Claims and Surface Use Agreements

Within the report area, Uranerz has 55 unpatented lode mining claims and one Surface Use Agreement ("SUA"). There are no mineral fee leases associated with the North Rolling Pin Property and the claims and unclaimed area encompass approximately 1,180 acres.

Uranerz' title to the unpatented lode mining claims is subject to the rights of *pedis possessio* against all third party claimants as long as said claims are maintained. The claims do not have an expiration date. However, affidavits must be filed annually with the federal U.S. Bureau of Land Management ("BLM") and respective county recorder's offices in order to maintain the claims' validity. In addition, most of the above-mentioned unpatented lode mining claims are located on Stock Raising Homestead land where the U.S. government has issued a patent for the surface to

an individual and reserved the minerals to the U.S. government subject to the location rights by claimants as set forth in the 1872 Mining Law.

The SUA has a term of 10 years and has set provisions for reimbursement to the surface owner for disturbances resulting from Uranerz operations.

# 6.3 Legal Surveys

Legal surveys of unpatented lode mining claims are not required, and, to the Author's knowledge, have not been completed to advance the subject property towards patent. The area covered by the SUAs are based on the legal subdivision descriptions as set forth by the U.S. Cadastral Survey and, to the Authors' knowledge, the area covered by the SUAs has not been verified by legal survey.

# 6.4 Mineralized Areas and Existing Mine Workings

Mineral resources are located in the Eocene age Wasatch Formation in what is identified as the F host sand unit. To the Author's best knowledge, there has been no full scale mining production of the North Rolling Pin deposits. There has been previous development and operation of a pilot in-situ recovery site within the subject property as discussed in Section 8.4. The pilot plant was located in the northwest corner of Section 14, T43N, R76W, however the exact location of the site is currently undetermined and surface evidence of the pilot plant is not detectable, likely due to successful surface reclamation efforts following the brief operation of the test site. Other than the pilot plant site, there are no pre-existing mineral processing facilities or related tailings ponds or waste deposits within the subject property. There is currently an exploration drilling permit in effect for the North Rolling Pin Property (see additional information in Section 6.7). The proposed Nichols Ranch ISR Project (mining permits applied for from the Wyoming Department of Environmental Quality and the U.S. Nuclear Regulatory Commission) is located 2 miles west of the North Rolling Pin Area.

# 6.5 Royalties and Encumbrances

Lode mining claims in the North Rolling Pin area are not subject to royalties. The unpatented lode mining claims will remain the property of Uranerz provided they adhere to required filing and annual payment requirements with Campbell County and the BLM. The SUA will remain in force so long as the mining claims are maintained. Legal surveys of unpatented lode mining claims are not required and are not known to have been completed.

All of the unpatented lode mining claims have annual filing requirements (\$140 per claim) with the BLM, to be paid on or before September 1 of each year.

# 6.6 Environmental Liabilities

The Author is not aware of any environmental assessments having been performed to identify potential environmental issues at the subject property. As such, the Author is not aware of any outstanding environmental issues or liabilities. The only activities that have occurred on the subject property are exploration drilling for uranium, the development and operation of an in-situ uranium pilot plant, exploration for oil and gas, and production of coal bed methane ("CBM") gas. The Nuclear Regulatory Commission ("NRC") terminated the source materials license for the uranium pilot plant based on successful completion of groundwater restoration and surface

reclamation on November 5, 1982. Uranerz' only known existing potential liability is restoration of exploration drill sites and exploration access roads.

#### 6.7 Required Permits

#### Exploration

Exploration drilling has been conducted at the North Rolling Pin Property. The volume and extent of exploration is described in detail in Sections 8.1 and 8.2. Additional exploratory drilling may be conducted by Uranerz to better define mineralization within specified areas of interest. Uranerz has a Notification to Drill permit from the State of Wyoming Department of Environmental Quality/ Land Quality Division ("WDEQ/LQD") for all exploration drilling.

#### Production

Future mining development will require a number of licenses/permits with the two most significant being (a) the Permit to Mine, issued by the WDEQ/LQD and (b) the Source Material License, required and issued by the U.S. Nuclear Regulatory Commission ("NRC") for mineral processing of natural uranium. In December 2007, Uranerz submitted permit applications for the Permit to Mine and for the Source Material License to the WDEQ/LQD and NRC, respectively, for the Nichols Ranch ISR Project (100% owned by Uranerz) located west and northeast of the property. These applications are currently being reviewed by the regulatory oversight agencies. The applications include identification of a central processing plant, satellite plant and well fields to be located west and northeast of the North Rolling Pin Property.

The NRC has the responsibility to issue Source Material Licenses to "receive title to, receive, possess, use, transfer, or deliver any source material after removal from its place of deposit in nature" (Code of Federal Regulations ("CFR") 40.1 and 40.3). "Source nuclear material" is defined as uranium and/or thorium in any form, or ores containing 0.05 percent or more by weight uranium and/or thorium. The NRC is responsible for the oversight and implementation of the National Environmental Policy Act ("NEPA") regulations. Pursuant to 10 CFR 51.20, all licenses for new uranium mills (including ISR facilities) will be required to submit a license application that will include an environmental report and a technical report. 10 CFR 51.20 further requires that an Environmental Impact Statement (EIS) be conducted for new uranium mills (including ISR facilities). In June 2009, NRC issued a Generic Environmental Impact Statement ("GEIS") for new uranium ISR operations to meet this requirement. Additional site specific environmental reviews will be conducted at each new site resulting in a supplemental EIS that is tiered off of the GEIS. Environmental baseline information (hydrology, vegetation, wildlife, etc.) on this property would be developed in order to complete the applications for a WDEQ/LQD Permit to Mine and a NRC Source Material License.

Any injection or pumping operations will require permits from the WDEQ which has authority under the Safe Water Drinking Act that stems from a grant of primacy from the U.S. Environmental Protection Agency for administering underground injection control programs in Wyoming.

# 7. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

# 7.1 Topography, Elevation and Vegetation

The North Rolling Pin Property is located within the Wyoming Basin physiographic province, in the central portion of the Powder River Basin, within the Pumpkin Buttes Mining District. The Pumpkin Buttes are a series of small buttes rising up to nearly 6,000 feet elevation, and approximately 1,000 feet above the surrounding plains. The rock capping the top of the buttes is the Oligocene age White River Formation erosional remnant, which is believed to have overlain the majority of the Powder River Basin. While the volcanic tuffs in the White River Formation have been cited as a possible source of uranium in this basin (Davis, 1969), the White River itself is not considered a uranium resource in this area. The North Rolling Pin Property is located three air miles west of the North and South Middle Pumpkin Buttes.

The North Rolling Pin Property area consists of sagebrush and native grasses, covering rolling hills, steep walled gullies, and ephemeral streams. Elevations range from approximately 4,800 to 5,180 feet above sea level. Figures 1 and 3 illustrate the topography of the subject property.

Historically and currently, the land is used for livestock and wildlife grazing. Vegetation is characteristically sagebrush shrub land and mixed grassland with some pines on elevated terrain and some deciduous trees within drainages.

# 7.2 Access

The North Rolling Pin property is accessible via two-wheel drive on existing private gravel and dirt roads many of which have been improved by CBM development. The approximate center of the subject property is approximately nine miles north of Wyoming Highway 387 (see Figure 2). Some road development and improvements may be required at a later time to facilitate future development of well fields or satellite facilities.

# 7.3 **Proximity to Population Centers and Transport**

The North Rolling Pin Property is located approximately 67 road miles southwest of Gillette, Wyoming and 82 road miles northeast of Casper, Wyoming. The project is accessed from Wyoming Highway 387 from the south and Highway 50 from the northeast. A secondary county gravel road from the northeast and light-duty to unimproved private ranch roads provide access into the property area. The site location is shown on Figures 1 and 2.

# 7.4 Climate

In the vicinity of the North Rolling Pin Property, the weather may limit the time periods for capital construction but should not significantly affect the operation of an ISR facility. The climate is semiarid and receives an annual precipitation of approximately 13 inches, the majority of which falls from February to April as snow. Cold, wind, and snow/blizzards can make winter exploration and construction work in this area difficult but not impossible. The summer months are typically hot, dry and clear except for infrequent high-intensity, short-duration storm events.

# 7.5 Local Resources and Property Infrastructure

As discussed in Section 6.0, Uranerz has secured sufficient surface access rights for exploration

and development of the project.

The basic infrastructure (power, water, and transportation) necessary to support an ISR mining operation is located within reasonable proximity of the subject property. Existing infrastructure is associated with local oil, gas, and CBM development. Based upon discussions with the local electrical service provider, overhead power is currently committed, but additional power for future projects can be made available.

Non-potable water will be supplied by wells developed at or near the site. Water extracted as part of ISR operations will be recycled for reinjection. Typical ISR mining operations also require a disposal well for limited quantities of fluids that cannot be returned to the production aquifers. A deep disposal well is planned for the Nichols Ranch ISR Project processing facility immediately west of the North Rolling Pin Property.

The proximity of the North Rolling Pin Property to paved roads will facilitate transportation of equipment, supplies, personnel, and product to and from the project.

Although the population within 50 miles of the subject property consists mainly of rural ranch residences, personnel required for exploration, construction, and operation are available in the nearby towns of Wright, Midwest, Edgerton, Gillette, Buffalo, and Casper, Wyoming.

Tailings storage areas, waste disposal areas, heap leach pad(s) will not be a part of the infrastructure for the North Rolling Pin Property, as ISR operations do not require these types of facilities. However, solutions from mining North Rolling Pin may be sent by pipeline to the proposed Nichols Ranch ISR Project processing facility or a satellite plant may be constructed, once approved by a Source Material License and Permit to Mine, applications for which have not yet been submitted for North Rolling Pin.

# 8. HISTORY

# 8.1 Ownership History of the North Rolling Pin Property

The North Rolling Pin Property is located within a large exploration area encompassing Townships 33 through 50 North of Ranges 69 through 79 West, on the 6th principal meridian. In 1966, Mountain West Mines Inc. ("MWM", now Excalibur Industries) began a successful drilling exploration program in a portion of the larger area. In 1967, MWM entered into an agreement with CCI for further exploration and option if suitable resources were found. CCI exercised its option in 1976 with plans to begin underground mining operations in the vicinity of North Butte. Changing economic conditions and the development of ISR mining technology reportedly ended much of CCI's interest in the area.

In addition to CCI, other uranium exploration companies during the last forty years have controlled property either within or near the North Rolling Pin Property. These included Kerr McGee, Conoco, Texaco, American Nuclear, Tennessee Valley Authority, Rio Algom, and Uranerz U.S.A., Inc. The mining claims and leases originally controlled by most of these companies were let go over the years due to market conditions. These property abandonments continued into 2004.

In February 2007, Uranerz Energy Corporation purchased the North Rolling Pin claims group from Robert Shook as part of a larger 138 Federal mining claims acquisition. Uranerz subsequently expanded the properties by staking additional claims in the immediate area.

# 8.2 Exploration and Development Work Undertaken

Mining claims were first staked in the North Rolling Pin Project area by MWM sometime before 1968. Exploration drilling was conducted in the North Rolling Pin Project area Sections 11, 14 and 15, T43N, R76W, between 1968 and 1982 by CCI. A total of 476 exploration holes were drilled including 10 core holes. CCI was reported to be investigating the project area for open pit mining potential but never carried those plans past the exploration phase. In 2008 and 2009 Uranerz drilled 18 exploration holes in Sections 11 and 14. This drilling was performed to evaluate the potential for mineralization below the zones explored by CCI and for confirmation of the previously identified mineralization.

#### 8.3 Existing Mineral Resource Estimates and Their Reliability

An unpublished mineral resource report that covers the North Rolling Pin Property (Berglund, 2007) describes the estimated resources of the property using historical drill hole information. This report and associated resource estimate are considered to be relevant to the project and is the most recent resource report covering the North Rolling Pin Property. The resources developed were categorized as measured, indicated and inferred and are summarized in Table 8-1.

Confidence Category	Tons of Ore	Grade (%U3O8)	Lbs U3O8	
Total				
Measured	199,420	0.051	204,639	
Total				
Indicated	398,443	0.057	452,004	
Total Inferred	316,439	0.050	313,398	
Total				
Resource	914,302	0.053	970,041	

#### Table 8-1 North Rolling Pin Uranium Resource Estimation (Berglund, 2007)

The uranium resources described in the above cited report were estimated using a method that interpreted the roll front through the area, the mineralization intercepts were then coded with a designation of upper limb, lower limb or nose, and resource blocks were drawn for mineralization within a given sand unit. The method was applied with no minimum grade, a GT cutoff of 0.12, a tonnage factor of 16.9 ft<sup>3</sup>/ton, and a disequilibrium factor of 1. The Berglund report is deemed reliable by the Author for the method employed and the cutoff parameters used. Differences in resource numbers with those determined in this Technical Report can be attributed to the resource determination methods and to the differences in cutoff values, where the Berglund study used a lower GT cutoff with no minimum grade.

In addition to the unpublished report described above, there are two published NI 43-101 compliant reports: one on the Willow Creek Property (one of the West North Butte Satellite Properties) located 2 miles north of the subject property, and one on the Hank Unit located 2 miles northeast of the subject property. The Author reviewed the three reports identified in Section 4.4: Berglund, 2007, TREC 2008a and TREC 2008b. These reports were also used to

assist the Author in the identification and relative position of the host sand (F Sand) and to identify the general location of the mineralized trend (roll front).

# 8.4 Production History

The North Rolling Pin Property is located within the Pumpkin Buttes Mining District, which was the first commercial uranium production district in Wyoming. Uranium was first discovered in the Pumpkin Buttes in 1951. Intermittent production from some 55 small mines through 1967 produced 36,737 tons of ore containing 208,143 pounds of uranium (Breckenridge et al., 1974). This early mining focused on shallow oxidized ores exploited by small open-pit mines. The ore was generally transported to the Atomic Energy Commission buying station in Edgemont, South Dakota. Modern mining in the district has focused on deeper reduced ores.

CCI and Wyoming Mineral Corporation ("WMC") conducted research and development activities at the ISR test site located in the North Rolling Pin Property area, including production of an unknown amount of granular yellowcake. Available records indicate that CCI applied for a source materials license on December 26, 1973, and approval was granted on May 23, 1974 (SUA-1199). Research and development permitting was not required by the State of Wyoming at the time of the operation. The North Rolling Pin pilot plant was located in the northwest corner of Section 14, T43N, R76W. The plant utilized was portable, mounted on two 45 foot mobile trailers and had a rated capacity of 25 gpm. The well field consisted of twelve wells: eight were used for the injection and recovery and four were utilized as monitor wells. The lixiviant used in the tests was a low strength ammonium carbonate/bicarbonate solution with a hydrogen peroxide oxidant. The stripping of the uranium from the resin was effected with a chloride elution and the precipitation process utilized hydrochloric acid and ammonia (In-Situ Consulting, 1979).

On June 19, 1974, two 5-spot tests were conducted at the site by WMC. The tests ended November 1, 1974 and WMC concluded that the test work demonstrated that the confinement generated by injecting water into wells outside the system that provides leaching agent to the host is possible. A summary of the test results are presented in Table 8-1. An internal CCI document indicates that the well pattern and permeability values reported may be suspect.

Cleveland-Cliffs Iron Co., North Rolling Pin Site Campbell County, WY					
Source Material					
Host Rock	Arkosic Sandstone				
Permeability (Horizontal)	12,490 millidarcies				
Porosity (%)	30				
Density (t/yd <sup>3</sup> )	1.562				
Geologic Formation/Age	Wasatch Formation/Tertiary				
Ore Characteristics					

# Table 8-2 North Rolling Pin ISR Test Site Results

Uranium mineral(s)	Uraninite, Coffinite
Average Grade (% U <sub>3</sub> O <sub>8</sub> )	0.08
Average Depth (ft)	125
Average Thickness (ft)	23
Well Field Characteristics	
Total Number of wells	8
Injection	3
Recovery	1
Monitor	4
Type of Well Pattern	4-spot
Well Spacing	25 ft. Between Injection & Recovery Well
Well Casing Diameter (ID)	4 in.
Type of Casing	PVC Sch. 40
Type of screens Surface Elev. (ft. Above Sea Level)	PVC, Slotted, 3 in. Long, 3 in. Apart on Opposite Side of Casing 5,000
Leaching	5,000
Type of Leach Solution	Ammonium Carbonate -Bicarbonate
Average Concentration	1.0-5.0 g/liter
Influent (Injection)	
Average Flow Rate per well	2 gal/min
Effluent (Production)	
Average Flow Rate per Well	7 gal/min
pH	7.3
Average Uranium Content	50-150 ppm
Type of Oxidizer	Hydrogen Peroxide
Average Concentration	0.5-1.0 g/liter
Uranium Concentration Operation	
Type of System	Resin Ion Exchange
Rated Capacity	25 gal/min
Final Product	Granular Yellowcake

It should be noted that production of granular yellowcake at the North Rolling Pin pilot plant did not exceed 500 pounds as dictated by the limitation set forth in the source material license granted to CCI by the NRC.

Poor weather in late fall of 1974 cut short the restoration efforts by WMC. CCI hoped the reclamation work already conducted by WMC would satisfy the restoration liability but post assaying data confirmed above background concentrations in a majority of the wells and did not

show adequate restoration. CCI contracted In-Situ Consulting for technical assistance and continued with groundwater restoration efforts. CCI began field preparation for their restoration efforts in June, 1978 which involved the installation of a piping system to all wells, setting pumps, locating generators, fuel tanks, an evaporation pond and bladder tanks (In-Situ Consulting, 1979). In July of 1980 CCI was authorized to begin the comprehensive site restoration scheme and on November 5, 1982 the source material license (SUA-1199) was terminated based on successful completion of final site restoration and a NRC closeout inspection (NRC, 2010).

There has been other uranium production in close proximity to the North Rolling Pin Property. Prior ISR tests and operating uranium production near the subject property include the Christensen Ranch commercial ISR mine, now controlled by Uranium One, Americas located six miles northwest of North Rolling Pin; the Collins Draw pilot test located three miles south of the North Rolling Pin area which produced about 15,000 pounds of  $U_3O_8$ ; and the Ruth pilot test located six miles southwest of North Rolling Pin which produced 32,000 pounds of  $U_3O_8$ . The Christensen Ranch ISR facility has produced millions of pounds of  $U_3O_8$  and is currently undergoing renovations in preparation for the resumption of operation. Figure 2 illustrates the location of these projects.

# 9. GEOLOGIC SETTING

#### 9.1 Regional, Local, and Property Geology

Regional, local and property surficial geology, along with a geophysical log section in the host F Sand is shown on Figure 5. Figure 6 provides a conceptual model of the uranium roll front deposit that occurs within North Rolling Pin.

The Eocene age Wasatch Formation hosts the uranium mineralization within and adjacent to the North Rolling Pin Property. The Wasatch is a fluvial deposit composed of sandstones interbedded with claystones, siltstones, carbonaceous shale, and thin coal seams. The sandstones compose roughly one-third of the sequence and tend to be lenticular and laterally discontinuous. The finer claystone – siltstone layers are more laterally continuous. In the vicinity of the Pumpkin Buttes, the Wasatch Formation is reportedly 1,575 feet thick (Sharp and Gibbons, 1964).

Underlying the Wasatch is the Paleocene age Fort Union Formation, another fluvial sedimentary deposit consisting of coals, sandstones, siltstones, and claystones. Over most of the Powder River Basin, the coals in the upper portion of the Fort Union are separated from sands in the overlying Wasatch Formation by at least 300 feet of continuous, low-permeability claystone and siltstone units of variable thickness, separating the proposed uranium mining from existing CBM production horizons at North Rolling Pin. The total thickness of the Fort Union in this area is reportedly 3,000 feet.

The mineralized zones at the North Rolling Pin Property are typical Powder River Basin rollfront deposits. Uranium mineralization, where present, is found at the interface of naturally occurring chemical boundary between reduced and oxidized sandstone facies. Due to the nature of fluvial sandstone composition, an individual sand member may have several vertically superimposed subsidiary roll fronts. This is caused by small permeability differences in the sandstone or the occasional vertical contact between sand members resulting in development of multiple roll fronts that overlie each other (stacked) in complex patterns.

At the North Rolling Pin Property, the mineralized sand horizon (F Sand) occurs within the Wasatch at an approximate depth from surface ranging from 51 to 403 feet and averaging 282 feet to the top of the mineralization. Generally the depth of mineralization decreases from the northeast to the southwest due mainly to topography along which the surface elevation decreases from approximately 5,180 feet to around 4,800 feet. The F Sand ranges in thickness from approximately 30 feet to 60 feet and generally increases in thickness in the southwest portion of Section 11 and thins toward the northeast and southwest in the project area. The F Sand primarily consists of two stacked sand sets, termed the Upper and Lower F Sands that average 20 to 25 feet thick each and the nature of these sand sets, as described above, is a major control on the mineralization occurring at North Rolling Pin.

The host sand is primarily arkosic in composition, friable, and contains trace carbonaceous material and organic debris. There are local sandy mudstone/siltstone intervals with the sandstone, and the sand may thicken or pinch-out in some locations. The North Rolling Pin Property area lies east of the synclinal axis of the Powder River Basin, and the host Wasatch Formation dips approximately 1 to 2 degrees to the west.

# 9.2 Hydrogeology

The North Rolling Pin Property is located within the Powder River Drainage Basin. The area is of moderate topographic relief (elevations range from 4,800 to 5,180 feet above sea level) with ephemeral surface water drainages to the Powder River to the west. North Rolling Pin is located in the Cottonwood Creek sub drainage of the Dry Fork catchment and in the Upper Willow Creek sub drainage of the Willow Creek catchment. The Cottonwood Creek drainage is roughly 15 miles southeast of the confluence with the Powder River via the Cottonwood Creek, a tributary to the Dry Fork of the Powder River. The Upper Willow Creek drainage is roughly 17 miles southeast of the confluence with the Powder River via the Dry Willow Creek, a tributary to the Willow Creek of the Powder River. These drainages and tributaries are shown on Figure 4.

Recharge to the sands of the Wasatch is mainly on their outcrops. Flow in the aquifers generally moves to the north along the paleodrainage trends, with a small portion of the groundwater discharging to streams. Aquifer properties are locally unpredictable due to large variations in local lithologies. Transmissivities within the Wasatch are known to range anywhere from 1 to 5,000 gpd/ft.

According to the Wyoming State Engineer's Office (State of Wyoming SEO, 2010) there are two permitted stock water wells, one miscellaneous and no domestic water wells in the North Rolling Pin area. The three permitted water wells report static water depths and include:

Well Name	Permit Use	Township	Range	Section	Qtr/Qtr	Well Depth	Static Water Depth
Eychaner #5 Uppr	Stock	43N	76W	10	SE/SE	649 ft	487 ft
Franklin Brown #1	Misc.	43N	76W	14	NW/NW	520 ft	95 ft
Brown 216	Stock	43N	76W	15	NW/SE	653 ft	N/A

Table 9-1: Permitted Water Wells in the North Rolling Pin Project Area

The Franklin Brown #1 Well is located along the roll front trend and the depth to the top of mineralization in the F Sand in this well is approximately 120 feet below ground level, or about 25 feet below the reported static water level at this location. However, the completion interval data for this well is unavailable.

Additionally, Uranerz completed the following well in the project area during the 2009 drilling program:

• URZ RF-1 located in NW/NW Section 14 T43N, R76W was completed in the F Sand with a reported static water level (on 2/11/10) of 174 feet below surface.

Uranium spectral analysis logging was performed on the Franklin Brown #1 and URZ RF-1 wells for the purpose of disequilibrium testing as described in Section 20.0 of this Technical Report.

It is inconclusive whether the static water level in the URZ RF-1 well represents the ground water level in the area as additional hydrologic data is needed. However assuming a good well completion, the water level data suggests that the F Sand, which occurs from 140 feet to 185 feet deep in the URZ FR-1 well, is possibly unconfined and under-saturated in the area.

The limited static water level information suggests that water levels could have a negative impact on the suitability of ISR mining of the relatively shallow mineralized zones in the southern portion (Sections 14 and 15) of North Rolling Pin. The northern portion of the project area, generally in Section 11, where the mineralized zone depths are greater (ranging from 200 feet to 403 feet to the top of mineralization), should be suitable for ISR mining. However, the acquisition of additional hydrologic data is needed to determine water levels within both the northern and southern portions of the project area.

The host F Sand is lithologically confined from the overlying and sporadically occurring G Sand aquifer by the siltstone and claystone aquitard which overlies the F Sand at the North Rolling Pin Property (see Figure 8). Geophysical logs from holes that were drilled to depths below the F Sand indicate that the F Sand is also confined from underlying aquifers by thick claystone and siltstone aquitards. A hydrologic study, including aquifer pumping tests, will be needed to determine hydrologic confinement conditions of the F Sand aquifer.

Recommendations in this Technical Report include hydrologic investigations and studies including pumping tests and collection of ground water level data and quality.

#### **10. DEPOSIT TYPES**

Uranium mineralization at the North Rolling Pin Property is typical of the Wyoming roll-front sandstone deposits as described by Granger and Warren (1979), Rackley (1972), and Davis (1969). Sandstone-type deposits are irregular in shape, roughly tabular and elongate, and range from thin pods a few feet in width and length, to bodies several tens or hundreds of feet in length. The deposits are roughly parallel to the enclosing channels but may form rolls that cut across bedding.

Roll-front deposits generally occur along a geochemical front and are typified by a C-shaped morphology in which the outside of the "C" extends down-gradient (direction of historical groundwater flow), and the tails of the "C" extend up-gradient. The tails are typically caught up in the finer sand deposits that grade into the over- and underlying mudstones, whereas the heart of the roll-front (ore-grade mineralization) lies within the more permeable and porous sandstones toward the middle of the fluvial channels. Figure 6 shows a conceptual model of a typical roll front.

The uranium exploration program in this area requires drilling for discovery and to make grade/thickness determinations based on drill cuttings samples and geophysical log signature. Once the initial trend of the geochemical front is established, subsequent exploratory drilling continues along the trend utilizing a series of bore hole "fences" drilled normal to the front at pre-determined distances between fences. Critical information derived from the results of the exploratory drilling including mineralization and roll-front trends, the nature and distribution of the uranium deposits, host sandstone body characteristics, and other geologic data are utilized for describing the potential deposit.

# **11. MINERALIZATION**

Mineral resources in the North Rolling Pin Property occur within sand bodies of the Eocene age Wasatch Formation in what is identified as the F Sand host unit. The F Sand has been further divided into two horizons termed the Upper and Lower F Sands. Data from mineralization identified in the two F Sand horizons were used to develop the mineral resource presented in this Technical Report. Cross sections A-A' and B-B' seen in Figures 7 and 8 respectively, illustrate the relative positions of the Upper and Lower F Sand horizons.

The depth to the top of mineralization for the F Sand ranges from 51 feet to 403 feet from surface, and averages 282 feet in depth. Generally the depth of mineralization decreases from the northeast to the southwest due mainly to topography along which the surface elevation decreases from approximately 5,180 feet to around 4,800 feet (see Figures 3, 9 and 10). Figure 7 provides a cross section through the mineral trend in the northern part of the project area while Figure 8 provides a cross section through the mineral trend in the central portion of the project area.

Of the 368 geophysical logs from CCI drilling and 18 logs from Uranerz holes drilled in North Rolling Pin, 198 had mineralization using a minimum 0.2 GT cutoff. This mineral resource estimate used data from the 188 CCI and 10 Uranerz drill holes, to determine the grade, thickness, and GT for the stated mineral resource. Mineralization in the North Rolling Pin Project area was also noted in 27 drill holes that occur in the shallower G Sand of the Wasatch formation. However, the G Sand is not well developed and mineralization is inconsistent, based

on the available data (see Figure 8). Therefore, the mineralization noted to occur in the G Sand at North Rolling Pin was not included in this mineral resource estimate.

# Mineralization Thickness

Mineralized F Sand intercept thickness ranges from 1 to 30 feet, with an average mineralization thickness of 12.5 feet, for grades greater than 0.03% eU<sub>3</sub>O<sub>8</sub> and GT greater than 0.2. The average mineralized thickness for the Upper F Sand is 7.6 feet and for the Lower F Sand is 10.1 feet.

# <u>Grade</u>

Mineral resource estimates detailed in Section 19.0 below were determined by the GT contour method. Average grade is dependent upon cutoff assumptions. The average grade of the North Rolling Pin Upper and Lower F Sand Measured Resource, based on  $eU_3O_8$  (radiometric equivalent weight percent) for GT greater than 0.20 is 0.062%  $eU_3O_8$ ; the average grade of the Indicated Resource is 0.052%  $eU_3O_8$ . The combined Measured and Indicated Resources average grade is 0.058%  $eU_3O_8$ . The Inferred average grade at GT cutoff of 0.20 was 0.042%  $eU_3O_8$ .

# Trend Length

Exploration drill hole "fences" are spaced approximately 400 to 600 feet along trend and approximately 25 to 50 feet between holes is common in clusters of drilling or along fences perpendicular to the trend. The mineralization trend within the Upper F and Lower F Sands appears to be discontinuous with several mineral resource bodies being separated by regions of minimal mineralization, or barren of mineralization, as defined by drilling along the reduction/oxidation boundary in the F Sand. The exploratory drilling defines discontinuous mineralized trends for the Upper F Sand of approximately 7,200 feet, and approximately 10,800 feet in length for the Lower F Sand mineralization trend.

# Trend Width

Using a minimum GT value of 0.20, the trend width of the Upper F Sand, measured across the strike of the trend ranges from 20 to 140 feet, averaging approximately 60 feet. The Lower F Sand trend varies in width from 20 to 160 feet, and averages approximately 70 feet.

# **12. EXPLORATION**

As discussed in Section 8.2, CCI conducted an exploration program by drilling 476 holes, including 10 core holes in the North Rolling Pin Property area from 1968 to 1982, of which drilling data from 368 of the drill holes were available for this resource estimate. CCI core data were not available for use in this resource estimate. Uranerz drilled an additional 18 exploration holes in 2008 and 2009. Data from the CCI and Uranerz geophysical and lithological logs are considered reliable for the purposes of this estimate. The following summarizes the exploration activities that have occurred at the North Rolling Pin Property:

- 476 exploratory drill holes completed by CCI from 1968 to 1982 (data available from 368 of the holes);
- 18 exploratory drill holes completed by Uranerz in 2008 and 2009.

The results of the CCI drilling program are the primary source of information used in this mineral resource report, supplemented with data from the Uranerz exploration program. These

data demonstrate that mineralization is present on the property and the data define the spatial attributes of the mineralization.

The database also includes the results of two uranium spectral analysis logging runs performed by Century Geophysical Corporation for Uranerz in two completed wells (F. Brown #1 and URZ FR-1) at North Rolling Pin.

#### 13. DRILLING

Conventional water based mud drilling methods were used to drill the approximately 494 boreholes (historical CCI and Uranerz) at North Rolling Pin. The geophysical and lithologic log data from 386 of the 494 CCI and Uranerz drill holes were used in the evaluation of the North Rolling Pin Property. It should be noted that data from several CCI drill holes (108) were missing but it can be concluded that the majority of these drill holes were left out of the sequence and were not drilled. Of the data from 386 CCI and Uranerz drill holes, 198 of the holes had mineralization with a GT of 0.2 or greater. Data from the 198 drill holes were used to determine the grade, thickness, and GT for the stated mineral resource.

#### Uranium Exploration Drill Holes

Common practice for uranium exploration drilling is to drill vertical exploration holes using conventional rotary drill rigs circulating drilling mud and using approximately five-inch diameter bits. The cuttings are typically collected from five-foot vertical intervals and laid out on the ground in rows of 20 samples (each row representing 100 feet in boring depth) by the driller. The site geologist typically examines and documents the cuttings in the field to determine lithology and geochemical alteration, i.e., oxidized or reduced geochemistry.

Upon completion of the drilling, the drill holes are logged, from the bottom of the hole upward, with a gamma-ray, spontaneous-potential, and resistivity tool by either a contract logging company or a company-owned logging truck. The locations of the holes are recorded in the field by the site geologist using a Global Positioning System (GPS) unit.

The North Rolling Pin Property lies to the east of the Powder River Basin synclinal axis, and the host Wasatch Formation dips approximately 1-2 degrees to the west. As the drilling was generally conducted vertically, the relationship between the mineralized thickness interpreted from logging results and the true thickness of mineralization will have only slight variation, and will not have an impact on the mineral resource estimate, nor would a slight variation in horizontal location impact the mineral resource estimate.

In the Author's opinion, the data collected within the North Rolling Pin Property have been collected in a reliable manner consistent with standard industry practices, and the Author has relied upon these available data to prepare this mineral resource estimate.

#### CBM and Oil Exploration/Production Well Drilling

In the area which encompasses the North Rolling Pin Property there are seven actively producing CBM wells and two shut in wells according to the Wyoming Oil and Gas Conservation Commission ("WOGCC") records (WOGCC, 2010). The CBM wells range in depth from approximately 1,568 feet to 1,890 feet within the property boundary. The CBM target beneath the property is the Big George coal seam, which ranges locally from approximately 70 to 140 feet thick, and averages approximately 1,300 feet below the uranium

mineralization in this area. As indicated, the CBM production zones are significantly below the anticipated uranium recovery production zone.

# 14. SAMPLE METHOD AND APPROACH

Downhole geophysical logs and grade calculations provided by Uranerz were used as the primary source of data for defining the North Rolling Pin Property mineralization. As indicated in Section 13.0, data were obtained from approximately 386 historic and recent drill holes including 18 holes that were drilled by Uranerz in the North Rolling Pin area. The exploration drill holes were spaced approximately 25 to 50 feet apart in rows orientated perpendicular to the mineralization trend or in clusters of close spaced drilling. Additional fences were then drilled approximately every 400 to 600 feet along the length of the trend. See Figures 9 and 10 for illustrations of the spacing and density of the exploratory drill holes.

Historical data were assumed to have been collected in a manner consistent with standard industry practices at the time. Logging of each drill hole utilized the same basic methodology that has been used for over 40 years in the uranium industry. The historical logs were generally run with analog equipment and more recent logging utilizes digital equipment. The historical information is considered accurate and reliable by the Author for the purpose of developing this resource estimate. It is assumed that the appropriate logging tool "k" factor was developed for the historic geophysical logging equipment.

Uranium spectral analysis logging was performed in two wells (RF. Brown #1 and URZ RF-1) at North Rolling Pin during the 2009 Uranerz drilling program for the purpose of disequilibrium determination. A discussion of the logging results is found in Section 20.0 of this Technical Report.

The data are considered accurate and reliable for the purpose of completing a mineral resource estimate.

# 15. SAMPLE PREPARATION, ANALYSES AND SECURITY

Quality control for recent field sampling performed by Uranerz utilizes training, demonstration of basic geological abilities by field personnel and management oversight. Exploratory drill hole cutting samples are recovered in a wet or damp condition and soon after they are described by a field geologist. Down hole electric logging is checked against the driller's logs and the gamma detection instruments are calibrated in the Casper, Wyoming United States Department of Energy test pits approximately every 60 days. Records are kept on all these activities. The data are considered accurate and reliable for the purpose of completing a mineral resource estimate of the Property.

Core sampling was performed by a previous operator (CCI). No core sample preparation was performed by Uranerz staff and the sample preparation and handling of the historic coring cannot be confirmed. The test results from the historical CCI coring program at North Rolling Pin were not available for review, thus were not included in the calculation of resource quantities.

# **16. DATA VERIFICATION**

The mineral resource estimate presented herein was developed based on geophysical data, grade calculations, lithological logs, and cross sections from 386 historic and recent exploratory holes drilled within the North Rolling Pin area. These data were used to identify the sand host,

mineralization depth, and grade and thickness of mineralization. The grade calculation data were checked for accuracy of depth, thickness, grade and host sandstone identification and were compared with the geophysical logs. Each geophysical log header was checked against the data summary sheet to confirm the drill hole number and location, and the ore grade summaries presented on the geophysical logs were compared with the data summary sheets, and the data were confirmed. The drill hole locations were plotted and checked for accuracy by comparison with the original drill hole map, corrections were applied to some drill holes, and then confirmed. The data have been verified by the Author to the extent possible and within the limits discussed in Sections 14.0 and 15.0.

# **17. ADJACENT PROPERTIES**

Uranerz holds mineral rights to approximately 119,291 acres in the Pumpkin Buttes Mining District (approximately 186 square miles), including the North Rolling Pin Property. Some of the Uranerz properties are planned for development (see Figure 2). These lands are within the Pumpkin Buttes Mining District and have identified potential for mineralization in the Wasatch Formation. Some of these properties are within or adjacent to areas of known mineralization and/or past production. The following table summarizes land holdings in the vicinity of the North Rolling Pin Property. It also identifies additional properties near the North Rolling Pin Property that are owned by other operators.

Property	Ownership	Township	Range	Claims and Leases	Approximate Acreage
West North Butte Satellite Properties	Uranerz	T44N	R76W	145	2,900
Jane Dough	Uranerz/Arkose Mining Venture*	T43N	R76W	114	3190
Hank	Uranerz	T43N/44N	R75W	66	1320
Arkose Properties	Arkose Mining Venture	T41- 44N	R74 – 78W	4,109	88,367
Nichols Ranch	Uranerz	T43N	R76W	36	720
Collins Draw	Uranerz	T42/43N	R76W	38	1400
C-Line	Uranerz	T43N	R75W	40	800
Verna Ann/Niles Ranch	Uranerz	T44N	R74/75W	7	140

Table 17-1 Adi	acent Properti	es in Pumnkin	n Buttes Mining	District
I abic I / -I Muj	accine i roper u	co m i umpkin	Dutics Minning	District

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Property	Ownership	Township	Range	Claims and Leases	Approximate Acreage
Moore Ranch	Uranium One	T41/42N	R74/75W	91	3,214
North Butte	Cameco	T44N	R76W	Not Available	Not Available
Ruth	Cameco	T42N	R77W	Not Available	Not Available
Ruby	Cameco	T43N	R74W	Not Available	Not Available

\*Arkose Mining Venture is a joint venture with United Nuclear, LLC, of which Uranerz has an eighty-one percent working interest.

This Technical Report addresses only the North Rolling Pin Property and not the other adjacent properties identified in the table above. Existing reports (published and unpublished) for several of these adjacent properties (Brown 2006, 2006a, 2006b, 2007, 2009; Berglund 2006, 2007, 2007a; BRS, 2006 2007 and TREC, 2008, 2008a, 2008b, 2010, 2010a) provide estimates of mineral resources.

The following estimates of in-place tonnage and grade presented in the table below are based on reports and data that were prepared by Uranerz and/or other operators. Independent qualified person verification under NI 43-101 and CIM standards has not been completed for all of these estimates. *The highlighted estimates are not considered by the Author to be reliable for use in mineral resource estimates.* 

			Avg. Grade
Property	Source	Tons	% eU <sub>3</sub> O <sub>8</sub>
WNB Satellite			
Properties			
(West North	TREC, 2008b	926,293	0.153
Butte + East	,,,		
North Butte +			
Willow Creek)			
Hank	TREC,2008a	907,275	0.123
South			
Doughstick	TREC, 2009	945,687	.121
(part of Jane			
Dough Unit)			
Doughstick			
(part of Jane	TREC, 2010	593,369	.082
Dough Unit)			
Collins Draw	Brown, 2006b	318,392	0.089
Nichols Ranch	Brown, 2009	1,293,661	0.114
Moore Ranch	BRS, 2006	5,507,616	0.100

Table 17-2 Adjacent Property Estimates of In-Place Tonnage and Grade

The Author has not verified the information and data used from the adjacent properties, and this information is not necessarily indicative of the mineralization on the North Rolling Pin Property that is the subject of this Technical Report.

The Author has no material interest in the North Rolling Pin Property or the adjacent properties discussed above.

# 18. MINERAL PROCESSING AND METALLURGICAL TESTING

As described in Section 8.4, the North Rolling Pin ISR pilot plant operated during 1974 and produced an unknown quantity of "granular yellowcake," but production did not exceed 500 pounds as dictated by the source material license granted to CCI by the NRC. This project was located in NW Section 14, T43N, R76W, and was operated by CCI.

Additionally, other successful commercial mineral processing and metallurgical pilot ISR tests have been performed on at least three other areas in proximity to the North Rolling Pin Property and within the Pumpkin Buttes Mining District, as described below.

- 1. The Christensen Ranch ISR project is located in T44N, R76W, Section 6. Sodium bicarbonate leachate was used, and the project evolved into a commercial operation that has produced more than two million pounds of yellowcake to date.
- 2. Ruth pilot plant operated during 1982 through 1984 and produced 32,000 pounds of  $U_3O_8$  using sodium bicarbonate lixiviant. Ground water restoration was successfully accomplished to the satisfaction of the regulatory agencies as a part of this test. This plant was located in T42N, R77W, Section 14 and was operated by Uranerz U.S.A., Inc.
- 3. Collins Draw pilot plant operated 1980 through 1982 and produced approximately 15,000 pounds  $U_3O_8$ . Both ammonia and sodium bicarbonate leach solutions were used individually in adjacent well field pattern areas. This project was located in T43N, R76W, Section 35 and was operated by CCI.

# **19. MINERAL RESOURCE ESTIMATES**

# **19.1 Estimate Classification**

This section presents an estimate of measured, indicated, and inferred mineral resources as defined in Section 1.2 of NI 43-101. Estimates of mineral reserves are not included in this Technical Report.

# **19.2 Qualified Persons**

The following mineral resource estimates were prepared by the following qualified person: Douglass Graves, P.E., TREC, Inc. This qualified person is independent of Uranerz and has no material interest in the North Rolling Pin Property or adjacent properties.

Mr. Graves has over 30 years of professional engineering and project management experience including site and geotechnical investigations, feasibility studies, and design and construction for oil and gas processing, mineral processing, and mining facilities, impoundments, and reclamation in the United States and Russia.

#### **19.3** Quantity and Grade

Various economic and mining parameters enter into the final cutoff grade and/or grade-thickness (GT) to calculate the in-ground mineral resources during the economic evaluation stage of this project. Two GT cutoff grades were used to evaluate the reported resources in this report, both using a minimum grade cutoff of 0.03% eU<sub>3</sub>O<sub>8</sub>. The 0.20 GT was used to present an appropriate value relative to current ISR operations and is recommended for reporting purposes. The 0.50 GT has been used to highlight the areas of highest mineralization and value if economics dictate the need for lower operating costs. The estimated GT, quantity, and grade for measured, indicated, and inferred resources of the Upper and Lower F Sand unit for the North Rolling Pin Property is presented in the following table. Figures 9 and 10 present the combined GT contours for the North Rolling Pin area.

#### Table 19-1: Mineral Resource Estimate: Upper and Lower F Sand North Rolling Pin:

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	77,937	60,889	.064
0.50	41,698	25,119	.083

# Upper F Sand

#### **Measured Resource**

#### Indicated Resource

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	101,790	84,825	.060
0.50	47,122	28,733	.082

#### **Measured + Indicated Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	179,727	145,714	.062
0.50	88,820	53,852	.082

#### Inferred Resource

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	22,209	24,140	.046

Lower F	' Sand
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GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	308,961	249,162	.062
0.50	213,465	128,593	.083

#### **Measured Resource**

#### **Indicated Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	175,833	187,056	.047
0.50	88,039	68,780	.064

#### **Measured + Indicated Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	484,794	436,218	.056
0.50	301,504	197,373	.077

#### **Inferred Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>
0.20	10,313	14,734	.035

#### **Total F Sand Resources**

#### **Measured Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>		
0.20	386,898	310,051	.062		
0.50	255,163	153,712	.083		

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>		
0.20	277,623	271,881	.052		
0.50	135,161	97,513	.070		

#### **Indicated Resource**

#### Measured + Indicated Resource

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>		
0.20	664,521	581,932	.058		
0.50	390,324	251,225	.078		

#### **Inferred Resource**

GT Minimum	eU <sub>3</sub> O <sub>8</sub> Pounds	Tons	Average Grade % eU <sub>3</sub> O <sub>8</sub>	
0.20	32,522	38,874	.042	

#### **19.4** Assumptions and Methods

The mineral resource estimates were completed using accepted methods mandated by NI 43-101 and CIM standards. In order to "normalize" calculations, certain assumptions were incorporated throughout all calculations. The assumptions and methods are as follows:

#### Assumptions:

- 1. Radiometric equilibrium multiplier is 1.00.
- 2. The unit weight of the ore zone is 15.5 cubic feet per ton, based on historical data in the region (Hazen, 1980).
- 3. All geophysical logs are assumed to be calibrated per normal accepted protocols, and grade calculations are accurate.

#### Methods:

In the Author's opinion, the resource can generally be defined by existing drilling information which is of sufficient density and continuity to identify a meandering discontinuous general northeast to southwest mineralized trend for the Upper F Sand of approximately 7,200 feet, and a discontinuous general northeast to southwest mineralized trend of approximately 10,800 feet of the Lower F Sand for the North Rolling Pin Property (see Figures 9 and 10). The data appear to meet the criteria for "measured," "indicated" and "inferred" mineral resources under the CIM

standards on mineral resources and reserves. The grade and mineralized zone thickness were obtained from historical and recent drilling described in Section 13.0 Relevant data regarding average parameters of the mineralized zones is provided in Section 11.0. The mineralization is located in the Upper and Lower horizons of the F Sand of the Eocene age Wasatch Formation and this sand member was evaluated for this mineral resource estimate.

The mineral resource estimates shown above were calculated using a GT (Grade x Thickness) contour method using a minimum grade cutoff of 0.03% eU<sub>3</sub>O<sub>8</sub> and a minimum mineralization thickness of 1.0 feet. The GT values of the subject sand intervals for each hole were plotted on a drill hole map and contour lines were drawn along the mineralization trend. The contour map was developed from the calculated GTs for various GT ranges (see Figures 9 and 10). The areas within the GT contour boundaries, up to certain distances from the drill hole and to certain maximum areas of influence, were used for calculating estimates for measured, indicated and inferred resources. All resources were limited to the extent of the 0.2 GT boundaries. The contained pounds of uranium were calculated using the following formula:

Mineral Resource, pounds = (Area,  $ft^2$ ) X (GT, %-ft) X (20 lbs) X (DEF) / (RD,  $ft^3$ /ton)

Area  $(ft^2)$  = Area of influence in square feet (measured from contour interval) GT (percent x feet) = Ore grade in percent times feet thickness of mineralization 20 (1% of a ton) = 1% of a ton (20 pounds) DEF (1.00) = Disequilibrium factor (1.00) RD (15.5) = Rock density (15.5 cubic feet/ton)

Tonnage was calculated based on grade, pounds and a tonnage conversion factor for a given GT contour area.

# 19.5 Additional Considerations That Could Materially Affect Mineral Resources

There are situations that could potentially impact the realization of the mineral resource estimate presented herein. These could be associated with acquiring the permits needed to develop the resource, third party intervention, project boundary issues, hydrology or difficulties implementing the project due to inadequate infrastructure. These potential issues are discussed below.

<u>Project Boundary</u>: Difficulty in developing a wellfield at the northern end of Section 11 may occur due to the project area boundary lying in close proximity to the mineral resource body (see Figure 9). The wellfield design would be affected in this area due to WDEQ/LQD well placement requirements at project area boundaries unless a reciprocal monitor well agreement is signed with the adjacent mineral owner.

<u>Infrastructure:</u> Generally, the existing needed infrastructure (power, water and transportation) is located within reasonable proximity to the North Rolling Pin Property to support an ISR mining operation. Existing infrastructure is associated with local oil, gas, and CBM development. However, access to certain areas in the North Rolling Pin Property (steep gullies) may be difficult.

<u>Permits/Licenses:</u> Mine development will require approval of a number of permits. These include the NRC Source Material License and the Permit to Mine issued by the WDEQ/LQD. These requirements are discussed in more detail in Section 6.7.

Socioeconomic and Political Environment: Wyoming mines have produced over 200 million

pounds of uranium from both conventional and ISR mine and mill operations. The state has been ranked as the number one US producer of uranium since 1994. Uranium has been produced by ISR mining operations in the Powder River Basin within a few miles of the North Rolling Pin Property. Wyoming generally is in favor of mine developments provided the operators comply with established environmental regulations.

<u>Hydrology</u>: The limited static water level information suggests that water levels could have a negative impact on the suitability of ISR mining of the relatively shallow mineralized zones in the southern portion (Sections 14 and 15) of North Rolling Pin. The acquisition of additional hydrologic data are needed to determine water levels within both the northern and southern portions of the project area.

# **19.6** No Economic Analyses

This Technical Report has been prepared to provide an estimate of mineral resources within the North Rolling Pin Property. Economic evaluation of the North Rolling Pin Property mineralization described herein was not completed, and the estimates presented herein are solely estimates of mineral resource pursuant to Section 1.2 of NI 43-101. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

#### 20. OTHER RELEVANT DATA AND INFORMATION

The uranium content used to develop the mineral resource estimate is derived from radiometric geophysical logs from which the uranium content is interpreted. Radiometric equilibrium exists when the ratio of radiometric  $eU_3O_8$  to Chemical  $U_3O_8$  is 1. This can be determined by obtaining physical samples of the mineralized formation and conducting laboratory analyses of their uranium content, or by modern logging methods including prompt fission neutron and uranium spectral analysis logging tool developed by Century Geophysical Corporation. This latter method of logging employs a germanium detector that measures the second daughter element after U-238. Data collected from uranium spectral analysis logging of two wells (F. Brown #1 and the URZ RF-1) at the North Rolling Pin Property indicate a variable disequilibrium factor depending upon location relative to the reduction/oxidation (redox) boundary in the F Sand. Uranium spectral analysis logging of the F Brown #1 well located on the reduced side of the redox boundary indicated a strong positive disequilibrium factor, while the same logging of the URZ RF-1 well located on the oxidized side of the redox boundary resulted in a negative disequilibrium factor. Since site specific data are not fully developed at North Rolling Pin, a disequilibrium factor of 1.0 was used in the development of the resources estimates presented herein.

# 21. INTERPRETATIONS AND CONCLUSIONS

This Technical Report summarizes the estimated mineral resource within the North Rolling Pin Property held by Uranerz in the Pumpkin Buttes Mining District of the Powder River Basin, Wyoming, via 55 unpatented lode mining claims and one Surface Use Agreement (SUA). The North Rolling Pin Property claims and unclaimed area encompass approximately 1,180 acres (See Figures 2 and 3). The estimated measured and indicated mineral resource at a 0.2 GT cutoff for the North Rolling Pin Property is approximately 664,521 pounds of  $eU_3O_8$  and inferred mineral resources of 32,522 pounds  $eU_3O_8$  (Table 19-1).

Available information, including data from exploration conducted by CCI from 1968 to 1982 and

Uranerz in 2008 and 2009, supports the estimate of mineral resources as summarized above and detailed in Section 19.3 and 19.4. In the opinion of the Author, the North Rolling Pin Property project represents a potentially viable mineral resource for future development.

The quantity and grade described in this NI 43-101 Technical Report is calculated using accepted protocols and, therefore, meets the NI 43-101 classification of "measured," "indicated," or "inferred" mineral resources as defined by NI 43-101 and the Canadian Institute of Mining, Metallurgy, and Petroleum Definitions Standards incorporated by reference therein. No economic evaluation of the mineral resource for the North Rolling Pin Property was completed by the Author at this time.

# 22. RECOMMENDATIONS

The following recommendations are made for moving the property towards development:

- Install additional monitor wells and conduct hydrologic studies including pumping tests, determination of current groundwater levels and the impact on possible ISR mining, and for the determination of groundwater quality. Approximate cost: \$100,000 to \$150,000.
- Conduct additional radiological disequilibrium with additional uranium spectral analysis logging or coring to develop a site-specific model, and conduct bench scale leach tests to determine amenability to in-situ extraction. Approximate cost: \$100,000 to \$200,000.
- Complete an economic evaluation of the project. Approximate cost: \$70,000 to \$100,000.
- Conduct environmental baseline studies for preparation of state and federal permit/license applications. Approximate cost: \$600,000 to \$800,000.

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#### DATE AND SIGNATURE PAGE

This NI 43-101 technical report titled "Technical Report – North Rolling Pin Property-Campbell County, Wyoming, U.S.A." dated June 4, 2010, has been prepared and signed by the following author.

Carry In A Har

"Signed and sealed" Douglass Graves, P.E.

Dated at Casper, Wyoming

June 4, 2010

#### **CERTIFICATE OF QUALIFIED PERSON**

I, Douglass Graves, P.E., do hereby certify that:

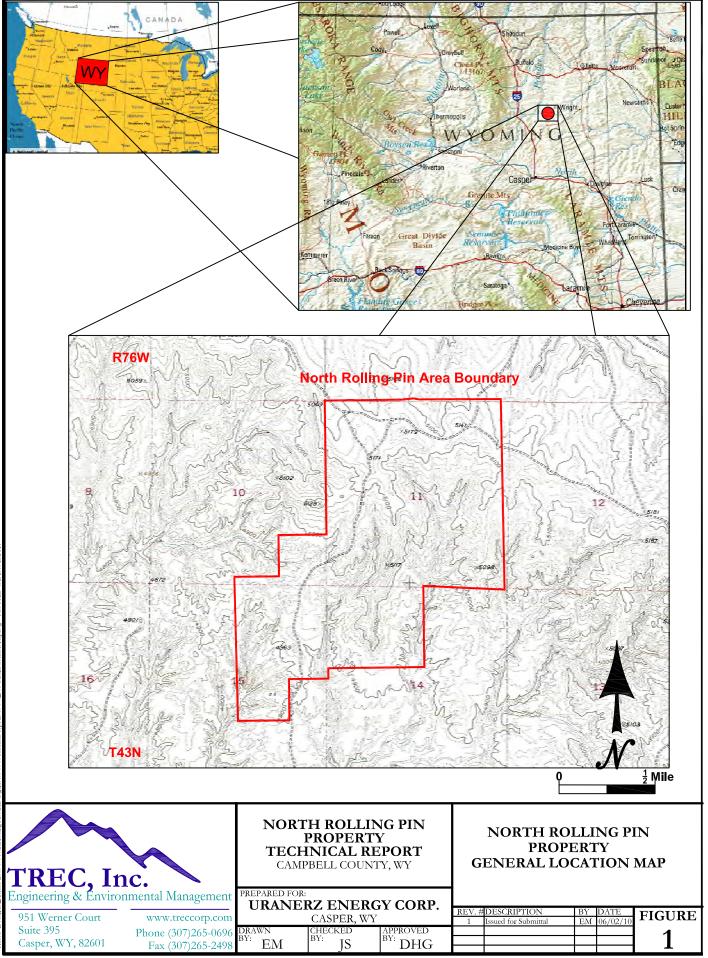
- 1. I am a principal owner and the president of TREC Inc., 951 Werner Court, Suite 395, Casper, Wyoming, USA.
- 2. I graduated with a Bachelor of Science degree in Civil Engineering from Montana State University in 1982.
- 3. I am a licensed Professional Engineer in Wyoming and other States and a member of the Society of Mining, Metallurgy and Exploration.
- 4. I have worked as an Engineer for over 30 years with project engineering and project management experience in uranium mine development and closure and base and precious mineral mining, planning, processing, operations and closure/reclamation. My experience also includes geotechnical investigations and tailings dam design and construction management, feasibility studies, infrastructure design and construction oversight/management and cost estimating and planning for multimillion dollar projects for numerous mineral extraction companies in the USA and overseas.
- 5. I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by reason of my education, professional registration, and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- 6. I am the author and am responsible for the preparation of the Technical Report entitled "Technical Report, North Rolling Pin Property Campbell County, Wyoming, U.S.A." I last visited the North Rolling Pin Property on November 19, 2008, as stated in Section 4.5 of the Technical Report, and have had no prior involvement with the North Rolling Pin Property.
- 7. As of the date hereof, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
- 8. I am independent of the issuer applying all of the tests in NI 43-101.
- 9. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with same.
- 10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority.

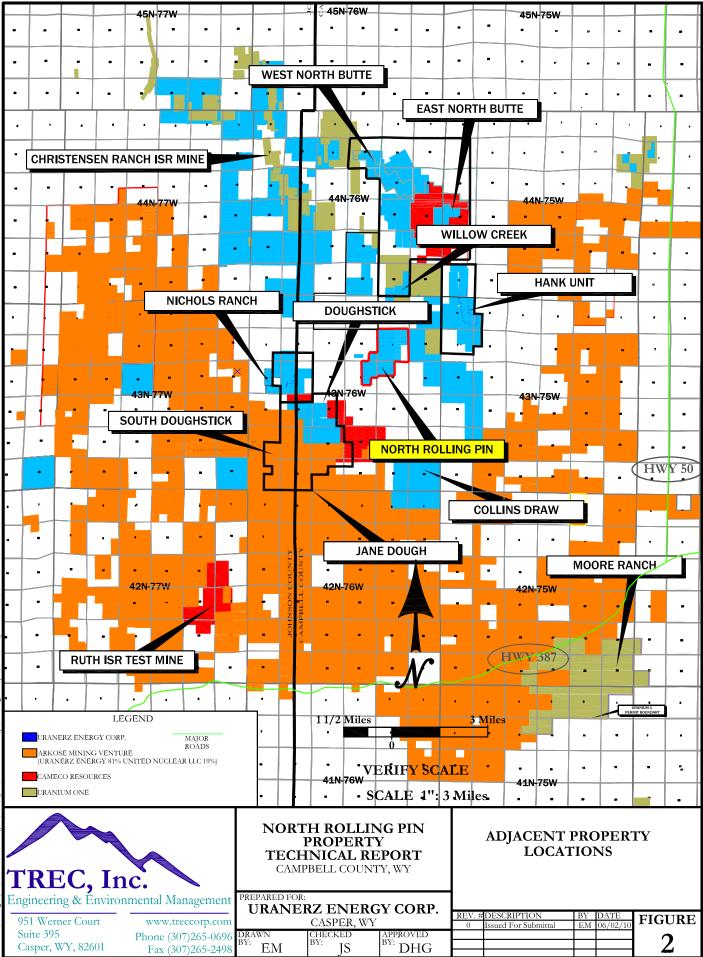
Original Signed as of June 4, 2010

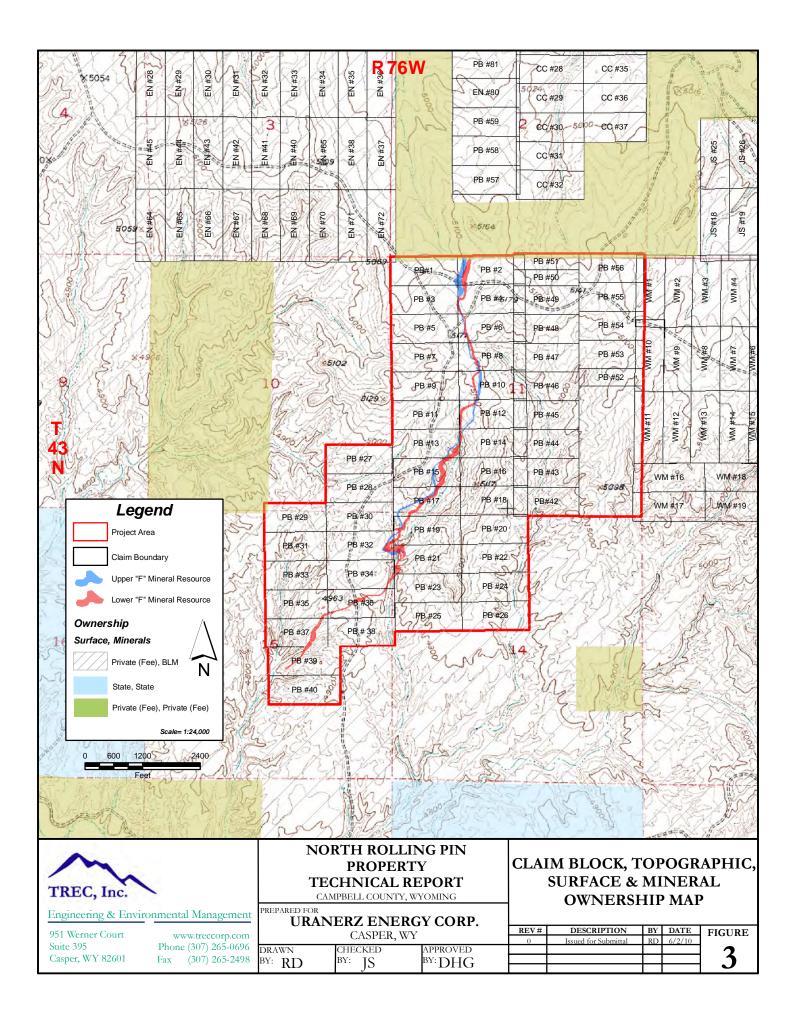
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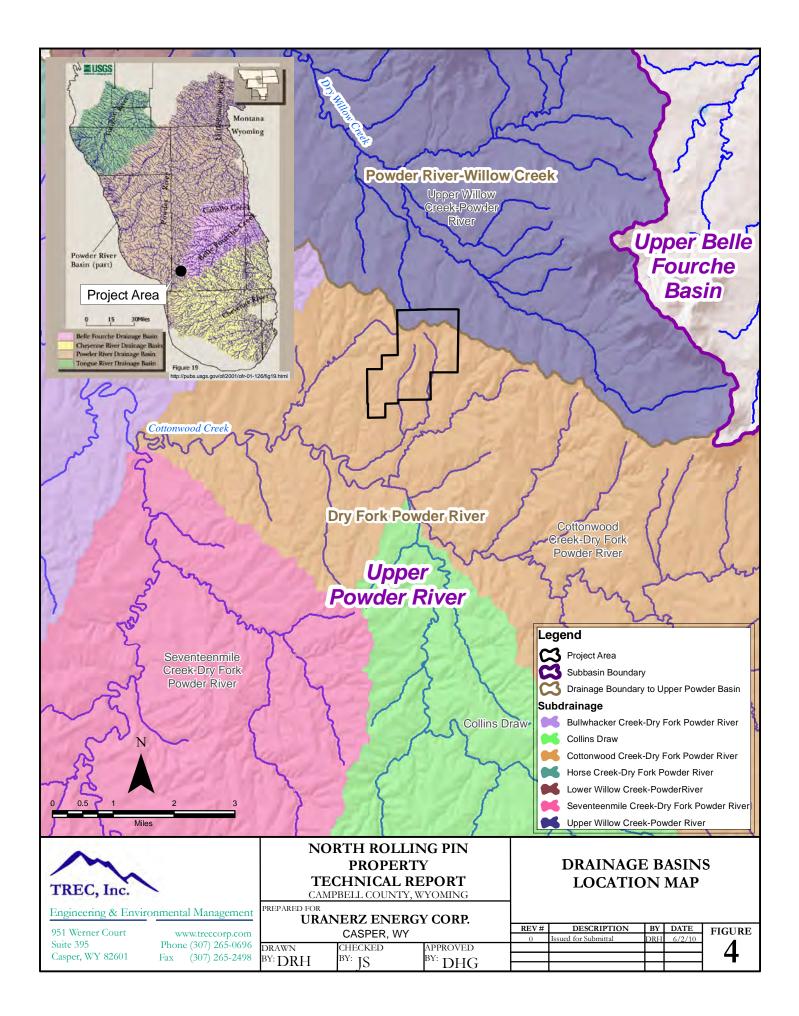
Douglass Graves, P.E.

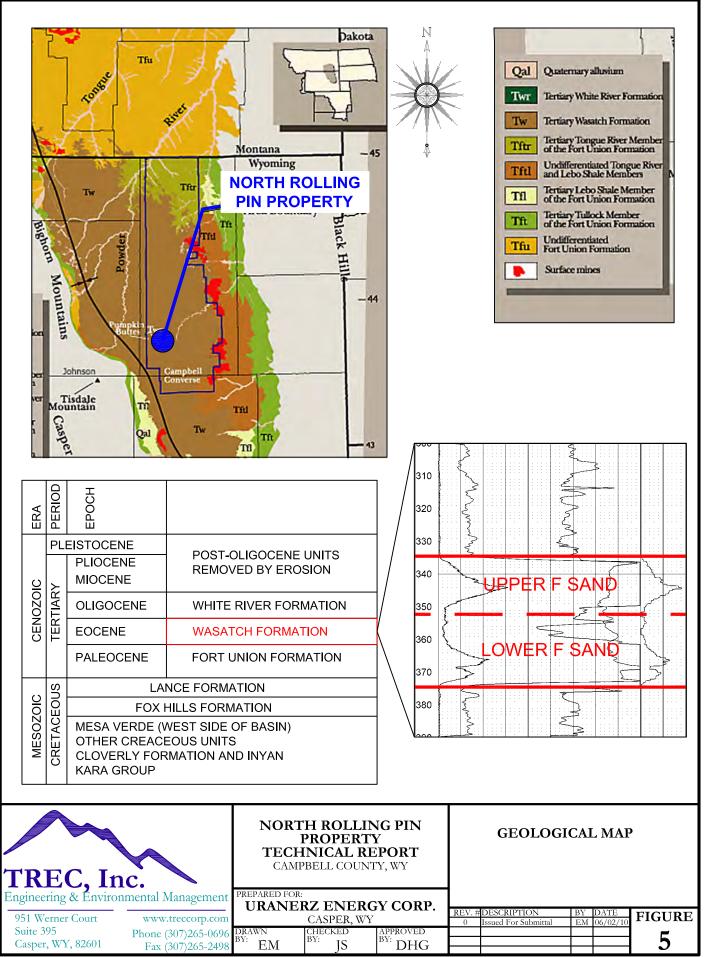
# 24. ILLUSTRATIONS

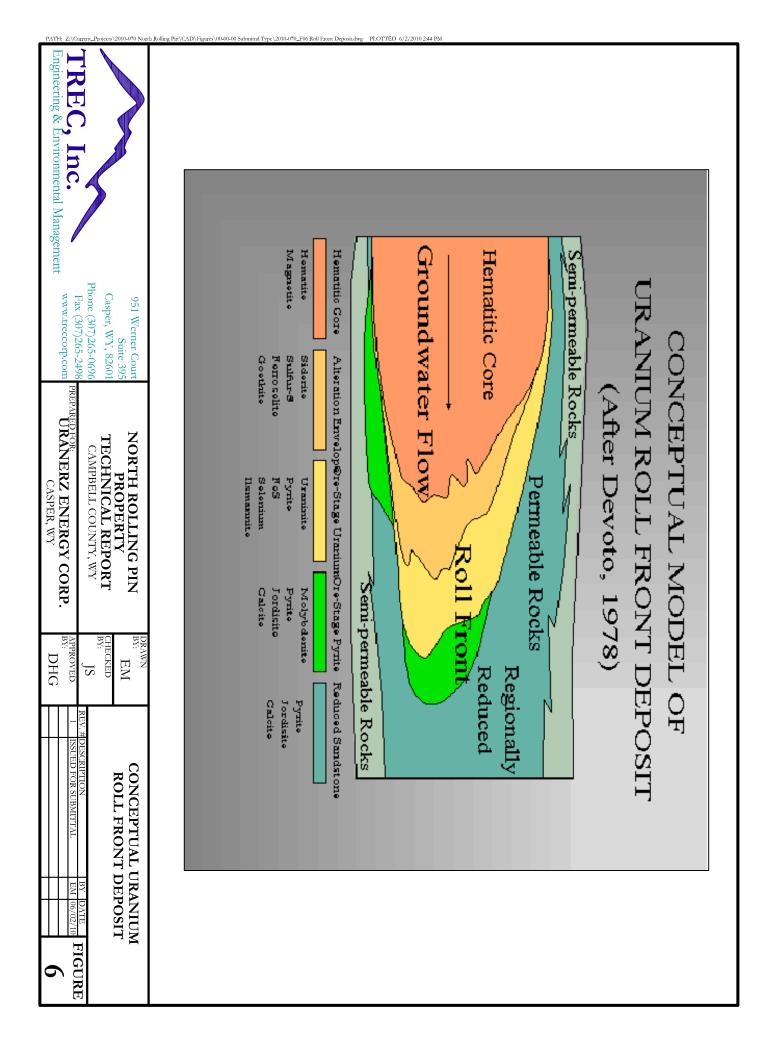


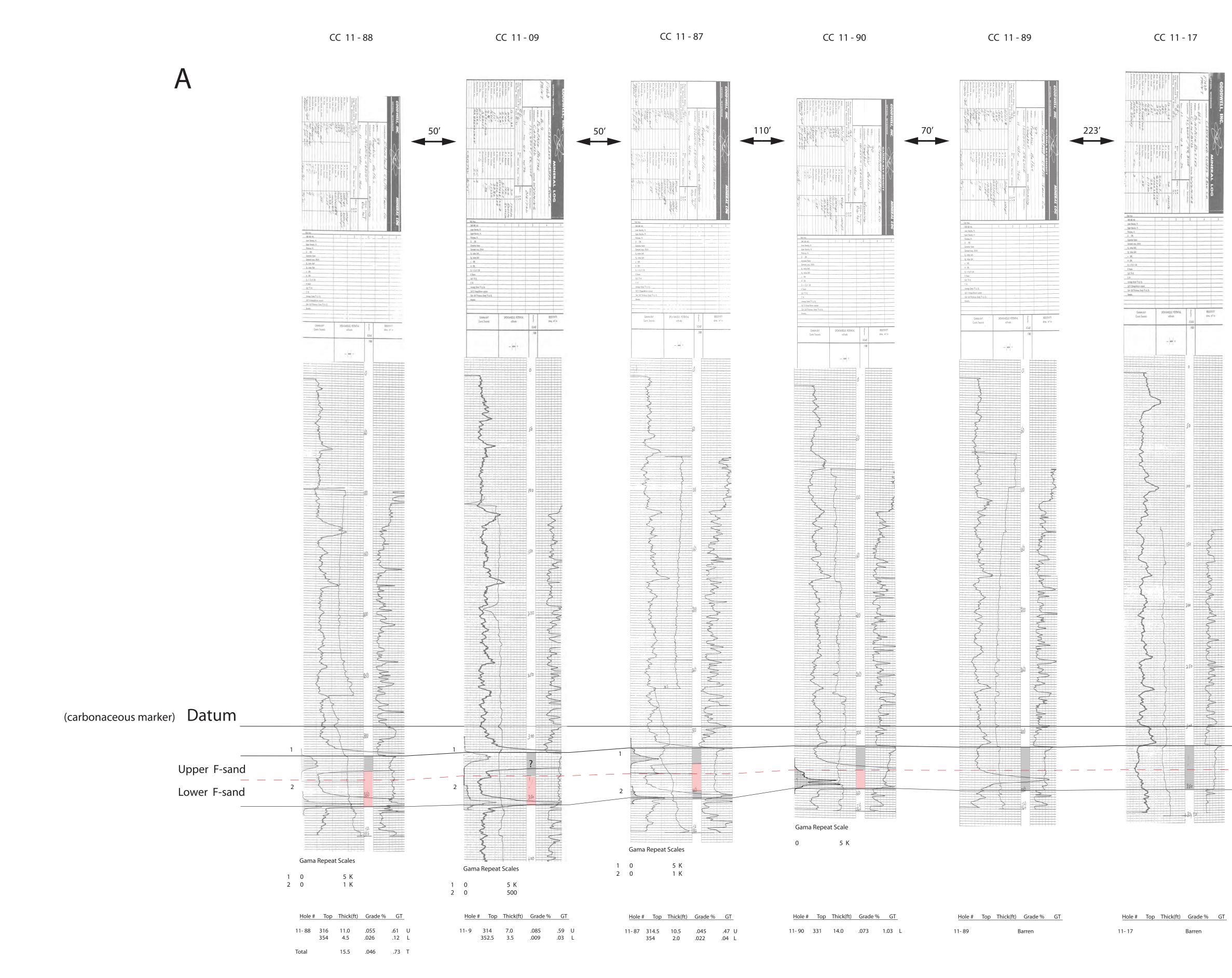






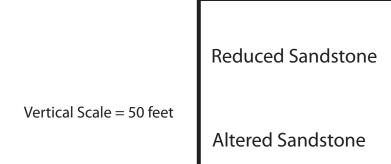






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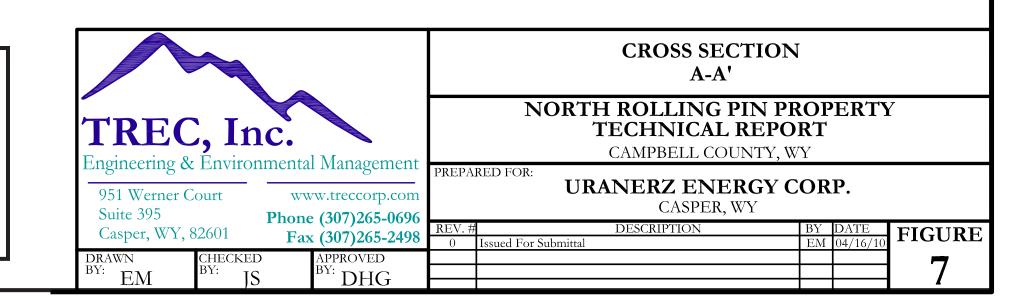
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Datum (carbonaceous marker)

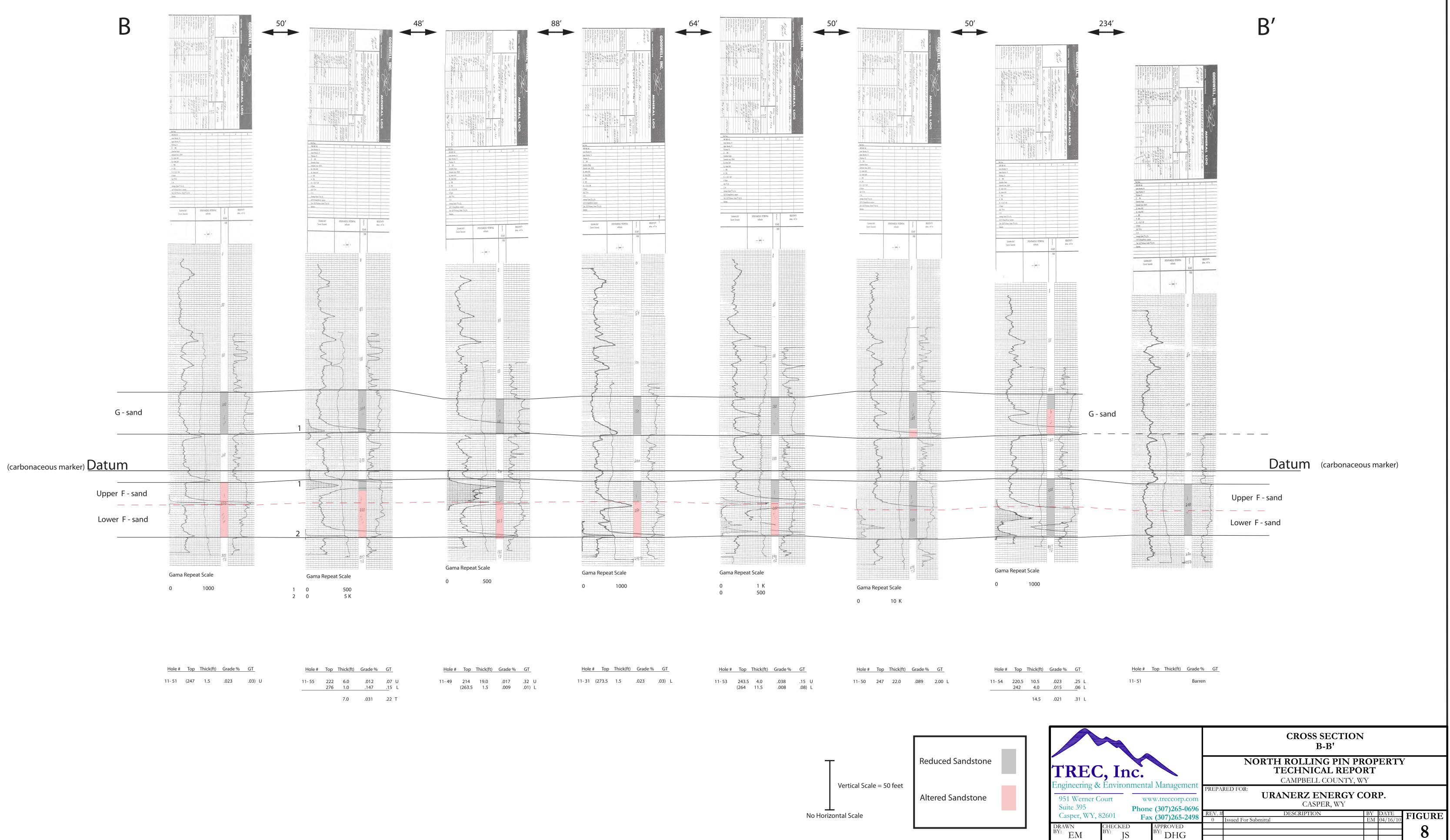
Upper F-sand Lower F-sand





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