Ross ISR Project USNRC License Application
Crook County, Wyoming

RAI Question and Answer Responses
Environmental Report
Docket #40-09091

Prepared for:
U.S. Nuclear Regulatory Commission
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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

LIST OF APPENDICES

General

ER RAI GEN-1

Please provide baseline and proposed operational plan views of the proposed facility.

A. *Please provide a current, baseline plan view of the existing Ross Project site, showing each of the physical (man-made) attributes listed below.*

The physical attributes include the following:

- *Towers, buildings, and other similar structures;*
- *Above- and below-ground electrical lines and poles (and other lines, such as telephone, if present);*
- *Above- and under-ground pipes and pipelines as well as their arrangement and related support structures;*
- *Above- and below-ground tanks;*
- *Storm-water management features such as collection drains and pipes to the sediment pond;*
- *Retention ponds;*
- *All active water wells, outlines of wellfields, outlines of monitoring well rings, and well-houses;*
- *Existing and planned structures unrelated to the Proposed Action, such as wells associated with oil and gas production;*
- *Site improvements such as paved and unpaved roads.*

These plan view figures should present a more regional view than Figure 1.2-5 and greater detail than present on Figures 1.2-6 and 1.2-7 in the Environmental Report (ER). In addition, these figures should be uncluttered with information not specifically requested (e.g., the mineralization areas). However, inclusion of some naturally occurring site features, such as the Oshoto Reservoir and the other water bodies such as the Little Missouri River and Deadman Creek, would enhance the clarity of the figures, as would the elimination of topographic contours in these particular views. These figures should be in an electronic format. The view of the existing, current site will serve as a baseline view and the other phased views will assist in the NRC's evaluation of Proposed Action's impacts progressively over time as required by 10 CFR Part 51.

ER RAI GEN-1(A) Response

Figure ER RAI GEN-1-1 depicts the current baseline plan view of the proposed Ross ISR Project area including land use, water bodies, streams, existing disturbance, nearby residences and infrastructure. As requested, this figure presents a more regional view of the proposed project area, including the entire proposed NRC license area, than ER Figure 1.2-5, which depicts only the CPP area.

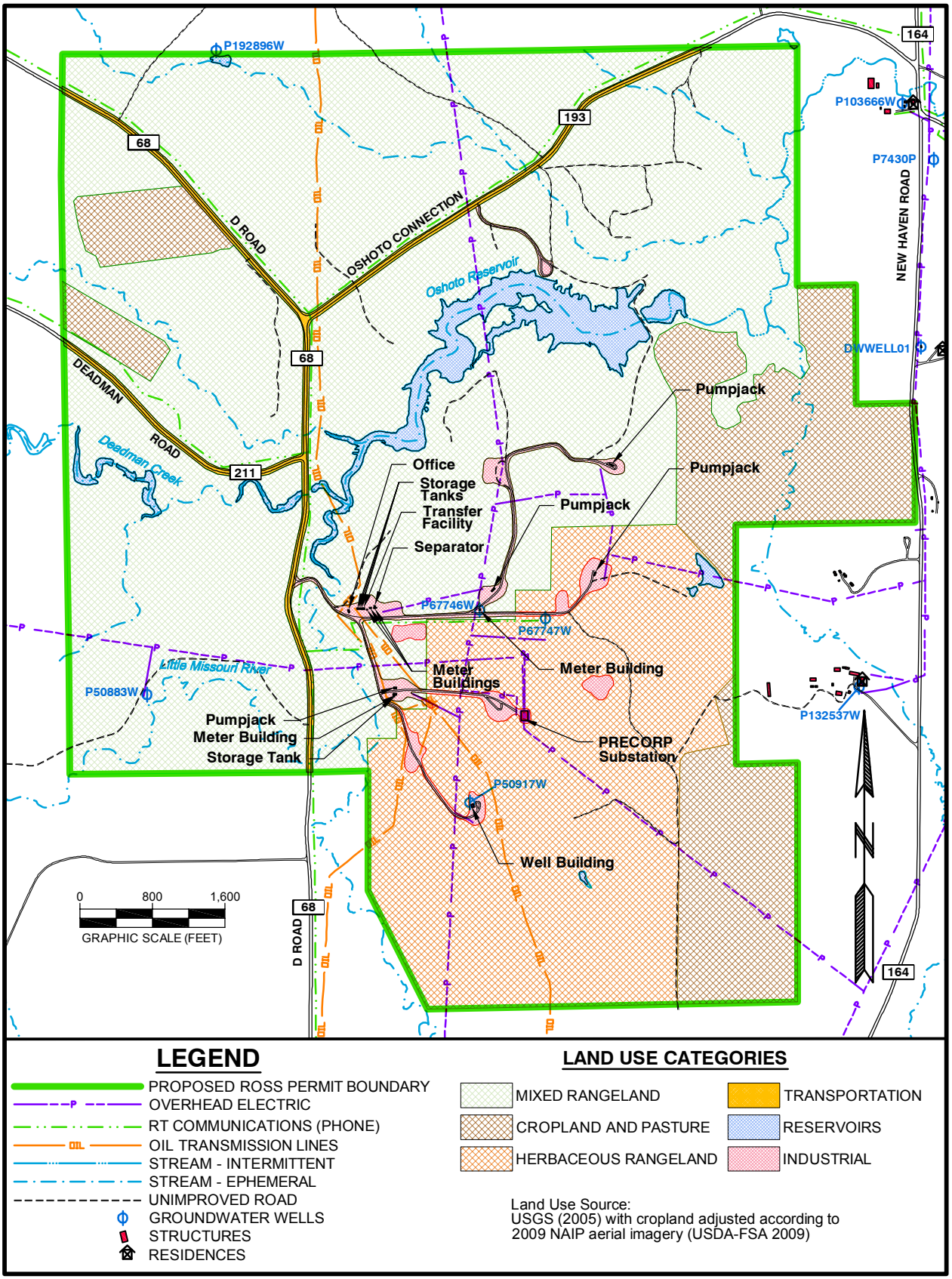


Figure ER RAI GEN-1-1. Ross ISR Project Current Baseline Plan View.

ER RAI GEN-1

Please provide baseline and proposed operational plan views of the proposed facility.

B. Please provide a plan view of the Ross Project site using the same scale and size as the baseline plan view and showing each of the physical (man-made) attributes listed below for each phase (i.e., construction, operation, aquifer restoration, and decommissioning) of the proposed Ross Project.

The physical attributes include the following:

- *Towers, buildings, and other similar structures;*
- *Above- and below-ground electrical lines and poles (and other lines, such as telephone, if present);*
- *Above- and under-ground pipes and pipelines as well as their arrangement and related support structures;*
- *Above- and below-ground tanks;*
- *Storm-water management features such as collection drains and pipes to the sediment pond;*
- *Retention ponds;*
- *All active water wells, outlines of wellfields, outlines of monitoring well rings, and well-houses;*
- *Existing and planned structures unrelated to the Proposed Action, such as wells associated with oil and gas production;*
- *Site improvements such as paved and unpaved roads.*

These plan view figures should present a more regional view than Figure 1.2-5 and greater detail than present on Figures 1.2-6 and 1.2-7 in the Environmental Report (ER). In addition, these figures should be uncluttered with information not specifically requested (e.g., the mineralization areas). However, inclusion of some naturally occurring site features, such as the Oshoto Reservoir and the other water bodies such as the Little Missouri River and Deadman Creek, would enhance the clarity of the figures, as would the elimination of topographic contours in these particular views. These figures should be in an electronic format. The view of the existing, current site will serve as a baseline view and the other phased views will assist in the NRC's evaluation of Proposed Action's impacts progressively over time as required by 10 CFR Part 51.

ER RAI GEN-1(B) Response

Using the project schedule in ER Figure 1.3-1 as the basis for the project phases, Figures ER RAI GEN-1-2 through 5 provide the requested views of the project area through the four project phases. The timeframes represented on the figures depict estimates of the amount of development that might occur at the end of facility construction, at the end of operations and at the end of aquifer restoration. Note that many of the baseline features depicted on Figure ER RAI GEN-1-1 are not shown on Figures ER RAI GEN-1-2 through 4 to

improve clarity. These features include existing overhead electric lines, oil transmission lines, land use categories, existing wells, and nearby residences. Each figure is described below.

Figure ER RAI GEN-1-2 depicts the anticipated facilities at the end of facility construction. This time period is indicated in ER Figure 1.3-1 as the beginning of year 1 after regulatory approval. The facilities anticipated to be constructed include the primary access road, CPP area diversion, containment barrier wall, deep disposal well proximal to the CPP, domestic well and access road, lined retention pond 1, sediment pond, wildlife-proof fencing around the controlled area boundary, CPP, administration building and warehouse/maintenance building, and domestic drainfield. In addition, it is anticipated that the wellfield access roads, pipelines, valve vaults and power to the first mine unit will have been completed along with all of the perimeter and wellfield baseline monitor wells for both of the mine units. (Refer to ER Section 1.2.5 for a description of mine units; the wellfield modules will be divided into two mine units within the project area.) Construction and installation are also anticipated to have been completed on the module buildings in the first mine unit along with some of the production patterns; however, wellfield modules are not shown on this figure since most wellfield construction will occur after the end of facility construction.

Figure ER RAI GEN-1-3 portrays the anticipated facilities at the end of operations. Full build-out of the proposed CPP area infrastructure will be completed, including all ponds. In addition, all of the wellfield roads, wellfield modules, module buildings, and supporting pipelines and power facilities will be constructed. The remainder of the deep disposal wells will have been installed as necessary along with the access roads, deep disposal well pipelines and power infrastructure. The time frame represented by Figure ER RAI GEN-1-3 represents approximately year 5 after regulatory approval in ER Figure 1.3-1. This time frame represents the end of concurrent operations with aquifer restoration and the beginning of the aquifer restoration only project phase.

Figure ER RAI GEN-1-4 provides the anticipated facilities at the end of aquifer restoration. The time frame represented by Figure ER RAI GEN-1-4 represents approximately the end of year 7 after regulatory approval in ER Figure 1.3-1. This figure represents the time period after regulatory approval of successful aquifer restoration and stability monitoring of the final wellfield modules. At this time the production and injection wells will have been plugged

and abandoned and associated pipelines will have been removed. In addition, all but one of the deep disposal wells will have been abandoned along with the conveyance and access infrastructure. The figure assumes that the wellfield baseline wells, perimeter monitor wells, ponds, and deep disposal well proximal to the CPP would remain as necessary for any compliance purposes.

Figure ER RAI GEN-1-5 portrays conditions at the end of decommissioning, which is, effectively, the current baseline plan view.

The RAI also requested that the figures depict stormwater management features. In response, Figures ER RAI GEN-1-2 through 4 provide the CPP area diversion, preliminary locations for culverts and the sediment pond. Due to the drawing scale, details of the CPP area drainage are not shown. Preliminary engineering on this component has been completed and uses V-ditches, trapezoidal ditches and concrete culverts to route drainage in the CPP area to the sediment pond. Additional details are provided in revised TR Addendum 3.1-A with the TR RAI responses. As described in ER Section 5.4.1.1, the final mitigation plan for stormwater management and sediment control will be addressed in two Stormwater Pollution Prevention Plans (SWPPPs) that will be prepared and submitted to WDEQ/WQD for coverage under construction and industrial WYPDES stormwater permits. The final approved SWPPPs and WYPDES stormwater permits will be available for NRC inspection.

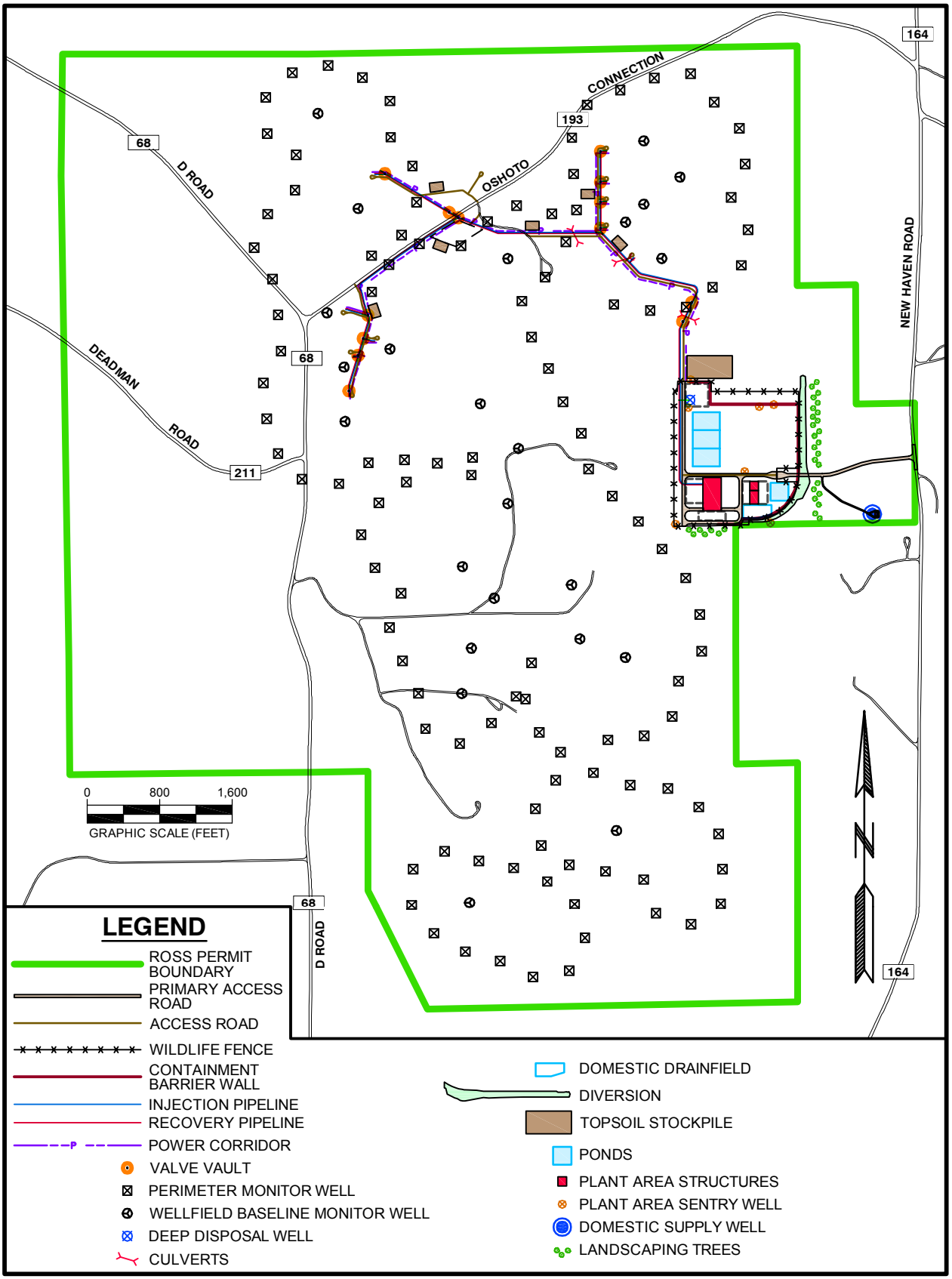


Figure ER RAI GEN-1-2. Anticipated Facilities at the End of Construction.

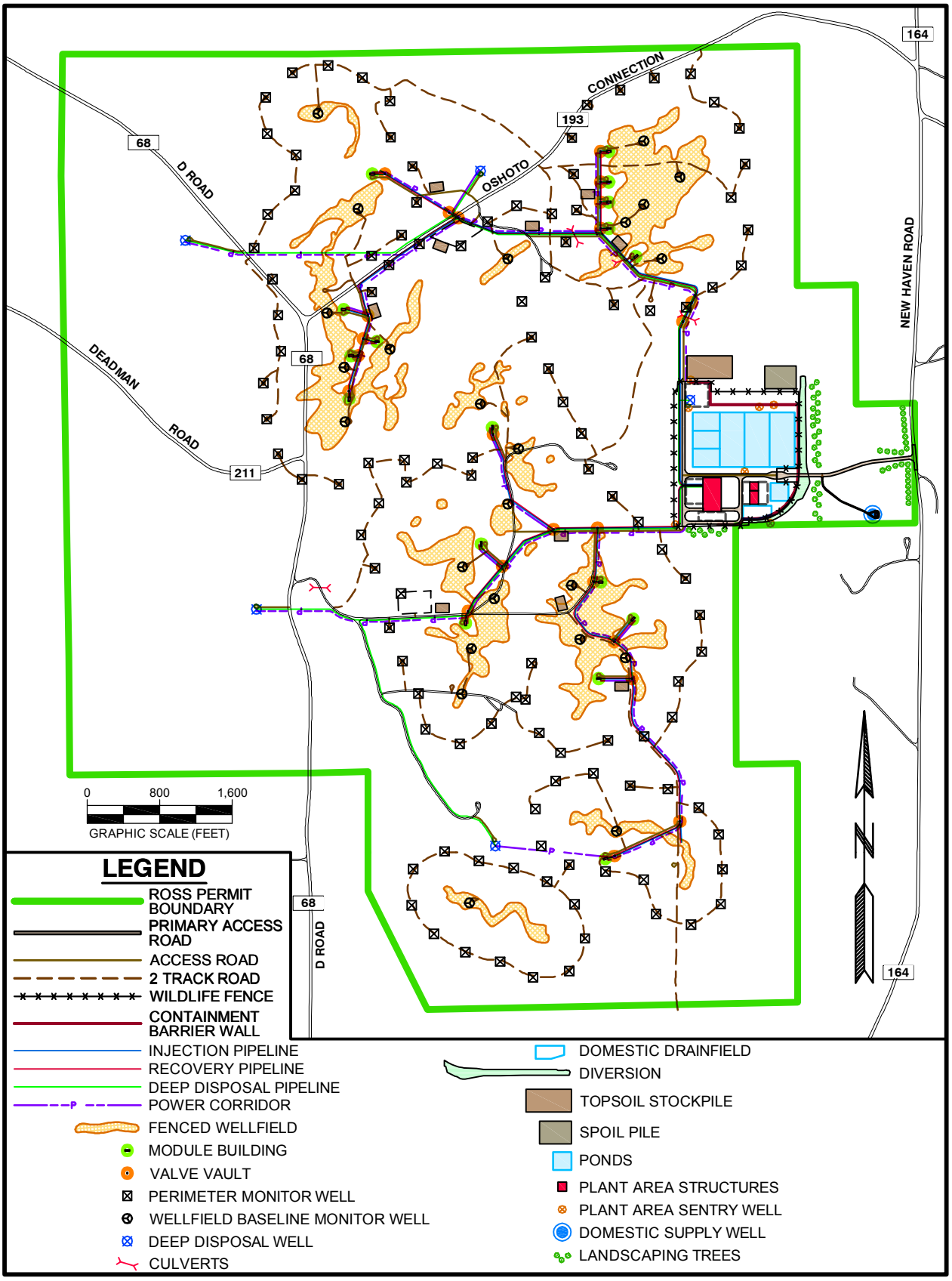


Figure ER RAI GEN-1-3. Anticipated Facilities at the End of Operation.

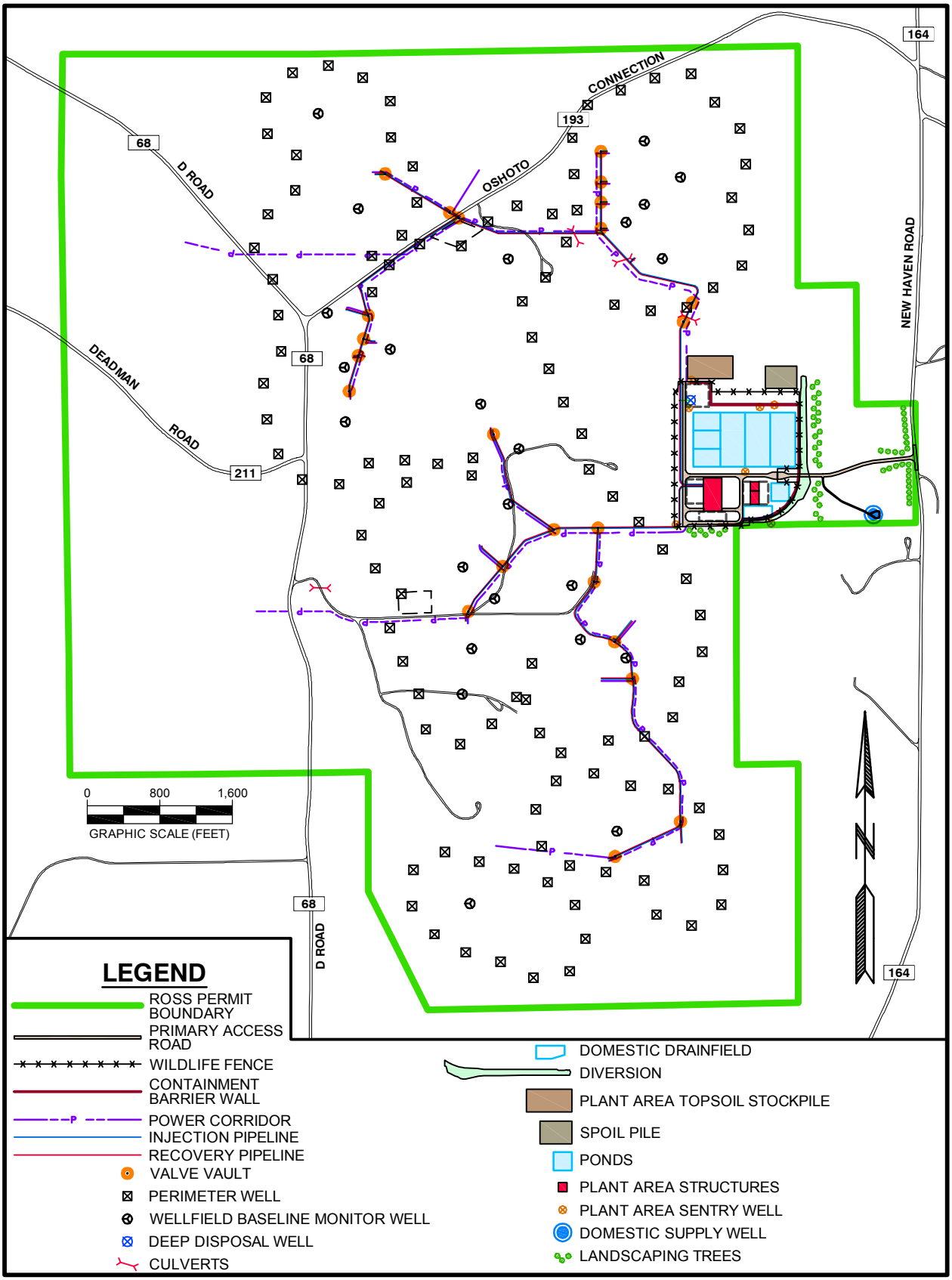


Figure ER RAI GEN-1-4. Anticipated Facilities at the End of Aquifer Restoration.

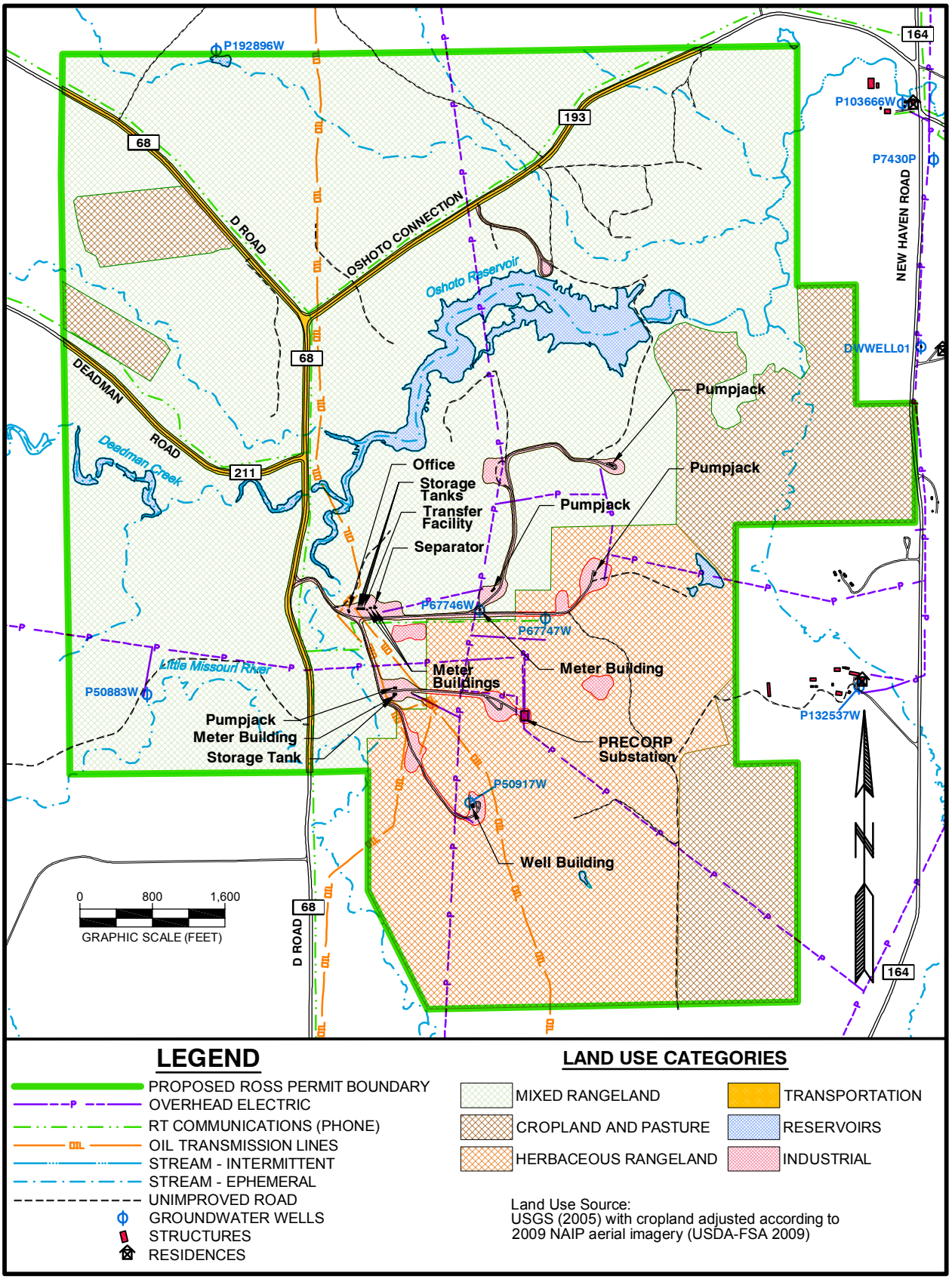


Figure ER RAI GEN-1-5. Anticipated Facilities at the End of Decommissioning.

ER RAI GEN-2

Please update the status of Strata's permitting and licensing information.

A. Please update Table 1.6-1, "Summary of Proposed, Pending and Approved Licenses and Permits for the Ross ISR Project" on pages 1-45 and 1-46 of the ER.

Following the submission of the license application to the NRC, Strata has continued to prepare, submit, and receive approval on license and permit applications. Thus, Table 1.6-1 should be updated. Table 1.6-1 also provides a record of publicly available information that may assist in the development of the SEIS. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI GEN-2(A) Response

Table 1.6-1 has been updated to show the current status of proposed, pending, and approved licenses and permits for the proposed Ross ISR Project as of the time of this submittal. The revised Table 1.6-1 is included with this response.

Table 1.6-1. Summary of Proposed, Pending and Approved Licenses and Permits for the Ross ISR Project

Regulatory Agency	Permit or License	Status and Accession Number
Federal		
NRC	Source and 11e.(2) Byproduct Material License	Application submitted January 4, 2011, Docket #040-09091, Accession #ML110120063
EPA	UIC Class I Permit (deep disposal wells)	See WDEQ/WQD and WDEQ/LQD permits; Wyoming has primacy for the UIC Program
	Aquifer Exemption (Class I wells)	
	UIC Class III Permit (injection and recovery wells)	
	Aquifer Exemption (Class III wells)	
	Public Water Supply System	The permit application will be submitted to WDEQ/WQD for review prior to EPA review
BLM	Plan of Operations	In review, submitted January 20, 2011, accepted July 11, 2011, Case File WYW170151, Accession #ML11320A293
	BLM Right of Way (roads)	Being prepared
	Notice of Intent to Explore	Being prepared
USACE	Verification of Preliminary Wetlands Delineation	Verification received December 9, 2010, Accession #ML11320A293
	Nationwide Permit Coverage Authorization	Application to be prepared prior to disturbance
State		
WY State Land & Farm Loan Office	Uranium Minerals Mining Lease	Approved #0-40979
WDEQ/AQD	Air Quality Permit	Approved September 13, 2011, Permit #CT-12198, Accession #ML11320A295
WDEQ/LQD	Permit to Mine	Application submitted January 13, 2011, accepted February 24, 2011, TFN 5 5/217, Accession #ML110190558
	UIC Class III Permit	Being prepared by WDEQ/LQD as part of the Permit to Mine.
	Aquifer Exemption (Class III wells)	Aquifer exemption request will be prepared by WDEQ/LQD as part of the Permit to Mine
	Wastewater Pond Construction Permit (lined retention ponds and sediment pond)	To be prepared
	Mineral Exploration Permit/Drilling Notification	Approved #384DN
WDEQ/WQD	UIC Class I Permit (deep disposal wells)	Approved April 13, 2011, Permit #10-263, Accession #ML111380015
	Aquifer Exemption (Class I wells)	
	Permit to Construct Public Water Supply System	To be prepared
	Permit to Construct Domestic Wastewater System	To be prepared
	WYPDES Permit (surface discharge of excess permeate)	To be prepared

Table 1.6-1. Summary of Proposed, Pending and Approved Licenses and Permits for the Ross ISR Project (Cont.)

Regulatory Agency	**Permit or License**	**Status**
WDEQ/WQD (cont.)	Stormwater WYPDES Permit (industrial/mining)	To be prepared
	Stormwater WYPDES Permit (construction)	To be prepared
WSEO	Temporary WYPDES Permit (discharge during well testing)	Approved April 23, 2010, Permit #WYG720229, renewed March 31, 2011
	Permit to Appropriate Groundwater for Monitor Wells	Approved Permit #'s: 191679-191702; 192703-192705 (regional baseline monitor wells) To be prepared for ISR monitor wells
	Permits to Appropriate Surface Water (S.W.-3) for Lined Retention Ponds and Sediment Pond	To be prepared
County		
Crook County	County Development Permits (access road approach and emergency services agreement)	Memorandum of Understanding executed April 6, 2011, Accession #ML111170303

ER RAI GEN-2

Please update the status of Strata's permitting and licensing information.

B. Please provide an update regarding any additional permits, such as those for land application and/or surface (industrial) discharge of excess permeate as discussed in Section 4.13.1 of the ER.

Following the submission of the license application to the NRC, Strata has continued to prepare, submit, and receive approval on license and permit applications. Thus, Table 1.6-1 should be updated. Table 1.6-1 also provides a record of publicly available information that may assist in the development of the SEIS. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI GEN-2(B) Response

Revised Table 1.6-1, presented in the response to ER RAI GEN-2(A), provides updated information for all additional permits anticipated for the Ross ISR Project. Land application is no longer being considered as a disposal option for excess permeate in the Ross ISR Project license application. For additional information, please refer to the response to TR RAI 23(C) in the separate TR RAI response package, which provides changes to the TR to clarify that land application will not be used without a license amendment. Following is a discussion of the permitting status of surface discharge of excess permeate through a WYPDES permit.

Excess permeate will only be produced during operation without concurrent aquifer restoration and during the beginning of aquifer restoration when the first wellfield modules are in groundwater sweep and no other modules have begun RO treatment with permeate injection. Refer to ER Figures 4.13-1 through 4.13-3, which provide the typical water balances during various operational phases. During all other times, no excess permeate will be produced due to high permeate demand in the injection streams for operation and aquifer restoration.

ER Section 4.13.1.1.1.2 describes how surface discharge of excess permeate will require a WYPDES permit issued by WDEQ/WQD. The WYPDES permit will include effluent limits designed to protect the receiving water(s), which would include one or more tributaries to the Little Missouri River. WDEQ/WQD regulations in Chapter 1, Section 22(c) require that "in all Wyoming surface waters, radioactive materials attributable to or influenced by

the activities of man shall not be present in the water or in the sediments in amounts which could cause harmful accumulations of radioactivity in plant, wildlife, stock or aquatic life" (WDEQ 2007). The anticipated WYPDES effluent limits are provided in TR Table 4.2-3 and include technology-based effluent limits that will be established by WDEQ/WQD in conformance with 40 CFR Part 440 and water quality-based effluent limits that will be established by WDEQ/WQD to protect the class of use of the receiving stream.

Strata anticipates that the radiological effluent limits in the WYPDES permit will be established as equal to or less than the established limits for discharge of radionuclides to the environment in 10 CFR Part 20, Appendix B, Table 2, Column 2. These limits are presented in Table ER RAI GEN-2-1 and are based on Annual Limits of Intake (ALI) of radionuclides for occupational exposure. Waste streams containing radionuclides below these regulatory limits are not classified as radioactive waste.

The excess permeate will have been treated to achieve uranium effluent limits in the reverse osmosis system and IX columns. It is not anticipated that thorium-230 and lead-210 will be present at concentrations above the limits; however, if concentrations are above the limits, the effluent will be treated as necessary to satisfy the WYPDES effluent limits. Radium-226 will be treated in the lined retention ponds by adding barium chloride to the liquid waste to co-precipitate radium-226 with barium sulfate. The technology for radium removal by barium chloride is well developed. Additional details are provided in TR Section 3.2.8.1.9.

Surface discharge of excess permeate, if used, would be a beneficial use of the nearly pure effluent stream. As described in ER Section 4.4.1.2, the water quality of the receiving channel would be protected by adhering to flow limits and effluent quality limits established by WDEQ/WQD. By complying with the WYPDES effluent limits, which would be at or below the 10 CFR Part 20, Appendix B, Table 2, Column 2 limits for discharge of radionuclides to the environment, Strata anticipates that the excess permeate will not be classified as radioactive waste, nor will it have potential for radiological impacts to public health or the environment.

An additional beneficial use of excess permeate includes recycling to the CPP for use as plant make-up water. The final method of excess permeate disposal is injection in Class I deep disposal wells. Should Strata fail to obtain

a WYPDES permit for surface discharge of excess permeate, the excess permeate will be disposed along with brine and other 11e.(2) liquid waste in the Class I deep disposal wells.

A copy of a WYPDES permit to discharge excess permeate will be available for NRC inspection.

Table ER RAI GEN-2-1. Anticipated Maximum Radiological Effluent Limits for WYPDES Permits

Radionuclide	**Anticipated Effluent Limits**	
Units	µCi/ml	pCi/L
Lead-210	1E-8	10
Radium-226	6E-8	60
Uranium-nat.	3E-7	300
Thorium-230	1E-7	100

Source: 10 CFR Part 20 Appendix B, Table 2, Column 2

Facility Design

ER RAI FD-1

Please describe any additional facility design attributes and specifications that have been developed since the submission of the license application.

Any additional available information regarding the facility design, both interior and exterior, will assist the NRC during its assessment of environmental impacts of the Proposed Action. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI FD-1 Response

Updated facility design information is provided in the revised TR Addendum 3.1-A, which is included with the TR RAI responses. The revised Addendum 3.1-A provides information on current designs and geotechnical investigation for facilities within the CPP area. The geotechnical investigations were done to provide provisional layouts of the site facilities and to better characterize the expected operating conditions, potential environmental impacts, and potential public and occupational health impacts for the proposed project.

The revised Addendum 3.1-A includes an updated facilities layout and material characterization. The lined retention pond design includes slope stability, settlement, dynamic stability, pond storage/freeboard analysis, leak detection system design, and hydrostatic uplift analysis.

The revised Addendum 3.1-A also provides design information for the containment barrier wall, including cross section and plan details, and design information for the dewatering system to be employed in the CPP area. The geotechnical investigations confirm the viability of using a containment barrier wall and dewatering system to control the groundwater level in the CPP area.

Cumulative Impacts

ER RAI CI-1

Please provide additional details that are currently available about the other proposed Strata projects to be located within the Lance District.

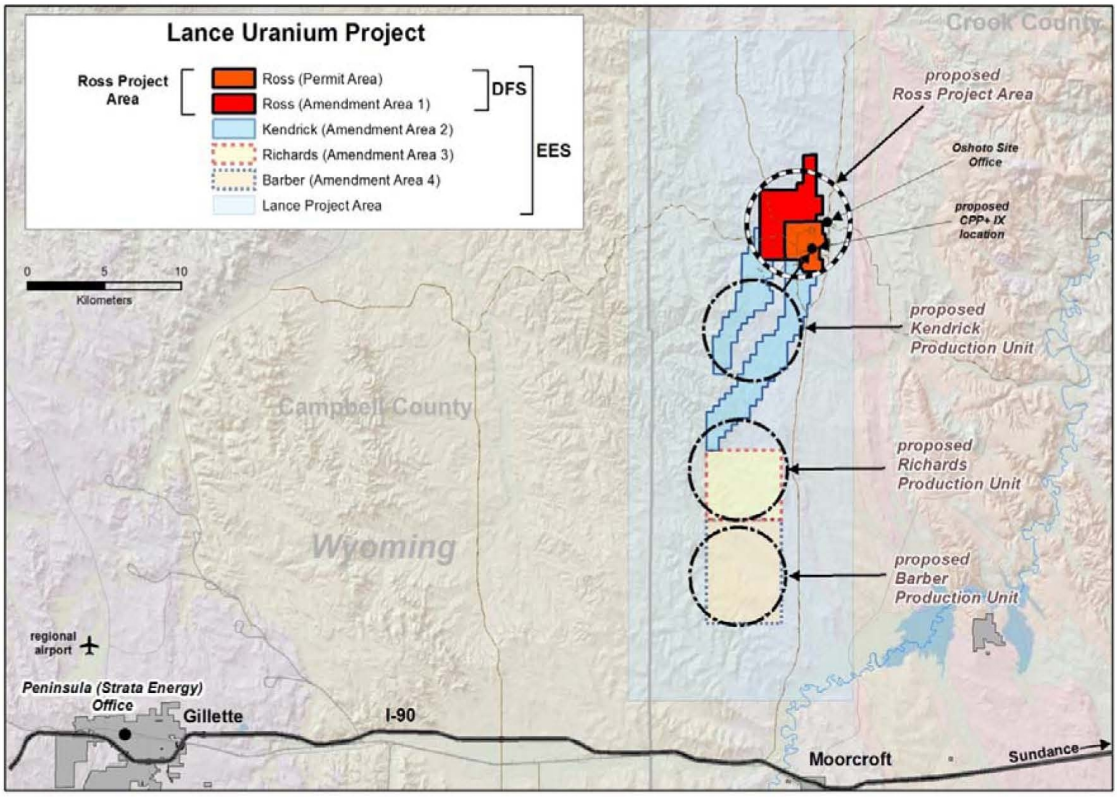
A. Please provide the proposed locations of the other projects relative to the Ross Project site.

The SEIS will include a discussion of any past, present, or reasonably foreseeable future actions (RFFA) that could result in cumulative impacts when combined with the Proposed Action. Section 2.2 of the ER notes Strata's plan to operate several additional in-situ uranium recovery (ISR) satellite facilities, which are to be developed near the Ross Project site, as RFFAs. Section 2.2 concludes that the impacts of the additional sites will prolong the identified impacts, but they will not increase the severity of the impacts. The locations of these projects and the timing of their activities is needed to verify these conclusions and to assess cumulative impacts on environmental resources, such as water, air, and visual resources, as well as on waste management, transportation, noise, and public and occupational health as required by 10 CFR Part 51.

ER RAI CI-1(A) Response

Figure ER RAI CI-1-1 depicts potential future Strata projects (license amendment areas) within the Lance District. As described in ER Section 2.2.7.1, Strata has identified significant uranium resources within the Lance District. The currently identified potential license amendment areas include an area adjacent to the proposed Ross project area (Ross Amendment Area 1), and the Kendrick, Richards, and Barber satellite facilities south of the proposed Ross project area (Peninsula 2011). Strata continues exploration drilling outside of the proposed Ross project area within the Lance District. As this exploration drilling continues, the number, location, and size of potential projects will likely change. Refer to the response ER RAI CI-1(B) for a discussion of the potential schedule of future Lance District satellite projects and to the response to ER RAI CI-2(B) for a discussion of potential cumulative impacts from these projects.

Figure ER RAI CI-1-1. Potential Future Lance District Projects



Source: Peninsula 2011

ER RAI CI-1

Please provide additional details that are currently available about the other proposed Strata projects to be located within the Lance District.

B. Please provide a schedule relative to the Proposed Action for these other projects and their activities.

The SEIS will include a discussion of any past, present, or reasonably foreseeable future actions (RFFA) that could result in cumulative impacts when combined with the Proposed Action. Section 2.2 of the ER notes Strata's plan to operate several additional in-situ uranium recovery (ISR) satellite facilities, which are to be developed near the Ross Project site, as RFFAs. Section 2.2 concludes that the impacts of the additional sites will prolong the identified impacts, but they will not increase the severity of the impacts. The locations of these projects and the timing of their activities is needed to verify these conclusions and to assess cumulative impacts on environmental resources, such as water, air, and visual resources, as well as on waste management, transportation, noise, and public and occupational health as required by 10 CFR Part 51.

ER RAI CI-1(B) Response

As described in ER Section 2.2.7.1, Strata has identified significant uranium resources in the Lance District and anticipates that the proposed Ross ISR Project may be the first of several ISR projects to be developed in the area. Subsequent Strata projects in the Lance District would be developed as satellite facilities under license amendments to the proposed Ross ISR Project. The following information presents the potential development schedule and potential cumulative impacts related to Strata satellite facilities within the Lance District. This information is based on a December 2011 press release (Peninsula 2011) and represents what Strata considers to be a reasonably foreseeable development scenario. The actual development plans will depend on a number of factors, including results of ongoing exploration drilling, surface and mineral acquisition efforts, environmental pre-license baseline studies for potential amendment areas, and the time required to acquire the necessary permits and licenses. Refer to the response to ER RAI CI-2(B) for the estimated number of employees, vehicles, and transportation routes associated with potential Lance District satellite projects.

Currently identified potential projects include the Ross Amendment Area 1 and the Kendrick, Richards, and Barber satellite facilities. These areas are depicted on Figure ER RAI CI-1-1. A brief description of each of these potential satellite projects is provided below followed by a discussion of the potential schedule for various Lance District satellite projects.

Ross Amendment Area 1

The first currently identified potential amendment area is the Ross Amendment Area 1. It would be an extension, likely to the north and west, of the proposed Ross project area. The likely development plans for the Ross Amendment Area 1 include operating this area as additional wellfield modules connected to the Ross CPP. This amendment area is not anticipated to change the annual U_3O_8 production rate from 750,000 lb/yr, for the proposed Ross wellfield modules, but would instead extend the operating life of the proposed Ross ISR Project. ER Section 1.3.2 describes how the overall duration of operations for the proposed Ross ISR Project is expected to be 4 to 8 years. With the addition of the Ross Amendment Area 1, Strata estimates that the operating life would be extended by several years. The amendment area ISR production and restoration solutions would be piped to the Ross CPP through extensions of the production and restoration trunklines in the proposed Ross project area.

Kendrick Satellite Facility

The second currently identified potential amendment area is the Kendrick Satellite Facility, which is also referred to as the Kendrick Production Unit in Figure ER RAI CI-1-1. Like the Ross Amendment Area 1, this satellite area likely would be contiguous with the proposed Ross project area and connected via pipelines. Strata anticipates that with the addition of the second amendment area, the IX production capacity of the Ross CPP would be increased from 750,000 to 1.5 million lb/yr U_3O_8.

Richards Satellite Facility

The third currently identified potential amendment area is the Richards Satellite Facility (also referred to as the Richards Production Unit). This potential satellite facility is anticipated to be contiguous with the Kendrick Satellite Facility and with the Barber Satellite Facility. As such, it would likely be connected via pipelines to either the Ross CPP or a remote IX plant at the Barber Satellite Facility.

Barber Satellite Facility

Currently the fourth identified potential amendment area is the Barber Satellite Facility, or Barber Production Unit. The fact that this potential project

is currently fourth on the list reflects the ongoing evolution of the development plans for the Lance District. ER Section 2.1.3.3 described how Strata evaluated construction of the CPP within the Barber Amendment Area, which is referred to as the Barber Satellite Facility in this RAI response. Strata anticipates that a remote IX processing plant would be constructed at the Barber Satellite Facility. Resin loaded at the IX plant would be transported by truck to the Ross CPP. With the addition of a remote IX plant, Strata anticipates that the steady-state U_3O_8 production capacity of the Ross CPP would increase from 1.5 to 2.19 million lb/yr. Strata anticipates reasonably foreseeable future Lance District operations to include steady-state production of 2.19 million lb/yr U_3O_8 after construction of an IX plant in a satellite facility.

Resin loaded at the satellite facility would be transported by truck to the Ross CPP. For additional information on potential transportation-related impacts associated with loaded resin shipments, please refer to the response to ER RAI TR-1, which describes how the potential transportation impacts have been analyzed in the ER and in the draft NRC regulatory issue summary on receiving uranium-loaded IX resin.

Potential Development Schedule

Figure ER RAI CI-1-2 depicts the potential Lance District development schedule. This figure compares the potential schedule with the proposed Ross schedule as requested in the RAI. Reasonably foreseeable plans include steady-state operation of three satellite facilities. Based on potential resources in the Lance District, Strata anticipates that the total duration of ISR uranium production could be 11 to 18 years, including the Proposed Action. The potential Lance District development schedule assumes that wellfield construction in the first amendment area would begin 12 months after initial construction. The total duration of wellfield construction is estimated to be approximately 7 years. Facility construction, which would be primarily associated with the Barber Satellite Facility remote IX plant and associated ponds, is estimated to last 9 to 12 months. Operation of the amendment area wellfields is anticipated to last 10 to 17 years. Aquifer restoration is anticipated to begin approximately 2 to 2.5 years after the start of operation and last approximately 9 to 16 years. As with the Proposed Action, significant overlap is anticipated between operations and aquifer restoration, since aquifer restoration of individual wellfield modules would begin almost immediately

after operations. Strata will adhere to the timelines in decommissioning regulations of 10 CFR § 40.42 and if necessary, will request approval for an alternate schedule through a license amendment as allowed under 10 CFR § 40.42(i). Decommissioning would be ongoing as wellfield modules receive regulatory approval for successful aquifer restoration. Decommissioning is anticipated to last 12 to 18 months after the end of aquifer restoration.

Potential Cumulative Impacts from Lance District Development

The basis for this RAI indicates the need to assess potential cumulative impacts from future development within the Lance District on environmental resources such as water, air, and visual resources, as well as on waste management, transportation, noise, and public and occupational health. The following discussion presents a brief overview of potential cumulative impacts from future Lance District development. A much more detailed analysis will be provided by Strata in any amendment application for a satellite facility.

The response to ER RAI CI-2(B) provides an estimate of the number of employees, vehicles, and transportation routes. This response shows that the maximum number of employees and vehicle trips would be similar to the maximum number anticipated during construction of the proposed Ross ISR Project; therefore, the magnitude of potential transportation, noise, and air quality impacts related to transport of supplies and workers would be similar to those resulting from the proposed Ross ISR Project. The Memorandum of Understanding (MOU) with Crook County provided in Appendix C to Strata's Air Quality Permit Application (Strata 2011) will apply to potential future Lance District satellite projects and will be amended as needed to ensure similar dust control, road maintenance, speed limit controls, and emergency management coordination is conducted.

Figure ER RAI CI-1-1 depicts the locations of the currently identified potential satellite projects within the Lance District. These potential satellite projects occur in an area approximately 20 miles long by 3 miles wide. Potential visual resource impacts will be limited by the diffuse development within this relatively large area, lack of structures (with the exception of the potential Barber remote IX plant, structures would be limited primarily to wellfield module buildings and well houses), and rolling topography, which will significantly limit the vantages from which the facilities will be visible.

Potential cumulative waste management impacts will be significantly lower for a satellite facility than for the proposed Ross ISR Project. Since most of the ISR production and restoration fluids would be piped to the Ross CPP, most of the 11e.(2) liquid waste would be disposed in the lined retention ponds and deep disposal wells within the proposed Ross project area. This would generally extend the duration of operation of the waste disposal facilities within the proposed Ross project area, but it would not change the magnitude of the potential impacts. Similarly, most of the 11e.(2) solid waste anticipated for the Proposed Action will be generated during decommissioning of the facilities in the CPP area. Since only one satellite IX plant with associated lined retention ponds is anticipated, the quantity of 11e.(2) solid waste is anticipated to be less for a typical satellite facility. It will primarily be associated with wellfield decommissioning, including pipelines, downhole well piping, and impacted soil (refer to ER Section 4.13.1.1.1.4). Non-AEA-regulated waste will be generated in smaller quantities than the Proposed Action due to the lack of processing facilities, administrative facilities, and warehouse/maintenance facilities at a typical satellite facility.

Potential groundwater quality impacts within each satellite facility are anticipated to be similar to those evaluated for the Proposed Action. Potential water quality impacts will be minimized by restoring groundwater quality in the ore zone in accordance with NRC requirements, by constructing monitoring well networks within and around each wellfield module, and by locating and abandoning exploration holes. The hydrogeologic setting of the potential satellite facilities is anticipated to be similar to that in the proposed Ross project area, such that natural confining conditions will limit potential impacts to overlying or underlying aquifers. The density of historical exploration hole drilling within the Lance District is much lower outside of the proposed Ross project area, and therefore the potential excursion risk through exploration holes will be lower than that in the proposed Ross project area.

Potential groundwater quantity (drawdown) impacts within the entire Lance District are expected to be similar to or less than those evaluated for the Proposed Action. ER Section 4.4.2.3.4 describes how potential impacts due to withdrawals during operation and aquifer restoration in the proposed Ross project area were evaluated through a regional groundwater model (TR Addendum 2.7-H). The estimated maximum drawdown at a well outside of the proposed Ross project area was 33 feet, which is not anticipated to be enough

to materially decrease the yield from the well. Potential drawdown impacts for any satellite facility will be evaluated through groundwater modeling, the results of which will be provided to the NRC in an amendment license application. Due to the similar hydrogeologic setting anticipated for other Lance District projects, the potential impacts are expected to be similar to those evaluated for the proposed Ross ISR Project. Potential impacts will be minimized by using the same operational measures discussed in ER Section 5.4.2.1.2 for the Proposed Action. These include:

- Designing wellfield modules to enable balancing.
- Minimizing consumptive use through reinjecting all ISR fluids except for the small production and restoration bleeds necessary to maintain an inward hydraulic gradient in each wellfield module and to conduct successful aquifer restoration.
- Minimizing production bleed through continuous wellfield balancing.
- Employing two stages of RO to treat production bleed and restoration fluids.
- Treating water recovered during groundwater sweep.
- Employing limited and/or selective groundwater sweep.

Potential drawdown impacts from Lance District projects, including the Proposed Action and potential future satellite projects, will not occur east of the outcrop of the Fox Hills Formation. The outcrop location is depicted on ER Figure 3.3-4 and is immediately east of the proposed Ross project area. Any wells east of this outcrop will be completed in formations that, if present in the proposed Ross project area, are deeper than the Pierre Shale, which is described on ER page 3-50 as, "a significant hydraulic barrier between water bearing intervals within the older, underlying Cretaceous, Mesozoic, and Paleozoic formations and the younger, overlying Upper Cretaceous Fox Hills/Lance formations." Further, stock and domestic wells west of the potential Lance District satellite projects are generally completed in water bearing units shallower than the sandstones targeted for uranium production in the Lance/Fox Hills formations.

Potential impacts to water supply wells surrounding existing NRC-licensed operating ISR facilities were evaluated by NRC staff in a report entitled "Data on Groundwater Impacts at the Existing ISR Facilities" (NRC 2009). The

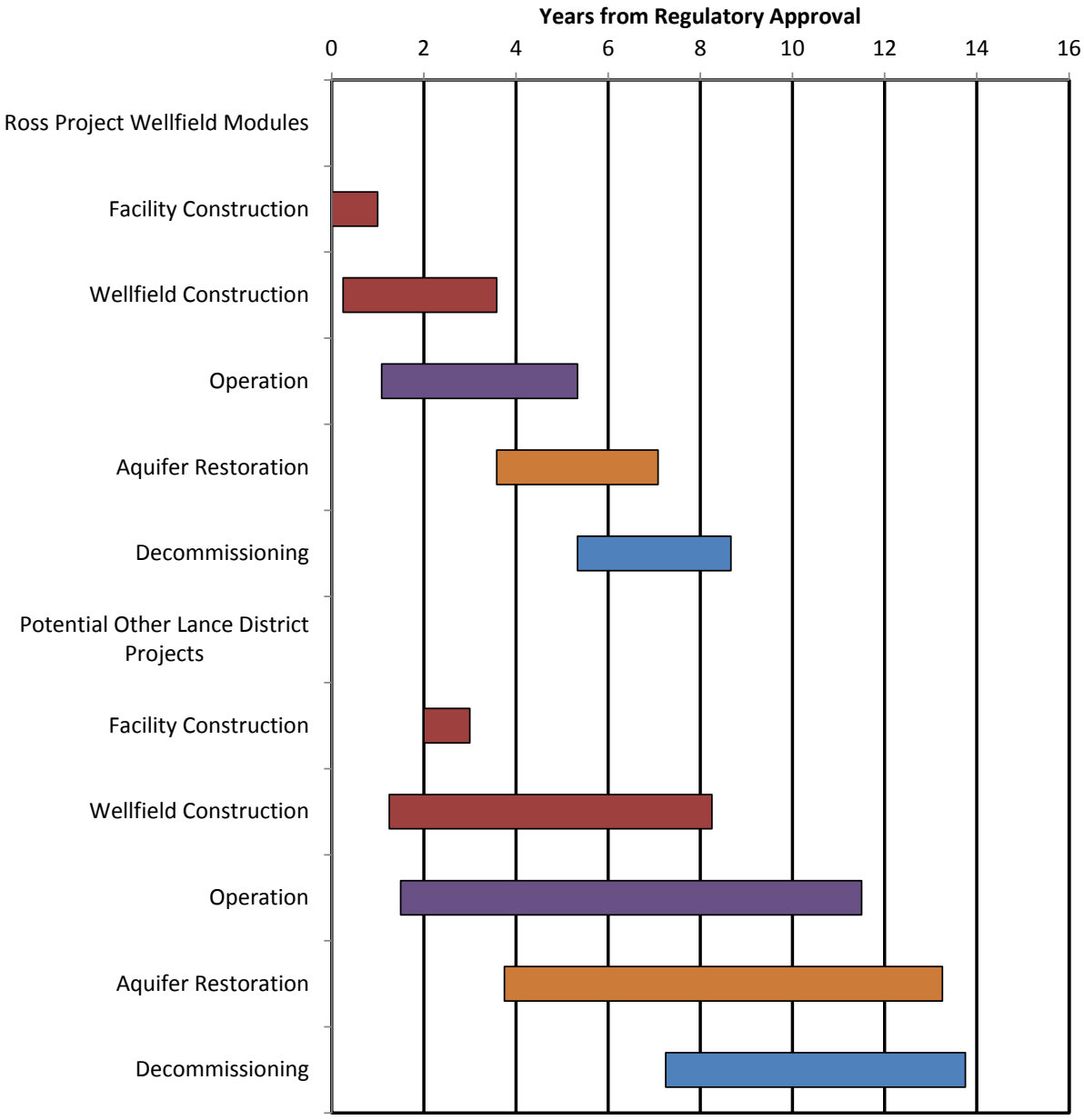
report concluded the following:

"Annual reporting that includes monitoring of the aquifers regionally (i.e., at a distance from the operations) is a license condition for all existing NRC-licensed operating ISR facilities … The sampling locations include domestic wells, livestock wells, or any nearby groundwater source. Based on a review of historical licensing documentation, data from the regional monitoring at all existing ISR facilities indicate that no impacts attributable to an ISR facility were observed at the regional monitoring locations. In addition, the staff is unaware of any situation indicating that: (1) the quality of groundwater at a nearby water supply well has been degraded; (2) the use of a water supply well has been discontinued; or, (3) a well has been relocated because of environmental impacts attributed to an ISR facility."

Potential drawdown impacts to any wells within satellite facility license amendment areas will be addressed through lease agreements with the well owners. Potential impacts to wells adjacent to satellite facility license amendment areas will be mitigated using the methods described in ER Section 5.4.2.1.2:

- Modifying wells suspected of experiencing drawdown with a sounding tube or similar device to allow periodic water level measurement.
- Lowering the submersible pump in an affected well.
- Providing an alternate source of water of equal or better quality and quantity subject to Wyoming State water law should Strata's activities prevent full use of a well.

Figure ER RAI CI-1-2. Potential Lance District Development Schedule



ER RAI CI-2

Please identify and describe any known current and/or proposed projects of any type outside of the Lance District that may cumulatively impact resources impacted by the proposed Ross Project.

A. For each project, please specify the owner, the type of project, and its location and distance to the Ross Project site.

In order to assess the cumulative impacts of local, adjacent, and/or nearby operations, those operations must first be identified (in more detail than what is presented in Section 2.2.7 of the ER). For example, if another facility whose purpose is to retrieve other underlying mineral resources is to be constructed and operated in or near the Lance District, then Strata's Proposed Action could compete with the nearby operation for local workers, a socioeconomic cumulative impact. In addition, if there are other facilities near the Ross Project site, the total increase in traffic that would be associated with the construction and operation of the nearby facilities could cause cumulative impacts to transportation. Thus, it is important to identify and describe any current and anticipated projects that may cumulatively impact resources anticipated to be impacted by the proposed Ross Project. The assessment of cumulative impacts is conducted under the authority of 10 CFR Part 51.

ER RAI CI-2(A) Response

Following is a discussion of known current and potential projects that may cumulatively impact resources potentially impacted by the proposed Ross ISR Project. These include potential uranium projects within and outside of the Lance District, a potential rare-earth elements project in Crook County, a potential wind farm in Weston County, and existing and potential future coal, oil and gas and bentonite projects in the project vicinity. For each project or potential project, the project owner, location, and distance are provided. The response to part (B) of this RAI addresses potential cumulative impacts to key resource areas, including transportation and socioeconomics.

Figure ER RAI CI-2-1 depicts the current and potential projects included in the cumulative impact analysis.

Uranium - Potential Additional Lance District Projects

Please refer to the response to ER RAI CI-1, which describes the location of the currently identified potential projects within the Lance District. The distance to these projects from the Ross ISR Project ranges from about 0 to 20 miles.

Uranium - Potential Aladdin Project

ER Section 3.1.8 describes the potential Aladdin uranium ISR project. Additional information is provided below.

Project Owner:	Powertech (USA) Inc.
Location:	17,554-acre project centered in approximately Sec. 1, T54N, R61W, Crook County, latitude 44.70°N, longitude 104.13°W
Distance:	Straight-line distance: 41 miles east-northeast of the Ross ISR Project Driving distance: 70 miles

Uranium - Potential Elkhorn Project

ER Section 3.1.8 describes the potential Elkhorn uranium project. Additional information is provided below. The following information was obtained from a National Instrument 43-101 technical report prepared for the Elkhorn Project by International Nuclear, Inc. (2010). Uranium mineralization is found in the lower Cretaceous Fall River and Lakota sandstones, which are stratigraphically between the thick overlying Skull Creek Shale and the thick underlying Morrison formation. Both the Skull Creek and Morrison formations in the vicinity of the Elkhorn Project are impermeable shales. Although these formations are fairly shallow in the Elkhorn project area, they are more than 4,000 feet below the Ross ore zone at the proposed project area (in the Lance-Fox Hills formation), and the intervening interval includes the relatively impermeable and massive Pierre Shale. Therefore, ISR operations in the Fall River and Lakota Formations will not be affected by and will not affect ISR operations in the Ross vicinity (see ER Figures 3.3-3 and 3.3-5). Current resource estimates include approximately 1.2 million pounds indicated and inferred U_3O_8. According to the 43-101 technical report, "Shallow Fall River resources may be recoverable by open pit mining or by hydraulic borehole mining. Deeper Lakota resources maybe recoverable by in situ, underground, or hydraulic borehole mining."

Project Owner:	NCA Nuclear, Inc., a wholly-owned subsidiary of Bayswater Uranium Corporation
Location:	Approximately 5,215 acres in various sections in T55-56N, R66-67W, Crook County, centered at approximately Sec. 6, T55N, R66W, latitude 44.78°N, longitude 104.83°W

Distance: Straight-line distance: 13 to 18 miles north-northeast of the Ross ISR Project
Driving distance: 15 to 25 miles

Uranium - Potential Hauber Project

ER Section 3.1.8 describes the potential Hauber uranium project. The following information was obtained from International Nuclear, Inc. (2010). Like the Elkhorn Project, uranium mineralization is found within the Fall River and Lakota Formations. The current resource estimate is 1.5 million pounds indicated/inferred U_3O_8.

Project Owner: NCA Nuclear, Inc. and Ur-Energy (joint venture)
Location: Approximately 5,160 acres in various sections in T54-57N, R66-67W, Crook County, centered at approximately Sec. 22, T55N, R67W, latitude 44.73°N, longitude 104.88°W
Distance: Straight-line distance: 7 to 22 miles north-northeast of the Ross ISR Project
Driving distance: 10 to 30 miles

Uranium - Potential Alzada Project

ER Section 3.1.8 describes the potential Alzada uranium project. The following information was obtained from Bayswater Uranium Corporation (2012) and World Industrial Minerals (2007).

Project Owner: NCA Nuclear, Inc., a wholly-owned subsidiary of Bayswater Uranium Corporation
Location: Approximately 25,000 acres in various sections in T8-9S, R57-61E, Carter County, Montana, centered at approximately Sec. 9, T9S, R59E, latitude 45.07°N, longitude 104.50°W
Distance: Straight-Line distance: 32 to 44 miles north-northeast of the Ross ISR Project
Driving distance: 75 to 85 miles

Rare-Earth Elements - Potential Bear Lodge Project

As described in ER Section 2.2.7.3, a potential rare-earth elements project has been identified in Crook County. The following information was

obtained from a National Instrument 43-101 preliminary economic assessment prepared for the Bear Lodge Rare-Earths Project (John T. Boyd Company 2010). The Bear Lodge Rare-Earth Elements Project is a potential project consisting of a mine and processing facility. The mine would likely be excavated using typical truck and excavator open-pit mining methods. Processing would include crushing, scrubbing and screening the ore; hydrochloric acid leaching; and precipitation at an off-site location.

Project Owner:	Rare Element Resources LTD
Type of Project:	Rare-earth element and gold mineral exploration project
Location:	Parts of Sections 7, 16, 17, 18, 21, 28, 29, 32 and 33, T52N, R63W, Crook County, latitude 44.50°N , longitude 104.45°W
Distance:	Straight-line distance: 25 miles east-southeast of the Ross ISR Project Driving distance: 50 miles

Wind Energy - Proposed Weston I Wind Project

According to the Wyoming State Geological Survey (2012), there is one proposed wind energy project within 50 miles of the Ross ISR Project. The proposed project would have a maximum power generating capacity of 250 MW and would include 166 turbines. According to Wind Energy America (2010), the company was moving forward with a system impact study in September 2010 for the project that would be capable of generating approximately 600 million kWh annually.

Project Owner:	Wind Energy America
Location:	Section 15, T46N, R66W, latitude 43.97°N, longitude 104.77°W
Distance:	Straight-line distance: 42 miles south-southeast of the Ross ISR Project Driving distance: 60 miles

Coal - Active Coal Mines

Figure ER RAI CI-2-1 shows the location of active coal mines in relation to the Ross ISR Project. Within a 50-mile radius of the Ross ISR Project there are nine active coal mines. The owners and locations of these mines in relation to the Ross ISR Project are provided in Table ER RAI CI-2-1.

Oil and Gas

Figure ER RAI CI-2-1 depicts existing oil and gas fields and coal bed natural gas (CBNG) fields within 50 miles of the proposed Ross project area (DOE 2012a, 2012b). As described in ER Section 2.2.7.2.3, there are three producing oil wells, two water injection wells, and three water supply wells used for enhanced oil recovery within the proposed Ross project area. Mitigation measures for potential impacts to the enhanced oil recovery water supply wells are described in ER Section 5.4.2.1.2 (pg. 5-36) and include working with the oil production company to temporarily provide an alternate water supply or alternate means of enhanced oil recovery. See also the response to TR RAI 18 in the TR RAI response package, which describes how Strata is currently working with Merit to discontinue use of their water supply wells within the proposed Ross project area prior to ISR operations. The density of oil and gas development is typical of the region as shown on Figure ER RAI CI-2-1. No CBNG well fields are within the proposed Ross project area due to its location stratigraphically below the Wasatch and Fort Union formations where the CBNG production occurs (refer to ER Section 2.2.7.3).

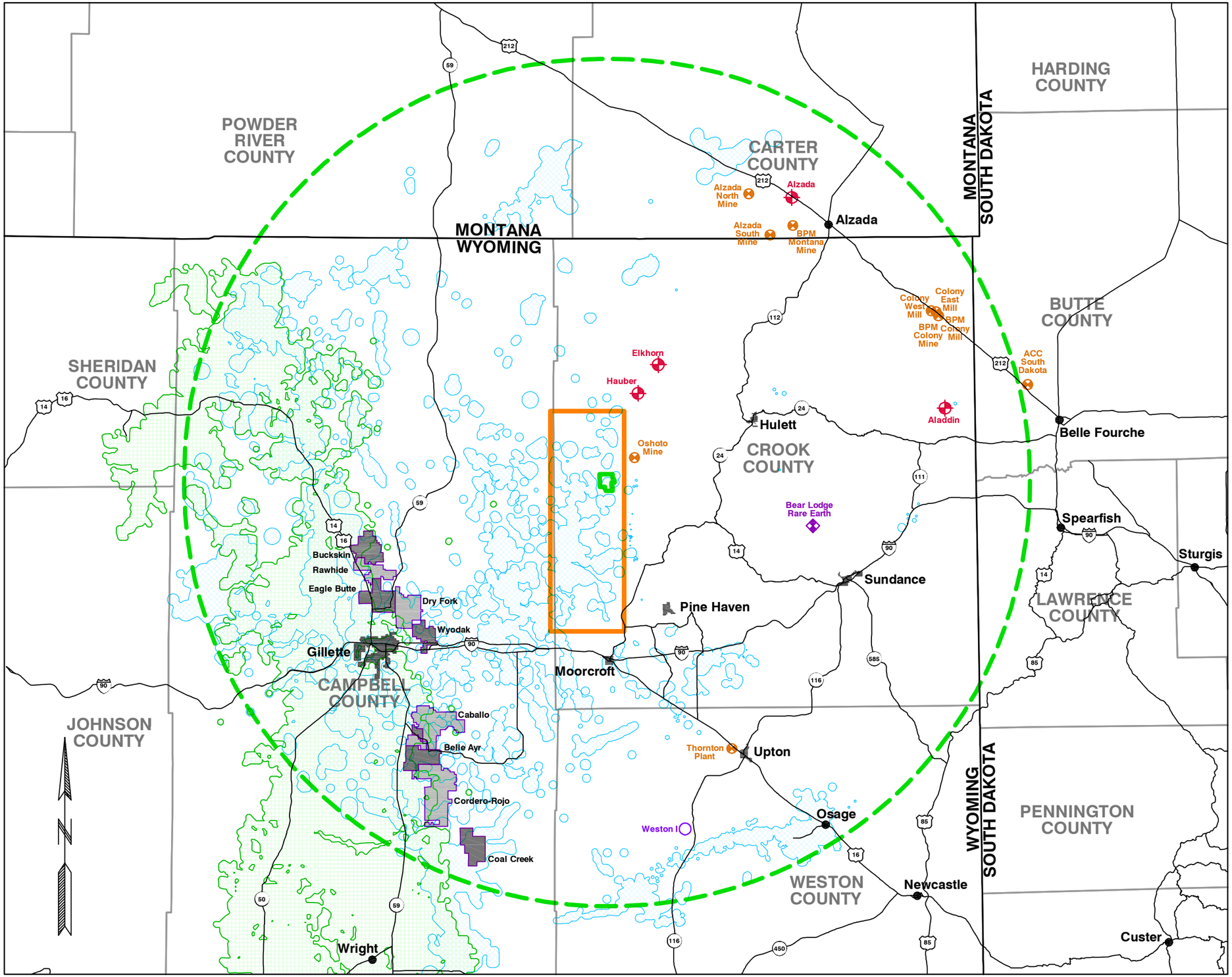
Strata is not aware of any plans for future oil and gas production activities near the proposed Ross ISR Project. As described in ER Section 3.1.12, oil production within the proposed Ross project area peaked in 1985 to 1986 and has generally declined since then.

ER Section 3.1.12 also describes how there may be potential for tight shale oil and gas development within the proposed Ross project area. However, to date there have not been any horizontal wells drilled in Crook or Weston counties (WOGCC 2012).

Bentonite

The Ross ISR Project is proposed about 40 miles from the primary bentonite deposits in the Northern Black Hills mining district, which includes parts of Butte County, South Dakota, Crook County, Wyoming, and Carter County, Montana (BLM 2008). Existing bentonite mines within 50 miles of the Ross ISR Project are depicted on Figure ER RAI CI-2-1 and described in Table ER RAI CI-2-2. Reasonably foreseeable future bentonite mining projects include expansions of existing mines. As described by BLM (2011a), “As active areas

have been mined out, reclaimed and removed from the … permit over the years, additional acreages have been added through … amendments to the permit."



LEGEND

- PROPOSED ROSS PERMIT BOUNDARY
- 50 MILE RADIUS FROM PROPOSED PERMIT BOUNDARY
- APPROXIMATE LANCE DISTRICT BOUNDARY
- OIL AND GAS FIELD
- PRODUCING CBNG FIELD
- PRODUCING COAL MINE
- BENTONITE MINE OR MILL
- POTENTIAL URANIUM PROJECT
- POTENTIAL RARE EARTH ELEMENTS PROJECT
- POTENTIAL WIND PROJECT

Sources: Bayswater (2012)
BLM (2012)
DOE (2012a and 2012b)
John T. Boyd Company (2010)
WDEQ (2012)
World Industrial Minerals (2007)
WSGS (2012)
Wyoming State Mine Inspector (2010)

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GRAPHIC SCALE (FEET)

STRATA energy

ROSS ISR PROJECT
CROOK COUNTY, WY
P.O. BOX 2318
GILLETTE, WY 82716

REVISIONS	
Date	Description

ER RAI RESPONSE
FIGURE ER RAI CI-2-1

EXISTING AND POTENTIAL MINERAL DEVELOPMENT PROJECTS WITHIN 80 KM OF THE ROSS PROJECT AREA

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Table ER RAI CI-2-1. Active Coal Mines within 50 Miles

Mine Name	Owner	Straight-Line Distance (miles)	Driving Distance (miles)
Belle Ayr Mine	Alpha Coal West, Inc.	40	64
Buckskin Mine	Buckskin Mining Company	29	67
Caballo Mine	Peabody Caballo Coal, LLC	39	68
Coal Creek Mine	Thunder Basin Coal Co. LLC/Coal Creek	45	85
Cordero Rojo Mine	Cloud Peak Energy/Cordero Rojo Mine	42	74
Dry Fork Mine	Western Fuels Wyoming, Inc.	28	53
Eagle Butte Mine	Alpha Coal West, Inc.	30	58
Rawhide Mine	Peabody Energy Rawhide Mine	29	62
Wyodak Mine	Wyodak Resources Development	28	44

Source: Wyoming State Mine Inspector (2010); BLM (2012)

Table ER RAI CI-2-2. Active Bentonite Mines within 50 Miles

Mine Name	Owner	Legal Location	Geographic Coordinates (lat/lon)	Straight-Line Distance (miles)	Driving Distance (miles)
ACC South Dakota	American Colloid Company	Various Sections, T9-10N, R1-2E, Butte County, SD	44.739°N 103.927°W	46-55	80
Alzada North	American Colloid Company	Various Sections, T8-9S, R57-58E, Carter County, MT	45.077°N 104.606°W	35-40	55
Alzada South	American Colloid Company	Various Sections, T9S, R57-58E, Carter County, MT	45.005°N 104.554°W	35-40	45
BPM Colony Mill	Bentonite Performance Minerals LLC	Sec. 11, T56N, R61W, Crook County	44.861°N 104.143°W	44	94
BPM Colony Mine	Bentonite Performance Minerals LLC	Sec. 11, T56N, R61W, Crook County	44.861°N 104.143°W	44	94
BPM Montana	Bentonite Performance Minerals LLC	Various Sections, T9S, R57-58E, Carter County, MT	45.021°N 104.498°W	35-40	45
Colony East Mill	American Colloid Company	Sec. 11, T56N, 61W, Crook County	44.866°N 104.150°W	44	94
Colony West Mill	American Colloid Company	Sec. 3 and 10, T56N, R61W, Crook County	44.870°N 104.161°W	43	94
Oshoto Mine	Black Hills Bentonite	Sec. 34, T54N, R67W	44.618°N 104.889°W	3	5
Thornton Plant	Black Hills Bentonite	Sec. 27, T48N, R65W, Weston County	44.110°N 104.656°W	35	43

Sources: Wyoming State Mine Inspector (2010); WDEQ (2012); BLM (2008, 2011a)

ER RAI CI-2

Please identify and describe any known current and/or proposed projects of any type outside of the Lance District that may cumulatively impact resources impacted by the proposed Ross Project.

B. For each project, please provide the approximate number of employees, the approximate number of vehicles traveling to and from the project per day, and the transportation routes.

In order to assess the cumulative impacts of local, adjacent, and/or nearby operations, those operations must first be identified (in more detail than what is presented in Section 2.2.7 of the ER). For example, if another facility whose purpose is to retrieve other underlying mineral resources is to be constructed and operated in or near the Lance District, then Strata's Proposed Action could compete with the nearby operation for local workers, a socioeconomic cumulative impact. In addition, if there are other facilities near the Ross Project site, the total increase in traffic that would be associated with the construction and operation of the nearby facilities could cause cumulative impacts to transportation. Thus, it is important to identify and describe any current and anticipated projects that may cumulatively impact resources anticipated to be impacted by the proposed Ross Project. The assessment of cumulative impacts is conducted under the authority of 10 CFR Part 51.

ER RAI CI-2(B) Response

For each of the projects identified in the response to ER RAI CI-2(A), the following provides the estimated number of employees, number of vehicles traveling to and from the project per day, and the transportation routes.

The projects identified in the response to ER RAI CI-2(A) are predominantly existing projects that have been in existence for 20 years or more. As described in ER Section 2.2.7.2.1, coal production in the Powder River Basin generally increased from 1989 to 2008 and then declined in 2009. Coal production increased by about 2.5 percent in the Powder River Basin (Campbell County production) from 2009 through 2010 (Wyoming State Mine Inspector 2012). ER Section 3.1.12 describes how oil production within the proposed Ross project area peaked in 1985 to 1986 and has generally declined since then. This response describes how bentonite production within 50 miles of the proposed Ross project area has been relatively steady for the past 15 years. While there are a number of potential future projects identified in the cumulative impact analysis area, the response below shows that the number of employees will be relatively low compared to existing projects. For example, the number of operating employees estimated for potential Lance District uranium projects (including the Proposed Action and potential satellite projects), rare-earth element projects, and wind projects is less than or equal to about 432

employees. By comparison, this response shows that 2010 employment at coal mines and Wyoming bentonite mines alone within the review area totaled 2,737 employees. The socioeconomic impacts of energy-related development in the study area have been ongoing for many years, and the cumulative future impacts are not anticipated to be appreciably different.

This response shows that the potential cumulative transportation impacts will be limited significantly by the primary transportation routes to existing and potential future projects. Of all of the projects analyzed, only the potential future Lance District satellite projects, the potential Elkhorn and Hauber uranium projects, local oil and gas production facilities, and one relatively small bentonite mine are accessed by the primary access route for the Proposed Action. As described in ER Section 3.2.1, the primary access route to or from the proposed Ross project area will be to or from I-90 along D Road (County Road 68) for 18.3 miles, then on the New Haven Road (County Road 164) for 3.0 miles to the proposed Ross ISR Project primary access road. Page 3-27 of the ER describes how the affected portion of D Road (from south to north) includes 3 miles of pavement, followed by 7.3 miles of reclaimed asphalt pavement, followed by an all-weather gravel road. The affected portion of the New Haven Road is an all-weather crushed shale road. Strata has executed an MOU with Crook County to assist with dust control, road maintenance, and speed limit controls on the primary access route. Virtually all traffic associated with the proposed Ross ISR Project will use this primary access route, such that no impacts will occur to local roads north, east, or west of the proposed Ross ISR Project.

Uranium - Potential Additional Lance District Projects

Number of Employees

The anticipated maximum workforce is 220 workers for the entire Lance District. This includes 60 workers during operation of the proposed Ross ISR Project (ER Table 4.2-1) plus 70 wellfield construction workers at each of two additional potential satellite projects, plus 20 wellfield operators at one of the additional potential satellite projects. The number of workers at the proposed Ross ISR Project was estimated based on the maximum yellowcake production rate of 3 million pounds per year and will not be increased with additional potential Lance District satellite projects.

Transportation Route

The transportation route to the potential Lance District satellite projects will be approximately the same as that for the proposed Ross ISR Project: travel north from I-90 at Moorcroft along the D Road and the New Haven Road to one of the additional primary access roads. Potential transportation impacts will be mitigated under the existing MOU with Crook County that addresses dust control, road maintenance, and speed limits.

Number of Vehicles

The number of passenger vehicles could be as high as about 440 trips per day, based on a peak workforce of around 220 workers and the very conservative assumption that each worker would commute alone. ER page 4-18 describes how the conservative assumption is made that each construction worker for the Proposed Action will travel in a separate passenger vehicle. While this assumption is believed to be very conservative, it is not unreasonable given that most of the workers at various periods of construction will not be Strata employees, but will be contractors who may or may not carpool. During operation of the proposed Ross ISR Project, nearly all of the worker-related traffic will result from Strata employees, who will be much more likely to carpool or participate in a park and ride system if available. ER page 5-15 describes how Strata will investigate the feasibility of park and ride system from Gillette or Moorcroft, particularly during operation when employment levels will be relatively high and worker schedules will be relatively static. Therefore, the assumption that each Lance District worker will commute alone is very conservative. Transportation of chemicals and supplies to the CPP and yellowcake and waste materials from the CPP discussed in ER Section 4.2 are based on the maximum yellowcake production rate of 3 million pounds per year; therefore, there will be no increase in the operational shipments beyond what was described previously. There will be additional shipments of construction supplies to the other facilities, but these are not expected to increase above the maximum shipments for the proposed Ross ISR Project in ER Table 4.2-1 (24 heavy truck trips per day during construction).

Schedule

Please refer to the response to ER RAI CI-1(B). Operation of all potential Lance District project, including the proposed Ross ISR Project and potential satellite projects, is estimated to last 11 to 18 years.

Uranium - Potential Aladdin Project

Number of Employees

Since the potential Aladdin project likely will be a satellite facility to Powertech (USA)'s Dewey-Burdock Project, the number of employees will likely be limited to those required to construct and operate the wellfield and satellite facility. Assuming the number of employees is similar to that required to operate the Dewey Satellite Facility, the estimated number is 40. This includes geologists, wellfield engineers, wellfield operating personnel, maintenance personnel, and satellite facility operators. The number required for initial construction of the satellite facility and initial wellfields likely will be higher. It is assumed that the construction workforce might total approximately 50 to 100 workers, based on Powertech (USA)'s estimated workforce of 86 employees during construction of the Dewey-Burdock Project (Powertech (USA) 2009).

Transportation Route

The potential Aladdin Project is about 5 to 10 miles north of U.S. Highway 24. Access likely will be from I-90, then approximately 9 miles north on Wyoming Highway 111 and then approximately 2 miles east to a gravel Crook County access road. The transportation route will not coincide with the primary access route for the proposed Ross ISR Project except for traffic traveling along I-90. Therefore, no cumulative transportation impacts will occur.

Number of Vehicles

Based on an estimated operating workforce of around 40 workers, the estimated number of vehicle trips, including passenger vehicles and material shipments, is up to approximately 100 vehicles per day during operations. The number of vehicles may be up to twice this amount during construction.

Schedule

As described in ER Section 3.1.8, the potential Aladdin project has yet to be developed as licensing activities are currently focused on Powertech (USA)'s Dewey-Burdock and Centennial Projects. According to the Sundance Times (Pridgeon n.d.), Mark Hollenbeck, Project Manager for Powertech (USA)'s Dewey-Burdock Project, indicated that "There are no current plans to drill at the Wyoming sites, although both are considered to be 'very promising properties.' We're not yet sure of the timescale, it's dependent on regulation and permitting." According to NRC (2012a), a letter of intent has not been filed to license the potential Aladdin Project.

Uranium - Potential Elkhorn Project

Number of Employees

The number of employees at the potential Elkhorn Project will depend on the mining methods and whether the project is operated as a satellite facility for an ISR CPP or conventional mill. As described previously, shallow resources may be recoverable by open-pit mining or by hydraulic borehole mining, while deeper resources may be recoverable by ISR, underground mining, or hydraulic borehole mining. Each of these mining techniques will have different employee requirements. Further, several processing methods are being considered, including conventional acid leach milling, heap leaching, vat leaching, or ion exchange. As described in the 43-101 technical report, "Much work remains to be done in order to identify optimal methods." Due to the uncertainty in mining and milling techniques, no estimate of the number of employees is available at this time.

Transportation Route

From the west, the primary transportation route will be north from I-90 at Moorcroft for approximately 18 miles on D Road (CR 68), then north on the New Haven Road for approximately 16 miles, then north on additional county roads and site access roads. From the east the primary transportation route will be through Hulett on Wyoming Highway 24, then west on the New Haven Road, then north on additional county roads and site access roads.

According to the 43-101 technical report, Hulett is the nearest town to the project site and food, lodging, fuel and other basic necessities can be

obtained in Hulett. Gillette, Wyoming is approximately 75 miles southwest and will have all services necessary for the potential mining operation. Since Hulett has been identified as the nearest town and much of the traffic will access the potential Elkhorn project from the east, potential cumulative transportation impacts to the Proposed Action will be limited to the traffic from the west.

Number of Vehicles

No estimate is currently available of the number of vehicles required for the potential Elkhorn Project due to the uncertainty in uranium recovery and processing methods.

Schedule

No estimate of the potential project schedule is currently available.

Uranium - Potential Hauber Project

Number of Employees

Due to the uncertainty in mining and milling techniques, no estimate of the number of employees is available at this time. Like the potential Elkhorn Project, additional work is required to determine the best uranium recovery and processing methods for the potential Hauber Project.

Transportation Route

From the west, the primary transportation route will be north from I-90 at Moorcroft for approximately 18 miles on D Road (CR 68), then north on the New Haven Road for approximately 16 miles, then north on additional county roads and site access roads. From the east the primary transportation route will be through Hulett on Wyoming Highway 24, then west on the New Haven Road, then north on additional county roads and site access roads.

According to the 43-101 technical report, Hulett is the nearest town to the project site and food, lodging, fuel and other basic necessities can be obtained in Hulett. Gillette, Wyoming is approximately 75 miles southwest and will have all services necessary for the mining operation. Like the potential Elkhorn project, potential cumulative transportation impacts to the Proposed Action will be limited to traffic from the west that travels on the Proposed Action primary access route.

Number of Vehicles

No estimate is currently available of the number of vehicles required for the potential Hauber Project due to the uncertainty in uranium recovery and processing methods.

Schedule

No estimate of the potential project schedule is currently available.

Uranium - Potential Alzada Project

Number of Employees

No estimate of the potential number of employees is currently available.

Transportation Route

The potential Alzada project is accessed by driving northwest from the town of Belle Fourche, South Dakota, along U.S. Highway 212 about 60 miles to the town of Alzada, Montana. The transportation route does not coincide with the primary access route for the proposed Ross ISR Project. Therefore, no cumulative transportation impacts will occur.

Number of Vehicles

No estimate is currently available of the number of vehicles required for the potential Alzada Project.

Schedule

No estimate of the potential project schedule is currently available.

Bear Lodge Rare-Earth Elements Project

Number of Employees

The maximum number of employees is projected to be 114 to operate the mine, including 99 hourly and 15 supervisory and technical employees. Up to 78 additional people will be required to operate the processing plant, including supervision, maintenance and operational support personnel. The total estimated work force is therefore up to 192 employees. Housing, food, fuel, etc.

would be available in Sundance, Wyoming, Spearfish, South Dakota, or Gillette, Wyoming (John T. Boyd Company 2010).

Transportation Route

The project site is reached by traveling west from Sundance about 1 mile along I-90, then northwest 1.5 miles on U.S. Highway 14, then north on the paved Sundance-Warren Peaks Road (USFS road #838 and County Road 100) for 7.4 miles, then 3.2 miles on gravel roads. Supplies will be trucked from Gillette (60 miles west) or from the BNSF rail line in Moorcroft, which is 34 miles west of Sundance (John T. Boyd Company 2010). The transportation route will not coincide with the primary access route for the proposed Ross ISR Project except for traffic traveling along I-90. Therefore, cumulative transportation impacts will not occur.

Number of Vehicles

Using the very conservative assumption that each employee drives to and from the project site each day, the total number of passenger vehicle trips per day could be approximately 400 during peak production. Additional vehicles will transport chemicals such as sulfuric acid, hydrochloric acid and oxalic acid, water treatment chemicals, and maintenance supplies to the site. Vehicles also will transport the final product (rare-earth oxides and potentially, gold) and waste materials from the project site.

Schedule

Construction potentially will commence in 2014, with initial production in 2015. The anticipated mine life is approximately 20 years (John T. Boyd Company 2010).

<u>Wind Energy - Potential Weston I Wind Project</u>

Number of Employees

Strata estimated the number of employees for this wind project through comparison with another Wyoming wind project, the Sand Hills Wind Energy Facility (BLM 2011b). BLM estimates that the workforce required to construct the Sand Hills project will be 110 to 120 workers per day during construction, which is anticipated to take 6 months. The Weston I Project potentially is larger than the Sand Hills Project, which will include up to 25 wind turbines. It is

assumed that the construction workforce will be the same (110 to 120 workers) but over a longer time period, likely 1 to 2 years.

During operation, the Sand Hills project is expected to employ up to 10 workers, including 1 office administrator, 1 foreman, and up to 8 windsmiths/electricians. By comparison, it is estimated that the Weston I Project could employ up to 20 workers due to its larger size.

During decommissioning, the workforce likely will be similar to or smaller than that required for construction.

Transportation Route

Access to the Weston I Wind Project will be from State Highway 116, approximately 12 miles southwest of Upton, Wyoming. The transportation route will not coincide with the proposed Ross ISR Project primary access route. Therefore, cumulative transportation impacts will not occur.

Number of Vehicles

According to BLM (2005), activities associated with wind turbine erection include worker traffic on access roads, traffic associated with transportation of the dismantled crane to and from the site, delivery traffic associated with delivery of tower sections and turbine parts, and transportation of the crane between tower sites. During operation, traffic will be associated with maintenance operations, routine worker access, infrequent heavy overhaul/repairs, and possibly routine brush cleaning. During decommissioning, the construction process essentially will be reversed, with many of the same traffic operations.

BLM (2005) indicates that during operations, larger sites may be attended during business hours by a small maintenance crew of six individuals or fewer. "Transportation activities would be limited to a small number of daily trips by pickup trucks, medium-duty vehicles, or personal vehicles." Heavy truck shipments, such as those required for large component replacement, will be infrequent. Traffic during construction and decommissioning will be higher due to shipments of materials, such as gravel, concrete, and water, and due to a larger workforce.

BLM (2011b) estimates that up to 7,470 truck round trips would occur during construction of the Sand Hills facility, including 390 trips for turbine

components. This is equal to about 42 round trips per day during the 6-month construction period. Since the Weston I Project is not estimated to require a larger construction workforce, the number of daily trips is estimated at 42 round trips per day during construction.

Schedule

According to BLM (2005), construction activities for a typical wind project last for 1 to 2 years. The Wyoming wind farm analogue, the Sand Hills facility, is expected to have an operational life of 30 years or more. It is assumed the Weston I Project will have a similar operational life. No information could be obtained on when construction of the Weston I Project will commence.

Coal Mines

Number of Employees

Table ER RAI CI-2-3 describes the employment and tons of coal produced from active coal mines within 50 miles of the project area in 2010 (Wyoming State Mine Inspector 2010).

Transportation Route

The primary transportation routes to the active coal mines include I-90, Wyoming Highway 59, and U.S. Highway 14/16 from Gillette, Wyoming. These transportation routes do not coincide with the proposed Ross ISR Project primary transportation route except for vehicles using I-90. Therefore, cumulative transportation impacts will not occur.

Number of Vehicles

The number of vehicles accessing active coal mines is less than the number of employees, since ride sharing and employee transport buses are widely used, and these significantly reduce the number of vehicles associated with active coal mines.

Schedule

As described in ER Section 2.2.7.2.1, coal production in the Powder River Basin increased from 1989 to 2008, then declined slightly in 2009. BLM (2009) predicts a modest increase of about 20 percent in Powder River Basin coal production from 2010 through 2020. This will be accomplished through

ongoing coal lease sales, which as described in ER Section 2.2.7.2.1, are consistent with the BLM's objective of maintaining production at existing mines.

Aside from lease sales adjacent to existing mines, which are anticipated to maintain operations in the foreseeable future, Strata is not aware of any major expansions or new coal mines proposed within 50 miles of the proposed Ross ISR Project.

Oil and Gas

Strata is not aware of any plans for future oil and gas production activities near the proposed Ross project area. Existing production facilities are accessed through the local transportation network. As described in on page 2-29 of the ER, oil in this area is produced from the Minnelusa Formation, which lies more than a mile deeper than the uranium mineralization in the proposed Ross ISR Project. The Minnelusa Formation is also well above the Deadwood and Flathead formations targeted by the Class I deep disposal wells (ER page 3-49). No impacts to the Minnelusa Formation will occur as result of ISR operations or deep disposal of liquid waste.

Bentonite Mines and Mills

Number of Employees

Table ER RAI CI-2-4 describes the employment and tons of bentonite produced from active Wyoming bentonite mines and processing plants within 50 miles of the proposed Ross project area in 2010. Information on Montana and South Dakota bentonite mine employment and production was unavailable for 2010. According to BLM (2011a), the American Colloid Company employs 43 people in its Wyoming, Montana and South Dakota field operations shown on Table ER RAI CI-2-2 (excluding the plants and mills).

Transportation Route

The majority of bentonite mines and plants are in the Colony area, where access is by US Highway 212 and does not coincide with the primary access route for the proposed Ross ISR Project. The only exceptions are the Black Hills Bentonite Oshoto Mine and Thornton Plant. As described in ER Section 3.7.1, highway-legal trucks (as opposed to heavy mine haul trucks) transport bentonite from the Oshoto Mine site to the processing and packaging plant in

Upton. The transportation route between the mine and plant includes portions of D Road and the New Haven Road on the proposed Ross ISR Project primary access route. It also includes roads north and east of the proposed Ross ISR Project primary access route that will not be used by the proposed Ross ISR Project.

Number of Vehicles

The estimated number of vehicle trips per day traveling to and from the Oshoto Mine is 8 passenger vehicles (based on 4 employees in 2010) and 10 haul truck trips (based on ER Table 3.2-3, Site 2).

Schedule

Table ER RAI CI-2-5 presents the bentonite production and historical number of employees for the various Wyoming mines within 50 miles of the proposed Ross ISR Project. Production has been relatively steady over the past 15 years. There has been a recent drop in production and employment at the American Colloid Company mills, which has been partially offset by a gradual increase in employment at the Bentonite Performance Minerals and Black Hills Bentonite facilities. Based on the 15-year recent trend, future production and employment are expected to remain steady or decrease slightly in the foreseeable future.

Table ER RAI CI-2-3. Employment and Production at Active Coal Mines within 50 Miles

Mine Name	Owner	No. Employees in 2010	2010 Coal Production (million tons)
Belle Ayr Mine	Alpha Coal West, Inc.	350	25.8
Buckskin Mine	Buckskin Mining Company	353	25.5
Caballo Mine	Peabody Caballo Coal, LLC	389	23.5
Coal Creek Mine	Thunder Basin Coal Co. LLC/Coal Creek	155	11.4
Cordero Rojo Mine	Cloud Peak Energy/Cordero Rojo Mine	608	38.5
Dry Fork Mine	Western Fuels Wyoming, Inc.	71	5.4
Eagle Butte Mine	Alpha Coal West, Inc.	308	23.2
Rawhide Mine	Peabody Energy Rawhide Mine	180	11.2
Wyodak Mine	Wyodak Resources Development	122	5.9
Total		2,536	170.4

Source: Wyoming State Mine Inspector (2010).

Table ER RAI CI-2-4. Employment and Production at Active Wyoming Bentonite Mines and Plants within 50 Miles

Mine Name	Owner	No. Employees in 2010	2010 Bentonite Production (tons)
Colony East Mill	American Colloid Company	39	646,625
Colony West Mill	American Colloid Company	48	435,603
BPM Colony Mill	Bentonite Performance Minerals LLC	83	434,326
BPM Colony Mine	Bentonite Performance Minerals LLC	19	625,970
Oshoto Mine	Black Hills Bentonite	4	96,755
Thornton Plant	Black Hills Bentonite	8	87,160
Total		201	1,603,714 (plant) 722,725 (mine)

Source: Wyoming State Mine Inspector (2010)

Table ER RAI CI-2-5. Production and Employment History of Wyoming Bentonite Mines and Plants within 50 Miles

	Colony East & West[1]		BPM Colony[2]		Oshoto Mine		Thornton Plant	
Year	**Prod. (tons)**	**Empl.**	**Prod. (tons)**	**Empl.**	**Prod. (tons)**	**Empl.**	**Prod. (tons)**	**Empl.**
1995	1,263,029	119	578,778	83	---	---	---	---
1996	1,332,919	125	465,339	85	---	---	---	---
1997	1,190,884	135	494,965	85	---	---	---	---
1998	1,247,608	142	629,966	81	---	---	---	---
1999	1,133,885	145	499,043	78	---	---	---	---
2000	1,310,374	152	466,294	80	984	1	---	---
2001	1,423,393	152	437,717	78	21,620	2	---	---
2002	1,370,244	144	494,649	76	48,477	3	---	---
2003	unavail.	147	470,231	76	29,816	3	23,288	2
2004	1,584,526	151	510,284	77	37,896	2	37,864	2
2005	1,222,566	152	667,738	82	52,090	2	38,571	2
2006	1,751,457	158	757,309	96	73,867	3	61,981	4
2007	1,736,201	164	729,384	101	6,906	4	13,632	4
2008	1,866,450	160	634,684	105	58,613	7	52,812	8
2009	942,806	92	368,837	84	77,468	4	73,448	8
2010	1,082,228	87	625,970	102	96,755	4	87,160	8

Source: Wyoming Mining Association (2012)

Notes: [1] Production and employment: mine plus Colony East and West Mills

[2] Production: mine only; employment: mine and mill

Land Use

ER RAI LU-1

Please identify current land use at the Ross Project site.

A. Please determine whether persons hunt and/or fish on the Ross Project site.

The ER indicates that hunting would be possible on the Bureau of Land Management (BLM) land within the Ross Project site, except that there is no public access to that portion of the Site (Section 3.1.6). However, there does appear to be access to the State-owned land within the boundaries of the Ross Project site, as noted by Strata in the ER on page 3-8. The ER on page 3-8 also indicates that public fishing opportunities are very limited in the proposed project area. However, during the August 2011 site visit, NRC staff learned fishing was reported to have occurred at the Oshoto Reservoir. Further, Section 4.12 in the ER provides information regarding agricultural metrics at the Ross Project site, and Figures 3.1-1 and 3.1-2 provide an overview of regional and local land uses. However, a current inventory of actual agricultural uses is needed to evaluate land use impacts. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI LU-1(A) Response

ER Sections 3.1.3 through 3.1.6 describe the land use categories in detail. Hunting and fishing are included in Section 3.1.6 as recreational uses on the proposed project area. Section 3.1.6 indicates that State and BLM-administered federal lands are open to hunting *if legal access is available*. Only 20.6 percent of the project area land surface is publicly owned. As shown in ER Table 3.1-1, this includes 314.1 acres of State-owned land surface and 40.0 acres of BLM-administered federal land. Section 3.1.6 further states that that State land can be accessed via County Road 193 but the BLM land cannot be accessed by public road. Thus, hunting opportunities are limited on public lands due to the small percentage of public lands within the area and due to limited access. Hunting may occur on private land within the project area, at the discretion of the landowner. Oshoto Reservoir does support a limited fishery, but fishing opportunities are reduced in that black bullheads and green sunfish are the only game fish species present. These species are not highly sought after at Oshoto Reservoir, because the individuals are stunted in size for their age due to high reproductive rates and limited predation.

ER RAI LU-1

Please identify current land use at the Ross Project site.

B. Please identify all current agricultural uses of the Ross Project site, including the crop(s) planted, the size of the area(s) planted, the growing season(s), and the nature of the agriculture (i.e., irrigated or dry land).

The ER indicates that hunting would be possible on the Bureau of Land Management (BLM) land within the Ross Project site, except that there is no public access to that portion of the Site (Section 3.1.6). However, there does appear to be access to the State-owned land within the boundaries of the Ross Project site, as noted by Strata in the ER on page 3-8. The ER on page 3-8 also indicates that public fishing opportunities are very limited in the proposed project area. However, during the August 2011 site visit, NRC staff learned fishing was reported to have occurred at the Oshoto Reservoir. Further, Section 4.12 in the ER provides information regarding agricultural metrics at the Ross Project site, and Figures 3.1-1 and 3.1-2 provide an overview of regional and local land uses. However, a current inventory of actual agricultural uses is needed to evaluate land use impacts. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI LU-1(B) Response

Land use discussions contained in ER Section 3.1 (including land use classifications and acres) are based on USGS land use mapping and represent general land use categories on a regional scale. As designated by the USGS, the current agricultural uses within the project area are mixed rangeland/herbaceous rangeland (livestock production) and cropland and pasture (crop production). The site-specific vegetation analysis (ER Section 3.5.4.1) utilized a mapping unit system to classify vegetation approved by WDEQ that is slightly different than the land use classification utilized by the USGS. As such, the nomenclature used to describe the USGS land use types and Strata vegetation types are different. The acres included in each type are also slightly different since the vegetation sampling provided a more accurate delineation. Table ER RAI LU-1-1 offers a comparison between the USGS land use classifications and the delineated vegetation mapping units under the WDEQ-approved classification system with the proposed project area.

A majority of the land within the proposed project area is used as mixed or herbaceous rangeland. Rangeland is used primarily for livestock grazing (livestock production) and is dominated by native grasses and shrubs, including needleandthread, western wheatgrass, bulbous bluegrass, Kentucky

bluegrass, buffalograss, prairie junegrass, big sagebrush, and silver sagebrush. The growing season is normally between April and early September. This area has not been seeded and is considered agricultural only because of livestock grazing.

The remaining agricultural land within the proposed project area is used for cropland (including hayland) and pasture. Cropland is primarily seeded to dryland (not irrigated) wheat, but it has also been used for the production of oats and barley in the past. This area is typically seeded annually. Winter wheat generally is planted in early September in this region. Spring wheat, oats, and barley generally are planted in early April. The harvest for wheat, oats, and barley typically is from mid-July through mid-August.

The hayland type is dominated by perennial grass species, including smooth brome, crested wheatgrass and alfalfa. This area produces a dryland crop used for forage and is only seeded occasionally to reestablish preferred vegetation. The growing season normally is between April and early September.

The pastureland type is dominated by perennial grass species, which include intermediate wheatgrass, smooth brome, crested wheatgrass, bulbous bluegrass, and western wheatgrass. This area is dryland agriculture and is only seeded occasionally to reestablish preferred vegetation. The growing season normally is between April and early September. Even though this type primarily is grazed, it is considered a cropland because it is hayed occasionally.

As described in ER Section 3.1.4, irrigation water rights are associated with 70 acres of land within the proposed project area, but crop production is currently limited to dryland farming.

Table ER RAI LU-1-1. Comparison of USGS Agricultural Land Use Types and Strata Vegetation Mapping Units (Acres)

USGS Land Use Type		**Vegetation Mapping Unit**	
Mixed Rangeland	1,019.4	Upland Grassland	917.6
Herbaceous Rangeland	369.0	Sagebrush Shrubland	377.1
Cropland and Pasture	244.0	Pastureland	125.9
		Hayland	121.2
		Cropland	48.7
	Total 1,632.4		Total 1,590.5

ER RAI LU-1

Please identify current land use at the Ross Project site.

C. Please indicate whether any of the nearby residents identified in the ER grow vegetable gardens.

The ER indicates that hunting would be possible on the Bureau of Land Management (BLM) land within the Ross Project site, except that there is no public access to that portion of the Site (Section 3.1.6). However, there does appear to be access to the State-owned land within the boundaries of the Ross Project site, as noted by Strata in the ER on page 3-8. The ER on page 3-8 also indicates that public fishing opportunities are very limited in the proposed project area. However, during the August 2011 site visit, NRC staff learned fishing was reported to have occurred at the Oshoto Reservoir. Further, Section 4.12 in the ER provides information regarding agricultural metrics at the Ross Project site, and Figures 3.1-1 and 3.1-2 provide an overview of regional and local land uses. However, a current inventory of actual agricultural uses is needed to evaluate land use impacts. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI LU-1(C) Response

As outlined in Section 2.9.2.9 of the TR, one vegetable garden was sampled for baseline radiological characterization. This garden was at a residence located in the NWNW Section 20, T53N, R67W. This residence, depicted on ER Figure 3.1-3, is approximately ¼ mile outside of the proposed license boundary and approximately ½ mile from the proposed CPP. Vegetation, crop, and food product sampling locations are depicted on TR Figure 2.9-31. No other vegetable gardens were identified within 2 km of the proposed project area in 2010.

Transportation

ER RAI TR-1

Please provide information on the projected increase in traffic on local roads due to toll milling.

On page 1-4 of the ER, Strata indicates that it proposes to receive uranium-loaded ion exchange resins from satellite ISR facilities. It is expected that this toll milling will potentially increase the traffic volume and dust generation on the local roads. This information is necessary to inform the NRC's environmental impact analysis, as required by 10 CFR Part 51.

ER RAI TR-1 Response

As referenced in the basis for this RAI, ER Section 1.1, pg. 1-4 states that Strata proposes to receive uranium-loaded IX resin from satellite ISR facilities, including those owned and/or operated by Strata and those owned and/or operated by other ISR licensees, and from other water treatment entities generating uranium-loaded IX resins that are the same or substantially similar to those generated at ISR facilities.

ER Section 4.2.1.2 addresses potential traffic impacts related to shipping uranium-loaded IX resin. Specifically, pg. 4-24 notes that based on a maximum annual processing rate of 2.25 million pounds of U_3O_8 equivalent derived from uranium-loaded IX resin and an estimated 1,500 pounds U_3O_8 equivalent per load, up to 4 shipments could be made to the facility each day. Since there would be 2 one-way trips per load, up to 8 one-way trips per day could occur. ER Table 4.2-1 estimates that the total heavy truck traffic during operations will be 16 vehicles per day on local roads. This number includes the uranium-loaded resin shipments, which could account for up to 50 percent of the total heavy truck traffic trips during operation. Based on a total estimated vehicle count of 136 vehicles per day during operations (ER Table 4.2-1, including passenger vehicles and heavy truck traffic), the uranium-loaded IX resin shipments could contribute up to about 6 percent (8 of 136) of the total vehicle trips per day on local roads.

Potential impacts associated with receiving uranium-loaded IX resin are addressed in a draft regulatory issue summary (RIS) issued by NRC in February 2011 (NRC 2011). When approved, this RIS will allow a licensee to receive and process, without a license amendment, equivalent uranium-loaded IX resin feed as long as the existing limits on production of uranium in the

license are not exceeded and the processing is within the safety and environmental review envelope. Further, in the Environmental Assessment for R.M.D. Operations, LLC Performance-Based, Multisite License for a Uranium Water Treatment Program (NRC 2006), NRC staff reviewed and agreed with the conclusions in the associated Environmental Report that, "The radiation doses from uranium-bearing water treatment resins under normal and spill conditions in the water treatment plant and transportation are, in general, negligible and in the range of background variability."

Additional information about potential traffic related to resin shipments is provided in the response to ER RAI AQ-1, including the anticipated time of day, type of trucks, and estimated combustion emissions.

ER RAI TR-2

Please clarify the specific types and sizes of vehicles (e.g. type of truck) that will travel on the Ross Project site roads, on which roads, during which of the four phases of the project, as well as the time of day that this travel will occur.

The information provided in the ER for some shipment types is more detailed than the information provided for other shipment types. For example, the specific type of truck is provided for loaded resin shipments and a representative transportation route is provided for yellowcake shipments; however, this level of detail is not provided for vanadium shipments. Additionally, the time of day of the increased traffic is important because traffic at night could be more of a consideration for wildlife impacts. This information would support the NRC's environmental impact analysis as required by 10 CFR Part 51.

ER RAI TR-2 Response

Please refer to the response to ER RAI AQ-1, which estimates the type of vehicles, frequency of trips, and time of day for passenger vehicles and material shipments during each project phase. The response includes a detailed justification of the anticipated percentage of daytime versus nighttime activities for passenger vehicle trips and material shipments.

Virtually all of the vehicle trips described in the response to ER RAI AQ-1 will occur on the primary access route for transporting materials to and from the proposed project area. As described in ER Section 4.2.1, the primary access route includes traveling to or from Interstate 90 along D Road for 18.3 miles, then continuing along the New Haven Road 3.0 miles to the proposed Ross ISR Project primary access road. If Strata develops satellite ISR projects within the Lance District, uranium-loaded resin could be shipped from those facilities to the CPP at the proposed Ross ISR Project. In this case those shipments would travel on access roads from the satellite facilities to D Road or the New Haven Road and then to the proposed Ross ISR Project primary access road.

Please refer to the response to ER RAI CI-2(B), which describes how Strata has executed an MOU with Crook County to assist with dust control, road maintenance, and speed limit controls on the primary access route. Virtually all traffic associated with the proposed Ross ISR Project will use this primary access route, such that no impacts will occur to local roads north, east, or west of the proposed Ross ISR Project.

During all project phases, most vehicle trips to and from the site will not use roads within the project area other than the primary access road and the CPP area roads. Exceptions will include wellfield equipment and worker vehicle trips to wellfield staging areas, which primarily will occur during construction and decommissioning. The estimated annual operating hours of all vehicles and mobile equipment during each project phase are provided in the air quality permit application (Strata 2011).

Vanadium shipments, if vanadium is recovered as a side stream to yellowcake, will proceed from the proposed Ross ISR Project to I-90 along the primary access route. From I-90, shipments will proceed to a vanadium processing facility, the location of which has yet to be determined. Vanadium shipments will occur very infrequently (between 0 and 45 shipments annually as described in ER Section 4.2.1.2).

Water Resources

ER RAI WR-1

Please provide an estimate of the average and peak runoff (discharge) volumes from the paved areas at the proposed facility.

Storm-water runoff will be generated at the Ross Project site due to Strata's potential conversion of undeveloped land to buildings, parking lots, roads, and other paved, impermeable surfaces. It is expected that storm-water runoff will be most significant at the facility near the central processing plant (CPP). Depending on how this runoff is managed, there may be flow-quantity and water-quality impacts to surface water and/or ground water. Storm-water-related information will be used to describe the storm-water's characteristics, potential environmental impacts, and any necessary mitigation measures as required by 10 CFR Part 51.

ER RAI WR-1 Response

Stormwater runoff in the CPP area will be collected and stored in a sediment pond. The 10-year and 100-year peak discharges and volumes for the CPP area were computed using the rainfall/runoff program Trihydro using an SCS type II rainfall distribution. The contributing drainage area for the CPP area is estimated at 13.8 acres and includes parking lots, buildings and the bermed area around the sediment pond. The curve number of 91 is assigned based on the hydrologic soil-cover complexes for an industrial district, as described in Table 3.18 of *Hydrologic Analysis and Design* (McCuen 1941). The hydrologic storm calculations ignore any loss due to infiltration, which results in a conservatively high estimate. Runoff is estimated using a 10-year, 24-hour rainfall event with a precipitation amount of 2.8 inches (ER Table 3.4-4). The estimated peak discharge is 30.2 cfs, and the estimated runoff volume is 2.0 ac-ft. The 100-year peak runoff is estimated using a 100-year, 24-hour storm with a precipitation amount of 4.2 inches (ER Table 3.4-4). The estimated peak discharge and volume are 49.6 cfs and 3.4 ac-ft, respectively. The sediment pond will be designed to contain the runoff from the 100-year, 24-hour runoff event.

The preliminary design of the CPP stormwater runoff infrastructure has been updated to specify that the areas directly adjacent to the CPP will be either asphalt pavement or gravel. In addition, the stormwater runoff infrastructure will consist of V-ditches, trapezoidal ditches, and concrete culverts to route drainage in the CPP area to the sediment pond.

As described in ER Section 5.4.1.1 and described further in the response to ER RAI GEN-1(B), the final mitigation plan for stormwater management and sediment control will be addressed in two SWPPPs that will be prepared and submitted to WDEQ/WQD for coverage under construction and industrial WYPDES stormwater permits. The final approved SWPPPs and WYPDES stormwater permits will be available for NRC inspection.

ER RAI WR-2

Please provide additional information on non-production water use during all phases of the Proposed Action.

A. Please estimate the volumes of non-production water [e.g., that used for domestic consumption, dust control, and irrigation] to be used by Strata during each of the four phases of the Proposed Action.

Section 4.4 of the ER and Addendum 2.7-H of the TR describe water uses associated with uranium recovery, other industrial uses, and stock watering; however, other non-production water uses such as domestic consumption should be evaluated as well. These uses may vary during the different phases of the Proposed Action, and they may depend upon other factors, such as the size of the workforce or seasonal dust-control requirements. Information regarding water use is necessary to evaluate potential impacts to the water supply during the environmental impact evaluation as required by 10 CFR Part 51.

ER RAI WR-2(A) Response

Following is an estimate of non-production water usage during each project phase. Non-production water usage will include domestic usage, dust control, irrigation, and construction. The estimated quantity of non-production water usage during each project phase is summarized in Table ER RAI WR-2-1.

Domestic Usage

Strata plans to permit, construct, and operate a public water supply system at the Ross ISR Project. The system will be classified as a public water supply system because it will serve more than 25 individuals daily for more than 60 days per year. As described in revised ER Table 1.6-1 provided with the response to ER RAI GEN-2(A), the public water supply system will be permitted through EPA and will be operated in accordance with EPA and WDEQ/WQD standards, but the construction permit application will be submitted to WDEQ/WQD.

The public water supply system will provide domestic water to sinks, toilets, showers, laundry and laboratory facilities. It also is expected to provide vehicle wash water in the maintenance shop.

Average domestic water usage for toilets and sinks is estimated as 13 gallons per day (gpd) per worker as described in ER Section 4.13.1.1.2.4. During construction and decommissioning, the per capita usage rate is estimated to be half of that amount (6.5 gpd per worker) since sinks and toilets

will not be available during a significant portion of each of these project phases. The domestic usage estimates associated with sinks and toilets are obtained by multiplying the average per capita usage rate times the number of workers in ER Table 4.2-1. For example, during construction, up to 200 workers are expected. The estimated domestic usage rate for sinks and toilets is 6.5 gpd times 200 workers, which is equal to 1,300 gpd or 0.9 gpm.

Shower, laundry, laboratory, and vehicle wash water is estimated at 2,000 gpd during operation, aquifer restoration, and decommissioning. This number is based on typical water consumption rates for various activities from EPA (2002) and the estimated number of activities per day (e.g., number of showers, laundry loads, etc.). Specifically, the 2,000 gpd estimate is a conservatively high estimate based on the following:

- 600 gpd from showers (40 showers per day times 15 gallons per shower);
- 60 gpd from laboratory faucets (2 hours per day times 0.5 gpm);
- 162 gpd from laundry facilities (4 loads per day times 40.5 gallons per load); and
- 1,000 gpd from vehicle wash (5 vehicles per day times 200 gallons per vehicle).

Overall, the domestic usage is estimated to range from about 1,300 gpd (0.9 gpm) during construction to about 2,800 gpd (1.9 gpm) during operation.

Dust Control

As described in the air quality permit application (Strata 2011), water will be applied to project area roads and to disturbed areas to minimize dust. The estimated dust control water usage for project area roads is 9,000 gpd (6.3 gpm) during approximately May through November. This estimate is based on applying 0.1 inch of water twice per day to 0.8 mile of road 16 feet wide. The 0.8-mile length represents approximately 20 percent of the estimated secondary access road length within the project area. It does not include the primary access road or the CPP area roads, which will be treated with magnesium chloride. The 20 percent factor accounts for the majority of wellfield access roads that will not be in use at any one time and seasonal precipitation which will make dust control unnecessary during certain times of the year. The annualized usage is estimated at 3.6 gpm, including approximately 5 months per year when dust control will not be necessary due

to snow cover, frozen conditions or high soil moisture levels. This usage estimate is doubled during construction and decommissioning to estimate the water applied to disturbed areas for dust control.

Irrigation

Strata anticipates that irrigation will be limited to watering trees around the CPP area, likely using a drip irrigation system. The approximate tree locations are depicted on ER Figure 1.2-5. The Cheyenne Department of Urban Forestry (2012) recommends applying water at a rate of 10 gallons per inch of trunk diameter every 5 to 7 days during warm summer months and once per month during winter. Assuming 50 2-inch diameter trees are watered every 10 days throughout the year at an application rate of 20 gallons per tree, the estimated irrigation water usage is 100 gpd or approximately 0.1 gpm on an annual average basis.

Construction

Water will be used during construction for well drilling and development and wetting compacted fill. As described in ER Section 4.13.1.1.2.2, the quantity of water used during drilling and well development is estimated to average approximately 6,000 gallons per well. Since up to approximately 12 drilling rigs will be in operation during construction (ER Section 4.9.1.1) and assuming that each well will take 6 days to drill and develop, the estimated water usage during wellfield construction is up to 12,000 gpd (8.3 gpm). Water usage for wellfield development will continue through much or most of the operation phase as phased wellfield construction continues.

Strata estimates that approximately 200,000 cubic yards of compacted fill will be required for construction of the primary access road, lined retention ponds, CPP area site leveling, and facilities flood control diversion channel. Using a conservatively high application rate for construction in northeastern Wyoming of 20 gallons of water per cubic yard of compacted fill, the estimated water usage is 4,000,000 gallons during construction or 11,000 gpd (7.6 gpm) during a 12-month construction period. It is estimated that this usage will be cut in half during decommissioning, since decommissioning earthwork primarily will consist of excavation, which requires less water than compacting fill.

Total Non-Production Water Volume

Non-production water volumes are estimated based on the anticipated duration of each project phase. As shown in ER Figure 1.3-1, the duration of construction prior to operation is estimated at 1 year, the duration of operations (including concurrent operations and aquifer restoration) is estimated as 4.5 years, the duration of aquifer restoration (including concurrent aquifer restoration and wellfield decommissioning) without concurrent operations is estimated as 1.75 years, and the duration of decommissioning without concurrent aquifer restoration is estimated as 1.5 years. Using these estimated project phase time frames and the typical water usage totals in Table ER RAI WR-2-1, the total estimated non-production water usage during construction, operation, aquifer restoration, and decommissioning is 38.9, 101.0, 15.0, and 31.2 acre-feet, respectively, or a grand total of 186.1 acre-feet.

The response to part (B) of this RAI addresses potential surface and groundwater consumption impacts from non-production water use. Most of the non-production water usage will be from surface water. The entire estimated surface water usage for the proposed Ross ISR Project is approximately equal to the annual appropriation for the Oshoto Reservoir. The minor amount of non-production groundwater use primarily will be associated with domestic usage. Little or no impact to regional groundwater supplies is anticipated as result of domestic usage. Further, no impact to groundwater supplies east of the outcrop of the Lance Formation will occur as result of domestic usage from the SM zone within the Lance Formation. ER Figure 3.3-4 shows that the eastern border of the Lance Formation outcrop is immediately east of the proposed project area. See also the response to ER RAI CI-1(B), which indicates that there similarly will be no ISR-related impacts to groundwater supplies east of the Fox Hills Formation outcrop.

Table ER RAI WR-2-1. Estimated Non-Production Water Usage

Type of Use	Typical Water Usage (gpm)			
	Construction	Operation	Aquifer Restoration	Decommissioning
Domestic	0.9	1.9	1.6	1.8
Dust control	7.2	3.6	3.6	7.2
Irrigation	0.1	0.1	0.1	0.1
Construction	15.9	8.3	0.0	3.8
Total	24.1	13.9	5.3	12.9

ER RAI WR-2

Please provide additional information on non-production water use during all phases of the Proposed Action.

B. Please identify the source(s) of the volumes of water estimated above.

Section 4.4 of the ER and Addendum 2.7-H of the TR describe water uses associated with uranium recovery, other industrial uses, and stock watering; however, other non-production water uses such as domestic consumption should be evaluated as well. These uses may vary during the different phases of the Proposed Action, and they may depend upon other factors, such as the size of the workforce or seasonal dust-control requirements. Information regarding water use is necessary to evaluate potential impacts to the water supply during the environmental impact evaluation as required by 10 CFR Part 51.

ER RAI WR-2(B) Response

Following is a description of the anticipated water sources for the non-production water usage described in the response to ER RAI WR-2(A). For each type of use, the potential impacts to the available water supply are evaluated.

Domestic Usage

The planned public water supply system includes a new domestic well as shown on ER Figure 1.2-5. The expected completion interval will be in sandstone equivalent to the shallow monitoring (SM) zone, which is the first aquifer above the ore zone in the Lance Formation. Based on a review of geophysical logs from nearby exploration holes, the well depth will be approximately 100 to 250 feet. The domestic well will be located approximately 2,000 feet from the nearest domestic wells, which include DWWELL01 and CSWELL01 (P132537W) shown on ER Figure 3.4-26. Due to the relatively small domestic usage rate (around 2 gpm) and the distance from the new domestic well to existing wells, little or no impact to regional groundwater supplies is anticipated as result of domestic usage. This is supported by the numerical groundwater modeling report in TR Addendum 2.7-H. The ISR simulation results described in Section 4.9.3 of Addendum 2.7-H show minimal drawdown in the SM zone and include analysis of potential drawdown resulting from one existing oilfield well completed in both the SM and OZ zones. Historical usage from this well averages approximately 3.4 gpm, which is approximately the same magnitude as the anticipated domestic usage. Further, no impact to groundwater supplies east of the outcrop of the Lance Formation will occur as

result of domestic usage from the SM zone within the Lance Formation. ER Figure 3.3-4 shows that the eastern border of the Lance Formation outcrop is immediately east of the proposed project area. See also the response to ER RAI CI-1(B), which indicates that there similarly will be no ISR-related impacts to groundwater supplies east of the Fox Hills Formation outcrop.

Dust Control

Surface water is the planned water source for dust control, which will include water applied to proposed project area roads and disturbed areas. Specifically, Strata plans to use water from Oshoto Reservoir or directly from the Little Missouri River on the relatively infrequent occasions when it is flowing. Such surface water use will be subject to Wyoming State Engineer's Office (WSEO) water right provisions. A portion of the water in Oshoto Reservoir is currently permitted for industrial use (10 acre-feet). This allotment may be increased through a permit modification if needed. In addition, Strata anticipates applying for temporary water haul permits as needed during construction.

Irrigation

The small amount of irrigation water used for CPP area trees will come either from surface or groundwater. Most likely a drip irrigation system will be supplied directly from the domestic water supply system. At an estimated annual average usage rate of 0.1 gpm, the potential impact to water supplies will be negligible.

Construction

Strata plans to use surface water from Oshoto Reservoir or directly from the Little Missouri River (when flow events occur) as a temporary supply during construction activities. The total surface water usage, including dust control, irrigation (if surface water is used), and construction, is estimated to average about 11.4 gpm over an 8.75-year project life. This is equal to about 161 acre-feet. By comparison, the annual permitted appropriation for Oshoto Reservoir (the WSEO permit allows one filling annually at the permitted capacity), is 172.7 acre-feet (refer to ER Table 3.4-7, Permit P6046R).

ER RAI WR-3

Please describe the Ross Project site surface-water discharges during the high-intensity storm in May 2011.

A. If available, please provide the discharge measurements at the surface-water stations SW1, SW2, and SW3 from May 2011.

Section 5.4.1.2 of the ER and Section 3.1.9 of the TR describe the selection of the 100-year, 24-hour storm as the design criterion for the diversion channel around the paved area of the facility and for associated erosion-protection features. A comparison of the 100-year, 24-hour storm values to the May 2011 runoff measurements will be used to assess potential impacts to surface water and to soils as required by 10 CFR Part 51.

ER RAI WR-3(A) Response

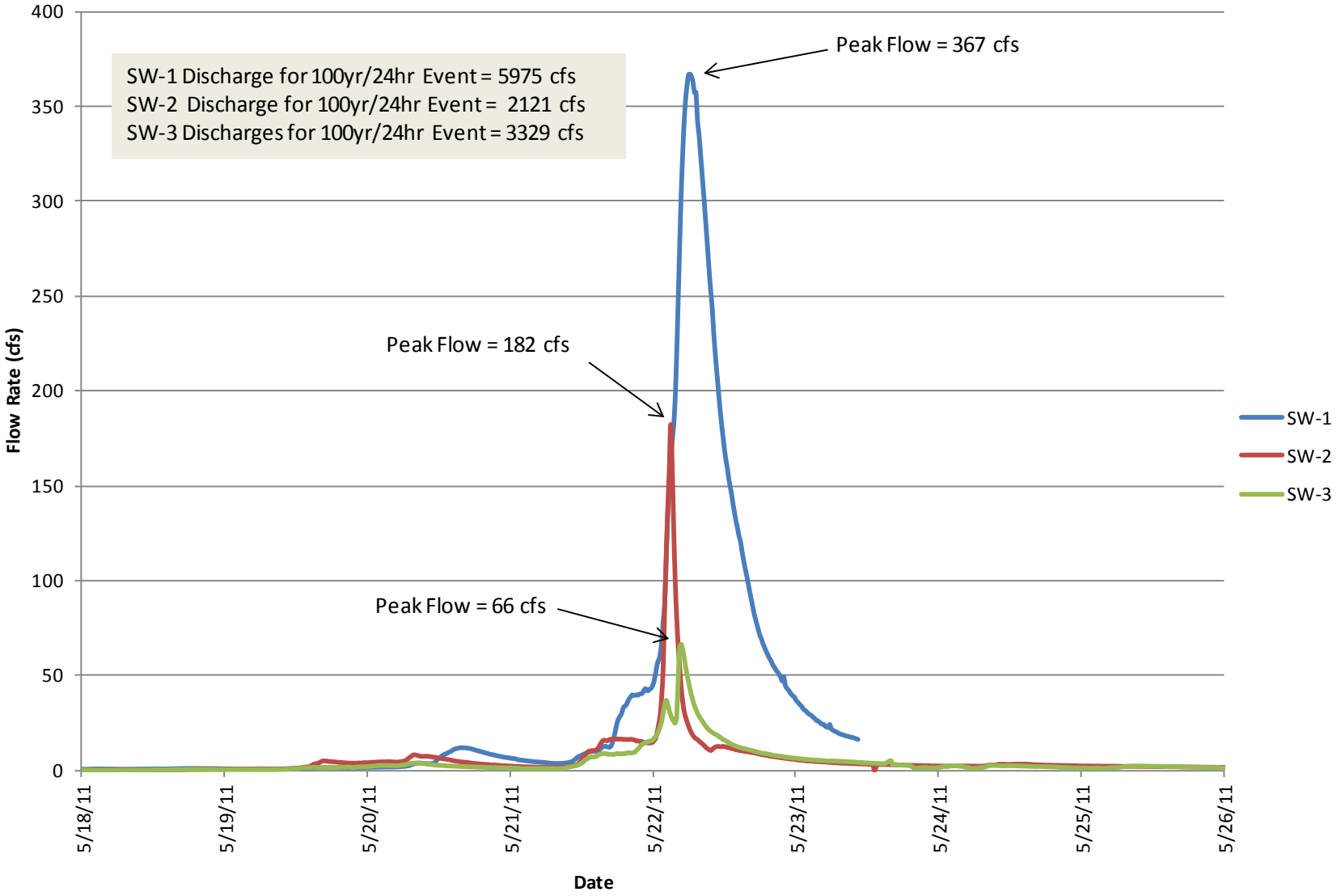
Surface water site flow/sampler instruments recorded that the peak flow for the surface water stations during 2010 and 2011 occurred on May 22, 2011. Peak flows for SW-1, SW-2, and SW-3 were 367, 182, and 66 cfs, respectively. Measured flow rates and precipitation data from the Ross MET station from May 2011 at surface water sites indicate that the storm event was a low-intensity storm. Estimated HEC-HMS peak flow and runoff volumes indicate the May 2011 storm event produced a peak flow rate less than a 2-year/24-hour general storm. Refer to the response to ER RAI WR-3(B), which describes how surface water sites SW-1, SW-2 and SW-3 are at approximately the same locations as Junctions 10, 3 and 2 in the HEC-HMS model. The 2-year, 24-hour estimated peak flow rates for these sites are approximately 457, 274, and 502 cfs, respectively (ER Table 3.4-5 and TR Addendum 2.7-A). In addition, hourly precipitation data collected from the Ross MET station showed a maximum 24-hour total precipitation of 1.74 inches for the period of May 20 through May 23. During this period the maximum hourly precipitation was 0.35 inch. As shown in ER Table 3.4-4, the precipitation value for the proposed project area for the 2-year/24-hour storm event is 1.8 inches based on NOAA Precipitation Frequency Atlas 2.

This analysis shows that the calculated 2-year, 24-hour peak flow rates at these sites are conservatively higher than the measured peak flow rates during the May 2011 precipitation event which nearly reached the 2-year, 24-hour intensity level. This analysis also shows that peak 2011 flow rates were many times higher than the proposed maximum excess permeate discharge rate. ER page 4-50 explains that the quantity of excess permeate discharged

under a WYPDES permit would typically be less than 50 gpm (0.1 cfs). This flow rate is 0.03 to 0.15 percent of the measured 2011 peak flow rates at SW-1 through SW-3.

Figure ER RAI WR-3-1 shows 15-minute interval discharge measurements for the surface water sites for May 18-26, 2011.

Figure ER RAI WR-3-1. Surface Water Station Discharge for May 2011 Runoff Event



ER RAI WR-3

Please describe the Ross Project site surface-water discharges during the high-intensity storm in May 2011.

B. Please provide the projected discharges at the surface-water stations SW1, SW2, and SW3 calculated for the 100-year, 24-hour storm.

Section 5.4.1.2 of the ER and Section 3.1.9 of the TR describe the selection of the 100-year, 24-hour storm as the design criterion for the diversion channel around the paved area of the facility and for associated erosion-protection features. A comparison of the 100-year, 24-hour storm values to the May 2011 runoff measurements will be used to assess potential impacts to surface water and to soils as required by 10 CFR Part 51.

ER RAI WR-3(B) Response

The HEC-HMS model created for the surface water study is used to determine the computed flows at surface water stations SW-1, SW-2, and SW-3. The model is adjusted to calculate flows at the exact location of each surface water station. As discussed below, the flows are reported in reference to the original model.

Surface water station SW-1 is located on the Little Missouri River just downstream of the project area. This location is just slightly downstream of Junction 10 in the HEC-HMS model. The computed 100-year, 24-hour peak discharge at SW-1 is 5,975 cfs.

Surface water station SW-2 is located on the Little Missouri River upstream of the confluence with Deadman Creek. The location is just slightly downstream from Junction 3. The computed 100-year, 24-hour peak discharge at SW-2 is 2,121 cfs.

Surface water station SW-3 is located on Deadman Creek upstream of its confluence with the Little Missouri River. The location is slightly downstream from Junction 2. The computed 100-year, 24-hour peak discharge at SW-3 is 3,329 cfs.

ER RAI WR-4

Please provide the surface- and ground-water-quality data that are summarized in Tables 3.4-12, 3.4-14, and 3.4-37 through 3.4-54 as an electronic file (Microsoft Excel®).

Sections 3.4.1.7 and 3.4.3.5 of the ER along with associated tables and figures describe surface- and ground-water quality; however, respective mean values as well as spatial and temporal analyses are not explicitly addressed. In order to facilitate an analysis of water quality in the SEIS, these data are needed in a format that supports computation. Please also include all water-quality data collected subsequent to the submittal of the license application. Water-quality analyses are necessary for a description of the affected environment at the Ross Project site and the related impact analyses as required by 10 CFR Part 51.

ER RAI WR-4 Response

The requested Excel files in the WDEQ/LQD Uranium Data Submission Spreadsheets are included as Appendix A to this response package. See the response for ER RAI EM-1 for discussion on the submission of data collected after license submittal.

ER RAI WR-5

Please provide hydrologic data from monitoring wells and surface-water stations collected subsequent to the submittal of the ER, if available.

Section 3.4.3.3.5 of the ER discusses baseline monitoring hydrographs for which data collection started at various dates in 2010. Hydrograph plots are presented in the TR as Addendum 2.7-G. Similarly, Section 1.4.1.6.3 of the ER addresses surface-water quantity. NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs, in Section 6.3.4, suggests that the ER include "historical or seasonal trends in ground water elevation or piezometric levels." Thus, this additional information will contribute to an understanding of such trends. These additional data will provide a more complete record of seasonal observations to use in a description of the affected environment as required by 10 CFR Part 51.

ER RAI WR-5 Response

Please refer to the response to ER RAI EM-1 for discussion on the submission of data collected after license submittal.

ER RAI WR-6

Please provide the well logs and/or the geological unit in which the well is completed for all wells identified in Table 3.4-25, if available.

Section 3.4.3.4 of the ER discusses ground-water use within the proposed Ross Project site and the surrounding two-mile area. Further discussion is provided in the TR, Addendum 2.7-H. However, Strata has made interpretations of the completion interval of some of the wells in its textual discussion in the ER; the logs of individual wells are needed so that these interpretations can be evaluated. These logs will provide important information for the water-resource impact analysis as required by 10 CFR Part 51.

ER RAI WR-6 Response

The WSEO registers all groundwater rights for all uses in the state, and requires the well owner to file a Statement of Completion (currently a U.W. 6 Form). A Statement of Completion form must be submitted to the WSEO within 30 days of the date that the well is completed and ready for use. Information related to the well's location, use, and completion, including a lithologic log (or drill cuttings description), is included on the form. However, lithologic borehole logs are not always recorded by the well driller (particularly for shallower wells intended for livestock use); therefore, it is not uncommon for lithologic logs to not be provided by the owner. In addition, well drillers are generally not professional geologists trained to describe lithologic characteristics, nor make correlations of lithology to named geologic formations.

In response to this RAI, Appendix B includes the U.W. 6 Forms for 56 wells listed in ER Table 3.4-25 that are in good standing (meaning the well status is not "abandoned" or "cancelled") at the time that the WSEO database of groundwater rights was searched for the proposed project area (which was during the 4th quarter 2010), and that a lithologic log is included on the well's U.W 6 Form. A tabulation of those 56 wells also is provided as additional information in Table ER RAI WR-6-1.

Strata made interpretations of the well completion intervals, particularly with respect to the OZ aquifer unit, which is the stratigraphic horizon in the Upper Fox Hills and Lance formations that contains the targeted uranium ore-bearing sands. For instance, Figure 2.3-2 and Table 2.3-1 in the Groundwater Model Report (Addendum 2.7-H) show wells completed in the OZ aquifer that are located within and near the proposed project area. The OZ aquifer

completions for those wells are documented either by the Nubeth R&D uranium project (i.e., the three Nubeth wells, 19XX, 22X-19 and 789V, which are currently being used as water supply wells by Merit Energy), or correlations are made between well completion intervals using information obtained from the WSEO and/or the Wyoming Oil and Gas Conservation Commission databases and the known depths to the OZ aquifer unit near the proposed project area (as depicted by the geologic structure maps included in TR Addendum 2.6-D).

Table ER RAI WR-6-1. Groundwater Rights in Good Standing and with Lithologic Logs within 2 Miles of Proposed Project Area

WSEO Permit No.	Facility Name	Priority Date	Location (Tns-Rng-Sec-¼¼)	Total Depth (ft)	Uses	Status	Appropriator	Depth to Water (ft)	Yield (gpm)	Within Proposed Permit Area
P7330P	MINNIE BERGER #1	4/22/1961	53-67-5-NWNE	222	STK	Complete	MINNIE B. BERGER		2	No
P7325P	BERGER #8	8/10/1951	53-67-5-SESW	100	DOM_GW	Complete	HARRY J. BERGER		5	No
P7324P	BERGER #7	9/10/1954	53-67-5-SWSW	160	STK	Complete	HARRY J. BERGER		3	No
P7328P	BERGER #11	9/5/1954	53-67-6-NENE	207	STK	Complete	HARRY J. BERGER		4	No
P7331P	MINNIE BURGER #2	9/14/1958	53-67-6-SESW	125	STK	Complete	MINNIE B. BERGER		3	No
P74302W	YARD #1	3/23/1987	53-67-7-NESE	200	DOM_GW; STK	Complete	JOHN H. & RONDI L. YARD	120	10	No
P191679W	DM 34-7	10/12/2009	53-67-7-SESE	487	MON	Complete	STRATA ENERGY INC	84		Yes
P191680W	SA 34-7	10/12/2009	53-67-7-SESE	52	MON	Complete	STRATA ENERGY INC	21		Yes
P191681W	SM 34-7	10/12/2009	53-67-7-SESE	245	MON	Complete	STRATA ENERGY INC	55		Yes
P191682W	OZ 34-7	10/12/2009	53-67-7-SESE	379	MON	Complete	STRATA ENERGY INC	84		Yes
P7326P	BERGER #9	5/15/1954	53-67-8-NENW	100	STK	Complete	HARRY J. BERGER		5	No
P103666W	WESLEY #1	9/3/1996	53-67-8-SWSW	160	DOM_GW; STK	Complete	VESTA LOUISA WESLEY	22	25	No
P76190W	OSHOTO CHURCH #1	1/11/1988	53-67-9-SESW	120	MIS	Fully Adjudicated	OSHOTO COMMUNITY BIBLE CHURCH	60	15	No
P7323P	BERGER #6	8/10/1949	53-67-17-NWSW	150	STK	Complete	HARRY J. BERGER	2	3	Yes
P55052W	WINDMILL WELL #2	12/15/1980	53-67-18-NENE	128	STK	Complete	S. ELMO WESLEY	25	10	Yes
P41449W	TEST SET #1	11/18/1977	53-67-18-SESW	550	MON	Complete	NUCLEAR DYNAMICS	150		Yes
P191683W	DM 12-18	10/12/2009	53-67-18-NWNW	632	MON	Complete	STRATA ENERGY INC	175		Yes
P191684W	SA 12-18	10/12/2009	53-67-18-SWNW	103	MON	Complete	STRATA ENERGY INC	50		Yes
P191685W	SM 12-18	10/12/2009	53-67-18-SWNW	352	MON	Complete	STRATA ENERGY	88		Yes
P191686W	OZ 12-18	10/12/2009	53-67-18-SWNW	584	MON	Complete	STRATA ENERGY	169		Yes
P50243W	PHASE II-1	9/25/1979	53-67-18-SWNW	580	MON	Complete	WY BOARD OF LAND COMMISSIONERS**INC NUCLEAR DYNAMICS	28		Yes
P50244W	PHASE II-2	9/25/1979	53-67-18-SWNW	434	MON	Complete	WY BOARD OF LAND COMMISSIONERS**INC NUCLEAR DYNAMICS	28		Yes
P50245W	PHASE II-3	9/25/1979	53-67-18-SWNW	565	MON	Complete	WY BOARD OF LAND COMMISSIONERS**INC NUCLEAR DYNAMICS	32		Yes

Table ER RAI WR-6-1. Groundwater Rights in Good Standing and with Lithologic Logs within 2 Miles of Proposed Project Area (Continued)

WSEO Permit No.	Facility Name	Priority Date	Location (Tns-Rng-Sec-¼¼)	Total Depth (ft)	Uses	Status	Appropriator	Depth to Water (ft)	Yield (gpm)	Within Proposed Permit Area
P50246W	PHASE II-4	9/25/1979	53-67-18-SWNW	575	MON	Complete	WY BOARD OF LAND COMMISSIONERS**INC NUCLEAR DYNAMICS	26		Yes
P50247W	PHASE II-5	9/25/1979	53-67-18-SWNW	548	MON	Complete	WY BOARD OF LAND COMMISSIONERS**INC NUCLEAR DYNAMICS	27		Yes
P191691W	DM 34-18	10/12/2009	53-67-18-SWSE	620	MON	Complete	STRATA ENERGY INC	268		Yes
P191692W	SA 34-18	10/12/2009	53-67-18-SWSE	70	MON	Complete	STRATA ENERGY INC	70		Yes
P191693W	SM 34-18	10/12/2009	53-67-18-SWSE	298	MON	Complete	STRATA ENERGY INC	136		Yes
P191694W	OZ 34-18	10/12/2009	53-67-18-SWSE	565	MON	Complete	STRATA ENERGY INC	277		Yes
P191687W	DM 14-18	10/12/2009	53-67-18-SWSW	585	MON	Complete	STRATA ENERGY INC	156		Yes
P191688W	SA 14-18	10/12/2009	53-67-18-NWSW	65	MON	Complete	STRATA ENERGY INC	22		Yes
P191689W	SM 14-18	10/12/2009	53-67-18-SWSW	327	MON	Complete	STRATA ENERGY INC	66		Yes
P191690W	OZ 14-18	10/12/2009	53-67-18-SWSW	529	MON	Complete	STRATA ENERGY INC	157		Yes
P191695W	DM 21-19	10/12/2009	53-67-19-NENW	565	MON	Complete	STRATA ENERGY INC	195		Yes
P191696W	SA 21-19	10/12/2009	53-67-19-NENW	30	MON	Complete	STRATA ENERGY INC	9		Yes
P191697W	SM 21-19	10/12/2009	53-67-19-NENW	315	MON	Complete	STRATA ENERGY INC	84		Yes
P191698W	OZ 21-19	10/12/2009	53-67-19-NENW	468	MON	Complete	STRATA ENERGY INC	215		Yes
P191699W	DM 42-19	10/12/2009	53-67-19-SWNE	610	MON	Complete	STRATA ENERGY INC	285		Yes
P191700W	SA 42-19	10/12/2009	53-67-19-SWNE	108	MON	Complete	STRATA ENERGY INC	108		Yes
P191701W	SM 42-19	10/12/2009	53-67-19-SENE	290	MON	Complete	STRATA ENERGY INC	154		Yes
P191702W	OZ 42-19	10/12/2009	53-67-19-SWNE	560	MON	Complete	STRATA ENERGY INC	299		Yes
P132537W	STRONG # 1	2/8/2001	53-67-20-NWNW	330	DOM_GW; STK	Complete	GEORGE / CAROL STRONG	27		No
P645W	ROBINSON #3	10/3/1961	53-67-20-NWNW	120	DOM_GW; STK	Complete	RAY W. ROBINSON	70	20	No
P78474W	ROBINSON #4	11/9/1988	53-67-20-NWNW	600	DOM_GW; STK	Complete	GEORGE & CAROL STRONG	40	2	No
P7320P	BERGER #3	8/5/1961	53-67-22-NWNW	434	STK	Complete	HARRY J. BERGER	6	4	No
P619W	ROBINSON #2	9/29/1961	53-67-30-NENE	120	STK	Complete	RAY W. ROBINSON	90	25	No
P72004W	KIEHL WATER WELL #1	2/24/1986	53-67-30-SESE	662	STK	Complete	PETROLEUM** ANTONE SWANDA	220	25	No
P71108W	GOODLAD #2	9/10/1985	53-68-2-SENE	220	STK	Complete	PHILENA BLATT	100	15	No
P50113W	GOODLAD WELL #3	9/27/1979	53-68-2-SWNE	40	STK	Complete	HAROLD BURCH** PHILENA BALTT	8	5	No

Table ER RAI WR-6-1. Groundwater Rights in Good Standing and with Lithologic Logs within 2 Miles of Proposed Project Area (Continued)

WSEO Permit No.	Facility Name	Priority Date	Location (Tns-Rng-Sec-¼¼)	Total Depth (ft)	Uses	Status	Appropriator	Depth to Water (ft)	Yield (gpm)	Within Proposed Permit Area
P84665W	GOODLAD #3	3/25/1991	53-68-2-SWNW	50	STK	Complete	PHILENA BLATT	20	5	No
P148750W	Z-1	1/8/2003	53-68-10-SESE	410	STK	Complete	GRACE ZIMMERSCHIED	200	8	No
P146029W	EVERETT NO 1	7/25/2002	53-68-11-NESW	260	STK	Complete	GRACE ZIMMERSCHIED	120	3	No
P42868W	BESS #1	4/17/1978	53-68-14-NWSE	243	DOM_GW; STK	Complete	JAMES & BESSIE HAHN	100	15	No
P144030W	TOWER #2	4/23/2002	53-68-23-SESW	401	DOM_GW; STK	Complete	ANTONE SWANDA	200	12	No
P99263W	REYNOLDS #2	5/22/1995	53-68-24-NESE	100	DOM_GW	Complete	DAVID A. OR BETTY J. REYNOLDS	60	10	No
P150688W	TOWER #3	5/2/2003	53-68-25-NESW	460	DOM_GW; STK	Complete	ANTONE SWANDA	205	10	No

Uses:

DOM_GW	Domestic
IRR_GW	Irrigation
MIS	Miscellaneous
IND_GW	Industrial
MON	Monitoring

Source: WSEO database as of 4th quarter 2010.

Listed are those wells in good standing and having a lithologic log on file with the WSEO. (Note: a record of a well's lithologic log is typically, but not always, provided by the well owner and included on the WSEO U.W. 6 Form.)

ER RAI WR-7

Please provide any geological, ground-water, and surface-water information and data that Strata has available for the "Barber Site," which is an alternative location that may be considered within the SEIS.

The SEIS for the Ross Project site is required to evaluate alternatives to the Proposed Action. Currently, the four Alternatives being considered for the Ross Project site SEIS are:

- *The Proposed Action*
- *The No-Action Alternative*
- *The construction of the CPP to the north of the Ross Project site, where all other ISR operations remain the same as in the Proposed Action*
- *The construction, operation, aquifer restoration, and decommissioning of the entire ISR facility at the Barber Site, approximately 15 miles south of the Ross Project site.*

In order to evaluate the Barber Site as an Alternative, sufficient data are required to allow comparison of this Alternative with the Proposed Action. While many of the operational aspects of the Proposed Action and the Alternative may be the same, there are bound to be site-specific differences in the natural setting—in particular, differences in topography, drainage, geology, stratigraphy, and hydrogeology. Thus, any information that Strata has developed for the Barber Site will assist the NRC staff in the analysis of a reasonable range of alternatives within the SEIS, as required by 10 CFR Part 51.

ER RAI WR-7 Response

Formal pre-license baseline characterization of the potential Barber project area has not been initiated at this time, and any data relevant to the Barber project area will have no significant value because such data do not satisfy 10 CFR Part 40, Appendix A Criteria for 12 months of pre-license data and, thus, represents an incomplete picture at that site. Limited exploration drilling to further confirm the uranium resource has occurred under State of Wyoming mineral exploration permit/drilling notice DN#397. Significant uranium mineralization is present in the area; as such, the Barber project area represents a potential future target for ISR satellite operations. As described in the response to ER RAI CI-1(B), the potential Barber Satellite Facility is currently fourth on the timeline list of potential Lance District satellite projects. No regional baseline monitor wells have been installed in the Barber project area, nor has routine surface water sampling occurred.

Should Strata determine that economic conditions support the potential Barber Satellite Facility, the following will occur. First, Strata will submit a formal Letter of Intent (LOI) to NRC indicating that pre-license baseline characterization has been initiated and indicating when the amendment application to the Ross ISR Project license will be submitted formally. Second,

Strata will brief NRC staff on the methods, procedures and resource areas that will be addressed during the pre-license baseline characterization efforts. Third, Strata will brief NRC staff on the geohydrologic and operational connections to the Ross ISR Project including such information as uranium host formation(s), nature of mineralization (multiple, stacked roll fronts), aquifer confinement, etc. Fourth, Strata will provide proposed operational characteristics, such as influent and production rates, satellite plant location(s) and preliminary extent of the economic mineralization. Finally, after all of the necessary pre-license data have been collected and assembled into a complete license amendment application, the appropriate data sets will be submitted to NRC staff including a full assessment of the potential cumulative impacts associated with the proposed Barber Satellite Facility and the potential contributing factors that the Ross site will have on such an impact analysis. Thus, Strata does not have any additional data to provide NRC staff regarding the Barber site as a CPP location, since the proposed Ross ISR Project would be the first developed for uranium recovery. The only information Strata has gathered to date consists of exploration drilling, sampling some private wells, and performing a desktop file search for previous cultural resources inventories as described in the response to ER RAI Cultural-2. In addition, Strata questions whether further compliance with this request is necessary for NRC staff's review of Strata's Ross ISR Project license application.

Ecology

ER RAI ECO-1

A. Please describe the design features of the ponds to be located at the proposed facility as indicated in Figure 1.2-5 of the ER.

The ponds shown in Figure 2.1-3 of the TR might potentially impact wildlife, including mammals and waterfowl that use the ponds. For example, because the ponds are to be lined, if mammals were to fall into the ponds, it would be difficult for them to escape. Additionally, waterfowl might use the ponds, and these birds could be impacted by water-quality issues in the ponds. Although the ER mentions that the ponds will be fenced and avian-specific deterrents will be used (page 4-79) and describes mitigation measures for ecological resources (Section 5.5), additional information regarding the specifications of these approaches is needed. This information should include the type, number, and height of the proposed fences (e.g., around the entire perimeter as well as each individual pond) as well as any other techniques to be employed at the retention ponds, such as netting, noise makers, and/or additional deterrents. Given the proposed size of these ponds, traditional netting may not be practical, and local winds may pose concomitant issues. Thus, the engineering design of the ponds is very important to the analysis of the ecological impacts, which is required by 10 CFR Part 51.

ER RAI ECO-1(A) Response

Please refer to the response to TR RAI 23(f) in the TR RAI response package, which includes the most recent pond design information. Updated pond design information is provided in a revised TR Addendum 3.1-A. The revised Addendum 3.1-A provides information on current designs and geotechnical investigations for facilities within the CPP area. The geotechnical investigations are prepared to provide provisional layouts of the site facilities, and to better characterize the expected operating conditions, potential environmental impacts, and potential public and occupational health impacts for the proposed project.

ER RAI ECO-1

B. Please provide additional information regarding the design of both i) the fencing proposed for the ponds that is intended to keep mammals out of the ponds and any design features that would allow trapped mammals to escape the ponds as well as ii) any design features and "avian deterrents" that are intended to keep birds and waterfowl out of the ponds.

The ponds shown in Figure 2.1-3 of the TR might potentially impact wildlife, including mammals and waterfowl that use the ponds. For example, because the ponds are to be lined, if mammals were to fall into the ponds, it would be difficult for them to escape. Additionally, waterfowl might use the ponds, and these birds could be impacted by water-quality issues in the ponds. Although the ER mentions that the ponds will be fenced and avian-specific deterrents will be used (page 4-79) and describes mitigation measures for ecological resources (Section 5.5), additional information regarding the specifications of these approaches is needed. This information should include the type, number, and height of the proposed fences (e.g., around the entire perimeter as well as each individual pond) as well as any other techniques to be employed at the retention ponds, such as netting, noise makers, and/or additional deterrents. Given the proposed size of these ponds, traditional netting may not be practical, and local winds may pose concomitant issues. Thus, the engineering design of the ponds is very important to the analysis of the ecological impacts, which is required by 10 CFR Part 51.

ER RAI ECO-1(B) Response

The entire CPP area perimeter, which is also defined as the controlled access area, will be enclosed by a livestock and big game-proof fence (Type II - WDEQ/LQD Guideline No. 10 or equivalent). The fence will be at least 8 feet high and constructed of either woven wire or chain link. This type of fence is currently used to control access at Wyoming and Texas ISR facilities. Access into the facility will be through gates (tipping type, also livestock and big game proof) that will be closed at all times except when a vehicle is entering the site. The site perimeter will be secure from big game and livestock, eliminating the need for additional fencing around the ponds and the need for pond design features that would facilitate escape by trapped animals.

At this time the specific type of avian deterrent has not been selected. Three options are being considered for avian control, including netting, "bird balls" (hollow or water-filled balls), or a radar hazing system. Following an extensive literature review and contact with knowledgeable individuals regarding avian deterrents for ponds, a radar hazing system has been identified as the most likely solution for deterring avian species from lined retention ponds associated with the CPP. Based on conversations with manufacturers and a company that uses a radar hazing system at a mining facility in northern

Colorado, radar hazing systems have proven effective in the Rocky Mountain region and are suited to the size and configuration of the proposed Ross ISR Project lined retention ponds. The system uses radar to detect incoming waterfowl and then uses hazing techniques (primarily noise) to scare them away. The avian deterrent system will require setup and routine maintenance, including calibrating the radar to site-specific conditions to avoid false activations. Section 4.7 of the revised TR Addendum 3.1-A discusses avian control in greater detail.

ER RAI ECO-1

C. Please discuss the permitting and/or licensing process Strata envisions for the ponds.

The ponds shown in Figure 2.1-3 of the TR might potentially impact wildlife, including mammals and waterfowl that use the ponds. For example, because the ponds are to be lined, if mammals were to fall into the ponds, it would be difficult for them to escape. Additionally, waterfowl might use the ponds, and these birds could be impacted by water-quality issues in the ponds. Although the ER mentions that the ponds will be fenced and avian-specific deterrents will be used (page 4-79) and describes mitigation measures for ecological resources (Section 5.5), additional information regarding the specifications of these approaches is needed. This information should include the type, number, and height of the proposed fences (e.g., around the entire perimeter as well as each individual pond) as well as any other techniques to be employed at the retention ponds, such as netting, noise makers, and/or additional deterrents. Given the proposed size of these ponds, traditional netting may not be practical, and local winds may pose concomitant issues. Thus, the engineering design of the ponds is very important to the analysis of the ecological impacts, which is required by 10 CFR Part 51.

ER RAI ECO-1(C) Response

The sediment pond and lined retention ponds will require permits from the WSEO and WDEQ (refer to the response to ER RAI GEN-2(A)). In order to construct the sediment pond and store runoff from the CPP area, a permit to appropriate surface water will be required from the WSEO. Similarly, the lined retention ponds will also require a permit to appropriate surface water in order to store fluids from ISR operations. Each permit application to appropriate surface water will include an S.W. 3 application form and permit-level drawings certified by a professional engineer licensed in the State of Wyoming. Strata plans to apply for required permits from the WSEO during late 2012.

The lined retention ponds will also require a Permit to Construct subject to the requirements of Chapter 11 of the Wyoming Water Quality Rules and Regulations. A Permit to Construct for a lined wastewater pond normally will be acquired through WDEQ/WQD. However, LQD and WQD have developed a working agreement which designates permitting of impoundments for sedimentation, process water or any combination of the two to LQD when these impoundments are related to mining operations. Further, LQD has incorporated the Permit to Construct for lined wastewater ponds into the Permit to Mine, which Strata submitted January 13, 2011. Please see the response to ER RAI GEN-2(A) for more information about the status of the WDEQ Permit to Mine.

The response to TR RAI 23(f) in the TR RAI response package describes the design characteristics of the lined retention ponds. Lined retention ponds will be designed to meet the requirements of Regulatory Guide 3.11, as described on page 4-12 of the TR. The WDEQ and WSEO permits for lined retention ponds will be available for NRC inspection.

ER RAI ECO-2

Please clarify whether Strata proposes to implement mitigation measures to protect wildlife from above-ground power lines and associated poles.

Above-ground power lines can impact waterfowl and other birds, primarily through their collision with the lines and any ground wires. Additionally, associated power-line poles can provide supplemental perches for raptors, which will provide them with a competitive advantage over sage-obligate prey species. Identification of the mitigation measures, if any, that will be used by Strata to reduce ecological and other environmental impacts resulting from above-ground lines and poles is necessary for the evaluation of environmental impacts to the local ecology as required by 10 CFR Part 51.

ER RAI ECO-2 Response

As stated in ER Section 5.5.2, overhead powerlines will be built according to current guidelines and recommendations by the Avian Power Line Interaction Commission and/or USFWS. These guidelines are primarily related to raptor-safe construction and have been implemented at numerous surface coal mines in the Powder River Basin (PRB). As described in ER Section 3.5.4, there are no sage-grouse leks, core areas, or connectivity areas within or near the proposed Ross project area. Nor were any sage-grouse broods, brood-rearing areas, or wintering areas identified during the 2010 field surveys. No sharp-tailed grouse dancing grounds were located within the 3.2-kilometer buffer during the 2010 surveys. Therefore, the likelihood of significant negative impacts from overhead power lines on upland game birds is minimal and no mitigation measures specific to game birds/power lines are planned. There may be impacts to waterfowl and other birds primarily through their collision with the lines and any ground wires. The likelihood of significant negative impacts from overhead power lines on these species is minimal, so no specific mitigation measures are planned. General ecological resource impacts mitigation measures are discussed in ER Section 5.5.

Air Quality and Meteorology

ER RAI AQ-1

Please provide additional information regarding the combustion emissions estimates provided in the ER's Addendum 4.6-A, "Preliminary Emissions Inventory."

All significant sources of combustion emissions should be identified during an evaluation of the impacts to air quality and public and occupational health and safety as well as visual and other resources in the SEIS. The combustion-emissions calculations should include all transportation activities such as the delivery of supplies and equipment to the Ross Project site and the transport of yellowcake and wastes from the site (see Appendix A to Addendum 4.6-A). These data are necessary to complete a review of emissions estimates and controls for an evaluation of the corresponding environmental impacts on air quality as required by 10 CFR Part 51.

ER RAI AQ-1 Response

Combustion emissions for passenger vehicles or from material shipment vehicles traveling to and from the site are assumed to be insignificant and are not included in the preliminary emissions inventory in ER Addendum 4.6-A or the final emissions inventory in the air quality permit application (Strata 2011). Section 5.1 of the air quality permit application states, "Since the predominant source of combustion emissions will be from industrial equipment, Strata did not calculate combustion emissions for passenger vehicles or shipments traveling to and from the site." To validate this assumption, the following provides additional information regarding combustion emissions related to transportation activities. Also provided are estimates of the time of day and types of vehicles for passenger vehicles and material shipment vehicles in order to assess potential impacts to noise and visual and scenic resources.

ER Section 4.2.1 describes the anticipated number of passenger vehicle trips to and from the site during each project phase. It also describes the number of each type of material shipment vehicles during each project phase. This information is summarized in ER Table 4.2-1. In order to estimate combustion emissions, Strata has estimated the annual operating duration and type of equipment associated with passenger vehicles and material shipment vehicles. This information is summarized in Tables ER RAI AQ-1-1 through AQ-1-4 for each project phase. The passenger vehicle combustion emissions are conservatively high, since they assume that each worker will commute to and from the site alone. As described in the response to ER RAI CI-2(B), this assumption is very conservative during operation, when nearly all of

the worker-related traffic will result from Strata employees, who will be likely to carpool or participate in a park and ride system if available.

In order to evaluate potential impacts to other resource areas such as noise and visual and scenic resources, Tables ER RAI AQ-1-1 through AQ-1-4 describe the anticipated time of day for the various transportation activities. Following is justification for the percentages of daytime activities for the passenger vehicle trips and material shipment vehicles.

- **Worker transport**: Strata predicts that the construction workforce will include up to 200 workers (ER Table 4.2-1). Only a very small percentage of the construction work will occur at night. As described in ER Section 5.7, the majority of construction equipment will only be run during daylight hours. The same section notes that Strata will restrict drilling to daytime hours in areas where the noise threshold could be exceeded at nearby residences. Strata estimates that at least 90 percent of the construction and decommissioning workforce will commute during normal daytime hours.

- During operation and aquifer restoration, staff will be on site 24 hours per day as described in TR Section 5.6. It is estimated that approximately 60 percent of the workforce will operate on 12-hour shifts. Using a typical shift rotation of 7:00 a.m./p.m. to 7:00 p.m./a.m., only 25 percent of the 60 percent or 15 percent of the workers will travel to or from the site between the EPA (1974) defined nighttime hours of 10:00 p.m. to 7:00 a.m. (i.e., only the workers arriving at the site at 7:00 a.m.; shift workers arriving and departing at 7:00 p.m. will travel during the EPA-defined daytime hours, as will workers departing at 7:00 a.m.). The remaining passenger vehicle trips will occur during daytime hours. The overall estimate of daytime workforce commutes is therefore 85 percent.

- **Construction supplies**: Strata estimates that at least 90 percent of construction supply deliveries will occur during daytime hours due to company receiving policies, availability of workers to unload the shipments, safety, and normal supplier delivery times. This is supported by information obtained from Casper Well Products (2012), who supplies well casing and drilling fluids to numerous licensed and operating ISR facilities. Casper Well Products has made deliveries of materials and supplies to the proposed Ross project area for exploration drilling and regional baseline monitor well construction. Casper Well Products is open from 8:00 a.m. to 5:00 p.m. Monday through Friday. The historical normal delivery time to the proposed project area is between 11:00 a.m. and 12:00 p.m., since delivery drivers load their own trucks and then drive approximately 2.5 hours

from Casper, Wyoming to the project site. Casper Well Products indicates that even when wellfield supplies are shipped directly from the factory, the delivery time is coordinated to occur virtually always during daytime hours. Personnel or equipment typically will not be available to unload at night, and nighttime construction supply deliveries will cause unnecessary safety risks.

- **Equipment**: It is estimated that at least 90 percent of equipment deliveries will occur during daytime hours in accordance with the aforementioned reasons for delivery times of construction supplies. Equipment deliveries typically will require a signature from the Strata purchasing manager, who typically will work during normal daytime hours.

- **Chemicals and fuel**: It is estimated that at least 95 percent of chemical and fuel deliveries will occur during daytime hours based on conversations with local suppliers. These include Brenntag (2012), Homax Oil Sales Inc. (2012) and Way Oil Company Inc. (2012). Brenntag delivers sulfuric acid and other bulk chemicals to many of the coal mines and ISR facilities in Wyoming and Nebraska. Brenntag indicated that while they can deliver at night if there is an urgent need, nearly 100 percent of their deliveries occur during the daytime hours, typically between 7:00 a.m. and 3:00 p.m. Brenntag's primary considerations for daytime deliveries are driver safety and the receiving policies of their customers. With one week or more typical chemical storage capacity available at the proposed Ross ISR Project (TR Tables 3.2-1 and 3.2-2), there will be very few instances when chemical deliveries will be required outside of normal daytime hours.

- Homax Oil Sales Inc. and Way Oil Company Inc. both are bulk fuel distributors in northeastern Wyoming. These or similar companies will deliver fuel and lubricants for equipment operated within the proposed project area during all project phases. Like other large construction projects, it is anticipated that the earthwork contractors will have one or more portable fuel storage tanks on site, which will allow the fuel distributors to schedule deliveries during normal daytime hours. The small percentage (5 percent) of estimated nighttime deliveries is attributed to fueling drilling rigs if operating at night. As described on ER page 5-54, Strata will restrict drilling to daytime hours in areas where the annoyance noise threshold could be exceeded at nearby residences.

- **Solid waste**: Due to the short commute to area landfills, including those in Moorcroft, Sundance and Gillette (ER Section 4.13.1.1.2.1), it is anticipated that 100 percent of solid waste disposal trips will occur during daytime hours. This includes the four categories of non-AEA-regulated solid waste described in the response to ER RAI Waste-1:

industrial/municipal solid waste, recyclable solid waste, construction/demolition waste, and petroleum-contaminated soil.

- **Hazardous waste**: 100 percent of the infrequent hazardous waste disposal trips are assumed to occur during daytime hours due to the ability to schedule the trips well in advance, the relatively short commutes to disposal facilities such as the Campbell County Landfill (ER Section 4.13.1.1.2.3), and the normal daytime operating hours of disposal facilities. This category as used in this response includes non-AEA-regulated hazardous waste, used oil, used oil filters, and oily rags described in the response to ER RAI Waste-1.

- **Uranium-loaded ion exchange resin**: It is estimated that 70 percent of resin deliveries will occur during daytime hours due to the safety in loading/unloading in daylight, driver safety, and the proximity to potential satellite facilities, which typically will allow round trips to occur during a normal daytime shift. Refer to the response to ER RAI TR-1 for additional information on the potential transportation and receiving of uranium-loaded ion exchange resin.

- **Yellowcake**: It is assumed that 70 percent of yellowcake shipments will occur during daytime hours due to the safety of loading during daylight and the infrequent but regular shipments, which can be scheduled well in advance.

- **Vanadium**: It is assumed that 70 percent of vanadium shipments will occur during daytime hours due to the safety of loading during daylight and the infrequent but regular shipments, which can be scheduled well in advance.

- **11e.(2) byproduct material**: It is assumed that 70 percent of 11e.(2) byproduct material shipments will occur during daytime hours due to the safety of loading during daylight and the infrequent but regular shipments, which can be scheduled well in advance.

To calculate combustion emissions from semi-haul trucks and pickup trucks, AP-42 emission factors for stationary diesel engines were used (EPA 1996). These factors are conservative. As explained in ER Section 4.6, the AP-42 factors are consistently higher than those computed from the EPA mobile source NONROAD2008 Emissions Model. For passenger vehicles, average highway emission factors for all pollutants except carbon monoxide (CO) are taken from an EPA emissions report (EPA 2000). CO emission factors are taken from AP-42 (Table 3.3-1 for gasoline engines). Passenger vehicles were assumed to be light trucks (less than 6,000 lbs) since the reported emission factors are

slightly higher than for passenger cars, and since SUVs and light pickups constitute a significant portion of passenger traffic in Wyoming.

Tables ER RAI AQ-1-5 through AQ-1-8 present the combustion emission estimates for passenger vehicles and material transport vehicles during each project phase. Tables ER RAI AQ-1-9 and AQ-1-10 compare combustion emission totals between transportation and non-transportation sources. The non-transportation emission totals appear as reported in ER Addendum 4.6-A and in the air quality permit application. On average, transportation-related combustion emissions add 13.9% to the reported totals.

Table ER RAI AQ-1-1. Estimated Passenger Vehicles and Incoming and Outgoing Shipments during Construction

Category	Equipment Type	Make/ Model[1]	HP	No. One-Way Trips per Day	Calculation Method	Duration of Operation per Trip[2] (hrs)	Equipment Operation (hrs/yr)	% Day[3]	% Night
Worker transport	Passenger vehicle	Light truck	200	400	200 workers x 2 round trips/day	0.083	12,167	90	10
Construction supplies	Semi-haul truck	Kenworth	260	6	3 deliveries/day x 2 one-way trips	0.5	1,095	90	10
Equipment	Semi-haul truck	Kenworth	260	6	3 deliveries/day x 2 one-way trips	0.5	1,095	90	10
Chemicals and fuel	Semi-haul truck	Kenworth	260	12	6 deliveries/day x 2 one-way trips	0.5	2,190	95	5
Solid waste	Semi-haul truck	Kenworth	260	0.29	1 shipment/week x 2 one-way trips	0.5	52	100	0
Hazardous waste	Pickup truck	Ford 350	350	0.07	1 shipment/month x 2 one-way trips	0.083	2	100	0

Notes: [1] Typical make/model for anticipated type of equipment. Actual equipment may differ.
[2] Within proposed NRC license area; assumes 5 min. for passenger vehicle and pickup truck trips and 30 min. for semi-haul truck trips (including idling during loading/unloading).
[3] Daytime hours defined as 7:00 a.m. to 10:00 p.m. per EPA (1974).

Table ER RAI AQ-1-2. Estimated Passenger Vehicles and Incoming and Outgoing Shipments during Operation

Category	Equipment Type	Make/ Model[1]	HP	No. One-Way Trips per Day	Calculation Method	Duration of Operation per Trip[2] (hrs)	Equipment Operation (hrs/yr)	% Day[3]	% Night
Worker transport	Passenger vehicle	Light truck	200	120	60 workers x 2 round trips/day	0.083	3,650	85	15
Chemicals and fuel	Semi-haul truck	Kenworth	260	8	4 deliveries x 2 round trips/day	0.5	1,460	95	5
Uranium-loaded resin	Semi-haul truck	Kenworth	260	8	4 deliveries x 2 round trips/day	0.5	1,460	70	30
Yellowcake	Semi-haul truck	Kenworth	260	0.41	75 shipments/yr x 2 round trips/shipment	0.5	75	70	30
Vanadium	Semi-haul truck	Kenworth	260	0.25	45 shipments/yr x 2 round trips/shipment	0.5	45	70	30
Solid waste	Semi-haul truck	Kenworth	260	0.29	1 shipment/week x 2 one-way trips	0.5	52	100	0
11e.(2) byproduct material	Semi-haul truck	Kenworth	260	0.03	5 shipments/yr x 2 round-trips/shipment	0.5	5	70	30
Hazardous waste	Pickup truck	Ford 350	350	0.07	1 shipment/month x 2 one-way trips	0.083	2	100	0

Notes: [1] Typical make/model for anticipated type of equipment. Actual equipment may differ.
[2] Within proposed NRC license area; assumes 5 min. for passenger vehicle and pickup truck trips and 30 min. for semi-haul truck trips (including idling during loading/unloading).
[3] Daytime hours defined as 7:00 a.m. to 10:00 p.m. per EPA (1974).

Table ER RAI AQ-1-3. Estimated Passenger Vehicles and Incoming and Outgoing Shipments during Aquifer Restoration

Category	Equipment Type	Make/ Model[1]	HP	No. One-Way Trips per Day	Calculation Method	Duration of Operation per Trip[2] (hrs)	Equipment Operation (hrs/yr)	% Day[3]	% Night
Worker transport	Passenger vehicle	Light truck	200	40	20 workers x 2 round trips/day	0.083	1,217	85	15
Chemicals and fuel	Semi-haul truck	Kenworth	260	4	2 deliveries x 2 round trips/day	0.5	730	95	5
Uranium-loaded resin	Semi-haul truck	Kenworth	260	8	4 deliveries x 2 round trips/day	0.5	1,460	70	30
Yellowcake	Semi-haul truck	Kenworth	260	0.41	75 shipments/yr x 2 round trips/shipment	0.5	75	70	30
Vanadium	Semi-haul truck	Kenworth	260	0.25	45 shipments/yr x 2 round trips/shipment	0.5	45	70	30
Solid waste	Semi-haul truck	Kenworth	260	0.29	1 shipment/week x 2 one-way trips	0.5	52	100	0
11e.(2) byproduct material	Semi-haul truck	Kenworth	260	0.03	5 shipments/yr x 2 round-trips/shipment	0.5	5	70	30
Hazardous waste	Pickup truck	Ford 350	350	0.07	1 shipment/month x 2 one-way trips	0.083	2	100	0

Notes: [1] Typical make/model for anticipated type of equipment. Actual equipment may differ.
[2] Within proposed NRC license area; assumes 5 min. for passenger vehicle and pickup truck trips and 30 min. for semi-haul truck trips (including idling during loading/unloading).
[3] Daytime hours defined as 7:00 a.m. to 10:00 p.m. per EPA (1974).

Table ER RAI AQ-1-4. Estimated Passenger Vehicles and Incoming and Outgoing Shipments during Decommissioning

Category	Equipment Type	Make/ Model[1]	HP	No. One-Way Trips per Day	Calculation Method	Duration of Operation per Trip[2] (hrs)	Equipment Operation (hrs/yr)	% Day[3]	% Night
Worker transport	Passenger vehicle	Light truck	200	180	90 workers x 2 round trips/day	0.083	5,475	90	10
Chemicals and fuel	Semi-haul truck	Kenworth	260	8	4 deliveries x 2 round trips/day	0.5	1,460	90	10
Solid waste	Semi-haul truck	Kenworth	260	0.57	2 shipments/week x 2 one-way trips	0.5	104	100	0
11e.(2) byproduct material	Semi-haul truck	Kenworth	260	1.1	200 shipments/yr x 2 round-trips/shipment	0.5	5	90	10
Hazardous waste	Pickup truck	Ford 350	350	0.07	1 shipment/month x 2 one-way trips	0.083	2	100	0

Notes: [1] Typical make/model for anticipated type of equipment. Actual equipment may differ.
[2] Within proposed NRC license area; assumes 5 min. for passenger vehicle and pickup truck trips and 30 min. for semi-haul truck trips (including idling during loading/unloading).
[3] Daytime hours defined as 7:00 a.m. to 10:00 p.m. per EPA (1974).

Table ER RAI AQ-1-5. Construction Phase Passenger Vehicle and Material Transport Tailpipe Emissions

Category	Equipment Type	Operating Hours	Combustion Emissions (tons/yr)					
			TOC	NO_x	CO	PM_{10}	SO_2	CO_2
Worker transport	Passenger vehicle	12,167	3.53	1.82	3.39	0.34	0.29	524.70
Construction supplies	Semi-haul truck	1,095	0.12	1.46	0.31	0.10	0.10	54.15
Equipment	Semi-haul truck	1,095	0.12	1.46	0.31	0.10	0.10	54.15
Chemicals and fuel	Semi-haul truck	2,190	0.23	2.92	0.63	0.21	0.19	108.30
Solid waste	Semi-haul truck	52	0.01	0.07	0.01	0.00	0.00	2.57
Hazardous waste	Pickup truck	2	0.00	0.00	0.00	0.00	0.00	0.14

Table ER RAI AQ-1-6. Operation Phase Passenger Vehicle and Material Transport Tailpipe Emissions

Category	Equipment Type	Operating Hours	Combustion Emissions (tons/yr)					
			TOC	NO_x	CO	PM_{10}	SO_2	CO_2
Worker transport	Passenger vehicle	3,650	1.06	0.55	1.02	0.10	0.09	157.41
Chemicals and fuel	Semi-haul truck	1,460	0.16	1.95	0.42	0.14	0.13	72.20
Uranium-loaded resin	Semi-haul truck	1,460	0.16	1.95	0.42	0.14	0.13	72.20
Yellowcake	Semi-haul truck	75	0.01	0.10	0.02	0.01	0.01	3.71
Vanadium	Semi-haul truck	45	0.00	0.06	0.01	0.00	0.00	2.23
Solid waste	Semi-haul truck	52	0.01	0.07	0.01	0.00	0.00	2.57
11e.(2) byproduct material	Semi-haul truck	5	0.00	0.01	0.00	0.00	0.00	0.25
Hazardous waste	Pickup truck	2	0.00	0.00	0.00	0.00	0.00	0.14

Table ER RAI AQ-1-7. Aquifer Restoration Phase Passenger Vehicle and Material Transport Tailpipe Emissions

Category	Equipment Type	Operating Hours	Combustion Emissions (tons/yr)					
			TOC	NO_X	CO	PM_{10}	SO_2	CO_2
Worker transport	Passenger vehicle	1,217	0.35	0.18	0.34	0.03	0.03	52.48
Chemicals and fuel	Semi-haul truck	730	0.08	0.97	0.21	0.07	0.06	36.10
Uranium-loaded resin	Semi-haul truck	1,460	0.16	1.95	0.42	0.14	0.13	72.20
Yellowcake	Semi-haul truck	75	0.01	0.10	0.02	0.01	0.01	3.71
Vanadium	Semi-haul truck	45	0.00	0.06	0.01	0.00	0.00	2.23
Solid waste	Semi-haul truck	52	0.01	0.07	0.01	0.00	0.00	2.57
11e.(2) byproduct material	Semi-haul truck	5	0.00	0.01	0.00	0.00	0.00	0.25
Hazardous waste	Pickup truck	2	0.00	0.00	0.00	0.00	0.00	0.14

Table ER RAI AQ-1-8. Decommissioning Phase Passenger Vehicle and Material Transport Tailpipe Emissions

Category	Equipment Type	Operating Hours	Combustion Emissions (tons/yr)					
			TOC	NO_X	CO	PM_{10}	SO_2	CO_2
Worker transport	Passenger vehicle	5,475	1.59	0.82	1.52	0.15	0.13	236.11
Chemicals and fuel	Semi-haul truck	1,460	0.16	1.95	0.42	0.14	0.13	72.20
Solid waste	Semi-haul truck	104	0.01	0.14	0.03	0.01	0.01	5.14
11e.(2) byproduct material	Semi-haul truck	5	0.00	0.01	0.00	0.00	0.00	0.25
Hazardous waste	Pickup truck	2	0.00	0.00	0.00	0.00	0.00	0.14

Table ER RAI AQ-1-9. Summary of Transportation-Related Emissions from Combustion

Project Phase	Transportation Combustion Emissions (short tons/yr)					
	TOC	**NO_X**	**CO**	**PM_{10}**	**SO_2**	**CO_2**
Construction	4.0	7.7	4.7	0.8	0.7	744
Operation	1.4	4.7	1.9	0.4	0.4	311
Aquifer Restoration	0.6	3.3	1.0	0.3	0.2	170
Decommissioning	1.8	2.9	2.0	0.3	0.3	314

Table ER RAI AQ-1-10. Summary of Non-Transportation-Related Emissions from Combustion

Project Phase	Non-Transportation Combustion Emissions (short tons/yr)					
	TOC	**NO_X**	**CO**	**PM_{10}**	**SO_2**	**CO_2**
Construction	13.3	181.8	39.5	11.9	10.8	7,015
Operation	3.1	38.8	8.4	2.8	2.6	1,439
Aquifer Restoration	1.8	22.7	4.9	1.6	1.5	843
Decommissioning	5.1	64.3	13.9	4.6	4.3	2,385

ER RAI AQ-2

Please provide additional information regarding the dust-suppression measures to be used by Strata to control fugitive dust at the Ross Project site during each phase of the Proposed Action (i.e., construction, operation, aquifer restoration, and decommissioning).

A. Please identify the fugitive-dust levels that will trigger the control measures cited in the ER (e.g., Section 5.6). Will Strata use a visible-dust standard as promulgated in the state of Wyoming's Standards and Regulations, "General Emission Standards," Chapter 3, Section 2(f), Fugitive Dusts?

Dust suppression in the disturbed areas of the Ross Project site, especially during facility construction but also during all phases, is particularly important to several environmental impact analyses, such as those for occupational health and safety as well as air quality and visual resources. The success of implementation of dust-suppression measures directly affects air-quality impacts. [Magnesium chloride is proposed by Strata as a chemical dust suppressant (Section 5.2.2 in the ER).] In order to assess air-quality and other environmental impacts in the SEIS, more information is required regarding the implementation and the associated performance of dust-control measures as required by 10 CFR Part 51

ER RAI AQ-2(A) Response

Control of fugitive dust at the Ross ISR Project site will be regulated through Strata's air quality permit (No. CT-12198). This permit was issued by the Air Quality Division (AQD) of the Wyoming Department of Environmental Quality. Condition 16 of permit CT-12198 states:

"… Strata Energy, Inc. shall treat the roads associated with the Ross ISR Project with water and/or chemical dust suppressants to control fugitive dust emissions, as depicted in Exhibit 1 – Fugitive Dust Control Map contained within the permit application, on a schedule such that treatment remains a viable fugitive dust control measure. Strata Energy, Inc. shall apply magnesium chloride to the following road sections once per year:

- 1.1 miles of primary access and central processing plant area roads.
- 0.6 miles of the more frequently traveled wellfield access roads.
- 8.4 miles of county roads that fall within or adjacent to the permit area, including D road and the New Haven Road.

These roads are depicted in Exhibit 1 of the permit application. The chemical dust suppressant shall be maintained continuously to the extent that it remains a viable control measure, which may require additional applications."

This permit condition is consistent with the provisions of the Wyoming Air Quality Division's Standards and Regulations (WAQSR), Chapter 3, Section 2(f), relating to fugitive dust. Other parts of Section 2 that quantify opacity and emission limits apply exclusively to point sources of particulate matter. Examples of such sources include truck dumps, baghouses, engine exhausts and burner stacks. Strata's proposed standby diesel generator is subject to stack testing and emission limits for particulates and other pollutants.

In contrast to point sources, AQD regulates fugitive dust by imposing management practices rather than numerical limits. Exceptions occur where fugitive dust emissions are anticipated to be very large and/or concentrated, in which case air quality permit conditions may require ambient particulate (PM_{10}) monitoring. Such monitoring is then subject to ambient standards specified in WAQSR Chapter 2, Section 2. For PM_{10}, the applicable standards are 150 micrograms per cubic meter ($\mu g/m^3$) averaged over a 24-hour period, and 50 $\mu g/m^3$ averaged over a one-year period.

No ambient monitoring condition is attached to permit CT-12198. Condition 1, however, grants AQD the right to "enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders." AQD conducts regular inspections of permitted facilities such as the proposed Ross ISR Project, as well as unannounced inspections sometimes triggered by complaints from the public. Notwithstanding the absence of quantitative fugitive dust standards, AQD has enforced dust management practices and issued notices of violation in cases where those practices are not adequately implemented.

The control measures cited as conditions in permit CT-12198 are consistent with those cited in ER Sections 5.6 and 5.9. These measures will be applied on a regular basis, with provisions for more frequent application in response to dry weather, heavy traffic, or complaints from local residents. At minimum, fugitive dust from project roads and county roads will be controlled to provide adequate driving visibility and ensure public safety. Construction, material handling, and transport activities will follow the practices set forth in WAQSR Chapter 3, Section 2(f). In particular, as required in Section 2(f)(ii)(B), chemicals brought to the project site in powdered form will be delivered in covered trucks and unloaded through sealed pathways into tanks vented

through dust vent bags or fabric filters. In addition, earthmoving and excavation activities will be accompanied by steps to minimize fugitive dust from disturbed areas by implementing control measures such as watering.

ER RAI AQ-2

Please provide additional information regarding the dust-suppression measures to be used by Strata to control fugitive dust at the Ross Project site during each phase of the Proposed Action (i.e., construction, operation, aquifer restoration, and decommissioning).

B. Please discuss how fugitive dust will be monitored: Does Strata intend to use observation or will a real-time particle monitoring device be used? Also, where will the determination of dust concentrations be made (i.e., relative distance from the disturbance)?

Dust suppression in the disturbed areas of the Ross Project site, especially during facility construction but also during all phases, is particularly important to several environmental impact analyses, such as those for occupational health and safety as well as air quality and visual resources. The success of implementation of dust-suppression measures directly affects air-quality impacts. [Magnesium chloride is proposed by Strata as a chemical dust suppressant (Section 5.2.2 in the ER).] In order to assess air-quality and other environmental impacts in the SEIS, more information is required regarding the implementation and the associated performance of dust-control measures as required by 10 CFR Part 51.

ER RAI AQ-2(B) Response

As discussed in the response to ER RAI AQ-2(A), instrument monitoring of fugitive dust is not planned for the Ross ISR Project, nor is it a requirement under Strata's air quality permit. Fugitive dust control, on the other hand, is a permit requirement and has been implemented at both Moore Ranch and Nichols Ranch ISR projects through WDEQ/AQD permits. Beyond the minimum practices required and enforceable by WDEQ/AQD, Strata will use visual observation to monitor air quality in the project area. Such observation will be performed on at least an hourly basis at the project site and a twice-daily basis at locations along the primary access route leading to the site. Strata will use the results of these observations to determine the frequency of dust suppression activities such as watering, chemical application, road surface maintenance, and enforcement of speed limits in the proposed project area. See also the response to part (D) of this RAI, which describes the portions of the primary access route and wellfield access roads that Strata will treat with magnesium chloride as part of an MOU with Crook County. See also the response to ER RAI CI-2(B), which describes how virtually all traffic associated with the proposed Ross ISR Project will use the primary access route, such that no impacts, including dust generation, will occur on local roads north, east, or west of the proposed Ross ISR Project. Strata will respond aggressively to any

dust-related concerns expressed by its employees, contractors, or members of the public.

ER RAI AQ-2

Please provide additional information regarding the dust-suppression measures to be used by Strata to control fugitive dust at the Ross Project site during each phase of the Proposed Action (i.e., construction, operation, aquifer restoration, and decommissioning).

C. Please clarify whether magnesium chloride ($MgCl_2$) is anticipated to be stored on site, and, if so, please indicate where and in what volume.

Dust suppression in the disturbed areas of the Ross Project site, especially during facility construction but also during all phases, is particularly important to several environmental impact analyses, such as those for occupational health and safety as well as air quality and visual resources. The success of implementation of dust-suppression measures directly affects air-quality impacts. [Magnesium chloride is proposed by Strata as a chemical dust suppressant (Section 5.2.2 in the ER).] In order to assess air-quality and other environmental impacts in the SEIS, more information is required regarding the implementation and the associated performance of dust-control measures as required by 10 CFR Part 51.

ER RAI AQ-2(C) Response

Strata anticipates that the magnesium chloride solution used for dust suppression will be delivered and applied by a contractor with no on-site storage. Additional information about the planned magnesium chloride solution application procedures is found in the response to ER RAI AQ-2(D), including the length and location of affected road segments, application rate, application frequency, equipment used, and potential environmental impacts. As part of an MOU with Crook County, Strata has agreed to apply magnesium chloride to key portions of the primary access route between I-90 and the proposed Ross ISR Project, and to more heavily traveled wellfield access roads within the proposed Ross project area. Virtually all traffic associated with the Ross ISR Project will use the primary access route, such that no impacts, including dust generation, will occur on local roads north, east, or west of the proposed Ross ISR Project.

ER RAI AQ-2

Please provide additional information regarding the dust-suppression measures to be used by Strata to control fugitive dust at the Ross Project site during each phase of the Proposed Action (i.e., construction, operation, aquifer restoration, and decommissioning).

D. Please specify the equipment that will be used to spread the suppressant on the roads.

Dust suppression in the disturbed areas of the Ross Project site, especially during facility construction but also during all phases, is particularly important to several environmental impact analyses, such as those for occupational health and safety as well as air quality and visual resources. The success of implementation of dust-suppression measures directly affects air-quality impacts. [Magnesium chloride is proposed by Strata as a chemical dust suppressant (Section 5.2.2 in the ER).] In order to assess air-quality and other environmental impacts in the SEIS, more information is required regarding the implementation and the associated performance of dust-control measures as required by 10 CFR Part 51.

ER RAI AQ-2(D) Response

As discussed in Strata's air quality permit application (Strata 2011), the water truck anticipated to be used for application of dust suppressant will be comparable to a 260-HP tandem-axle truck equipped with a 3,000 to 4,000-gallon tank. The gross vehicle weight with a full load of suppressant is estimated at 20 tons. The water tank will be equipped with a spray system that includes a pump and a set of spray nozzles designed to uniformly spray dust suppressant laterally and backward from the rear of the truck. From within the cab of the truck, the driver will engage and control the spray system.

As discussed in the response to ER RAI AQ-2(C), Strata plans to use a magnesium chloride solution for dust suppression. Strata anticipates that the solution will be applied by a contractor and will not be stored on site. Magnesium chloride solution will be applied to high-traffic roads within the project area, which are defined as those with an annual average daily traffic count greater than 40 vehicles per day. Magnesium chloride solution will also be applied to portions of Crook County roads for dust suppression per an MOU with the County. Strata does not anticipate using magnesium chloride for road de-icing.

Magnesium chloride is an effective dust suppressant and is regularly used by both public and private entities such as surface coal mines and city and county maintenance departments. Magnesium chloride is hygroscopic, i.e., it absorbs moisture from the air. For this reason, dust and other fine particles

are limited from becoming airborne in a similar fashion to using water as a dust suppressant. The two major advantages of using magnesium chloride over water for dust suppression are that: 1) magnesium chloride effects last longer such that magnesium chloride works throughout the year with only one to two applications per year, and 2) magnesium chloride is more effective at limiting dust from becoming airborne.

In the MOU between Strata and Crook County, which is included as Appendix C to Strata's air quality permit application (Strata 2011), Strata has agreed to apply magnesium chloride to the following road segments:

- 8.4 miles of Crook County Roads along the primary access route, including ¼ mile segments adjacent to three residences;
- 1.1 miles along the entire length of the primary access road and CPP area roads; and
- 0.6 mile of wellfield access roads.

The magnesium chloride solution will be applied to key portions of the primary access route, including segments adjacent to residences. Virtually all traffic associated with the proposed Ross ISR Project will use the primary access route, such that no impacts, including dust generation, will occur on local roads north, east, or west of the proposed Ross ISR Project

A 28 to 35 percent (by weight) solution of magnesium chloride will be applied to the roads indicated above at an approximate rate of 0.25 gallon per sq. yard or 0.04 inch of depth per unit area.

Two potential environmental impacts from the use of chemical dust suppressants such as magnesium chloride are: 1) possible elevated chloride concentration in streams downstream of application areas and 2) negative impacts to the growth of some vegetation and tree species. The nominal application rate described above is the same used by many state transportation departments (Colorado Department of Transportation 2011). At this rate it is highly unlikely that the magnesium chloride solution will run off the roadway and be absorbed into native soil. The application equipment described above is specifically designed to closely control the application rate as well as the area of application. Furthermore, contractors who apply magnesium chloride will be experienced with specialized training and will not attempt applications during

windy conditions, during which time the solution spray could unintentionally carry to adjacent areas. It is unlikely that runoff of the magnesium chloride solution will occur and even more unlikely that the solution will contact surface water because of the significant distance from application areas to any perennial streams. Furthermore, the roadside vegetation typically consists of native grasses such as western wheatgrass and smooth brome that are not salt-sensitive. Therefore, potential environmental impacts from magnesium chloride will be low on the basis that that the level of exposure will be minimal, accordingly, the potential impacts of exposure also will be low.

Noise

ER RAI Noise-1

Please provide additional noise information to allow an evaluation of noise impacts on nearest residential receptors, local wildlife, and site workers.

A. *Please provide available data regarding the general frequency (i.e., octave band) characterization of noise levels specified in the ER so that an evaluation of impacts to nearby residents may be performed.*

The nearest residents to the Ross Project site are described in the ER and TR as 690 feet and 835 feet from the Proposed Action's boundaries. These residences front New Haven Road, which is expected to bear most of the additional traffic during all four phases of the Proposed Action. Further, although typical vehicle-noise levels and sound-level measurements for various construction equipment are provided in Tables 3.7-2, 3.7-3, and 4.7-1 of the ER, additional factors, such as the frequency distribution as well as impact and impulse characteristics, affect the estimation of noise impacts. This information regarding noise sources and their relationships is important to the analysis of noise impacts that is required by 10 CFR Part 51.

ER RAI Noise-1(A) Response

The unit of measure used to establish baseline noise levels for the proposed Ross ISR Project is the A-weighted decibel (dBA) scale. This is consistent with 29 CFR § 1910.95, which requires use of the A-weighting network with a slow response setting for evaluating exposure to noise. It is a measure designed to simulate human hearing by placing less emphasis on lower frequency noise because the human ear does not perceive sounds at low frequency in the same manner as sounds at higher frequencies.

ER Section 3.7.2 provides a detailed discussion on sound level standards and how these standards are applied to determine if noise generated by the proposed project will exceed exposure limit for the workplace and to assess the potential noise impacts on local residents. Section 3.7.3 describes the noise level study methods and the results. As stated in ER Section 4.7, noise impacts from the proposed project are expected to be small due to the remote location of the proposed project area and low number of nearby noise receptors.

For comparison purposes, selected results of the proposed Ross ISR Project noise studies have been converted from A-weighted decibel scale values to octave band range values. These results are presented in Tables ER RAI

Noise-1-1 and ER RAI Noise-1-2. The tables convert A-weighted decibel scale values listed in ER Tables 3.7-2 and 3.7-3, respectively. The locations for the noise level monitoring listed in the tables are provided on ER Figure 3.7-2. The conversion to octave band equivalents is selected for traffic related to nearby residences (Table ER RAI Noise-1-1) and for noise associated with drilling activities (Table ER RAI Noise-1-2) since vehicle traffic along the New Haven Road and drilling activities are expected to be the greatest contributors to noise levels.

Any potential impact analysis to nearby residences needs to consider sound level reduction with distance from the noise source. Please refer to ER Table 4.7-1, which depicts the estimated noise levels resulting from construction equipment located 690 feet from a noise receptor (the minimum distance between a residence and the proposed license boundary) or 2,500 feet from a noise receptor (the minimum distance between a residence and the proposed CPP). ER page 4-97 describes how noise from point sources diminished by 6 dBA for each doubling of distance. ER Table 4.7-1 shows that the estimated noise levels at the nearest residence to the CPP from construction activity in the CPP area, which is where most construction activities will occur, are well below the nuisance level of 55 dBA. Furthermore, a comparison between the nearby residences in ER Figure 3.1-3 and Figure ER RAI GEN-1-2 shows that the minimum distance between a perimeter monitor well and a residence will be at least 1,100 feet. Therefore, the maximum estimated noise level related to construction equipment at a nearby residence will be less than that shown in ER Table 4.7-1. Table ER RAI Noise-1-3 presents the revised ER Table 4.7-1 using the minimum distance between a residence and planned construction activities of 1,100 feet. The revised table shows that the maximum estimated noise level at a nearby residence resulting from a drill rig operating at the closest potential well location will be below the nuisance level of 55 dBA.

Table ER RAI Noise-1-1. Octave Band dBA Equivalent Baseline Noise Measurements at Nearby Residences

Sample Name	Average Octave Band dBA Equivalent Range					Maximum Octave Band dBA Equivalent Range				
	North	South	East	West	Average	North	South	East	West	Average
N-1[1]	19-57	18-56	37-75	25-63	25-63	27-65	20-58	61-99	50-88	40-78
N-2[1]	26-64	29-67	21-59	30-68	26-64	44-82	62-100	32-70	58-96	49-87

Notes:
- Value calculated from dBA values in ER Table 3.7-2
- Noise levels were measured for 3 minutes at 30-second intervals facing each of the four cardinal directions.

[1] Sampling locations are included on ER Figure 3.7-2.

Table ER RAI Noise-1-2. Octave Band dBA Equivalent Sound Level Measurements at Source Locations

Sample Name	Type	Distance from Source (ft)	Average Octave Band Range (dBA Equivalent)	Maximum Octave Band Range (dBA Equivalent)
N-3[1]	Pump Jack	130	33-70	39-76
N-4[1]	Drill Rig	200	41-79	51-89

Notes:
- Value calculated from dBA values in ER Table 3.7-3
- Noise levels were measured for 12 minutes at 30-second intervals.

[1] Sampling locations are included on ER Figure 3.7-2.

Table ER RAI Noise-1-3. Noise Levels for Construction Equipment

Equipment Type	Noise Level at 50 feet[1] (dBA)	Noise Level at 1,100 feet[2] (dBA)	Noise Level at 2,500 feet[3] (dBA)
Heavy Truck	82-96	55-69	24-38
Bulldozer	92-109	65-82	34-51
Grader	79-93	52-66	21-35
Excavator	81-97	54-70	23-39
Crane	74-89	47-62	16-31
Concrete Mixer	75-88	48-61	17-30
Compressor	73-88	46-61	15-30
Backhoe	72-90	45-63	14-32
Front Loader	72-90	45-63	14-32
Generator	71-82	44-54	13-24
Jackhammer/Rock Drill	75-99	48-72	17-41
Pump	68-80	41-53	10-22
Drill Rig[4]	52-74	25-47	18-40

Notes: [1] ISR GEIS Table 4.2-1.
[2] Minimum distance between potential perimeter monitor well and nearby residence.
[3] Minimum distance between CPP and nearby residence.
[4] Based on 2010 noise study described in Section 3.7 of the ER. The noise level measured 200 feet from an operating drill rig ranged from 40 to 62 dBA.

ER RAI Noise-1

Please provide additional noise information to allow an evaluation of noise impacts on nearest residential receptors, local wildlife, and site workers.

B. Please identify whether significant sources of impulse or impact noises, as defined by the Occupational Safety and Health Administration, will be present during any phase of the Proposed Action. If so, please identify the source(s), location(s), and the respective phase of the Proposed Action.

The nearest residents to the Ross Project site are described in the ER and TR as 690 feet and 835 feet from the Proposed Action's boundaries. These residences front New Haven Road, which is expected to bear most of the additional traffic during all four phases of the Proposed Action. Further, although typical vehicle-noise levels and sound-level measurements for various construction equipment are provided in Tables 3.7-2, 3.7-3, and 4.7-1 of the ER, additional factors, such as the frequency distribution as well as impact and impulse characteristics, affect the estimation of noise impacts. This information regarding noise sources and their relationships is important to the analysis of noise impacts that is required by 10 CFR Part 51.

ER RAI Noise-1(B) Response

29 CFR § 1910.95(b)(1) defines continuous noise as that with variation in noise level maxima at intervals of 1 second or less. Noises not meeting this definition are considered impulse or impact noises. Impulse or impact noises may be present during some phases of the project. The sources of the impulse/impact noises may include impact wrenches, pneumatic attachments on excavating machines used to break rock, and incidental construction related noises. If present, these impulse/impact noises primarily will occur during the construction and decommissioning phases and will be of short duration. During operations and aquifer restoration, the occurrence of impulse/impact noises will be very infrequent and generally will be associated with maintenance activities. The primary locations for the noise will be associated with the CPP, wellfield modules, and associated infrastructure. These all will be more than 200 feet from the proposed license boundary and at least 1,100 feet from the nearest residence.

Field measurements for noise studies were made using a Quest SoundPro DL-2 sound level meter, which measures noise between 0 and 140 dBA, with the slow response mode selected on the meter (that setting measures reasonably consistent noise level or averages quickly changing noise levels such as would be associated with impulse/impact noise). This is

consistent with 29 CFR § 1910.95, which requires use of the A-weighting network with a slow response setting for evaluating exposure to noise. As stated in ER Section 4.7, the noise levels generated from drilling operations, when two rigs are operating within 200 feet of each other, ranges from 40 to 62 dBA at a distance of 200 feet. Since the nearest residence is at least 1,100 feet from the nearest potential perimeter monitor well, the average noise at the residences resulting from equipment (including impact/impulse noise) will be significantly less than 55 dBA based on the noise study results. Refer to Part (A) of this response.

Members of the public will not be exposed to potentially damaging noise levels, including impulse/impact noises. In addition, as described in the response to ER RAI P&O Health-1(C), a hearing conservation program for Strata employees and contractors will prevent occupational noise impacts during construction. The hearing conservation program will ensure that exposure to impulse or impact noise will never exceed 140 dB peak sound pressure level in accordance with 29 CFR § 1910.95(b)(2).

ER RAI Noise-1

Please provide additional noise information to allow an evaluation of noise impacts on nearest residential receptors, local wildlife, and site workers.

C. Please identify whether more than one piece of heavy equipment or truck will be operating simultaneously in proximity to each other during the four phases of the Proposed Action. If so, please address such multiple noise sources in the estimates of noise impacts on the nearest residents and on-site workers.

The nearest residents to the Ross Project site are described in the ER and TR as 690 feet and 835 feet from the Proposed Action's boundaries. These residences front New Haven Road, which is expected to bear most of the additional traffic during all four phases of the Proposed Action. Further, although typical vehicle-noise levels and sound-level measurements for various construction equipment are provided in Tables 3.7-2, 3.7-3, and 4.7-1 of the ER, additional factors, such as the frequency distribution as well as impact and impulse characteristics, affect the estimation of noise impacts. This information regarding noise sources and their relationships is important to the analysis of noise impacts that is required by 10 CFR Part 51.

ER RAI Noise-1(C) Response

There will be times when more than one piece of heavy equipment or truck will be operating simultaneously in proximity to each other, particularly during the construction and decommissioning phases when most of the heavy equipment operations will occur. As discussed in ER Section 3.7.3.1, noise studies were conducted to establish baseline noise levels in and around the proposed project area. As described in Part (B) of this response, one phase of the baseline noise study involved measuring the noise generated from drilling operations, at which time two rigs were operating within 200 feet of each other. The noise levels ranged from 40 to 62 dBA at a distance of 200 feet. Since the nearest residence is at least 1,100 feet from a potential perimeter well, the average noise at the residences resulting from multiple pieces of equipment will be significantly less than 55 dBA nuisance level based on the noise study results. Refer to Part (A) of this response for additional information. Accordingly, members of the public will not be exposed to potentially damaging noise levels, including noise from multiple pieces of equipment, and a hearing conservation program for Strata employees and contractors will prevent occupational noise impacts. Please refer to the response to ER RAI P&O Health-1(C) for additional information regarding the hearing conservation program.

Cultural Resources

ER RAI Cultural-1

Please provide a complete identification of historic properties within the Ross Project site.

A. *Please provide a description and location of archaeological properties eligible for the National Register of Historic Places (NRHP). Additionally, please provide locations of areas that may be sensitive for deeply buried sites. [As noted in the "Baseline Cultural and Paleontological Resource Survey" (Baseline Survey, Addendum 3.8-A to the ER), these sites cannot be identified by surface examination or shallow probes, and they may present difficulty when mitigation measures such as those noted in Section 5.8 of the ER are implemented.]*

Historic properties are sites, buildings, structures, districts, objects, or traditional cultural properties that qualify for listing on the NRHP by meeting at least one of four criteria for significance and standards for integrity (see 36 CFR Part 800). The Baseline Survey cited above suggests that additional investigation(s) to identify further archaeological sites and/or to evaluate their significance be conducted within the Ross Project site's boundaries; the Baseline Survey also suggests verification of the respective significance of the 15 archaeological sites within the project's boundaries. The need for an ethnographic context provides a partial basis for such an evaluation as well as for the evaluation of late-period archaeological sites. This information is required in order to consider the impacts to historic and cultural resources of the Proposed Action as required by 10 CFR Part 51.

ER RAI Cultural-1(A) Response

The information requested in this RAI will be provided under a separate submission due to the sensitivity and confidentiality of the material. The submission will include the appropriate affidavit and formatting per 10 CFR § 2.390 and will be submitted on or near March 30, 2012.

ER RAI Cultural-1

Please provide a complete identification of historic properties within the Ross Project site.

B. Please provide a justification for the decision not to record nor evaluate any water-control features, such as the Oshoto Reservoir Dam.

Historic properties are sites, buildings, structures, districts, objects, or traditional cultural properties that qualify for listing on the NRHP by meeting at least one of four criteria for significance and standards for integrity (see 36 CFR Part 800). The Baseline Survey cited above suggests that additional investigation(s) to identify further archaeological sites and/or to evaluate their significance be conducted within the Ross Project site's boundaries; the Baseline Survey also suggests verification of the respective significance of the 15 archaeological sites within the project's boundaries. The need for an ethnographic context provides a partial basis for such an evaluation as well as for the evaluation of late-period archaeological sites. This information is required in order to consider the impacts to historic and cultural resources of the Proposed Action as required by 10 CFR Part 51.

ER RAI Cultural-1(B) Response

The Oshoto Dam on the Little Missouri River was permitted by the WSEO (No. 6046) on July 15, 1953, following a request from applicant Harry Berger, the landowner. The purpose was to provide 162.7 acre-feet of water to irrigate 70 acres using stored water to supplement direct-flow water rights. In addition, 10 acre-feet of water were allocated for industrial purposes. The irrigation water was permitted to be pumped directly from the reservoir via a 5-inch pump with capacity of 2.23 cfs into 6-inch main lines and 4-inch lateral irrigation pipes across an adjacent hay meadow.

The construction of the dam began on September 15, 1954 and notice of completion was filed on October 4, 1954. The cost of the project was $1,150. The dam, according to the engineering plan (WSEO 1954) was to be 23 feet tall, 350 feet long, 90 feet wide at the base and 10 feet wide at the top. The emergency spillway was to be 8 feet deep and 100 feet wide. The 1953 plan called for 5,889 cubic yards of earth-fill material with a 3 to 1 slope on the dam face and 2 to 1 slope on back. The resulting impoundment was planned to cover about 28 acres, with 172.7 acre-feet of stored water.

According to the last inspection report filed by the WSEO in 2010, the current dam is an unlined, earthen berm roughly 510 feet long and about 21 feet wide at the top. An unimproved two-track road crosses the top of the dam. The reservoir water level was about 4.5 feet below the top of the dam and

the dam is a maximum of about 20 feet high above the downstream drainage channel. The reservoir is drained by an unlined trench which serves as an emergency spillway that is about 6 feet deep by 60 feet wide.

The original Oshoto Dam would be 58 years old now and therefore potentially a historic property. However, the drainage basin above the reservoir is nearly 10 square miles and episodic flooding has necessitated rebuilding or repairing the dam several times. The dam was most recently rebuilt in 2004-2005 (Wesley 2012) and prior to that, had been rebuilt after floods in May 1978 and June 1982 (University of Wyoming n.d; Wyoming Office of Homeland Security n.d.). This work goes beyond routine maintenance and essentially consists of reconstruction. This dam is fairly typical of local irrigation project dams. It served a single farm/ranch operation's irrigation needs. It is a simple earthen structure that is relatively readily rebuilt with earth-moving equipment.

The dam has had no historic significance to the local economy or any historical patterns or events, it is not associated with any historically significant persons, it has no significant engineering or design aspects, and no further significant information can be expected reasonably from the site itself or the historic record. The dam is expected to undergo ongoing maintenance activities in compliance with dam safety laws and regulations. Moreover, because the structure that exists today was built in 2004-2005 and is not the same structure built in 1954, it does not appear to meet the definition of a historic property. However, a Wyoming Cultural Property Form was prepared for the Oshoto Dam. It was submitted to the Wyoming SHPO on February 29, 2012 for a Smithsonian site number and has been designated as 48CK2157.

ER RAI Cultural-1

Please provide a complete identification of historic properties within the Ross Project site.

C. Please provide an ethnographic context for evaluation of archaeological sites and TCPs.

Historic properties are sites, buildings, structures, districts, objects, or traditional cultural properties that qualify for listing on the NRHP by meeting at least one of four criteria for significance and standards for integrity (see 36 CFR Part 800). The Baseline Survey cited above suggests that additional investigation(s) to identify further archaeological sites and/or to evaluate their significance be conducted within the Ross Project site's boundaries; the Baseline Survey also suggests verification of the respective significance of the 15 archaeological sites within the project's boundaries. The need for an ethnographic context provides a partial basis for such an evaluation as well as for the evaluation of late-period archaeological sites. This information is required in order to consider the impacts to historic and cultural resources of the Proposed Action as required by 10 CFR Part 51.

ER RAI Cultural-1(C) Response

NRC staff has indicated via email on February 29, 2012 that the consultant providing the ethnographic survey will report directly to the NRC. No response to this RAI is included with this package.

ER RAI Cultural-2

Please provide information to support a comparison of potential impacts to historic properties at the Ross Project site to impacts that could be expected at the Barber Site.

An alternative to be included in the Ross Project site SEIS will consider the construction of the proposed ISR facility at the Barber Site rather than the Ross Project site. Thus, an evaluation of the potential impacts to cultural, archeological, and historic resources at the Barber Site will be included in the SEIS. However, in lieu of a full cultural resource survey, such as has been conducted at the Ross Project site, a desk-top study may be sufficient for the Barber Site. The environmental setting, prehistory, history, and ethnography should be described, and a review of similar cultural resources studies in the vicinity of the Barber Site may be able to be used to assess whether greater or lesser impacts can be expected from the alternative action.
This information is required in order to consider the impacts to historic and cultural resources of the Proposed Action as required by 10 CFR Part 51.

ER RAI Cultural-2 Response

A comparison of the potential impacts to cultural resources between the proposed Ross project site and the potential Barber satellite site is difficult to estimate due to the lack of pre-license baseline data at the Barber site. Since the potential Barber site was ruled out by Strata as a CPP location, no Class III inventory has been conducted by Strata within the potential Barber Satellite Facility, whereas the entire proposed Ross project area of approximately 1,721 acres has been intensively inventoried. At the potential Barber site, a desktop file search in a one-mile radius buffer area identified a total of 650 acres of lands that have been surveyed through a combination of scattered, small inventory projects. Six cultural properties have been recorded in the buffer area. A Class III baseline inventory at the potential Barber site will be required in order to make a comparison of the potential impacts to cultural resources.

Given the similar historical context, similar topography, and similar geological setting between the proposed Ross project area and the potential Barber satellite site, the cultural site types at both locations are expected to be similar. Expected site types include prehistoric lithic scatters, lithic procurement sites, habitation (camp) sites, stone ring/stone circle sites, historic debris scatters, homesteads, stock herding camps, cairns and structures such as stock water reservoirs.

Visual Resource

ER RAI VIS-1

Please provide specific information regarding proposed tree plantings around the CPP, if available.

Section 5.9 of the ER (page 5-58) describes mitigation measures for visual-resource impacts for the Proposed Action. For example, tree plantings around the CPP are described as a mitigation measure to "help minimize the visibility of the facilities and traffic." In order to perform an evaluation of this mitigation measure, information regarding specific tree species, tree arrangement and spacing, and culture techniques that will be undertaken by Strata to ensure the success of these plantings, both in terms of screening as well as persistence, would be helpful. The trees shown in the "Preliminary Plant Layout" (Figure 1.2-5) are denoted by the industry-standard tree symbol for deciduous trees, which are not evergreens and therefore would not screen views year-round. Information regarding tree species, placement, and culture would support an analysis of visual impacts as required by 10 CFR Part 51.

ER RAI VIS-1 Response

Tree species used for planting likely will be a conifer type (evergreen characteristics) native to the area. One possible tree species that could be used for a visual barrier would be Rocky Mountain juniper. This tree is hardy and adapted to the area. Tree spacing would be from 3 to 6 feet. Fencing to reduce browsing impacts from livestock and big game and supplemental watering (i.e., drip system) are planned to promote growth. The tree planting will "soften" the potential visual impact of the CPP and associated facilities. As noted in the basis for this RAI, the approximate tree locations are depicted on ER Figure 1.2-5.

ER RAI VIS-2

Please provide information on the proposed site lighting equipment and system.

Section 5.9 of the ER (page 5-58) describes the lighting for the Proposed Action. However, more information is required to assess the environmental impacts of night-time lighting of the Ross Project site (i.e., the potential for light pollution), not only on the nearby residences, but also on Devils Tower and the Missouri Buttes. Specific information regarding the proposed lighting fixture(s), bulb type, light shielding, post locations, and hours of use would be helpful in order to evaluate the magnitude of these potential impacts. This visual-resource impact analysis is required by 10 CFR Part 51.

ER RAI VIS-2 Response

Exterior lighting will be necessary for safe and secure operations. Strata will use both continuous and intermittent lighting systems during all phases of the project. Continuous lights will be used at those locations that require continuous lighting during nighttime for safe operations including the 50 foot tall CPP and other facilities nearby. Intermittent lighting systems will be used at other areas where a periodic nighttime presence by Strata personnel will be required. Exterior lighting will primarily be used during the operations and aquifer restoration phases with the focus point on equipment and areas of concern for security and worker safety. Limiting the amount of artificial light emanation will be addressed through lighting system design and use. In addition to normal downward focused lighting, topography and distance play an important role in limiting any potential light pollution. Historically, light pollution has not been an issue at ISR facilities, even those that operate in suburban environments (e.g., the Uranium Resources Inc. Kingsville Dome Project). Through discussions with local residents, Strata is aware of some concerns regarding potential light pollution and therefore, has developed a detailed plan to minimize the potential impacts of light pollution effectively. Following is a summary of the light pollution mitigation plan.

Prior to construction of the proposed Ross ISR Project, baseline monitoring for potential light pollution will be conducted at eight sites, as depicted on Figure ER RAI VIS-2-1. Baseline light pollution readings will be measured at five residences within 2 miles of the proposed project area, one control site within the proposed project area, and two control sites adjacent to the proposed project area. Monitoring will be conducted using a sky quality

meter (SQM), which measures sky brightness and provides readings in units of magnitudes per square arc-second. Higher unit readings correspond to a darker night sky. Based on the results of this pre-construction baseline evaluation, a light pollution operational monitoring plan will be prepared and made available for NRC staff inspection. The plan will finalize the locations for both the continuous and intermittent light sources along with providing a schedule for periodic checks on sky brightness during operations to both ensure worker safety and measure and mitigate, if any, obtrusive light emanating from the proposed project.

Strata has initiated preliminary planning for the locations and duration of potential light sources during the operations and aquifer restoration. Figure ER RAI VIS-2-2 depicts the location and duration (continuous or intermittent) of the proposed lighting sources. Continuous nighttime lighting is planned for the CPP building, warehouse building and main security gate. Intermittent lighting is planned for the parking areas, lined retention pond areas, deep disposal well areas and module buildings. Intermittent lighting will utilize motion sensors and timers to activate and deactivate the lights. Continuous lights will operate using timers or day/night sensors. As discussed in ER Section 5.9, nighttime drilling activities may occur periodically. In these rare circumstances, Strata will turn the mobile lighting systems away from any residences and restrict the proximity of the rigs both to reduce light and noise impacts. The preliminary analysis of potential light locations and duration identified 29 intermittent lights and 3 continuous light sources.

The potential for impacts from light pollution would be greatest for those facility areas with the greatest visibility as depicted on Figure ER RAI VIS-2-1. Strata commits to evaluating the extent of the light pollution to nearby residences following installation of the final lighting system. Additionally, Strata commits to act on any concerns of local residents as long as worker safety is not compromised. With a limited number of continuous lights, the potential impacts are expected to be small both in the immediate area much less in the larger regional visual resource area.

The potential for light pollution impacts beyond the immediate area (>2 mile buffer used in the ER) is remote. Figure ER RAI VIS-2-3 depicts the proposed project site and the areas from which the proposed CPP will be visible within 3 miles. Distances beyond 3 miles have not been considered for the

analysis in Section 3.9 of the ER as the topography and landforms outside of 3 miles effectively limit the visual impact of the CPP. While the analysis is based on daylight scenic quality, the same principles restricting daytime visibility (i.e., topography) will restrict nighttime visibility. The proposed CPP and associated continuous light sources will be located in a low-lying area along a tributary to the Little Missouri River. With the exception of the winding Little Missouri River valley downstream of the proposed project area, the elevations increase in all directions away from the proposed CPP. Within 3 miles of the proposed project area, the elevation increases by as much as 550 feet, particularly to the east. Moreover, to the east, the landforms change to a more topographically varied woodland or forest type environment (forested areas are depicted on Figure ER RAI VIS-2-3 with green shading), further decreasing the visibility of the site. Even pictures taken with a telephoto lens from the *top* of Devils Tower in September 2011 (ML Accession #ML11320A307) reveal very few anthropogenic influences in the proposed Ross project area from this unique vantage point even though a number of ranches and oil producing facilities are located within and surrounding the proposed project area. From a residence located to the northeast (14.8 miles) or southeast (10.1 miles) (Figure ER RAI VIS-2-3) the three continuous lights planned at the CPP would not be visible due to the varied topography and forested areas that lie in the intervening spaces. In addition, Strata will implement the following mitigation measures to further limit potential light pollution impacts.

Proper lighting techniques will reduce potential light pollution impacts from both continuous and intermittent sources. In summary, Strata has proposed the following mitigation measures to further limit potential light pollution impacts at the site:

- Designing lighting plans with an emphasis on the minimum lighting requirements for operations, safety, and security purposes.
- Utilizing light sources of minimum intensity (measured in lumens) necessary to accomplish the light's purpose.
- Specifying lighting fixtures that direct light only where it is needed (shine down, not out or up) in conjunction with shielding that further directs the light towards the work area.
- Turning lights off when not needed using timers, occupancy sensors, or manually, as discussed at the proposed intermittent light locations.

- Adjusting the type of lights used so that the light waves emitted are those that are less likely to cause light pollution problems such as high pressure sodium lamps.

- Fitting building windows with shutters, where appropriate, to block light emissions, including the CPP and warehouse.

- Utilizing screens (i.e., placing facilities to take advantage of topography, trees, shutter systems on buildings, and other man-made structures) to reduce perceptible light.

- Evaluating the results of the operations phase light pollution monitoring to ensure that, as necessary, the mitigation measures suggested previously have been implemented successfully.

Exterior lighting will be necessary to safely produce uranium at the proposed Ross ISR Project; however, through careful planning, monitoring and mitigation, there will be a low potential for light pollution. In addition, the natural conditions provided by topography, landforms and vegetation further reduce potential impacts. Strata has been and will continue to be a 'good neighbor' to local residents. The mitigation plan provided in this RAI response will minimize potential light pollution impacts.

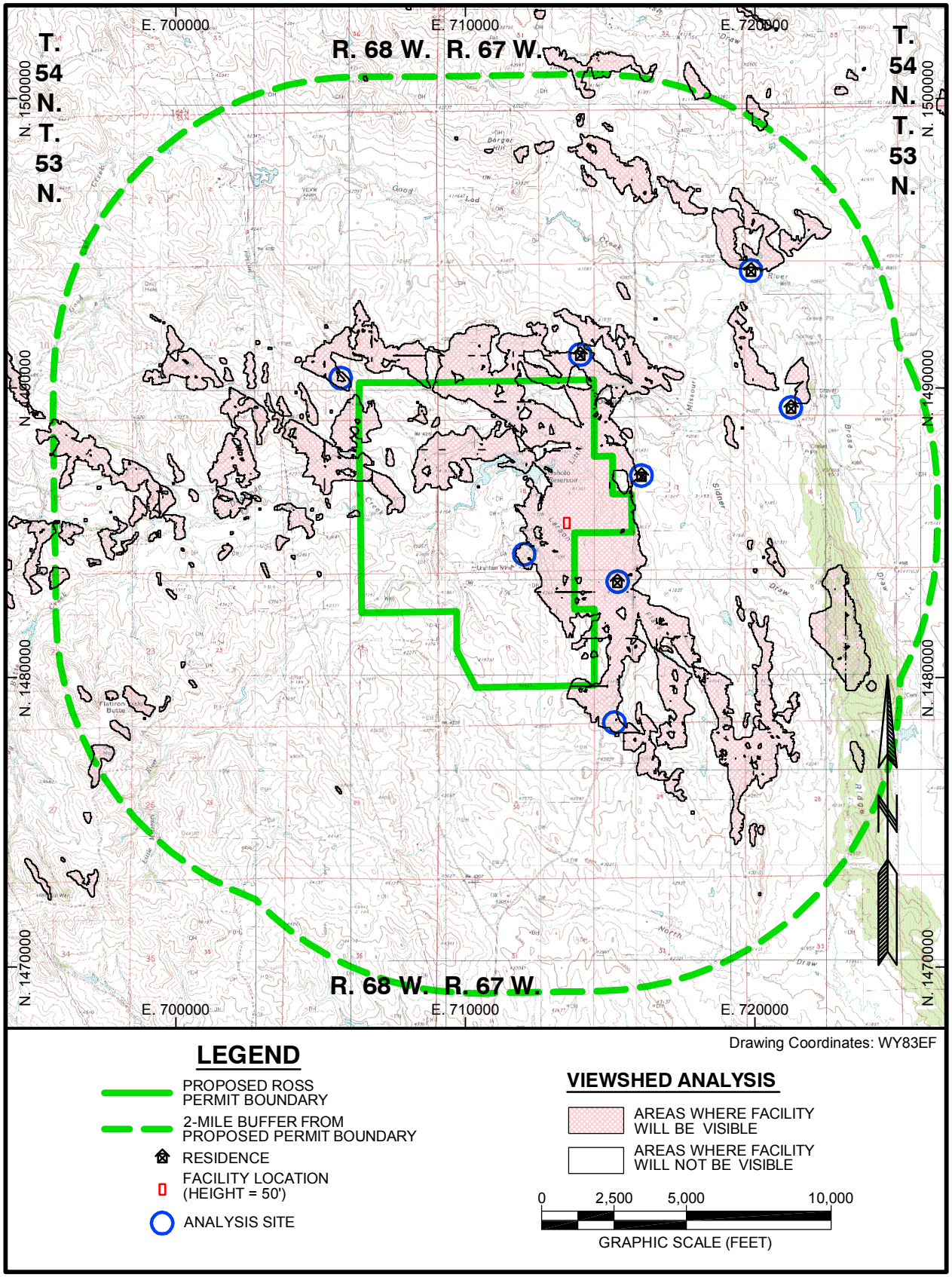


Figure ER RAI VIS-2-1. Light Pollution Analysis Sites.

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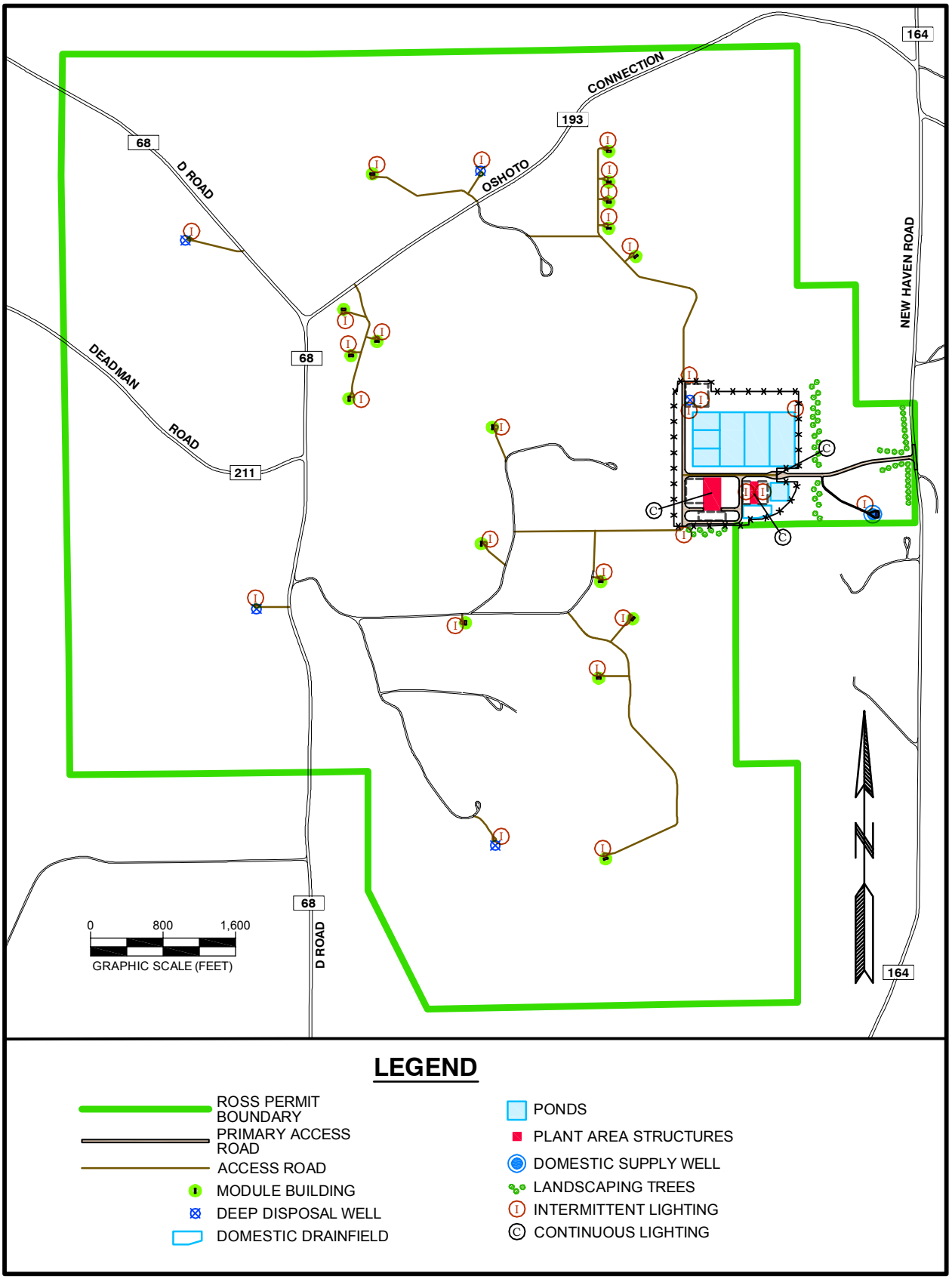


Figure ER RAI VIS-2-2. Preliminary Locations of Continuous and Intermittent Light Sources.

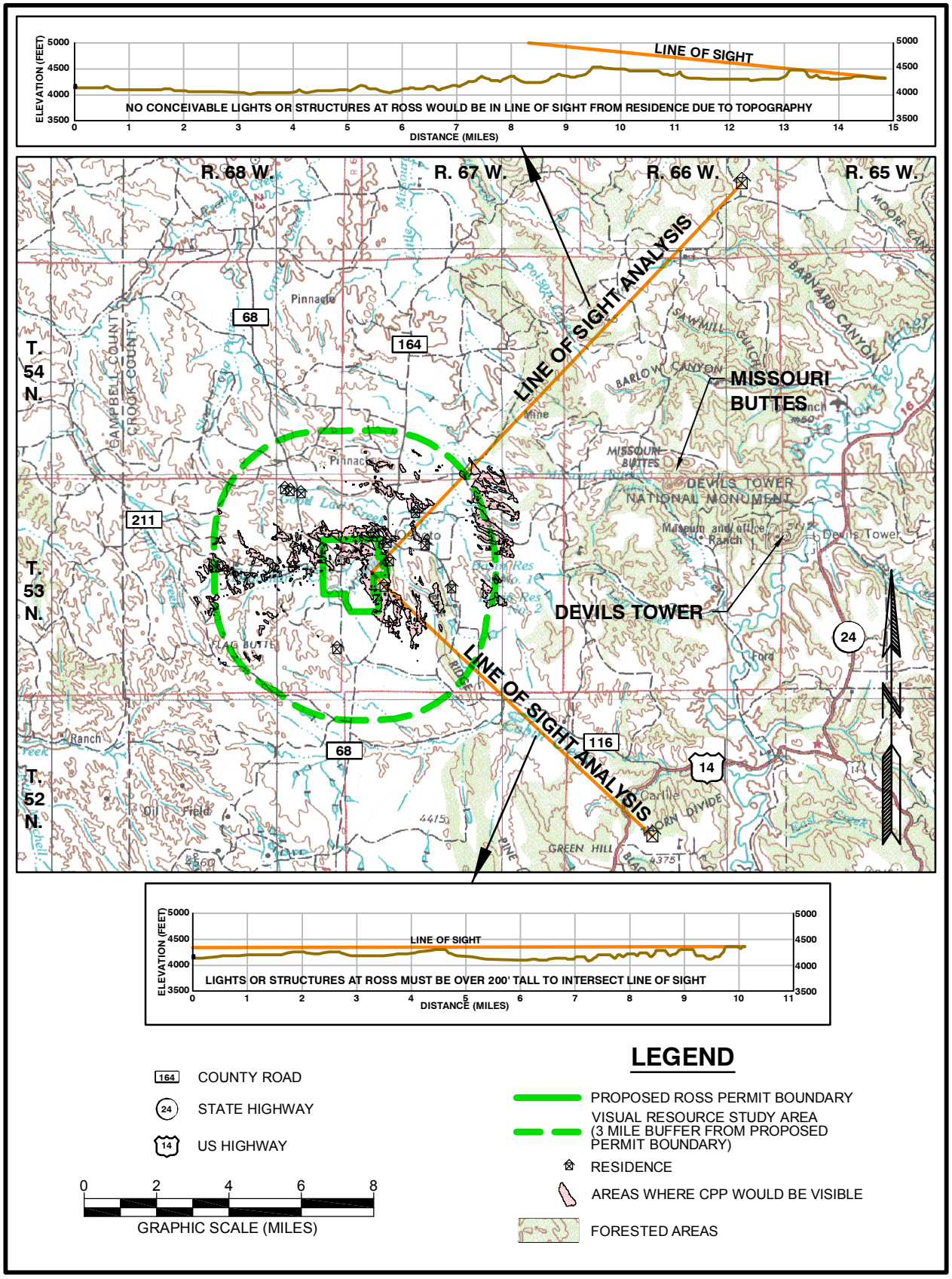


Figure ER RAI VIS-2-3. Regional Light Pollution Analysis.

Socioeconomics

ER RAI SOC-1

Please provide the related data, Strata's assumptions, and the calculations sufficient to reproduce the estimated major tax revenues expected from the Proposed Action as presented in Table 7.2-1 in the ER and Table 9.2-1 of the TR.

There appears to be a discrepancy between discussions of potential tax revenues as presented in the ER (page 4-121) and the data in Table 7.2-1 in the ER (and Table 9.2.-1 in the TR). For example, on page 4-121 of the ER, it is estimated that state royalties will be $1.01 million; however, Table 7.2-1 in the ER and Table 9.2.-1 in the TR indicate $180,000 per year. Similarly, property tax estimates given on page 4-121 present calculations showing property taxes expected by just yellowcake production alone is $880,000 per year, while the referenced tables indicate $350,000 per year. Please provide the data, assumptions, and calculations used in developing the estimated tax revenues for the four revenue sources in these tables. Also, provide clarification for discussion on pages 4-121 and 4-122 of the ER under "Local Finance." These data are necessary for the NRC staff to evaluate effectively the socioeconomic impacts of the Proposed Action as required by 10 CFR Part 51.

ER RAI SOC-1 Response

Several discrepancies and errors were noted between the discussions of potential tax revenues as presented in the ER (p. 4-121) and the data in Tables 7.2-1 in the ER and 9.2-1 in the TR. These are corrected in Table ER RAI SOC-1-1, which is similar to ER Table 7.2-1 and TR Table 9.2-1. Tax revenue numbers which have been revised are shown in italics, and the calculations and assumptions used to reproduce the major revenue numbers are provided as footnotes in the table.

With respect to the discussion of state royalties on page 4-121 in the ER, there may be some confusion regarding the estimate that about 18% of the mineral production in the project area will come from State-owned lands, but during the early years of production about 50% of the production will come from State-owned lands. Both statements are correct. The 18% estimate applies to total production from the proposed Ross ISR Project over the life of the project, while the 50% estimate only applies to the early production (initial wellfields). As noted in footnote b in Table ER RAI SOC-1-1, Strata used the 18% value to obtain the average state royalties per year of $243,000.

The following discussion is provided to correct the paragraph at the bottom of ER page 4-121 and the top of ER page 4-122. Changes from the original ER text are shown in italics.

About 18% of the proposed Ross project area of 1,723 acres is owned by the State of Wyoming. Yellowcake production from the State lands will be subject to the 4% royalty plus the 4% severance tax *times the industry factor (currently 0.5488).* During the early years of production, Strata anticipates that about half of the yellowcake will be produced from State lands. Assuming a yellowcake price of $45 per pound and an annual production rate of 750,000 pounds per year, the *average* annual State royalty would be about *$243,000* and the *average* annual severance tax would be about *$855,000*, for a total of $1,098*,000 per year. The State royalty payments will be higher during the early years of operation when about 50% of the annual production will come from state-owned lands.* Considering the projected FY 2010 revenues to the State of $631,600,000 and estimating that 23.3% will come from mineral taxes, the projected impact to the State from production at the Ross ISR Project will be small (refer to Section 3.10.3.3). However, the *gross production* tax on yellowcake production at the Ross ISR Project would be about $1,337,000 per year (assuming $45 per pound times 750,000 pounds per year times an industry factor of 54.88% times a 62.545 mill levy, see Table *ER RAI SOC-1-1*). Compared to total FY 2008 property taxes levied in Crook County of $10,067,332 (see Table 3.10-11), this represents an increase of about 13%, which could be considered a significant benefit. Considering that vanadium may also be sold for about $12 per pound, and assuming it is produced at a rate of 0.6 pound per pound of yellowcake, the tax revenues from production would increase by about 10% to 20%.

Table ER RAI SOC-1-1. Estimated Major Tax Revenues from the Ross ISR Project

Revenue Source	Tax Revenues	
	Average Per Year	**Over 10 Years Production**
Severance taxes [1]	*$855,000*	*$8,550,000*
State royalties [2]	$243,000	$2,430,000
Gross production taxes [3]	$1,337,000	$13,370,000
Property taxes [4]	$350,000	$3,500,000
Total	*$2,785,000*	*$27,850.000*

Notes:

[1] Severance taxes computed as (750,000 lbs/year of U_3O_8 produced) multiplied by ($45 per lb U_3O_8) multiplied by (4% severance tax rate) multiplied by (54.88% industry factor) = $854,797 per year or $8,547,970 over 10 years.

[2] State royalties computed as (750,000 lbs/year of U_3O_8 produced) multiplied by ($45 per lb U_3O_8) multiplied by (18% of U_3O_8 which comes from State-owned lands) multiplied by (4% royalty rate) = $243,000 royalty per year averaged over 10 years. This was rounded to $2,430,000 to remove implied precision.

[3] Gross production taxes calculated as (750,000 lbs/year of U_3O_8 produced) multiplied by ($45 per lb U_3O_8) multiplied by (54.88% industry factor for U_3O_8) multiplied by (0.062545 Crook County mill levy) = $1,336,581 per year. This was rounded to $1,337,000 per year to remove implied precision.

[4] Property taxes computed as ($50,000,000 valuation of production facilities and real property) multiplied by (11.5% assessment value for industrial property) multiplied by (0.062545 Crook County mill levy) = $359,633.75 per year). This was rounded to $350,000 to remove implied precision.

ER RAI SOC-2

Please provide an estimate of the tax revenues for the Barber Site.

The SEIS will include an analysis of the construction, operation, aquifer restoration, and decommissioning of the ISR facility at the Barber Site as an alternative. In order for the NRC to perform a thorough analysis of this Alternative's socioeconomic impacts, data comparable to that for the Proposed Action are needed. This evaluation of the socioeconomic impacts of Alternatives is required by 10 CFR Part 51.

ER RAI SOC-2 Response

The following estimate of tax revenues for the potential Barber Satellite Facility is based on a currently projected resource of 15,235,388 lb U_3O_8 of which total production could exceed 5,700,000 lb U_3O_8 based on numbers published in a December 21, 2011 press release by Peninsula Energy, Ltd (Peninsula 2011). It is estimated that about 7% of the production within the potential Barber Satellite Facility will come from State-owned lands and therefore subject to State mineral royalties. Table ER RAI SOC-2-1 shows the estimate of tax revenues for the potential Barber Satellite Facility assuming a project life of 7.6 years at 750,000 lb U_3O_8 per year. These are very preliminary estimates and subject to change.

Table ER RAI SOC-2-1. Estimated Tax Revenues for the Barber Satellite Facility

Revenue Source	Tax Revenues	
	Average Per Year	**Over 7.6 Years Production**
Severance taxes [1]	$852,000	$6,475,000
State royalties[2]	$94,500	$718,200
Gross production taxes [3]	$1,332,187	$10,124,625
Property taxes [4]	$359,600	$2,733,000
Total	$2,278,687	$20,050,825

Notes:

[1] Severance taxes computed as (average of 750,000 lbs per year of U_3O_8 produced) times ($45 per lb U_3O_8) times (4% severance tax rate) x (54.88% industry factor) = $852,000 per year or $6,475,000 over 7.6 years.

[2] State royalties computed as (average of 750,000 lbs/year of U_3O_8 produced) times ($45 per lb U_3O_8) times (7% of U_3O_8 which comes from State-owned minerals) times (3% royalty rate) = $94,500 royalty per year averaged over 7.6 years.

[3] Gross production taxes calculated as (average of 750,000 lbs/year of U_3O_8 produced) times ($45 per lb U_3O_8) times (54.88% industry factor for U_3O_8) times (0.062545 Crook County mill levy) = $1,332,187 per year.

[4] Property taxes computed as ($50,000,000 valuation of production facilities) times (11.5% assessment value for industrial property) times (0.062545 Crook County mill levy) = $359,600 per year).

ER RAI SOC-3

Please clarify whether the construction workforce estimate of 200 workers includes supervisory, administrative, and other support (such as waste management or occupational safety) personnel.

Page 4-111 of the ER states there will be 200 construction workers (115 for construction of the CPP and other general or civil site work as well as 85 for wellfield construction). Please specify whether this number includes supervisory, administrative, and other support personnel who will be present at the Ross Project site during facility construction. This information is necessary to effectively evaluate the potential impacts of the Proposed Action, such as those related to socioeconomics, traffic, and air quality as required in 10 CFR Part 51.

ER RAI SOC-3 Response

The estimated construction workforce number on ER page 4-111 and ER Table 4.2-1 includes supervisory, administrative and other support personnel, such as waste management and occupational safety personnel. The total construction workforce is estimated to be 200 workers as analyzed in various sections of the ER.

ER RAI SOC-4

Please provide additional information regarding Strata's estimates of workforce size and origin during facility construction and operation phases.

A. Please provide Strata's best estimate and rationale for the number of construction workers expected to be non-local hires.

Page 4-113 of the ER states that the labor force for construction will "likely" come from nearby communities. The actual number and its underlying rationale need to be presented so that the related socioeconomic impacts as well as the related costs and benefits of the Proposed Action may be accurately evaluated. In addition, on pages 4-118 - 4-119 of the ER it is estimated that 20 percent of the 60 operations workers (12 workers) will be non-local hires. The rationale for this estimate should be provided (e.g., is there a sufficient number of unemployed workers, who are trained for ISR operations, in the locale) in order for the NRC to assess the related socioeconomic impacts as well as the costs and benefits of the Proposed Action as required by 10 CFR Part 51.

ER RAI SOC-4(A) Response

The rationale for assuming that most of the construction workforce will come from the local area is provided on ER pages 4-111 through 4-113. The facilities to be constructed include wells, roads, ponds, pumps and piping, electrical infrastructure and steel buildings. This type of construction has been common in this part of Wyoming for many years, a time which has seen the recent construction and modification of power plants, coal bed natural gas infrastructure, and ongoing surface coal mine operation and expansion. Building construction has seen a rapid decline after the housing collapse in 2007-08, and more recently the rapid decline in natural gas prices has caused a slowdown in the coal bed natural gas industry in this general area. Workers are available in the area who are trained and experienced in erecting steel buildings and constructing ponds, roads, and infrastructure associated with production of coal bed natural gas (including water treatment facilities, underground electric lines and water pipelines). There are local (in the Gillette area) contractors who are capable of building the types of facilities required at the proposed Ross ISR Project. Further, expertise in actual ISR facility construction is currently growing in northeastern Wyoming through ongoing startup activities at the Willow Creek Project and through construction of the Moore Ranch and Nichols Ranch ISR projects.

As part of the ongoing design of the civil infrastructure components of the proposed Ross ISR Project, Strata contacted three local contractors to inquire about their specific experience related to the types of facilities to be constructed at the proposed Ross ISR Project. These included Fuller Construction, Earthwork Solutions and DRM. Fuller Construction is based in Moorcroft, approximately 20 road miles from the proposed project area. Earthwork Solutions and DRM are based in Gillette, approximately 50 road miles from the proposed project area. All are familiar with local material sources (Earthwork Solutions owns and operates a gravel pit within 10 miles of the project area), civil construction, including specialty items such as pond liners (Earthwork Solutions recently completed a new landfill in Gillette), and the importance of safety when working at an extraction facility (Fuller Construction previously operated the Coal Creek Mine near Gillette). These and many other local contractors have experience in road construction, site leveling, pipeline construction, pond construction, and steel building erection. Other local contractors have extensive experience in well drilling and wellfield construction.

If a contractor from outside the area should win some of the construction contracts, they likely will bring in supervisors and foremen from their home offices but still will likely hire most of their laborers and equipment operators locally. In addition, Strata has made a commitment to hire locally and make equipment purchases locally whenever possible. This commitment is included in Section 1.1.3 of Strata's Public Involvement Plan which is included in the ER as Addendum 1.6-A. It is estimated that less than 10% of the construction workforce would be from more than 100 miles from the proposed project site.

ER RAI SOC-4

Please provide additional information regarding Strata's estimates of workforce size and origin during facility construction and operation phases.

B. Please provide the basis for Strata's estimate that 20 percent of the operations workforce will be non-local hires.

Page 4-113 of the ER states that the labor force for construction will "likely" come from nearby communities. The actual number and its underlying rationale need to be presented so that the related socioeconomic impacts as well as the related costs and benefits of the Proposed Action may be accurately evaluated. In addition, on pages 4-118 - 4-119 of the ER it is estimated that 20 percent of the 60 operations workers (12 workers) will be non-local hires. The rationale for this estimate should be provided (e.g., is there a sufficient number of unemployed workers, who are trained for ISR operations, in the locale) in order for the NRC to assess the related socioeconomic impacts as well as the costs and benefits of the Proposed Action as required by 10 CFR Part 51.

ER RAI SOC-4(B) Response

The following describes the rationale used to derive the estimate that about 20% of the operations workforce will be non-local hires. As stated on ER page 4-117, employees with a different technical expertise will be required during operations as opposed to during construction. There will be a need for more on-site management personnel, health and safety personnel, regulatory, accounting and laboratory personnel. Strata anticipates that some of the construction workforce who work on the initial wellfield modules and associated infrastructure (e.g., roads, electrical systems, and pipe networks) will hire on as operations personnel in order for Strata and these employees to capitalize on the project-specific experience acquired during construction of the initial facilities. Construction personnel with particular aptitudes or interests may receive special training to operate the water treatment system, deep injection wells, IX columns and vacuum dryers because that type of experience is not as likely to be available in the local area.

It is estimated that the following staff positions could be the most likely to be non-local hires because these people likely will be transferred in from corporate offices or because people with the special training or experience to hold these positions may not be available locally.

1. Facility Manager
2. Manager of Health, Safety and Environmental Affairs
3. Radiation Safety Officer
    a. Radiation Safety Technician (2)
4. Operations Superintendent
    a. Operations Foreman
    b. Maintenance Foreman
5. Construction Superintendent
6. Chief Geologist
    a. Project Geologist

The best individuals available will be hired for these positions and may not be available in the local area. The preceding list totals 11 people. With an operations workforce of about 60, this list constitutes about 18.3%, which was rounded to 20% or 12 employees.

ER RAI SOC-5

Please provide additional information regarding Strata's estimates of workforce size and origin during aquifer restoration and facility decommissioning.

A. Please confirm Strata's best estimate for the actual number of workers required for aquifer restoration and estimate the number of workers that will be non-local hires.

Page 4-122 of the ER states that, during the aquifer restoration phase, the work force is expected to be reduced by one-half to two-thirds. Please confirm that this estimate means a reduction from the operations level of 60 persons. In addition, Strata's best estimate for the actual number of workers required for facility decommissioning and the related underlying rationale would be helpful in order to accurately assess socioeconomic impacts as required in 10 CFR Part 51.

ER RAI SOC-5(A) Response

As stated in the ER on page 4-122, the workforce is expected to be reduced by one-half to two-thirds during aquifer restoration. The reduction in workforce is expected after the end of uranium extraction operations and not during concurrent operations/aquifer restoration. If this projection is correct, this means that the workforce will be reduced from about 60 during operations to between 20 and 30 during aquifer restoration without concurrent operations. Most of the reductions will be field workers because it no longer will be necessary to drill new wells or install wellfield plumbing and electrical systems. As the ore grade reaching the CPP from the final wellfield modules declines, the CPP workforce will be reduced. It no longer will be necessary to run shifts for 24-hour operation, reducing the CPP workforce by 50% or more. Administrative and technical staff will not be subject to major reductions during aquifer restoration because the lab and regulatory work and water management activities, including monitoring and reporting, RO treatment and deep well disposal activities will continue throughout the aquifer restoration process. The need for regulatory, management and health and safety personnel will continue throughout aquifer restoration and decommissioning. These personnel changes will occur gradually, beginning after the final wellfield modules are placed into operation and continuing throughout aquifer restoration and decommissioning. It is anticipated that much of the demolition and decommissioning will be done by contractors.

As stated in the response to ER RAI SOC-4(B), about 20% of the operations workforce, or about 12 people, will require specialized training and/or experience and are not as likely to be local hires. These people will be needed throughout operations, aquifer restoration and decommissioning. No new staff will be required as the project transforms from operations into aquifer restoration and decommissioning, and after 4 to 5 years of operations, these people will no longer classify as non-local employees, even though they may have originally been hired as such.

ER RAI SOC-5

Please provide additional information regarding Strata's estimates of workforce size and origin during aquifer restoration and facility decommissioning.

B. Please explain why the total number of the decommissioning workforce (i.e., 90 workers) presented on page 4-123 of the ER is less than that presented in the Generic Environmental Impact Statement (GEIS) (i.e., 200 workers).

Page 4-122 of the ER states that, during the aquifer restoration phase, the work force is expected to be reduced by one-half to two-thirds. Please confirm that this estimate means a reduction from the operations level of 60 persons. In addition, Strata's best estimate for the actual number of workers required for facility decommissioning and the related underlying rationale would be helpful in order to accurately assess socioeconomic impacts as required in 10 CFR Part 51.

ER RAI SOC-5(B) Response

The primary reason that a smaller workforce is estimated during decommissioning than construction is phased wellfield decommissioning. ER page 4-123 describes how decommissioning of individual wellfield modules is anticipated after regulatory approval of successful aquifer restoration. ER Figure 1.3-1 shows significant overlap between aquifer restoration and decommissioning, such that the total duration of decommissioning is expected to be approximately 3 years, or about 3 times as long as the facility construction period. Further, decommissioning of the CPP and ancillary facilities is estimated to last 12 to 18 months (ER page 1-21), which is up to 150% longer than the 6 to 12 months anticipated for initial facility construction (ER page 1-20). Phased decommissioning will result in the need for fewer workers over a relatively longer period of time. In addition, increased efficiency is expected to reduce the workforce demands during decommissioning as described below.

Project planning usually is based on manpower, or man-hours, rather than on number of employees. If any project (decommissioning, for example) is properly planned and scheduled, it is possible to optimize labor requirements by minimizing overtime and by avoiding large fluctuations in manpower requirements. Productivity also is steadily increasing. According to the U.S. Bureau of Labor Statistics, productivity in the non-farm business sector is increasing at around 2% per year (U.S. Department of Labor 2012), indicating a

likely increase of 20% to 35% in the 10 to 15 years from now until the decommissioning likely is to be completed.

Strata believes that with proper planning and scheduling the 90 workers estimated on ER page 4-123 will be adequate for decommissioning of the proposed Ross ISR facilities.

ER RAI SOC-5

Please provide additional information regarding Strata's estimates of workforce size and origin during aquifer restoration and facility decommissioning.

C. Please provide Strata's best estimate of the number of decommissioning workers who will be non-local hires.

Page 4-122 of the ER states that, during the aquifer restoration phase, the work force is expected to be reduced by one-half to two-thirds. Please confirm that this estimate means a reduction from the operations level of 60 persons. In addition, Strata's best estimate for the actual number of workers required for facility decommissioning and the related underlying rationale would be helpful in order to accurately assess socioeconomic impacts as required in 10 CFR Part 51.

ER RAI SOC-5(C) Response

As stated in the response to ER RAI SOC-4(B), Strata projects that about 12 people, mostly technical and administrative staff, will be non-local hires. Most if not all of these positions will be needed throughout operations, aquifer restoration, and decommissioning. Although these people might be non-local hires, by the time decommissioning commences these people will have been on the Ross staff for several years and may not still be considered non-local.

Some of the decommissioning activities will be done by specialized contractors. Moreover, it is believed that local contractors, using local labor, will do the majority of the work. The local contractors described in the response to ER RAI SOC-4(A) have reclamation experience in addition to construction experience for most of the types of facilities requiring decommissioning and reclamation, including the CPP, roads, pipelines, lined ponds, re-grading and re-seeding. In addition, the well drillers hired during construction will have experience in plugging and abandoning ISR injection/recovery and monitor wells. For some of the work, such as management and disposal of 11e.(2) byproduct material, specialty contractors may be hired in which case the workforce will at times be comprised of a larger percentage of non-local hires. Such situations will be short-term, and the bulk of the labor force will be local hires. It will be to Strata's advantage to keep as much of the operation and restoration staff as possible through reclamation and decommissioning in order to take full advantage of their familiarity with the proposed Ross ISR Project facilities. It is Strata's projection that not more than 10% of the workforce will

be non-local hires during decommissioning based on a similar percentage of work requiring specialty contractors.

Environmental Justice

ER RAI EJ-1

Please identify any gathering activities known to occur at the Ross and Barber Sites and the population which conducts such activities.

It is important to understand whether any gathering of plants or other natural resources occurs at the Ross Project site and the Barber Site in order for the NRC to assess potential environmental and environmental-justice impacts to specific groups, such as Native American and/or low income as required by 10 CFR Part 51.

ER RAI EJ-1 Response

Based on the Council on Environmental Quality definition, no minority or low income populations exist in the area (see ER Section 3.10.5). Moreover, the majority of the land surface is private and would require authorization from the surface owner for activities such as the gathering of plants or other natural resources, including subsistence hunting or fishing. Strata has not observed these activities in the proposed Ross ISR Project area nor in the potential Barber satellite project area. Further, based on interviews with six landowners whose ranches occupy the majority of both the proposed Ross ISR Project area as well as potential Barber satellite project area, these types of activities have not occurred in their lengthy experience. The interviews, conducted as part of normal landowner outreach efforts, were completed in February 2012.

Please see also the response to ER RAI LU-1(A), which describes how fishing in the Oshoto Reservoir has limited potential due to the undesirable fish species present.

Public and Occupational Health

ER RAI P&O Health-1

Please provide additional information regarding the tasks to be performed and risks to be faced by workers at the Ross Project site.

A. Please provide occupational injury and illness-rate data available to Strata from other comparable ISR facilities, if possible.

The review of injury and illness statistics can inform the "anticipation, recognition, evaluation, and control"—the definition of an industrial hygiene program—of occupational hazards at the Ross Project site. Section 3.11.4 of the ER provides descriptions of agricultural and oil production workers' occupational hazards; however, these classifications may not be entirely reflective of the potential injuries and illnesses specifically at ISR facilities. In addition, the Bureau of Labor Statistics data for 2009 represent a small number of workers ("1,000") under "uranium-radium-vanadium ore mining." These statistics do not specifically discriminate ISR facilities and no injuries or illnesses are reported. The Wyoming Department of Occupational Safety and Health confirmed that there are current workers' compensation claims within the NAICS code used by ISR facilities, but no fatalities; however, it could provide no details due to privacy concerns. If staff at operating ISR facilities would share lessons learned regarding hazards, injuries, and illnesses at their facilities, this information would be useful for Strata's establishing effective occupational-safety programs and for the NRC in evaluating the occupational health and safety impacts in the SEIS. Further, the additional information regarding the nature of the work and the location of individual workers is also important in an evaluation of occupational health and safety impacts. The concomitant risks borne by individual workers are important. Exposures to both toxic materials as well as noise are each important risk factors during occupational health and safety analyses. This information would support the NRC's assessment of the potential occupational health impacts of the Proposed Action, as required by 10 CFR Part 51.

ER RAI P&O Health-1(A) Response

The following response provides additional information related to injury and illness rate data for the Wyoming mining industry in general, the Wyoming uranium industry, and for ISR facilities in Wyoming and elsewhere. ER Table 4.12-1 provides the number and rate of nonfatal injuries and illnesses for the Wyoming mining industry (NAICS code 212) during 2008. The trend in workers' compensation claims in the Wyoming mining industry is shown in Figure ER RAI P&O Health-1-1. This figure shows a drop in initial workers' compensation claims from the 3rd quarter 2008 through the 2nd quarter 2009. According to Manning (2010), the drop in the initial claims in this time period may be correlated with a drop in overall employment levels in Wyoming. The steady increase from the 4th quarter 2009 through the 4th quarter 2010 could be attributed to a rise in mining employment.

Information on occupational injuries and illness for the Wyoming uranium industry is available from the Wyoming State Mine Inspector (2012). Table ER RAI P&O Health-1-1 summarizes available data for the Wyoming uranium industry from 2006 through 2010. This table shows that for three of the five years with data, no disabling injuries were reported. Based on the average annual man hours of 134,694 and a 2,000-hour typical man-year, the average number of full-time workers was 67. This equates to an average injury rate of 1.5 injuries per 100 full-time workers. This is below the value provided in ER Table 4.12-1 for the Wyoming mining industry as a whole (2.1 injuries per 100 full-time workers). It is important to note that not all Wyoming uranium facilities responded to the annual surveys. Therefore, the total number of employees, man hours, and injuries in Table ER RAI P&O Health-1-1 only reflect the facilities identified as responding each year to the Wyoming State Mine Inspector survey.

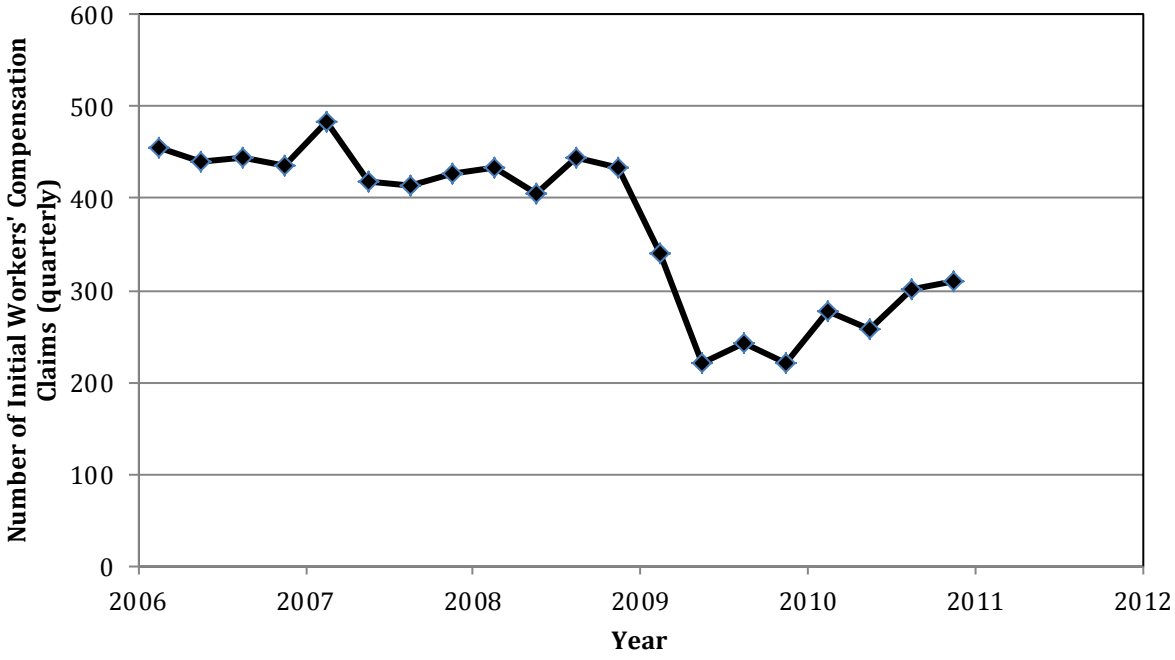
For the years 2006-2007, the Wyoming State Mine Inspector annual reports list the injury rates for uranium contractors in addition to mining employees. In 2006 there were 0 disabling injuries and 304 workers (272,929 man hours). In 2007 there were 3 disabling injuries and 211 workers (157,148 man hours). This equates to an average injury rate of 1.4 injuries per 100 full-time workers. According to the 2007 annual report, the three injuries by uranium contractors included two strains or sprains (one from striking/bumping and one from falling/slipping) and one fracture (from falling/slipping). The total lost time was 121 days.

ISR-specific information is available from the Wyoming State Mine Inspector annual reports. Table ER RAI P&O Health-1-2 summarizes the data from Wyoming ISR projects, which include Irigaray/Christensen, the Smith Ranch/Highland Project, and the Nichols Ranch ISR Project. Note that not all ISR facilities responded to the survey each year. Data were not available for the only ISR facility in production (Smith Ranch/Highland Project) from 2008-2010. Based on the annual average reported man hours of 114,355 (57 full-time equivalents) and an annual average injury rate of 0.8, the calculated injury rate for Wyoming ISR facilities during 2006-2010 is 1.4 injuries per 100 full-time workers.

ISR-specific information from Texas is available from Powertech (USA) Inc. (2010). According to information provided to Powertech (USA) Inc. by

Uranium Resources Inc., a Texas ISR facility with approximately 100 employees experienced an average of 9 injuries/illnesses per year requiring medical attention (not all OSHA recordable) from 2006 through 2009. Over the same period there were 4 lost time cases, or an average of 1 per year and 1 fatality (contractor).

Figure ER RAI P&O Health-1-1. Quarterly Initial Worker's Compensation Claims in the Wyoming Mining Industry, 2006-2010



Source: Wyoming Department of Employment (2012)

Table ER RAI P&O Health-1-1. Non-Fatal Injuries in the Wyoming Uranium Industry, 2006-2010

Year	Employees	Man Hours	No. Disabling Injuries	Description of Injuries	Uranium Facilities Responding to Survey
2006	138	261,429	0	---	Smith Ranch/Highland Project, Irigaray & Christensen, Big Eagle/Jackpot Mine, Sweetwater Uranium Project, Shirley Basin Mine, Petrotomics, Gas Hills Mill, Crooks Gap Mines, Nichols Ranch ISR Project, Sheep Mountain, Split Rock Mill
2007	142	277,370	4	2 strains & sprains; 2 miscellaneous; 36 days lost	Smith Ranch/Highland Project, Irigaray & Christensen, Big Eagle/Jackpot Mine, Sweetwater Uranium Project, Shirley Basin Mine, Lucky Mc Mine, Gas Hills Mill, Nichols Ranch ISR Project, Sheep Mountain, Split Rock Mill
2008	50	40,561	1	1 laceration/ bruise; 1 day lost	Big Eagle/Jackpot Mine, Sweetwater Uranium Project, Shirley Basin Mine, Lucky Mc Mine, Gas Hills Mill, Nichols Ranch ISR Project, Sheep Mountain, Split Rock Mill
2009	47	57,705	0	---	Irigaray & Christensen, Big Eagle/Jackpot Mine, Sweetwater Uranium Project, Shirley Basin Mine, Lucky Mc Mine, Gas Hills Mill, Nichols Ranch ISR Project, Split Rock Mill
2010	39	36,406	0	---	Big Eagle/Jackpot Mine, Sweetwater Uranium Project, Shirley Basin Mine, Lucky Mc Mine, Gas Hills Mill, Nichols Ranch ISR Project, Split Rock Mill

Source: Wyoming State Mine Inspector (2012)

Table ER RAI P&O Health-1-2. Non-Fatal Injuries at Wyoming Uranium ISR Facilities, 2006-2010

Year	Employees	Man Hours	No. Disabling Injuries	Uranium Facilities Responding to Survey
2006	113	227,299	0	Smith Ranch/Highland Project, Irigaray & Christensen, Nichols Ranch ISR Project
2007	122	252,605	3	Smith Ranch/Highland Project, Irigaray & Christensen, Nichols Ranch ISR Project
2008	12	22,086	1	Nichols Ranch ISR Project
2009	22	45,351	0	Irigaray & Christensen, Nichols Ranch ISR Project
2010	12	24,432	0	Nichols Ranch ISR Project

Source: Wyoming State Mine Inspector (2012)

ER RAI P&O Health-1

Please provide additional information regarding the tasks to be performed and risks to be faced by workers at the Ross Project site.

B. Please provide the principal locations and assignments of all workers specified in the various sections of the ER. At these locations, please provide estimates of respective exposures to non-radiological chemicals having Permissible Exposure Limits, including all specific combustion emissions and fugitive dust, for all phases of the Proposed Action.

The review of injury and illness statistics can inform the "anticipation, recognition, evaluation, and control"—the definition of an industrial hygiene program—of occupational hazards at the Ross Project site. Section 3.11.4 of the ER provides descriptions of agricultural and oil production workers' occupational hazards; however, these classifications may not be entirely reflective of the potential injuries and illnesses specifically at ISR facilities. In addition, the Bureau of Labor Statistics data for 2009 represent a small number of workers ("1,000") under "uranium-radium-vanadium ore mining." These statistics do not specifically discriminate ISR facilities and no injuries or illnesses are reported. The Wyoming Department of Occupational Safety and Health confirmed that there are current workers' compensation claims within the NAICS code used by ISR facilities, but no fatalities; however, it could provide no details due to privacy concerns. If staff at operating ISR facilities would share lessons learned regarding hazards, injuries, and illnesses at their facilities, this information would be useful for Strata's establishing effective occupational-safety programs and for the NRC in evaluating the occupational health and safety impacts in the SEIS. Further, the additional information regarding the nature of the work and the location of individual workers is also important in an evaluation of occupational health and safety impacts. The concomitant risks borne by individual workers are important. Exposures to both toxic materials as well as noise are each important risk factors during occupational health and safety analyses. This information would support the NRC's assessment of the potential occupational health impacts of the Proposed Action, as required by 10 CFR Part 51.

ER RAI P&O Health-1(B) Response

Tables ER RAI P&O Health-1-3 through ER RAI P&O Health-1-6 present the anticipated principal locations of all workers during the various project phases. These locations and potential non-radiological exposures are defined as follows:

- Wellfield: The wellfield includes the area within the wellfield modules, including the perimeter monitor well rings, header houses, wellfield access roads, pipeline corridors, and deep disposal wells. Potential non-radiological exposure in the wellfield includes oxygen gas used to fortify the lixiviant, deep disposal well additives, fugitive dust, and combustion emissions as described below.

    - **Oxygen**: ER Section 4.12.1.2.2.2 describes how oxygen may be stored as a cryogenic liquid near the wellfield module buildings.

The design and installation of the oxygen storage facilities in accordance with industry and OSHA standards will ensure that worker exposure is maintained at safe levels. OSHA does not have a PEL for oxygen; minimum acceptable breathing air contains 19.5% oxygen (OSHA 2012). Excessive oxygen levels result in a fire or explosion hazard. Continuous monitoring of oxygen levels will be required for any work performed in potentially oxygen-deficient atmospheres or oxygen-enriched atmospheres.

- **Deep disposal well additives**: TR Addendum 4.2-A, Section G, describes how minor concentrations of corrosion inhibitors, scale inhibitors, and/or biocides may be used as needed to maintain the deep disposal wells in optimum condition. Strata does not currently have PEL information for such chemicals, since it has not yet been determined which chemicals (if any) will be used. Worker exposure to deep disposal well additives will be maintained below PELs through proper engineering controls, administrative controls (SOPs) and, if needed, personal protective equipment such as air purifying respirators, chemical-resistant gloves, goggles, aprons, boots, etc.
- **Fugitive dust**: ER Section 4.6.1.1 describes how fugitive dust will be generated from trucks transporting supplies and from heavy equipment used to construct wellfield modules and access roads. For general industry and the construction industry, OSHA has established a PEL of 15 mg/m^3 for dust, which is regulated as particulates not otherwise regulated (PNOR) (OSHA 2012).Worker exposure will be maintained at levels below the PEL using the best available control technology (BACT) described in the air quality permit application (Strata 2011). See also the response to ER RAI AQ-2(B).
- **Combustion emissions**: ER Section 4.6.1.1 describes how diesel emissions will be emitted from drill rigs, diesel-powered water trucks and other heavy equipment during construction. Chemicals associated with combustion emissions that have PELs include NO_x (NO_2 PEL is 5 ppm; NO PEL is 25 ppm), CO (PEL is 50 ppm), and SO_2 (PEL is 5 ppm) (OSHA 2012). Worker exposure will be maintained below PELs through proper ventilation and, if necessary, proper PPE such as respirators.

- CPP: In the tables below, the CPP includes the CPP building and other process-related areas around the central plant area, including the chemical storage area and lined retention ponds. During construction the CPP refers to the general site work conducted in the central plant area plus the actual construction workforce for the CPP and other buildings. Potential non-radiological chemical exposure hazards at the CPP include process chemicals, fugitive dust, and combustion emissions. Fugitive dust and combustion emissions will be

maintained below PELs as described above. As described in ER Section 4.12.1.2.2.2, process chemicals include sulfuric acid, anhydrous ammonia, hydrogen peroxide, oxygen, carbon dioxide, sodium carbonate, sodium chloride, and sodium hydroxide.

Potential non-radiological chemical exposure will be the primary focus of Strata's hazard communication (HAZCOM) program, which will be implemented in accordance with OSHA regulations in 29 CFR § 1910.1200 and 29 CFR § 1910.1450. The written HAZCOM program will be prepared prior to operations and will be available for the anticipated NRC pre-operational inspection. It will address chemical container labeling, material safety data sheets (MSDS), and training requirements for all employees and contractors. MSDS will be available for all chemicals known to be present in the workplace to which employees may be exposed under normal conditions of use or in a foreseeable emergency. MSDS will address, among other things, hazard identification, safe handling and storage of chemicals, exposure controls/personal protective equipment, and emergency response procedures.

There are no PELs for sodium carbonate or sodium chloride. PELs and protective measures to ensure worker exposure is maintained below PELs are described below.

- **Sulfuric acid**: Sulfuric acid will be stored in the chemical storage area adjacent to the CPP and piped to the point of use within the CPP. The PEL for sulfuric acid is 1 mg/m^3 (OSHA 2012). The written HAZCOM program will specifically address safe storage, handling and use of sulfuric acid. Worker exposure will be maintained below the PEL through engineering controls such as ventilation and selection of corrosion-resistant piping, pumps and storage tanks. In addition, as described in the air permit application (Strata 2011), a closed-loop system will be used for sulfuric acid storage, wherein the displaced acid vapors from the storage tank will be routed back into the tank truck as the acid solution is transferred. Further, Strata will use acid fume scrubbers as BACT on all acid storage tanks to limit potential environmental releases as well as potential worker exposure. Administrative controls (SOPs) also will be in place in areas where workers could be exposed to acid. These areas will be identified with signs indicating the potential hazards and describing required PPE. Personal protective equipment also will be available around sulfuric acid storage and use areas. This will include emergency eyewash stations and, as needed, protective clothing, gloves, goggles, and respirators. A monitoring program for acid vapors will be established for any areas where the concentration has potential to exceed the PEL. Such areas will require the use of respirators

and will be documented in the Respiratory Protection Program discussed in the response to ER RAI P&O Health-2(B).

- **Anhydrous ammonia**: Strata may use anhydrous ammonia in the vanadium recovery circuit and to adjust the pH of the eluate solution in the precipitation tanks. The PEL for ammonia is 50 ppm (OSHA 2012). Worker doses of ammonia will be maintained below the PEL using the methods described in ER Section 4.12.1.2.2.2, including use of appropriate ANSI and ASME standard codes for non-refrigerated pressure piping and providing positive-pressure, self-contained, full-face respirators in the immediate vicinity of the ammonia piping and process operations.
- **Hydrogen peroxide**: Hydrogen peroxide will be stored in the chemical storage area and used in the precipitation circuit in the CPP. The PEL is 1 ppm (OSHA 2012). Control methods for safe handling and use of hydrogen peroxide are described in ER Section 4.12.1.2.2.2 and include incorporating recommendations concerning materials of construction for tanks and piping systems and the use of local ventilation to control vapors in the event of a leak.
- **Sodium hydroxide**: Sodium hydroxide will be stored in the chemical storage area and used in the precipitation circuit. The PEL is 2 mg/m^3 (OSHA 2012). Worker exposure will be maintained below this level by maintaining the sodium hydroxide in a closed system, providing adequate ventilation, and, if necessary, use of proper PPE such as respirators.

- Laboratory: The laboratory will be inside the CPP building as shown on TR Figure 3.2-1. Laboratory analytical reagents such as acids and bases will be present in the laboratory. Worker exposure will be maintained below PELs through standard operating procedures, general ventilation, and ventilation hoods where appropriate. National Fire Protection Association (NFPA) standards will be used to ensure safe storage of all flammable substances.

- Warehouse building: The warehouse building will be separate from the CPP as shown on ER Figure 1.2-5. Any chemicals stored in the warehouse will be in sealed containers. No worker exposure is anticipated in the warehouse building. NFPA standards will be used to ensure safe storage of all flammable substances.

- Maintenance shop: The maintenance shop also will be separate from the CPP as shown on ER Figure 1.2-5. Solvents, cleaners, degreasers, and diesel emissions will be present in the maintenance shop. Worker exposure will be maintained below PELs through adequate ventilation and use of proper PPE as appropriate. NFPA standards will be used to ensure safe storage of all flammable substances.

- Administration building: The office/administration building will be located in the central plant area separate from the CPP. Workers in the office/administration building are not expected be exposed to any chemicals at concentrations approaching PELs.

Table ER RAI P&O Health-1-3. Anticipated Worker Locations during Construction

Location	No. of Workers	% of Workforce
Wellfield	70	35.0%
CPP	130	65.0%
Total	200	100.0%

Table ER RAI P&O Health-1-4. Anticipated Worker Locations during Operation

Location	No. of Workers	% of Workforce
Wellfield	19	31.7%
CPP	17	28.3%
Laboratory	5	8.3%
Warehouse building	3	5.0%
Maintenance shop	5	8.3%
Administration	11	18.3%
Total	60	100.0%

Table ER RAI P&O Health-1-5. Anticipated Worker Locations during Aquifer Restoration

Location	No. of Workers	% of Workforce
Wellfield	3	15.0%
CPP	6	30.0%
Laboratory	2	10.0%
Warehouse building	1	5.0%
Maintenance shop	1	5.0%
Administration	7	35.0%
Total	20	100.0%

Table ER RAI P&O Health-1-6. Anticipated Worker Locations during Decommissioning

Location	No. of Workers	% of Workforce
Wellfield	40	44.4%
CPP	50	55.6%
Total	90	100.0%

ER RAI P&O Health-1

Please provide additional information regarding the tasks to be performed and risks to be faced by workers at the Ross Project site.

C. Please estimate whether the sound levels from equipment and operations at any of the locations identified above that may exceed an average of 85 dBA (decibels, A-weighted scale) over an eight-hour basis. Please describe Strata's Hearing Conservation Program for such locations.

The review of injury and illness statistics can inform the "anticipation, recognition, evaluation, and control"—the definition of an industrial hygiene program—of occupational hazards at the Ross Project site. Section 3.11.4 of the ER provides descriptions of agricultural and oil production workers' occupational hazards; however, these classifications may not be entirely reflective of the potential injuries and illnesses specifically at ISR facilities. In addition, the Bureau of Labor Statistics data for 2009 represent a small number of workers ("1,000") under "uranium-radium-vanadium ore mining." These statistics do not specifically discriminate ISR facilities and no injuries or illnesses are reported. The Wyoming Department of Occupational Safety and Health confirmed that there are current workers' compensation claims within the NAICS code used by ISR facilities, but no fatalities; however, it could provide no details due to privacy concerns. If staff at operating ISR facilities would share lessons learned regarding hazards, injuries, and illnesses at their facilities, this information would be useful for Strata's establishing effective occupational-safety programs and for the NRC in evaluating the occupational health and safety impacts in the SEIS. Further, the additional information regarding the nature of the work and the location of individual workers is also important in an evaluation of occupational health and safety impacts. The concomitant risks borne by individual workers are important. Exposures to both toxic materials as well as noise are each important risk factors during occupational health and safety analyses. This information would support the NRC's assessment of the potential occupational health impacts of the Proposed Action, as required by 10 CFR Part 51.

ER RAI P&O Health-1(C) Response

Sound levels will have the potential to exceed 85 dBA for a duration of 8 hours per day near construction equipment, drilling rigs, pumps, and other motorized equipment. These noise sources will be present in the wellfield, CPP, and maintenance shop. As described in ER Section 5.7, Strata will implement a hearing conservation program to ensure that engineering and administrative controls are in place and that proper PPE is worn to protect workers from potentially damaging noise. The hearing conservation program will be designed in accordance with OSHA standards in 29 CFR § 1910.95. Specific elements of the program will include:

- Workplace noise sampling;
- Informing workers of noise exposure;

- Providing workers opportunity to observe noise measurements;
- Maintaining a worker audiometric testing program;
- Implementing comprehensive hearing protection follow-up procedures;
- Proper selection of hearing protection;
- Evaluating hearing protectors' attenuation and effectiveness;
- Training to ensure workers are aware of the hazards; and
- Data management.

ER RAI P&O Health-2

Please provide occupational health and safety-related plans, if available.

A. Please provide Health and Safety Plans (HASPs) and standard operating procedures (SOPs) for all phases of the Proposed Action or discuss the projected requirements for the future phases of the Proposed Action.

HASPs are used to mitigate occupational health and safety risks and impacts; thus, Strata's HASPs for each of the four phases of the Proposed Action should be provided in order to support an evaluation by NRC staff of occupational health and safety impacts of the Proposed Action. The same is true for a RPP. This information would support an evaluation of mitigation measures related to occupational health and safety as required by 10 CFR Part 51.

ER RAI P&O Health-2(A) Response

Strata will prepare, and make available for NRC inspection, a Ross ISR Project Health and Safety Plan (HASP) including SOPs and a Radiation Protection Manual (RPM). The intended content of each of these documents is summarized below.

Health and Safety Plan

A HASP encompassing all phases of the proposed Ross ISR Project will be made available for NRC review at the pre-operational inspection. The HASP will include training requirements, SOPs, applicable MSDS, accident investigation recording and reporting requirements, industrial hygiene monitoring procedures, hazard identification and mitigation policies and procedures, etc. The proposed Ross ISR Project HASP will also define programs, methods and SOPs to ensure compliance with OSHA requirements contained in 29 CFR Part 1910. The main HASP document is envisioned to be organized as follows:

Safety Policy Statement - defines the overall safety and health protection policy of Strata and requirements that must be met by all employees at all times and by all contractors while on site.

1.0 Introduction – provides an overview of the health and safety program, organization and contents of the HASP.

2.0 Reporting Unsafe Work Conditions – responsibilities, requirements and procedures for reporting of unsafe conditions which is the responsibility of all employees.

3.0 Employee Conduct – management expectations for employee conduct; work place conduct that may result in disciplinary actions.

4.0 Personal Protection Equipment – general guidelines for selection, use, care and maintenance of PPE.

5.0 Health and Safety Procedures – summarizes and provides listing/cross reference to SOPS provided in appendices.

6.0 Health and Safety Department and Personnel – defines positions and functions; organizational roles, responsibilities and authorities of H & S personnel including RSO and RST; presents contact information and notification requirements; defines membership, roles, responsibilities and authorities of Safety and Environmental Review Panel (SERP).

7.0 Radiation Work Permits – identifies circumstances requiring RWPs, defines content requirements, responsibilities to prepare and authorities to approve.

The HASP will include, in an appendix, detailed SOPs, which are anticipated to include the following:

- Organization of Health and Safety Program
- Health and Safety Training
- As Low As Reasonably Achievable (ALARA) Program (reference to Radiation Protection Manual–see below)
- Accident Investigation
- Job Safety and Hazard Analysis
- Contractor Requirements
- Drug Policy
- Safety Meetings
- Hearing Conservation
- Vehicle and Mobile Equipment
- Confined Space Entry
- Electrical Safety
- Excavation and Trenching
- Fall Protection
- Flammable Materials Storage
- Ladders and Scaffolding
- Electrical Safety - Lockout/Tagout
- Tools-Hand and Powered
- Respiratory Protection (reference to Respiratory Protection Program)
- Air Quality Surveys - Non-Radiological

- Industrial Hygiene Monitoring
- Chemical Hazards – Material Safety Data
- Emergency Response

Radiation Protection Manual

An RPM will be prepared for the Ross ISR Project as required by NRC at 10 CFR § 20.1101, Radiation Protection Programs:

(a) Each licensee shall develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of this part.
(b) The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).
(c) The licensee shall periodically (at least annually) review the radiation protection program content and implementation.

The following offers examples of NRC regulations and guidance specific for and/or otherwise applicable to the radiation safety program which will be consulted in the development of the RPM for the Ross ISR Project:

- 10 CFR Part 19, *Notices, Instructions and Reports to Workers.*
- 10 CFR Part 20, *Standards for Protection Against Radiation.*
- 10 CFR Part 40, Appendix A, *Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for their Source Material Content* (Note: establishes radiological closure criteria).
- NRC Regulatory Guide 8.9, *Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program.*
- NRC Regulatory Guide 8.10, *Operating Philosophy for Maintaining Occupational Radiation Exposures as Low as Is Reasonably Achievable* (Note: also see NRC Regulatory Guide 8.36).
- NRC Regulatory Guide 8.22, *Bioassay at Uranium Mills.*
- NRC Regulatory Guide 8.25, *Air Sampling in the Workplace.*
- NRC Regulatory Guide 8.30, *Health Physics Surveys in Uranium Recovery Facilities.*
- NRC Regulatory Guide 8.31, *Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities Will Be as Low as Is Reasonably Achievable.*
- NRC Regulatory Guide 8.36, *Radiation Dose to the Embryo/Fetus.*

- NUREG-0874, *Internal Dosimetry Model for Applications to Bioassay at Uranium Mills.*

Based on the requirements and guidance defined in the above, particularly NRC regulations at 10 CFR Part 20 and Regulatory Guides 8.30 and 8.31, a preliminary outline for the Ross ISR Project RPM is presented below:

1.0 INTRODUCTION
- 1.1 Radionuclides of Concern
- 1.2 Responsibilities and Authorities
  - 1.2.1 Corporate Management
  - 1.2.2 Plant Manager and Supervisors
  - 1.2.3 Radiation Safety Officer and Radiation Safety Technicians
  - 1.2.4 Facility Workers
  - 1.2.5 Outside Contractors and Visitors
- 1.3 ALARA Policy
- 1.4 Applicable Regulations, Standards and Guidance
- 1.5 Summary of Major Elements of the Radiation Safety Program

2.0 ALARA PROGRAM
- 2.1 Licensee Management
- 2.2 Worker Responsibility
- 2.3 Operating Procedures
- 2.4 Inspections and Audits
- 2.5 Radiation Safety Training

3.0 STANDARDS AND GUIDES
- 3.1 Radiation Dose Limits
- 3.2 Release of Equipment for Unrestricted Use
- 3.3 NRC Regulatory Guidance Applicable to the Radiation Safety Program

4.0 RADIATION SURVEYS
- 4.1 Particulate Air Monitoring
- 4.2 Radon Progeny Monitoring
- 4.3 Surface Contamination Surveys
- 4.4 Gamma Surveys
- 4.5 Beta Surveys
- 4.6 Alpha Surveys
- 4.7 Personal Contamination Surveys

4.8 Equipment Surveys, Decontamination and Release for Unrestricted Use
4.9 Area Contamination Surveys and Decontamination Methods
4.10 Area Postings

5.0 RESPIRATORY PROTECTION PROGRAM

6.0 CONTROL OF RADIOACTIVE MATERIALS AND SEALED SOURCES

7.0 FEMALE EMPLOYEES AND PRENATAL RADIATION EXPOSURE

8.0 PERSONAL PROTECTIVE EQUIPMENT

9.0 RADIATION SAFETY TRAINING
9.1 Strata Employees
9.2 Contractors and Visitors

10.0 PERSONAL DOSIMETRY AND BIOASSAY PROGRAMS
10.1 Personnal Dosimeters
10.2 Bioassay Program
10.3 Calculation of Total Effective Dose Equivalent (TEDE) to Workers

11.0 RADIATION WORK PERMITS

12.0 CALCULATION OF DOSE TO MEMBERS OF THE PUBLIC

13.0 RECORDKEEPING AND REPORTING

14.0 PHYSICAL SECURITY FOR RADIOACTIVE MATERIALS

15.0 SHIPPING AND RECEIVING RADIOACTIVE MATERIALS

16.0 SPILL PREVENTION AND CONTAMINATION CONTROL

17.0 BIBLIOGRAPHY

The RPM will include, as an appendix, detailed SOPs which are anticipated to include:

- Radiological Health and Safety Training
- Decontamination
- Posting
- Radiation Exposure Action Levels
- Bioassay
- Radiation Work Permits
- Release of Equipment to Unrestricted Areas
- Shipment of Yellowcake or Contaminated Equipment
- Beta and/or Gamma Exposure Rate Surveys

- Alpha Contamination Surveys
- Beta Contamination Surveys (if necessary)
- Radon-222 Decay Product Surveys
- Occupational Breathing Zone Monitoring
- Personnel Release Surveys
- Personal Radiation Dosimeters
- Radiological Dose Calculation
- Worker Exposure to Long-lived Particulate Radionuclides in Air
- Radionuclide Concentrations in Product and/or Air Samples – Use of Isotopic Analysis
- Dose Calculation and Dose Assignment Procedures
- Instructions for Women of Child Bearing Age

ER RAI P&O Health-2

Please provide occupational health and safety-related plans, if available.

B. Please indicate whether Strata will have a Respiratory Protection Program (RPP) in place, and, if so, provide a description of the RPP.

HASPs are used to mitigate occupational health and safety risks and impacts; thus, Strata's HASPs for each of the four phases of the Proposed Action should be provided in order to support an evaluation by NRC staff of occupational health and safety impacts of the Proposed Action. The same is true for a RPP. This information would support an evaluation of mitigation measures related to occupational health and safety as required by 10 CFR Part 51.

ER RAI P&O Health-2(B) Response

Strata will develop and institute a Respiratory Protection Program (RPP) in accordance with 10 CFR Part 20, Subpart H for applications when it is not practical to use process or other engineering controls (e.g., containment, decontamination, or ventilation) to control the concentration of radioactive material in air. The RPP will require use of respiratory protection equipment that is tested and certified by the National Institute for Occupational Safety and Health (NIOSH). The program will define conditions and/or activities under which respiratory protection is required and will define approved equipment and protection factors for applicable airborne hazards. The RPP will be integrated with other aspects of the overall Radiation Protection Program (see discussion of the RPM in the response to ER RAI P&O Health-2(A)) and will be made available for NRC inspection. It will include:

- Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate doses.
- Surveys and bioassays, as necessary, to evaluate actual intakes.
- Testing of respirators for operability (user seal check for face sealing devices and functional check for others) immediately prior to each use.
- Written procedures including supervision and training of respirator users; for fit testing and for respirator selection; storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment; and for recordkeeping.

The RPP also will define limitations on periods of respirator use and relief from respirator use and will provide for determination and approval by a physician that the individual user is medically fit to use respiratory protection equipment.

ER RAI P&O Health-3

Please provide additional on-site emergency response information.

A. Please describe Strata's emergency response program for the Ross Project site during all phases of the Proposed Action.

The mitigation of potential impacts of spills, accidents, and other facility emergencies is accomplished through anticipation of the range of possible emergencies and sound planning, training, and equipping. Section 5.10.2 in the ER states that training programs will ensure that Strata personnel are adequately trained to respond to all potential emergencies (page 5-62). The additional information requested is necessary in order for the NRC staff to evaluate the basic emergency-response capability at the Ross Project site and review the potential public and occupational health impacts as required by 10 CFR Part 51.

ER RAI P&O Health-3(A) Response

Strata will develop an emergency response program that will meet EPA, OSHA, Crook County, Department of Homeland Security, DOT and other applicable standards, rules and regulations. The emergency response program will address specific SOPs and employee training requirements for each phase of operation. The emergency response program will be reviewed by Strata's SERP and available for NRC inspection at the pre-operational inspection. Specific provisions of the emergency response program will include but will not be limited to:

- A written emergency response plan demonstrating compliance with 40 CFR Part 355 - Emergency Planning and Notification. The emergency response plan will include emergency response procedures, an emergency evacuation plan and provisions for providing electronic warning signs with suitable battery backup to be activated by Strata or Crook County to close County roads into the proposed project area in case of an emergency (Crook County MOU, provision A(viii), Strata 2011, Appendix C).

- A Hazardous Waste Operations and Emergency Response (HAZWOPER) program meeting the requirements of 29 CFR § 1910.120 that includes policies, procedures and training for employees and contractors in chemical handling, storage, use and spill response.

- Training requirements, designated employees and responsibilities for an in-house emergency response team.

- An Incident Command System (ICS) to be used for managing an incident of any size. The ICS will include coordination procedures with local fire departments, local emergency response personnel, law enforcement and regional Hazmat teams to allow the site personnel to easily be integrated into the mutual aid response team.

- A fire safety program that will include written procedures for fire prevention, emergency response instructions for fire involving oxygen or other chemical systems, and coordinating fire suppression planning with the Crook County Fire Warden and Fire Zone Warden (Crook County MOU, provision A(xiii)).

- Demonstration of compliance with the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 regarding emergency planning and community right-to-know reporting on hazardous and toxic chemicals. The EPCRA program will include written procedures to coordinate emergency management and hazardous materials management with the Crook County Homeland Security Director (Crook County MOU, provision A(xii)).

- A written program addressing preparedness and emergency response procedures for potential natural disasters including tornados, earthquakes, flooding, power outages, and wildfires.

Strata has made significant commitments in both the ER and TR regarding emergency response SOPs and employees training. The list below cites the commitments found in the relevant TR and ER sections.

- Strata will develop procedures that implement emergency response instructions for a spill or fire involving oxygen systems (TR page 3-63).

- The goal of an RMP [in regards to anhydrous ammonia] is to prevent accidental releases of hazardous chemicals that can cause serious harm to the public and the environment. The RMP will include items such as accident consequence analysis, standard operating procedures, emergency response procedures, documented management system, and accident prevention plans (TR page 3-64).

- Strata will develop and implement an emergency response plan and emergency notification procedures in the event of a release [sulfuric acid] (TR page 3-67).

- SOPs [relevant to this RAI] which will be implemented at the proposed Ross ISR Project include but are not limited to the following (TR pages 5-10 to 5-11):

    - Accident Training for Local Emergency Officials
    - Hazardous/Radioactive Accident Emergency Response
    - Spill Response and Remediation

- Strata will develop emergency management procedures to implement the recommendations contained in the NRC analyses. As part of the emergency management procedures, a response program with emergency response SOPs will be developed. Training programs discussed in TR Chapter 5.0 will ensure that Strata personnel are adequately trained to respond to all potential emergencies. Accident occurrence will generally require notification and reporting to various agencies. SOPs contained in the emergency response program will specify under what conditions emergency notification and reporting will be required, and to which agencies. Assessments of potential accident scenarios as well as preventative and mitigation measures are discussed in the following sections (TR page 7-73).

- Strata will develop emergency response procedures for oxygen accidents. All employees who may be exposed to hazards associated with oxygen will be properly trained with respect to the hazards, accident prevention and mitigation, and emergency response procedures (TR page 7-77).

- The regulations listed above will require extensive accident analysis, and the development of standard operating procedures, emergency response procedures, a documented management system, and accident prevention plans (TR page 7-78).

- The use of sulfuric acid is subject to Threshold Planning Quantities (TPQs) contained in 40 CFR Part 355, Emergency Response Plans for threshold quantities (TQs) in excess of 1,000 pounds. This is also the EPA reportable limit under CERCLA. As discussed in Section 3.2, the storage quantity of sulfuric acid at the Ross project will exceed the TPQ. Based on the design capacity, the CPP will be subject to Emergency Response Plan requirements which will qualify for coverage under the DHS Chemical Facility Anti-Terrorism Standards. A “Top Screen” analysis for sulfuric acid will be submitted to DHS by Strata (TR page 7-80).

- Strata will implement an emergency response plan and SOPs to be used in the case of a spill of waste and process fluids at the proposed project. The RSO or RST will be notified immediately so that a prompt inspection of the spill can be made (TR page 7-84).

- Strata will contract with a transport company that specializes in shipment of yellowcake. The transport company will have extensive emergency response programs including spill response equipment on board, drivers will be trained in radiological emergency response, there will be constant monitoring of truck location and operating parameters, and standing contracts will be in place with environmental emergency response contractors for spill cleanup (TR page 7-91).

- With emergency services ranking at the top of this list, and given the remoteness of the proposed project area, it is apparent that the operator of the proposed Ross ISR Project will be required to maintain on staff personnel and equipment necessary to provide emergency services to deal with environmental, safety and health emergencies during construction, operation, aquifer restoration, and decommissioning of the site. Strata will maintain emergency response personnel on staff and will train local emergency responders in preparing and responding to potential environmental, safety and health emergencies resulting from the Ross ISR Project (ER page 3-374).

- Potential impacts will be minimized by implementing an emergency response plan for yellowcake spill cleanup. Emergency response protocols would include communication and emergency spill kits on each vehicle and emergency response kits at shipping and receiving facilities (ER page 4-23).

- Similar to transportation of yellowcake, Strata will contract with a transport company that provides training and emergency response procedures specific to the transport of 11e.(2) byproduct material (ER page 4-26).

ER RAI P&O Health-3

Please provide additional on-site emergency response information.

B. Please describe the emergency-response training program that will be implemented during all phases of the Proposed Action. Please indicate which employees will be trained, what emergency-response equipment will be available at the Ross Project site, and where the emergency-response equipment will be located.

The mitigation of potential impacts of spills, accidents, and other facility emergencies is accomplished through anticipation of the range of possible emergencies and sound planning, training, and equipping. Section 5.10.2 in the ER states that training programs will ensure that Strata personnel are adequately trained to respond to all potential emergencies (page 5-62). The additional information requested is necessary in order for the NRC staff to evaluate the basic emergency-response capability at the Ross Project site and review the potential public and occupational health impacts as required by 10 CFR Part 51.

ER RAI P&O Health-3(B) Response

Specifics of these programs for the various environmental and health/safety emergencies have not been fully developed at this time; however, Section 5.5 of the TR describes Radiation Safety Training which includes emergency procedures. All new employees will be trained in emergency procedures that cover the full breadth of potential environmental and health/safety emergencies. In addition, job-specific training for emergencies includes fire prevention and emergency notification procedures for wellfield personnel (see TR page 7-88) as well as emergency response training for plant operations staff (see TR page 5-37). Paramedic training would also be provided such that a trained person is on site at all times. In addition, as described in Section 7.5 of the TR, "As part of the emergency management procedures, a response program with emergency response SOPs will be developed. Training programs discussed in Chapter 5.0 will ensure that Strata personnel are adequately trained to respond to all potential emergencies. Accident occurrence will generally require notification and reporting to various agencies. SOPs contained in the emergency response program will specify under what conditions emergency notification and reporting will be required, and to which agencies. Assessments of potential accident scenarios, as well as preventative and mitigation measures are discussed in the following sections." The SOPs, emergency response training programs and procedures described in this response as well as in the ER and TR will include specific types of equipment required depending on the type of emergency as well as how to operate the

safety equipment effectively. Strata's SERP will review and approve the emergency response program. Strata has committed to having the emergency response program, including applicable SOPs and training guidelines, completed prior to the anticipated pre-operational inspection conducted by NRC at newly licensed facilities.

ER RAI P&O Health-3

Please provide additional on-site emergency response information.

C. Please provide Strata's Risk Management Plan as described in the ER on page 5-62.

The mitigation of potential impacts of spills, accidents, and other facility emergencies is accomplished through anticipation of the range of possible emergencies and sound planning, training, and equipping. Section 5.10.2 in the ER states that training programs will ensure that Strata personnel are adequately trained to respond to all potential emergencies (page 5-62). The additional information requested is necessary in order for the NRC staff to evaluate the basic emergency-response capability at the Ross Project site and review the potential public and occupational health impacts as required by 10 CFR Part 51.

ER RAI P&O Health-3(C) Response

The Risk Management Plan (RMP) for the ammonia system at the proposed Ross ISR Project processing plant is currently in development and will be completed prior to the anticipated pre-operational inspection. As indicated in the ER on page 5-62, the RMP will include items such as accident consequence analysis, SOPs, emergency response procedures, documented management system, and accident prevention plans.

ER RAI P&O Health-3

Please provide additional on-site emergency response information.

D. Please indicate whether there will be an on-site, full-time health and safety professional when construction begins and during all phases of the Proposed Action.

The mitigation of potential impacts of spills, accidents, and other facility emergencies is accomplished through anticipation of the range of possible emergencies and sound planning, training, and equipping. Section 5.10.2 in the ER states that training programs will ensure that Strata personnel are adequately trained to respond to all potential emergencies (page 5-62). The additional information requested is necessary in order for the NRC staff to evaluate the basic emergency-response capability at the Ross Project site and review the potential public and occupational health impacts as required by 10 CFR Part 51.

ER RAI P&O Health-3(D) Response

The management structure proposed by Strata for the proposed Ross ISR Project is depicted on TR Figure 5.1-1. The structure is applicable to site construction and site management (TR Section 5.2). The structure includes a Radiation Safety Officer who is responsible for the implementation of all on-site environmental programs, including emergency procedures, training programs for both the staff and the Radiation Safety Technician (Health Physics Technician), and sampling and inspection procedures (TR Section 5.4). The RSO will fill the role of on-site health and safety professional during all project phases.

ER RAI P&O Health-4

Please provide additional off-site emergency response information.

A. Please describe the specific training, supplies, and equipment that Strata will provide local municipalities and/or county governments.

In the case of emergency—facility fire, chemical or radioactivity release, truck accident, or worker injury—the services available from local municipal and/or county first responders will likely be critical. Strata notes on page 3-11 that it "will commit to training local emergency response personnel in the specific hazards and spill control procedures" of the ISR facility at the Ross Project site. Any agreements that have been or will be executed between the local municipalities and counties which implement this commitment would be helpful for evaluating risks to public health and safety. In addition, a description of the current, off-site emergency equipment and facilities as well as an identification of the closest, most probable location of the off-site first responders would help the NRC staff to further assess the public health impacts of the Proposed Action as required by 10 CFR Part 51.

ER RAI P&O Health-4(A) Response

Strata Energy has made significant commitments for training local first responders in preparing and responding to potential environmental, safety and health emergencies resulting from activities at the proposed Ross ISR Project (see ER pages 3-374 and 4-112 and TR page 7-89). Strata has committed to developing an SOP to provide ongoing training to local emergency response personnel including EMTs, firefighters and municipal and county law enforcement personnel. The SOP will include material-specific information regarding the physical and chemical characteristics, hazards, potential exposure pathways and spill response, containment and clean-up procedures (see ER page 5-17). Strata is committed to worker safety and will comply with the Wyoming Occupational Health and Safety Act, Title 27, Labor and Employment; Chapter 11, Occupational Health and Safety; and applicable OSHA standards.

Strata also has demonstrated a willingness to create partnerships with local county governments through the MOU completed with Crook County in April 2011 addressing fugitive dust mitigation and road maintenance. The MOU is found in Appendix C of the air quality permit application for the proposed Ross ISR project (Strata 2011). Not only does the MOU address road maintenance and dust control, but it also specifically addresses key aspects of emergency response preparedness. In the MOU Strata has agreed to provide electronic warning signs with suitable battery backup to be activated by Strata

or the Crook County Sheriff to close County roads into the proposed Ross ISR Project; to coordinate emergency management and hazardous materials management with the Crook County Homeland Security Director; and to Coordinate fire suppression planning with the Crook County Fire Warden and Fire Zone Warden. The cooperative approach taken by Strata, prior to licensing, sets a precedent for pre-operational and operational emergency response planning efforts that will be completed prior to commencement of operations. Strata anticipates having this SOP and any necessary modifications to the MOU to accommodate emergency response completed prior to the pre-operational inspection by NRC staff.

ER RAI P&O Health-4

Please provide additional off-site emergency response information.

B. Please describe how coordination with local municipalities and counties will be managed in an emergency.

In the case of emergency—facility fire, chemical or radioactivity release, truck accident, or worker injury—the services available from local municipal and/or county first responders will likely be critical. Strata notes on page 3-11 that it "will commit to training local emergency response personnel in the specific hazards and spill control procedures" of the ISR facility at the Ross Project site. Any agreements that have been or will be executed between the local municipalities and counties which implement this commitment would be helpful for evaluating risks to public health and safety. In addition, a description of the current, off-site emergency equipment and facilities as well as an identification of the closest, most probable location of the off-site first responders would help the NRC staff to further assess the public health impacts of the Proposed Action as required by 10 CFR Part 51.

ER RAI P&O Health-4(B) Response

Coordination with first responders will be addressed through the yet to be completed Emergency Response Plan and associated SOPs. Please refer to the response to ER RAI P&O Health-3(A), which describes how Strata will develop an ICS describing coordination procedures with local fire departments, local emergency response personnel, law enforcement and regional Hazmat teams to allow the site personnel to easily be integrated into the mutual aid response team. Strata also has committed to developing an SOP for accident training for local emergency officials (see TR page 5-10). In the MOU with Crook County, Strata also has committed to providing electronic warning signs with suitable battery backup to be activated by Strata or Crook County to close County roads into the proposed project area in case of an emergency. Additional commitments incorporated into the Crook County MOU include coordinating fire suppression planning with local fire officials and coordinating emergency management and hazardous materials management with the Crook County Homeland Security Director.

ER RAI P&O Health-4

Please provide additional off-site emergency response information.

C. Please identify the local facilities that will be used in emergencies.

In the case of emergency—facility fire, chemical or radioactivity release, truck accident, or worker injury—the services available from local municipal and/or county first responders will likely be critical. Strata notes on page 3-11 that it "will commit to training local emergency response personnel in the specific hazards and spill control procedures" of the ISR facility at the Ross Project site. Any agreements that have been or will be executed between the local municipalities and counties which implement this commitment would be helpful for evaluating risks to public health and safety. In addition, a description of the current, off-site emergency equipment and facilities as well as an identification of the closest, most probable location of the off-site first responders would help the NRC staff to further assess the public health impacts of the Proposed Action as required by 10 CFR Part 51.

ER RAI P&O Health-4(C) Response

ER Section 3.10.3.6, Medical and Emergency Services, describes the facilities and capacities of the nearest medical facilities to the proposed Ross ISR Project. In addition, Gillette hosts one of six (based on regions) Hazmat response teams present in Wyoming (Casper, approximately 175 road miles away, hosts the next closest Hazmat team). In addition to the regional medical center in Gillette, the Crook County Medical Services District consists of a hospital and clinic located in Sundance as well as clinics located in Moorcroft and Hulett. The district also provides a long-term care facility attached to the hospital in Sundance. Sundance, Moorcroft, and Hulett have an ambulance service to cover each town and surrounding areas. Each service has emergency medical technician (EMT) Intermediates, EMT Basics and emergency medical responders (EMRs) serving on their teams. Of these, Moorcroft is closest to the proposed project area (see ER pages 3-373 and 3-374). These are the local facilities that will be used in emergencies. In addition to emergency medical facilities, these communities also have both paid and volunteer fire emergency teams. Crook County has dispersed fire fighting equipment located around the county with a number of trucks and engine units in the Oshoto area.

Waste Management

ER RAI Waste-1

Please provide additional information regarding the non-liquid waste streams to be generated during the entire lifetime of the Proposed Action.

A. *Please fully characterize all the non-liquid waste streams (e.g. radioactive, hazardous, and solid) that will be generated during proposed project by the phase during which the waste will be generated, including the expected volume of on-site sewage as well as characterization of mixed waste (if any will be generated).*

To ensure that waste management impacts and mitigation measures are accurately assessed, all potential waste streams must be defined and characterized and the locations of their respective management must be clearly identified. Some waste streams are identified in Section 4.13 of the ER; however, it is not clear that all waste streams have been identified. Additionally, the individual characteristics of the waste streams (e.g., specific radionuclides and/or hazardous constituents) are needed to evaluate waste-management impacts of the Proposed Action. Waste-management techniques, including ultimate disposal, should be well defined for all waste streams. This information would support the NRC staff's assessment of waste-management impacts as required by 10 CFR Part 51.

ER RAI Waste-1(A) Response

Based on further clarification received from NRC staff on this RAI, Strata understands that the intent is to identify further all non-process liquid waste streams (i.e., all waste streams except brine, excess permeate, and other 11e.(2) liquid waste). The following response provides additional information about these waste streams, including the expected volumes and characterization. Mixed waste will not be generated at the proposed Ross ISR Project.

Revised ER Table 4.13-1 is included below and reflects several changes to the waste classifications. These primarily include separating solid waste into subcategories and separating used oil, oily rags, oil filters, and petroleum-contaminated soil from the hazardous waste category.

AEA-Regulated Solid Waste

Solid 11e.(2) Byproduct Material

A description of the types of solid wastes classified as 11e.(2) byproduct material is provided in ER Section 4.13.1.1.1.4 and includes filtrate and spent filter media from production and restoration circuits; general sludge, scale, etc.

from maintenance operations; affected soil collected from any spill or leak areas; spent/damaged ion exchange resin; well solids from injection/recovery well work-over operations; contaminated PPE; wellfield decommissioning waste such as pipelines, pumps, and impacted soil; affected concrete floors, sumps and berms in the CPP; equipment and piping in the CPP; pond sludge, pond liners, and leak detection systems; and disposal well piping and equipment. This material will be classified as 11e.(2) byproduct material under 10 CFR Part 40 and will be handled and shipped as low-specific-activity material as described in ER Section 4.2.1.2. Anticipated volumes of solid 11e.(2) byproduct material during each project phase are described in ER Section 4.13.1.1.1.4 and Table 4.13-1.

Non-AEA-Regulated Waste

Solid Waste

ER Section 4.13.1.1.2.1 describes the types of wastes classified as solid waste, including construction debris, office trash, and decontaminated material and equipment. Solid waste will not include hazardous, radioactive, or mixed waste.

Solid waste has been divided further into four categories. The first category is termed "industrial or municipal solid waste" and includes waste meeting the definition of industrial solid waste or municipal solid waste (WDEQ 1998a). Industrial solid waste is defined as "solid waste resulting from, or incidental to, any process of industry, manufacturing, mining or development of any agricultural or natural resources." Municipal solid waste is defined as "solid waste resulting from or incidental to residential, community, trade or business activities, including garbage, rubbish, ashes, street sweepings, dead animals, tires, abandoned automobiles and all other solid waste other than industrial or hazardous waste." Regardless of whether the waste is considered industrial or municipal solid waste by WDEQ/SHWD, it will consist primarily of office trash and will have the compositional characteristics of municipal solid waste.

The second category is "recyclable solid waste" and includes materials separated from general solid waste for recycling. This includes materials such as plastic, glass, paper, cardboard, and aluminum.

The third category is "construction/demolition waste," which "includes but is not limited to stone, wood, concrete, asphaltic concrete, cinder blocks, brick, plaster and metal" (WDEQ 1998a). Most of the solid waste generated during decommissioning will be classified as construction/demolition waste.

The final category of solid waste is "petroleum-contaminated soil," which is defined as "solid waste consisting of any natural or manmade soil or rock material into which petroleum product has been added, excluding hardened asphalt rubble" (WDEQ 1998a). Note that petroleum-contaminated soil was incorrectly described as hazardous waste in ER Section 4.13.1.1.2.3. Petroleum-contaminated soil is regulated as solid waste by WDEQ (1998b).

Revised Table 4.13-1 differentiates between the four categories of solid waste and provides the estimated volumes of each generated during the four project phases. The estimated quantity of industrial or municipal solid waste generated during each of the four project phases is 15 cubic yards per week. This is based on the previous estimate of 20 cubic yards per week and the assumption that 25% of the solid waste will be sorted and recycled. This recycling rate is slightly below the 2010 national average recycling rate of 34.1 percent (EPA 2012). The estimated quantity of construction/demolition waste is 5 cubic yards per week during each of the first three project phases and 2,000 cubic yards during decommissioning (refer to ER Section 4.13.1.1.2.1 and TR Section 6 for the decommissioning estimate). The estimated quantity of petroleum-contaminated soil is less than 1 cubic yard per week during all project phases.

TENORM

ER Section 4.13.1.1.2.2 describes TENORM (technologically enhanced naturally occurring radioactive materials), which will include drilling fluids and drill cuttings from monitor wells and from the construction and development of recovery and injection wells prior to using the wells for ISR uranium recovery. Expected volumes of TENORM during each project phase are provided in ER Section 4.13.1.1.2.2 and Table 4.13-1.

Hazardous Waste

Several changes in the sources of hazardous waste are shown on revised Table 4.13-1. Used oil, oily rags, and used oil filters are now listed separately from hazardous waste, since WDEQ/SHWD and EPA regulate used oil

separately from hazardous waste. Petroleum-contaminated soil has also been moved out of the hazardous waste category as previously described. Hazardous waste is anticipated to include used batteries, expired laboratory reagents, fluorescent light bulbs, solvent, cleaners and degreasers. Hazardous waste will not include radioactive or mixed waste. The estimated quantity of hazardous waste is unchanged in Table 4.13-1. As described in ER Section 4.13.1.1.2.3, Strata anticipates that the Ross ISR Project will be classified as a conditionally exempt small quantity generator (CESQG) by WDEQ/SHWD and will be required to generate less than 220 pounds of hazardous waste in any calendar month and store less than 2,200 pounds of hazardous waste at any one time.

Used Oil

Used oil primarily will be generated by motor vehicle maintenance in the maintenance shop. Assuming 10 fleet pickups with a capacity of 6 quarts each are changed quarterly, the estimated quantity of used oil generated at the project site is 60 gallons per year or 5 gallons per month. Heavy equipment such as construction equipment typically will be owned and maintained by a contractor and will not be serviced in the maintenance shop. Used oil will be accumulated separately from hazardous waste and will not be mixed with hazardous waste. Used oil is anticipated to meet the halogen screening levels that allow it to be handled as non-hazardous waste. This will be verified by a used oil contractor as described in the response to ER RAI Waste-1(B).

Used Oil Filters and Oily Rags

Used oil filters and oily rags will be generated as result of maintenance activities in the maintenance shop. The estimated quantity is less than 20 pounds per month. Used oil filters and oily rags will be accumulated separately from hazardous waste and will not be mixed with hazardous waste.

Domestic Sewage

Domestic sewage, or on-site sewage, is addressed in ER Section 4.13.1.1.2.4. The peak estimated volume of domestic sewage is 6,000 gpd, calculated using the maximum anticipated workforce (200 during construction) and the WDEQ/WQD peak per capita domestic wastewater generation rate of 30 gpd per industrial employee. The average daily on-site sewage volume is estimated to be 800 gpd, based on 60 workers during operation and an EPA

suggested average per capita wastewater generation rate of 13 gpd for industrial building employees.

It is anticipated that on-site sewage will not include the following wastewater sources: decontamination shower water or plant washdown water (disposed in lined retention ponds), laundry water (disposed in lined retention ponds), or vehicle or equipment wash water (disposed in lined retention ponds or sediment pond).

Table 4.13-1. Waste Management Systems and Anticipated Quantities

Waste Stream	Source	Storage Location	Disposal Method(s)	Estimated Typical Quantity
AEA-Regulated Waste				
Excess Permeate	Production and restoration RO circuits	Lined retention ponds	Reinjection into wellfield, CPP make-up water, surface discharge, land application, or deep disposal wells	C: 0 gpm O: 57 gpm R: 0 gpm D: 0 gpm
Brine and Other 11e.(2) Liquid Waste	Production and restoration RO circuits, CPP, well work-over, spent eluate, process drains, contaminated reagents, filter backwash, wash down water, and decontamination showers	Lined retention ponds	Deep disposal wells and evaporation in lined retention ponds	C: 0 gpm O: 62 gpm R: 227 gpm D: <10 gpm
Solid 11e.(2) Byproduct Material	Filtrate and spent filter media, scale and sludge from equipment maintenance, contaminated soil, damaged IX resin, contaminated solids from injection/recovery wells, contaminated PPE and contaminated materials and equipment from decommissioning	11e.(2) Storage and Preparation area within CPP or other designated and restricted 11e.(2) storage area	Shipment to NRC or Agreement State licensed disposal facility	C: 0 cy O: 100 cy/yr R: 100 cy/yr D: 4,000 cy
Non-AEA-Regulated Waste				
TENORM	Drilling fluids and drill cuttings	Mud pits	On-site disposal in mud pits	C (per well): drilling fluid: 6,000 gal drill cuttings: 15 cy O,R,D: 0 gal 0 cy
Solid Waste - Industrial or Municipal Solid Waste	General office trash	Designated waste receptacles	Shipment to municipal landfill	C: 15 cy/wk O: 15 cy/wk R: 15 cy/wk D: 15 cy/wk
Solid Waste - Recyclable Solid Waste	Plastic, glass, paper, aluminum, and cardboard	Designated recycling receptacles	Shipment to municipal recycling facility or recyclable waste collection facility	C: 5 cy/wk O: 5 cy/wk R: 5 cy/wk D: 5 cy/wk

Table 4.13-1. Waste Management Systems and Anticipated Quantities (Cont.)

Non-AEA-Regulated Waste				
Solid Waste - Construction/ Demolition Waste	Construction debris and decontaminated equipment/materials	Designated waste receptacles or waste accumulation areas	Shipment to municipal landfill	C: 5 cy/wk O: 5 cy/wk R: 5 cy/wk D: 2,000 cy
Solid Waste - Petroleum-Contaminated Soil	Equipment leaks	Designated storage area	Shipment to WDEQ/SHWD licensed disposal facility	C: <1 cy/wk O: <1 cy/wk R: <1 cy/wk D: <1 cy/wk
Hazardous Waste	Used batteries, expired laboratory reagents, fluorescent light bulbs, solvent, cleaners and degreasers	Designated hazardous waste storage area in maintenance shop	Shipment to WDEQ/SHWD licensed recycling or disposal facility except for expired laboratory reagents, which will be disposed with 11e.(2) liquid waste	< 220 lb/mo (<100 kg/mo) (C,O,R,D)
Used Oil	Vehicle and equipment maintenance	Designated used oil storage area in or adjacent to maintenance shop	Shipment to used oil recycling center	C: 5 gal/mo O: 5 gal/mo R: 5 gal/mo D: 5 gal/mo
Used Oil Filters and Oily Rags	Vehicle and equipment maintenance	Designated used oil storage area in or adjacent to maintenance shop	Shipment to used oil recycling center	C: <20 lb/mo O: <20 lb/mo R: <20 lb/mo D: <20 lb/mo
Domestic Sewage	Restrooms	Septic tank(s) near CPP and office/admin building	On-site wastewater disposal or treatment system plus holding tanks/portable toilets during construction and decommissioning	C: 2,600 gpd O: 800 gpd R: 300 gpd D: 1,200 gpd

Abbreviations:

C - Construction
O - Operation
R - Aquifer Restoration
D - Decommissioning

ER RAI Waste-1

Please provide additional information regarding the non-liquid waste streams to be generated during the entire lifetime of the Proposed Action.

B. Please identify all waste management processes and all associated waste-management areas anticipated to be established in the CPP and elsewhere at the Ross Project site (e.g., waste generation, waste sorting, waste treatment, waste storage, waste shipping, and waste disposal, including any on-site sewage disposal).

To ensure that waste management impacts and mitigation measures are accurately assessed, all potential waste streams must be defined and characterized and the locations of their respective management must be clearly identified. Some waste streams are identified in Section 4.13 of the ER; however, it is not clear that all waste streams have been identified. Additionally, the individual characteristics of the waste streams (e.g., specific radionuclides and/or hazardous constituents) are needed to evaluate waste-management impacts of the Proposed Action. Waste-management techniques, including ultimate disposal, should be well defined for all waste streams. This information would support the NRC staff's assessment of waste-management impacts as required by 10 CFR Part 51.

ER RAI Waste-1(B) Response

The following describes the waste management processes associated with all of the waste streams identified in the response to ER RAI Waste-1(A), including waste sorting, storage, shipping, and disposal. This information is summarized in revised ER Table 4.13-1 provided with the response to ER RAI Waste-1(A).

Solid 11e.(2) Byproduct Material

As described in ER Section 4.13.1.1.1.4 (pg. 4-167), solid 11e.(2) byproduct material will be accumulated in lined drums within the 11e.(2) Storage and Preparation Area. TR Figure 3.2-1 depicts the anticipated location of this storage area within the CPP. One or more additional 11e.(2) byproduct material storage areas may be designated outside of the CPP to accommodate large items such as contaminated equipment that cannot be stored inside. Such areas would be fenced, locked and posted with signs indicating they are restricted-access 11e.(2) byproduct material storage areas. Material stored in these areas would be covered/sealed in a manner that prevents the spread of contamination. Shipping procedures are described in ER Section 4.2.1.2 and involve transporting the 11e.(2) byproduct material as low-specific activity material in sealed roll-off containers in accordance with applicable DOT material shipping provisions. 11e.(2) byproduct material will be disposed in a

uranium mill tailings impoundment at a disposal facility licensed by NRC or an agreement state.

Solid Waste

As described in the response to ER RAI Waste-1(A), solid waste has been divided into four categories: industrial or municipal solid waste, recyclable solid waste, construction/demolition waste, and petroleum-contaminated soil. The waste management processes associated with these solid waste streams are described below.

Industrial or Municipal Solid Waste

ER Section 4.13.1.1.2.1 describes how industrial or municipal solid waste (formerly "solid waste") will be accumulated in roll-off containers in designated areas during construction and decommissioning. The designated areas will occur in wellfield staging/storage areas and within the central plant area. During operation and aquifer restoration, industrial or municipal solid waste will be accumulated in trash cans in the work areas and transferred to larger receptacles (dumpsters) at the designated solid waste storage area. This area will be within the central plant area and adjacent to an access road for ease of access by a waste disposal contractor. Industrial or municipal solid waste will be shipped to a municipal landfill permitted by WDEQ/SHWD or another state, where it will be buried in an engineered containment system. An example solid waste contractor is Waste Connections in Gillette, Wyoming, who has the capability of picking up dumpsters and transporting the waste to the Campbell County municipal landfill. Waste Connections currently provides this service to many of the coal mines in northeast Wyoming (Waste Connections 2012).

Recyclable Solid Waste

Recyclable solid waste will be accumulated in recycling bins located in work areas. The contents of these bins will be transferred to larger receptacles at the designated solid waste storage area for access by a waste disposal contractor. Recyclable solid waste will be transported to a recycling facility or recyclable solid waste collection facility. An example contractor is Waste Connections in Gillette, Wyoming, who currently performs this service for many of the coal mines in northeast Wyoming (Waste Connections 2012).

Construction/Demolition Waste

Construction/demolition waste will be accumulated in roll-off containers in designated areas during all project phases. These areas will include designated portions of wellfield staging/storage areas and a designated portion of the central plant area. During decommissioning, when a relatively large volume of construction/demolition waste will be generated, the waste may be accumulated outside of roll-off containers in designated temporary storage areas. Construction/demolition waste will be transported to a municipal landfill for disposal in a designated containment system.

Petroleum-Contaminated Soil

Petroleum-contaminated soil will be managed in accordance with WDEQ/SHWD regulations (WDEQ 1998b). Strata will temporarily store petroleum-contaminated soil in a designated storage area. The storage area will have restricted public access, it will be posed with a sign reading, "CAUTION - PETROLEUM-CONTAMINATED SOILS - NO SMOKING," and it will be lined and bermed to prevent runoff or run-on. Petroleum-contaminated soil would not be stored longer than 180 days in accordance with WDEQ/SHWD requirements for temporary storage of petroleum-contaminated soils at the point of generation. Petroleum-contaminated soils would be transported to a land farm permitted through WDEQ or another state.

TENORM

Information on TENORM waste management is provided in ER Section 4.13.1.1.2.2 and includes disposal in on-site mud pits constructed adjacent to drilling pads.

Hazardous Waste

ER Section 4.13.1.1.2.3 describes how hazardous waste will be accumulated in secure containers inside the maintenance shop. The containers will be compatible with the materials stored and contents labeled. The maintenance shop will have a specific area that is bermed and adequately vented for hazardous waste temporary storage.

Hazardous waste that is accumulated in the maintenance shop will be sorted into appropriately labeled containers. Strata anticipates that these will

include designated containers for used batteries, fluorescent light bulbs, and cleaners. Used reagents will also be generated in very small quantities in the laboratory. These will be disposed in the lined retention ponds and eventually through deep well injection as described in ER Section 4.13.1.1.1.3.

Strata anticipates using a hazardous waste contractor for transportation and disposal of hazardous waste. One potential provider is Tri-State Recycling Services in Newcastle, Wyoming. Tri-State serves as the primary contractor for used oil and hazardous waste for many of the mines in northeast Wyoming (Tri-State 2012). A waste disposal contractor such as Tri-State would be used to profile all hazardous waste, including laboratory analysis if needed, and transport it from the project area to an appropriately permitted facility. Tri-State indicated that they will arrange for disposal with an out-of-state hazardous waste disposal facility.

Another potential hazardous waste contractor is Haz-Matters in Moorcroft, Wyoming. Haz-Matters also has the ability to profile hazardous waste and arrange for the materials to be transported to an EPA-permitted facility for disposal (Haz-Matters 2012). Hazardous waste ultimately will be incinerated, treated, recycled, or otherwise disposed in accordance with EPA requirements at a permitted disposal facility.

Used Oil, Oily Rags and Used Oil Filters

Used oil will be managed in accordance with EPA requirements in 40 CFR Part 279 and WDEQ/SHWD requirements for used oil generators (WDEQ 2008). Used oil will be temporarily stored in a container that meets the WDEQ/SHWD requirements. The container will be in good condition with no visible leaks and labeled or marked clearly with the words “Used Oil.” The used oil container will be located inside or adjacent to the maintenance shop with secondary containment provided in accordance with SPCC requirements.

Used oil will be transported only by appropriately licensed transporters who have obtained EPA identification numbers; or, Strata may transport the used oil itself in containers no more than 55 gallons and in a vehicle owned by Strata subject to the provisions of 40 CFR § 279.24 and WDEQ/SHWD requirements. The used oil will be transported to a used oil collection center that is permitted through WDEQ/SHWD or another state. The used oil

collection center will eventually transport the used oil to a re-refiner for recycling or burning.

If Tri-State is used to transport the used oil, they will provide a 200 to 300-gallon tote that meets all EPA and WDEQ/SHWD requirements for temporary storage. They will test the used oil for halogens, water and metals to ensure it meets the EPA and WDEQ/SHWD requirements for used oil. The used oil will then be marketed to be burned for energy recovery (Tri-State 2012).

Used oil filters and oily rags will be accumulated in appropriately labeled containers located inside or adjacent to the maintenance shop. These will be transported by the used oil contractor to a recycling or disposal facility. Tri-State drains and crushes used oil filters at their Newcastle, Wyoming facility, disposing the liquid used oil with other used oil collected at the facility (Tri-State 2012).

ER RAI Waste-1

Please provide additional information regarding the non-liquid waste streams to be generated during the entire lifetime of the Proposed Action.

C. Please provide more detailed descriptions of the anticipated disposal facilities to which each of the individual waste streams will be shipped for disposal, including the name, the type, and the respective capacity of each facility, as well as any agreements that are expected to be required in order to ship the wastes.

To ensure that waste management impacts and mitigation measures are accurately assessed, all potential waste streams must be defined and characterized and the locations of their respective management must be clearly identified. Some waste streams are identified in Section 4.13 of the ER; however, it is not clear that all waste streams have been identified. Additionally, the individual characteristics of the waste streams (e.g., specific radionuclides and/or hazardous constituents) are needed to evaluate waste-management impacts of the Proposed Action. Waste-management techniques, including ultimate disposal, should be well defined for all waste streams. This information would support the NRC staff's assessment of waste-management impacts as required by 10 CFR Part 51.

ER RAI Waste-1(C) Response

Table ER RAI Waste-1-1 presents the anticipated disposal facilities to which each of the individual waste streams will be shipped for disposal. It includes the name, type, and respective capacity of each facility.

Table ER RAI Waste-1-1. Anticipated Waste Disposal Facilities

Waste Stream	Anticipated Disposal Facility	Type	Capacity	Agreement Required
11e.(2) Byproduct Material	Pathfinder Mine Corporation, Shirley Basin Facility, Shirley Basin, Wyoming	NRC licensed 11e.(2) byproduct material disposal facility	Unknown; the facility continues to accept 11e.(2) byproduct material from ISR facilities per NRC (2012b)	11e.(2) byproduct material disposal agreement
	Denison Mines Corporation, White Mesa Uranium Mill, Blanding, Utah	Utah licensed 11e.(2) byproduct material disposal facility	Up to 5,000 cubic yards from a single source (ER Section 4.13.1.1.1.4)	11e.(2) byproduct material disposal agreement
	Energy Solutions LLC, Clive Disposal Site, Clive, Utah	Utah licensed 11e.(2) byproduct material disposal facility	5.5 million cubic yards (ER Section 4.13.1.1.1.4)	11e.(2) byproduct material disposal agreement
	Waste Control Specialists LLC, Byproduct Material Disposal Facility, Andrews, Texas	Texas licensed 11e.(2) byproduct material disposal facility	1.17 million cubic yards (ER Section 4.13.1.1.1.4)	11e.(2) byproduct material disposal agreement
TENORM	On-site disposal	Mud pits constructed adjacent to drilling pads	Adequate capacity will be provided next to each drilling pad	None
Solid Waste - Industrial or Municipal Solid Waste	Moorcroft Landfill, Moorcroft, Wyoming	Municipal landfill	1,000 tons municipal solid waste annually (ER Section 4.13.1.1.2.1)	Contract with waste disposal contractor
	Campbell County Landfill, Gillette, Wyoming	Municipal landfill	Current space for at least 30 years of landfill life (Campbell County Public Works 2009); plans for expansion in next 5 to 20 years (Burns & McDonnell 2011)	Contract with waste disposal contractor

Table ER RAI Waste-1-1. Anticipated Waste Disposal Facilities (Cont.)

Waste Stream	Anticipated Disposal Facility	Type	Capacity	Agreement Required
Solid Waste - Recyclable Solid Waste	Campbell County Landfill, Gillette, Wyoming	Municipal recycling facility	200 tons per month (Campbell County Public Works 2012)	Contract with waste disposal contractor
Solid Waste - Construction/ Demolition Waste	Moorcroft Landfill, Moorcroft, Wyoming	Municipal landfill	600 tons construction debris annually (ER Section 4.13.1.1.2.1)	Contract with waste disposal contractor
	Campbell County Landfill, Gillette, Wyoming	Municipal landfill	Current space for at least 30 years of landfill life (Campbell County Public Works 2009); plans expansion in next 5 to 20 years (Burns & McDonnell 2011)	Contract with waste disposal contractor
	Sundance Landfill, Sundance, Wyoming	Municipal landfill	800 tons construction debris annually (Trihydro 2009)	Contract with waste disposal contractor
Petroleum-Contaminated Soil	Transported by waste disposal contractor to appropriately permitted facility in northeast Wyoming such as Campbell County Landfill	Land farm	Significantly greater than the <1 cubic yard per month estimated from Ross ISR Project	Contract with waste disposal contractor
Hazardous Waste (fluorescent light bulbs, solvent, cleaners and used batteries)	Transported by hazardous waste contractor to appropriately permitted facility	Commercial recycling facility outside Wyoming	Significantly greater than the small quantity anticipated from Ross ISR Project	Contract with hazardous waste contractor
Hazardous Waste (laboratory reagents)	On-site disposal	Lined retention ponds and deep injection wells	Up to 400 gpm (ER Section 4.13.1.1.1)	None

Table ER RAI Waste-1-1. Anticipated Waste Disposal Facilities (Cont.)

Waste Stream	Anticipated Disposal Facility	Type	Capacity	Agreement Required
Used Oil, Oily Rags and Used Oil Filters	Tri-State Recycling Services	Commercial recycling facility	Significantly greater than the estimated 60 gallons per year from Ross ISR Project	Contract with used oil recycling contractor
Domestic sewage	On-site disposal	On-site wastewater treatment or disposal system	Adequate capacity for peak design flow rate in accordance with WDEQ/WQD requirements (ER Section 4.13.1.1.2.4)	None

ER RAI Waste-2

Please provide the projected water chemistry for the brine and other liquid effluents to be generated by the Proposed Action during all of its phases.

Sections 4.13.1.1.1.1 and 4.13.1.1.1.3 of the ER present the estimated production of brine and other liquid effluents from the CPP as well as from work-over on injection and recovery wells. The chemical composition of these wastes is needed in order for the NRC to assess the impacts of waste management as required by 10 CFR Part 51.

ER RAI Waste-2 Response

TR Table 4.2-5 estimates the concentration of brine that will be generated by the proposed Ross ISR Project. The brine water quality is estimated using the anticipated water quality at the end of uranium recovery, the typical reverse osmosis salt rejection rates, and the quality and quantity of liquid waste from other 11e.(2) liquid waste sources. As such, the estimated range of liquid waste water quality in TR Table 4.2-5 includes brine and all other 11e.(2) liquid waste sources and is applicable to all project phases. Following is additional information on the specific liquid waste water quality of the other 11e.(2) liquid waste sources.

ER Section 4.13.1.1.1.3 describes the sources of other 11e.(2) liquid waste, which will include spent eluate, liquid from process drains in the CPP, fluids generated from work-over operations on injection and recovery wells, contaminated reagents, resin transfer wash water, filter backwash water, plant wash down water, and decontamination water (e.g., employee showers). Table ER RAI Waste-2-1 presents historical concentrations of liquid waste streams from a Wyoming ISR facility. The spent eluate from the Ross ISR Project is anticipated to have similar concentrations to the elution bleed column in the table. The liquid from process drains in the CPP is expected to fall generally within the range of all of the concentrations depicted in the table. Resin transfer wash water is anticipated to have concentrations similar to those in the resin rinse column in the table.

Fluids generated from work-over operations on injection and recovery wells will have water quality characteristics ranging from the pre-recovery concentrations in TR Table 6.1-8 to the anticipated water quality at the end of production in TR Table 6.1-9. Filter backwash water, plant wash down water,

and decontamination water will all have concentrations similar to the pre-recovery concentrations in TR Table 6.1-8.

Table ER RAI Waste-2-1. Typical Liquid Waste Water Quality

Parameter and Units	Resin Rinse	Elution Bleed	Yellowcake Wash Water
Cl, ppm	10,000–15,000	12,000–15,000	4,000–6,000
CO_3, ppm	500–800		
HCO_3, ppm	600–900		
Na, ppm	6,000–11,000	6,000–8,000	3,000–4,000
NH_4, ppm		180–640	
Ra-226, pCi/L	100–200	100–300	20–50
Th-230, pCi/L	50–100	10–30	10–20
U, ppm	1–3	5–10	3–5

Source: Modified from NUREG-1910, Table 2.7-3

ER RAI Waste-3

Please provide additional information on the disposal of excess permeate during ISR operations.

A. Please provide the estimated quantities of excess permeate that will be disposed of by land application and/or surface (industrial) discharge.

Section 4.13.1.1.1.2 of the ER notes that land application and surface discharge are two of the methods that Strata may use for disposal of excess permeate from the ISR facility. It is important to know if Strata will pursue one or both of these disposal methods, so that the SEIS can correctly include that information (or not) in the Proposed Action. An estimate of the volume of liquid released to land and/or surface drainages is needed so that the NRC can assess potential impacts of these waste-management techniques and an identification of the permits likely to be obtained will be important during mitigation-measure analysis as required by 10 CFR Part 51.

ER RAI Waste-3(A) Response

Land application is no longer being considered as a disposal option for excess permeate at the proposed Ross ISR Project. If in the future Strata decides to pursue land application of excess permeate, a license amendment application will be prepared.

Excess permeate will only be present during two relatively brief operational periods: uranium production without concurrent aquifer restoration and groundwater sweep in the first wellfield module(s) undergoing aquifer restoration. During all other operational periods, no excess permeate will be produced due to high permeate demand in the injection streams for uranium production and aquifer restoration. The estimated flow of excess permeate during uranium production without concurrent aquifer restoration (resulting from RO treatment of the production bleed) will be 57 gpm (0.13 cfs) as shown on ER Figure 4.13-1. During this time, the demand for excess permeate for use as plant makeup water is expected to be approximately 25 gpm, making the excess permeate available for surface discharge 32 gpm (0.07 cfs). The duration of uranium production without concurrent restoration will be approximately 2.5 years. Therefore, the total estimated volume of excess permeate available for surface discharge is approximately 129 ac-ft. Excess permeate generation during the time when groundwater sweep is occurring in the first wellfield modules will be approximately 184.5 gpm (0.41 cfs). This flow rate accounts for a restoration bleed of 75 gpm from two wellfield modules in groundwater sweep. The resulting flow rate of excess permeate from the

restoration bleed will be 127.5 gpm after two phases of RO. In addition, it is estimated that an excess permeate flow rate of 57 gpm will also be produced from wellfields in operation. As in the operation only phase, approximately 25 gpm of excess permeate will be used for plant make up water. Therefore, the net flow rate available for surface discharge will be approximately 159.5 gpm (0.36 cfs). The period where groundwater sweep is occurring in the first wellfield modules will be approximately 2 months. The total volume of excess permeate available for surface discharge will therefore be approximately 42.3 ac-ft.

While the flow rates discussed above are typical, a range of flow rates for excess permeate may be achieved by adjusting the RO feed rate. For example, zero excess permeate may be achieved if the RO feed rate is increased to the point that the final brine rate matches the production bleed. This scenario would maximize the flow rate of brine from the RO System. During operation and aquifer restoration, Strata may choose to adjust the RO feed rate based upon the available capacity in each of the liquid waste disposal systems.

As stated on pg. 4-50 of the ER, the estimated typical quantity of excess permeate to be discharged under a WYPDES permit would be 50 gpm (0.11 cfs) or less. During the relatively brief periods when the excess permeate production rate is higher, such as when the first wellfield modules are in groundwater sweep, surplus capacity in the lined retention ponds will buffer the flow of excess permeate and allow Strata to control the surface discharge rate. Proposed design capacities in the lined retention ponds total approximately 80 ac-ft, which is ample to store the entire volume of excess permeate produced during the 2-month period when the first wellfield modules are undergoing groundwater sweep.

A discharge flow rate of 50 gpm or less is expected to have a very minor potential impact on the receiving channel as stated on ER pg. 4-50. As described in the response to ER RAI GEN-2(B), potential impacts to surface water quality from the surface discharge of excess permeate would be mitigated through both technology-based effluent limits and water quality-based effluent limits established by WDEQ/WQD as part of the WYPDES permit.

ER RAI Waste-3

Please provide additional information on the disposal of excess permeate during ISR operations.

B. Please identify the corresponding permit applications that will be prepared by Strata and submitted to the Wyoming Department of Environmental Quality for either or both of these disposal methods.

Section 4.13.1.1.1.2 of the ER notes that land application and surface discharge are two of the methods that Strata may use for disposal of excess permeate from the ISR facility. It is important to know if Strata will pursue one or both of these disposal methods, so that the SEIS can correctly include that information (or not) in the Proposed Action. An estimate of the volume of liquid released to land and/or surface drainages is needed so that the NRC can assess potential impacts of these waste-management techniques and an identification of the permits likely to be obtained will be important during mitigation-measure analysis as required by 10 CFR Part 51.

ER RAI Waste-3(B) Response

As stated in the response to Part (A) of this RAI, land application is no longer being considered as a disposal option at the Ross ISR Project. The response to ER RAI GEN-2(B) describes the necessary WYPDES permit for which Strata will apply in order to surface discharge excess permeate. Such a permit will include flow rate and water quality effluent limits established by WDEQ/WQD as protective of the receiving stream(s). Strata anticipates that the radiological effluent limits in the WYPDES permit will be established as equal to or less than the established limits for discharge of radionuclides to the environment in 10 CFR Part 20, Appendix B, Table 2, Column 2. Waste streams containing radionuclides below these regulatory limits are not classified as radioactive waste

Environmental Monitoring

ER RAI EM-1

Please update all monitoring program results (i.e., radiation, physiochemical, environmental, ecological, and meteorological as well as public health and safety) that have been acquired since license application submittal.

For those site-characterization, pre-operational, and/or other monitoring programs that have continued to be implemented since license application submittal, the resulting data will provide additional information that will be useful during the preparation of the SEIS. For example, Section 5.2.1 in the ER indicates that "Strata will continue [physiochemical] monitoring efforts" (page 6-9). These data will support the environmental impact analyses as required by 10 CFR Part 51.

ER RAI EM-1 Response

Pursuant to 10 CFR Part 40, Appendix A criteria, Strata submitted a license application to NRC staff that contains at least 12 months of pre-license monitoring, sampling, and testing data to provide an appropriate site characterization of the proposed Ross ISR Project. Beyond meeting the requirements outlined in the 10 CFR Part 40 Regulations for Domestic Licensing of Source Material, the application includes all of the necessary components recommended in Regulatory Guides 3.46, 3.63, 3.8, and 4.14 along with NUREG-1569, 1748 and 1910. While a number of monitoring programs were continued in 2011 the intent was to ensure that any perceived deficiencies or specific gaps in the pre-license monitoring program could be addressed, if necessary, in a timely and efficient manner. A number of RAIs request submittal of data collected following license application transmittal to the NRC. As appropriate, Strata has provided these data to facilitate NRC staff review. However, NRC regulations and guidance merely require a license applicant to supply pre-license data in accordance with Appendix A criteria. Further, the language of NRC staff's RAI does not indicate that this request for ongoing pre-license data is intended to fill or supplement any specific gap in Strata's license application. Thus, Strata questions why this additional data request is necessary for NRC staff's review.

References

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APPENDIX A

WDEQ/LQD DATA SUBMISSION SPREADSHEETS
(ELECTRONIC FORMAT ONLY)

APPENDIX B

WELL STATEMENT OF COMPLETION FORMS

COPY TO U.S.G.S. : 1-15-71

M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7330

Temporary Filing No. 4-5-38c

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Minnie Berger #1

1. Owner Minnie B Berger
2. Address Osage Wyo 82724
3. Agent to receive correspondence Mary E Berger Osage Wyo 82724
4. Name & address of driller Jerry Brisco
5. Well is constructed on lands owned by Minnie B Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled [X] Cable (Type of Rig)
   Driven ☐ Jet ☐ Other Wind mill
7. Use of Water—Domestic ☐ Stock [X]
8. Means of conveyance, distance and direction to point of use
   Pump to tank 1 Ft East
9. Date started Apr 11, 19 61
10. Date completed Apr 22, 19 61 (including pump)
11. Date after completion when water was used Apr 22, 19 61
12. WELL DESCRIPTION
    Total Depth 222 Depth to Water Level ____ ft.
13. TEST DATA
    Yield 2 GPM How Tested Pump
    Drawdown ✓ Length of Test ✓
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source Windmill (Elec., Gas, etc.)
    Horsepower ____ Amount of Water Being Used 2 GPM (Gallons per Minute)
15. CASING RECORD

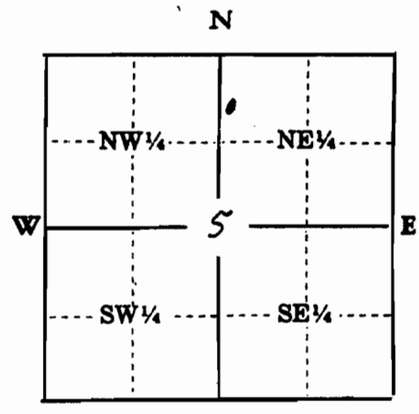
Plain Casing					
Size 6 in	Kind Steel	from 0	ft. to 222	ft.
Size ____	Kind ____	from ____	ft. to ____	ft.
Size ____	Kind ____	from ____	ft. to ____	ft.
Perforated Casing					
Size ____	Kind ____	from ____	ft. to ____	ft.
Size ____	Kind ____	from ____	ft. to ____	ft.

WELL LOCATION

Crook County

NW ¼ of NE ¼ of Sec. 5

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac.
or
fill in the following:

Lot ____ & Block ____ or Tract ____

of the ____ (Subdivision or Addition)

of ____ (City, Town or County)

Section ____, T. ____ N., R. ____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7330

Book No. 41 Page No. 177

THE MILLS COMPANY, SHERIDAN 127214

U.W. 7330

16. **Was surface seal provided?** Yes ☐ No ☐ **To What Depth** _____ **Material used:** _____
Was well gravel packed? Yes ☐ No ☐

17. **FLOWING WELL (Owner is responsible for installing control device on flowing well.)**
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ **Does well leak around casing?** Yes ☐ No ☒

18. **LOG OF WELL**—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
200	222	Unknown		Water sand	

19. **QUALITY OF WATER INFORMATION**
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☐
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. **IF WELL IS TO BE ABANDONED,** complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Minnie B. Berger — Signature of Owner or Authorized Agent

Dec 1, 1970 — Date

Date of Receipt: December 11, 1970.

Date of Priority: April 22, 1961

Sylvia H. Ross

Date of Approval: 21 December, 1970.

Sylvia H. Ross
for State Engineer

Copy To U.S.G.S.: 1-15-71

M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7325

Temporary Filing No. 4-5-367

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Berger no 8

1. Owner Harry J Berger
2. Address Oshoto Wyo 82724
3. Agent to receive correspondence Harry J Berger Oshoto Wyo 82724
4. Name & address of driller N moore Moorcroft Wyo
5. Well is constructed on lands owned by Harry J Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled [X] Cable Type of Rig
   Driven ☐ Jet [X] Other
7. Use of Water—Domestic [X] Stock ☐
8. Means of conveyance, distance and direction to point of use
   10 ft west to house
9. Date started Aug 5, 1951
10. Date completed Aug 10, 1951 (including pump)
11. Date after completion when water was used Aug 10, 1951
12. WELL DESCRIPTION
    Total Depth 100 Depth to Water Level ft.
13. TEST DATA
    Yield 5 GPM How Tested pumped
    Drawdown Length of Test
14. PUMP DATA
    Type Jet (Turbine, Centrifugal, etc.) Power Source Electric (Elec., Gasoline)
    Horsepower ½ Amount of Water Being Used 5 GPM (Gallons per Minute)
15. CASING RECORD

Plain Casing

Size	6 in	Kind	Steel	from 0 ft.	to 100 ft.
Size		Kind		from ft.	to ft.
Size		Kind		from ft.	to ft.

Perforated Casing

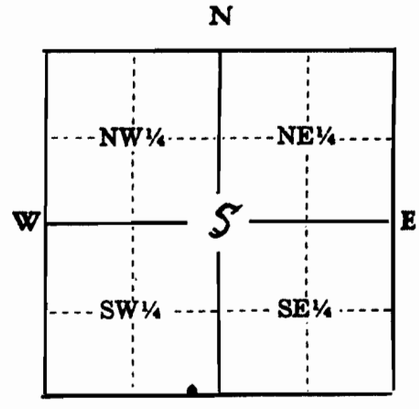
Size		Kind		from ft.	to ft.
Size		Kind		from ft.	to ft.

WELL LOCATION

Crook County

SE ¼ of SW ¼ of Sec. 5

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac.
or
fill in the following:

Lot ____ & Block ____ or Tract ____

of the ____ (Subdivision or Addition)

of ____ (City, Town or County)

Section ____, T. ____ N., R. ____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7325

Book No. 41 Page No. 172

THE MILLS COMPANY, SHERIDAN 127214

U.W. 7325

16. Was surface seal provided? Yes ☐ No ☐ To What Depth _____ Material used: _____
Was well gravel packed? Yes ☐ No ☐

17. FLOWING WELL (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ Does well leak around casing? Yes ☐ No ☒

18. LOG OF WELL—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
90	100			Water sand	

19. QUALITY OF WATER INFORMATION
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☐
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harry J. Berger
Signature of Owner or Authorized Agent

Dec 1, 1970
Date

Date of Receipt: December 11, 1970.

Date of Priority: August 10, 1951

Sylvia H. Ross

Date of Approval: 21 December, 1970.

Sylvia H. Ross
for State Engineer

Copy To U.S.G.S. : 1-15-71 M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7324

Temporary Filing No. 4-3-307

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Berger No 1

1. Owner Harry J Berger
2. Address Osage Wyo 82724
3. Agent to receive correspondence Harry J Berger Osage Wyo 82724
4. Name & address of driller W W Reynolds Moorcroft Wyo.
5. Well is constructed on lands owned by Harry J Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled [X] Cable (Type of Rig)
   Driven ☐ Jet ☐ Other Wind mill
7. Use of Water—Domestic ☐ Stock [X]
8. Means of conveyance, distance and direction to point of use
   Pump to Tank
9. Date started Sept 2, 1954.
10. Date completed Sept 10, 1954. (including pump)
11. Date after completion when water was used Sept 10, 1954.
12. WELL DESCRIPTION
    Total Depth 160 Depth to Water Level ____ ft.
13. TEST DATA
    Yield 3 GPM How Tested pump
    Drawdown 2 Length of Test 2
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source wind mill (Elec., Gas, etc.)
    Horsepower ¼ Amount of Water Being Used 3 GPM (Gallons per Minute)
15. CASING RECORD

Plain Casing

Size	6 in	Kind	Steel	from 0 ft.	to 160 ft.
Size		Kind		from ft.	to ft.
Size		Kind		from ft.	to ft.

Perforated Casing

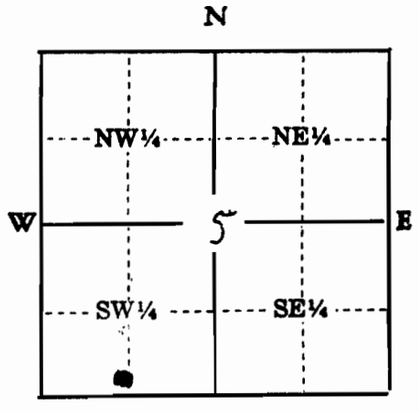
Size		Kind		from ft.	to ft.
Size		Kind		from ft.	to ft.

WELL LOCATION

Crook County

SW ¼ of SW ¼ of Sec. 5

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac. or fill in the following:

Lot ____ & Block ____ or Tract ____

of the ____ (Subdivision or Addition)

of ____ (City, Town or County)

Section ____, T. ____ N., R. ____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7324

Book No. 41 Page No. 171

THE MILLS COMPANY, SHERIDAN 127214

U.W. 7324

16. Was surface seal provided? Yes ☐ No ☐ To What Depth _____ Material used: _____
Was well gravel packed? Yes ☐ No ☐ Unknown

17. FLOWING WELL (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ Does well leak around casing? Yes ☐ No ☒

18. LOG OF WELL—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
150	160	Unknown		Water sand	

19. QUALITY OF WATER INFORMATION
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☐
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harry J. Berger — Signature of Owner or Authorized Agent

Dec 1, 1970 — Date

Date of Receipt: December 11, 1970.

Date of Priority: September 10, 1954

Sylvia H. Ross

Date of Approval: 21 December, 1970.

Sylvia H. Ross
for State Engineer

Copy To U.S.G.S.: 1-15-71

M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7328

Temporary Filing No. 4-3-306

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 ☒

NAME OF WELL Berger No 11

1. Owner Harry J Berger
2. Address Osage Wyo 82724
3. Agent to receive correspondence Harry J Berger Osage Wyo 82724
4. Name & address of driller E W Reynolds Moorcroft Wyo
5. Well is constructed on lands owned by Harry J Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled ☒ cable (Type of Rig)
   Driven ☐ Jet ☐ Other Windmill
7. Use of Water—Domestic ☐ Stock ☒
8. Means of conveyance, distance and direction to point of use
   4" Pipe to tank 10 Ft East
9. Date started Sept 1, 1954
10. Date completed Sept 5, 1954 (including pump)
11. Date after completion when water was used Sept 5, 1954.
12. WELL DESCRIPTION
    Total Depth 207 Depth to Water Level _____ ft.
13. TEST DATA
    Yield 4 GPM How Tested pump
    Drawdown _____ Length of Test _____
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source Wind mill (Elec., Gas, etc.)
    Horsepower _____ Amount of Water Being Used 4 GPM (Gallons per Minute)
15. CASING RECORD

Plain Casing

Size 6 in	Kind Steel	from 0	ft. to 207	ft.
Size _____	Kind _____	from _____	ft. to _____	ft.
Size _____	Kind _____	from _____	ft. to _____	ft.

Perforated Casing

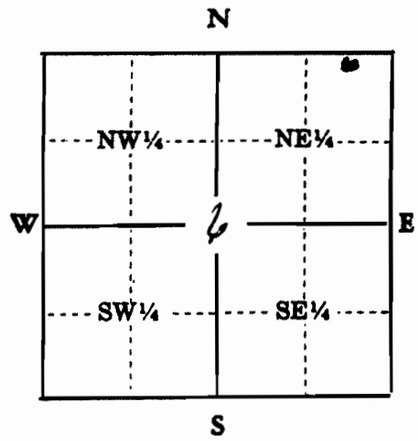
Size _____	Kind _____	from _____	ft. to _____	ft.
Size _____	Kind _____	from _____	ft. to _____	ft.

WELL LOCATION

Crook County

NE ¼ of NE ¼ of Sec. 6

T. 53 N., R. 61 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac.
or
fill in the following:

Lot _____ & Block _____ or Tract _____

of the _____ (Subdivision or Addition)

of _____ (City, Town or County)

Section _____, T. _____ N., R. _____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7328

Book No. 41 Page No. 175

THE MILLS COMPANY, SHERIDAN 127214

U.W. 7328

16. Was surface seal provided? Yes ☑ No ☐ To What Depth Unknown Material used: _____
Was well gravel packed? Yes ☐ No ☑

17. FLOWING WELL (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ Does well leak around casing? Yes ☐ No ☒

18. LOG OF WELL—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
180	207	Unknown		Water sand	

19. QUALITY OF WATER INFORMATION
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☒
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harry J. Berger
Signature of Owner or Authorized Agent

Dec 1, 1970
Date

Date of Receipt: December 11, 1970.

Date of Priority: September 5, 1954

Sylvia H. Ross

Date of Approval: 21 December, 1970.

Sylvia H. Ross
for State Engineer

Copy To U.S.G.S. : 1-15-71

M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7331

Temporary Filing No. 4-5-368

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Minnie Berger No 2

1. Owner Minnie B. Berger
2. Address Oshoto Wyo. 82724
3. Agent to receive correspondence Harry W. Berger Oshoto Wyo. 82724
4. Name & address of driller Jerry Broga Moorcroft Wyo
5. Well is constructed on lands owned by Minnie B Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled [X] Cable Type of Rig
   Driven ☐ Jet ☐ Other Wind mill
7. Use of Water—Domestic ☐ Stock [X]
8. Means of conveyance, distance and direction to point of use
9. Date started Sept 10, 1958.
10. Date completed Sept 14, 1958. (including pump)
11. Date after completion when water was used Sept 14, 1958.
12. WELL DESCRIPTION
    Total Depth 123 Depth to Water Level ~ ft.
13. TEST DATA
    Yield 3 GPM How Tested Bump
    Drawdown ____ Length of Test ____
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source Wind mill (Elec., Gas, etc.)
    Horsepower ____ Amount of Water Being Used 3 (Gallons per Minute)
15. CASING RECORD

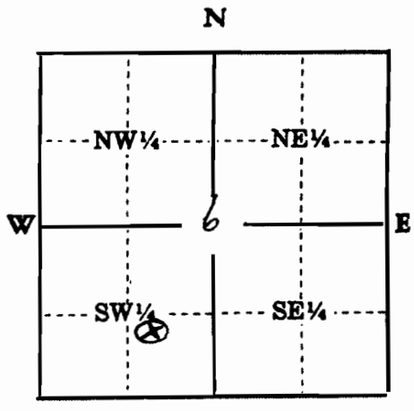
Plain Casing					
Size 6 in	Kind Steel	from 0	ft. to 125	ft.	
Size ____	Kind ____	from ____	ft. to ____	ft.	
Size ____	Kind ____	from ____	ft. to ____	ft.	
Perforated Casing					
Size ____	Kind ____	from ____	ft. to ____	ft.	
Size ____	Kind ____	from ____	ft. to ____	ft.	

WELL LOCATION

Crook County

SE ¼ of SW ¼ of Sec. 6

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac.
or
fill in the following:

Lot ____ & Block ____ or Tract ____

of the ____ (Subdivision or Addition)

of ____ (City, Town or County)

Section ____, T. ____ N., R. ____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7331

Book No. 41 Page No. 178

THE HILLS COMPANY, SHERIDAN 127214

U.W. 7331

16. **Was surface seal provided?** Yes ☐ No ☐ **To What Depth**_____ **Material used:** _____
Was well gravel packed? Yes ☐ No ☐

17. **FLOWING WELL** (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ **Does well leak around casing?** Yes ☐ No ☒

18. **LOG OF WELL**—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
110	125	Unknown		water sand	

19. **QUALITY OF WATER INFORMATION**
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☐
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. **IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.**
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Minnie B Berger
Signature of Owner or Authorized Agent

Dec 1
Date, 1970

Date of Receipt: December 11, 1970.

Date of Priority: September 14, 1958

Sylvia H. Ross

Date of Approval: 21 December, 1970.

Sylvia H. Ross
for State Engineer

Form U.W. 6
Rev. 2-83

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

MICRO FILMED JUL 1 '87

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 74302 NAME OF WELL Yard No 1

1. NAME OF OWNER John H and Rondi L Yard

2. ADDRESS OSHOTO, WYOMING Zip Code 82724

3. USE OF WATER: Domestic ☒ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐

4. LOCATION OF WELL: NE ¼ SE ¼ of Section 7, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.),

Wyoming, being specifically _____ (Bearing and Distance)

or _____ ft. North / South and _____ ft. East / West from the _____ corner of Section _____, T. _____ N., R. _____ W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ Cable Tool (Type of Rig) Dug ☐ Driven ☐ Jetted ☐

Other _____

6. CONSTRUCTION: Total Depth of Well 200' ft. Depth to Static Water Level 120' ft.

a. Casing Schedule New ☒ Used ☐

5½ OD diameter from 0 ft. to 200' ft. Material Plastic Gage Sch 40

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

b. Perforations: Type of perforator used ½" holes Drilled

Size of perforations ½ inches by ½ inches.

Number of perforations and depths where perforated:

100' perforations from 130' ft. to 200' feet.

_____ perforations from _____ ft. to _____ feet.

c. Was well screen installed? Yes ☐ No ☒

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____

e. Was surface casing used? Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLER Gerald Bross Box 6 Moorcroft Wyo.

8. DATE OF COMPLETION OF WELL (including pump installation) 4-2-87

9. PUMP INFORMATION: Manufacturer Myers Type Sub -

Source of power 220 VOLTS Horsepower .5 Depth of Pump Setting 140'

Amount of Water Being Pumped 10 Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 74302 Book No. 523 Page No. 39

10. PUMP TEST: Was a pump test made? Yes [ ] No [X]

If so, by whom _____ Address _____

Yield: _____gal./min. with _____ foot drawdown after _____ hours.

Yield: _____gal./min. with _____ foot drawdown after _____ hours.

11. FLOWING WELL (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes [ ] No [ ]

12. LOG OF WELL: Total depth drilled 200' _____ feet.

Depth of completed well 200' feet. Diameter of well 5 1/2 OD inches.

Depth to first water bearing formation 130 feet.

Depth to principal water bearing formation. Top 130 feet to Bottom 190' feet.

Ground Elevation, if known _____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	20'	Brown Surface			
20	30'	Dark Brown Clay			
30	90'	Brown Gray Clay			
90	130	Gray Shale			
130	150	Blue Gray Sand	WATER		
150	170	Brown Gray sandy Clay	(Sticky)		
170	190	Blue water Sand	WATER	Fox Hills	
190	200	Sandy Clay			130'-200'

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes [ ] No [X]

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good [X] Acceptable [ ] Poor [ ] Unusable [ ]

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Town-Ship	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
53N	67W	7													X				

TOTAL NUMBER OF ACRES TO BE IRRIGATED N/A

Original Supply _____ acres

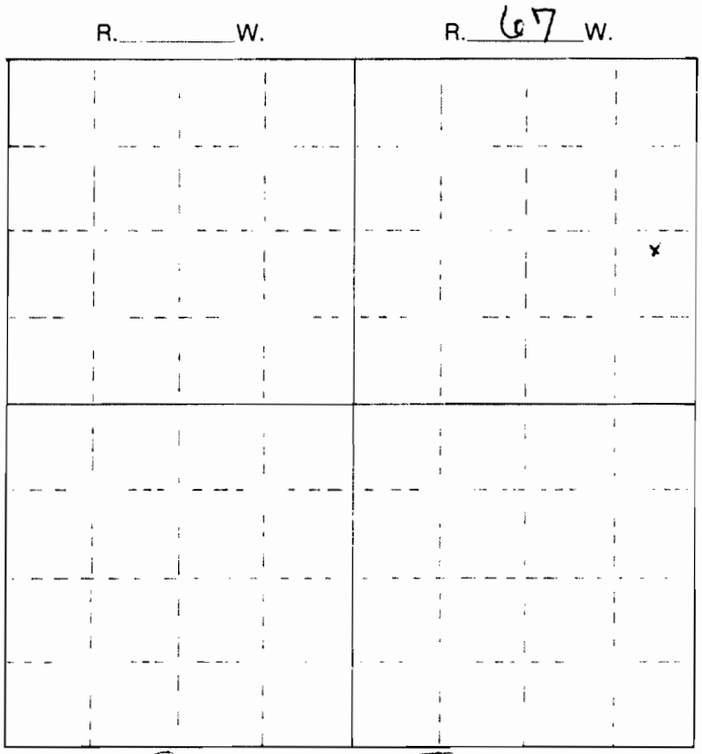
Additional Supply _____ acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.



Scale: 2" = 1 Mile

REMARKS: Piped To TRAILER From Well With -160' 1" Pipe (Plastic)

15. **IF WELL IS TO BE ABANDONED, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment and details of the plugging below.**

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

John H. Yard
Ronda L. Yard
Signature of Owner or Authorized Agent

APRIL 30, 1987
Date

Date of Receipt MAY 4 1987, 19

Date of Priority MAR 2? 1987, 19

Date of Approval June 18, 1987

Bruce R. Breitkreutz
for State Engineer

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191679 NAME OF WELL/SPRING DM 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,489,680.61 Easting 713,356.17 (Feet)
Land surface elevation (ft. above mean sea level) 4134.03 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 487 ft.
Depth to static water level 83.9 ft. (below land surface) Casing height 1.44 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.44 ft. to 472 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 472 ft.
Amount of grout used 109 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 472 ft. to 487 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-lift and pumping How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 472 ft. to 487 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 26, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake 440 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191679 Book No. 1383 Page No. 79

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 550 ft.
Depth of completed well 487 ft. Diameter of well 5 inches.
Depth to first water bearing formation 40 ft.
Depth to principal water bearing formation Top 473 ft. to bottom 489 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	550	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191679

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-7 DM** SEO Permit No.: 191679	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 474 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 460 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade & Tri Cone	Annular Seals: Depth: 0 to 472 Type: cement Depth: Type:
Location: SESE Section: 7 Township: 53N Range: 67W	Hole Depth: 550 Diameter: 8¾" Well Depth: 487 Diameter: 5"	Perforation Interval(s): 472 to 487 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: N: 1,489,680.61 E: 713,356.17	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 472 to 487 Type: 10-20 CSS Quantity (ft^3): 5.5
Recorded By: Mike Wolf WYPG#614 Date Started: 11/17/09 Date Finished: 12/5/09	Top of Casing Elevation: 4,135.47 M.P. Height: 1.44 Ground Elevation: 4,134.03	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	25	Sandy silt; light brown, very fine grained, moderate clay content	
25	30	Siltstone; grey	
30	40	Siltstone; carbonaceous, dark brown to black	
40	50	Silty sandstone; light grey, very fine grained	
50	65	Sandy clay; dark brown	
65	90	Clayey siltstone; soft, friable	
90	107	Sandstone; grey, very, very fine, soft, silty	
107	150	Siltstone; grey, very, very firm with interbedded soft clay	
150	156	Claystone; dark, carbonaceous, soft	
156	175	Siltstone; grey, firm but friable, hard streak at146 and 157 and 170	
175	186	Sandstone; very light grey with fined grained, moderately hard streaks	
186	201	Siltstone; grey, soft	
201	211	Silty sand, very, very fine grained, soft	
211	250	Sandstone; light grey, very fine grained to fine grained	
250	278	Mudstone; brown, silty clay, soft	
278	281	Siltstone; grey with carbonaceous streaks	
281	291	Sandstone; grey, very, very fine grained, silty	
291	306	Silty claystone; grey	
360	315	Siltstone; grey, friable, very hard at 316-317	
315	378	Sandstone; grey, very fine grained, fining up, soft, friable interbedded siltstone	
378	388	Siltstone; grey, abundant clay content	
388	392	Silty sandstone; grey, very fine grained, friable, interbedded	
392	395	Sand; grey, coaly, hard at 383	
395	397	Claystone; grey, soft	
397	410	Siltstone; grey	
410	419	Sandy siltstone; coaly streaks, hard streak at 435	
419	431	Sandstone; grey, very, very fine, silty, friable, occasional hard streaks	
431	437	Siltstone; grey, very soft	
437	473	Claystone; grey-dark grey, soft, 436-437 hard Hard streaks at 503 and 511	2:12
473	489	Sandy silt; grey	14:20
489	508	Claystone, grey to dark grey, soft to firm	

Hole No. 34-7 DM

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
508	525	Sandy siltstone; grey	
525	550	Claystone; grey, firm	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191680 NAME OF WELL/SPRING SA 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street

☒ Please check if address has changed from that shown on permit.

City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY83 EF Northing 1,489,614.77 Easting 713,356.10 (Feet)
Land surface elevation (ft. above mean sea level) 4134.19 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Groundwater Monitor Well

6. CONSTRUCTION Total depth of well/spring 52 ft.
Depth to static water level 21.0 ft. (below land surface) Casing height 1.22 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.5 ft. to 42 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 42 ft.
Amount of grout used 12 Sacks (example: 10 sacks) type II plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 42 ft. to 52 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air Lift & Pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica
Filter pack/gravel installed from 42 ft. to 52 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn Ent.; 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 3-26-2010

9. PUMP INFORMATION Manufacturer No Pump Installed Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* Sample Only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191680 Book No. 1383 Page No. 80

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 60 ft.
Depth of completed well 52 ft. Diameter of well 5 inches.
Depth to first water bearing formation 39 ft.
Depth to principal water bearing formation Top 39 ft. to bottom 52 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	60	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC
Signature of Owner or Authorized Agent

April 15, 2010
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191680

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

Hole/Well No.: **34-7 SA** SEO Permit No.: 191680	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 42' Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 35 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 42 Type: cement Depth: Type:
Location: SESE Section: 7 Township: 53N Range: 67W	Hole Depth: 60 Diameter: 8¼" Well Depth: 52 Diameter: 5"	Perforation Interval(s): 42 to 52 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,489,614.77 E: 713,356.10	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 42 to 52 Type: 10-20 CSS Quantity (ft^3): 2
Recorded By: Mike Wolf WYPG#614 Date Started: 11/18/09 Date Finished: 12/12/09	Top of Casing Elevation: 4,135.41 M.P. Height: 1.22 Ground Elevation: 4,134.19	Protective Casing: (Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	4	Sandy silt; brown, QAL fill	12:30
4	7	Sandy clay, dark brown, gypsum salts, cohesive	
7	9	Clay; grey, soft	
9	12	Clayey sand; brown, very fined gained, very moist to wet, very cohesive	12:16
12	18	Silty sand; buff-brown, soft, moist moderate clay, bedrock, moderate cohesion	
18	20	Siltstone; tan-brown, sandy, moist, friable, moist to wet, makes water at 20' ~2-3 gpm	
20	35	Siltstone; brown-grey, moderately firm, clay rich	
35	37	Siltstone; light grey, firm to moderately hard	
37	39	Siltstone; brown, soft, cohesive	
39	43	Sandstone; very light grey, very fine grained, quartz sand, moderately firm	
43	44	Sandstone; very hard, very light grey, quartzite sand	
44	52	Sandstone; very light grey, very, very fine, wet, very friable	
52	60	Siltstone; brown-dark brown, moderately friable, hard at 59-60	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE Do not fold this form Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191681 NAME OF WELL/SPRING SM 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2310 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,489,647.62 Easting 713,384.92 (Feet)
Land surface elevation (ft. above mean sea level) 4133.80 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 245 ft.
Depth to static water level 55.4 ft. (below land surface) Casing height 1.28 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.28 ft. to 210 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 210 ft.
Amount of grout used 49 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 210 ft. to 245 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2.5 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 210 ft. to 245 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 26, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable generator Horsepower 1/2 Depth of pump setting or intake 170 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191681 Book No. 1383 Page No. 81

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 245 ft.
Depth of completed well 245 ft. Diameter of well 5 inches.
Depth to first water bearing formation 41 ft.
Depth to principal water bearing formation Top 209 ft. to bottom 245 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	245	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191681

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-7 SM** SEO Permit No.: 191681	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 211 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 198 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 209 Type: cement Depth: Type:
Location: SESE Section: 7 Township: 53N Range: 67W	Hole Depth: pilot 240 Diameter: 8¾" Ream for casing: 210 Diameter: 5" Well Depth: 245	Perforation Interval(s): 210 to 245 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,489,647.62 E: 713,384.92	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 210 to 245 Type: 10-20 CSS Quantity (ft^3): 7
Recorded By: Mike Wolf WYPG#614 Date Started: 11/19/09 15:00 Date Finished: 12/11/09	Top of Casing Elevation: 4,135.08 M.P. Height: 1.28 Ground Elevation: 4,133.80	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	12	Sandy clay; brown, silty, colluvium/alluvial fill, wet at base	
12	24	Clayey siltstone; brown soft, weathered bedrock	
24	41	Siltstone; grey, clay rich, moderately firm	
41	48	Sandstone; very light grey, very, very fine grained, 80-90% quartz, friable, wet	
48	52	Claystone; grey, firm	
52	61	Silty sand; brown-grey, very soft, poorly sorted, damp, low permeability, hard at 56-57'	
61	65	Claystone/mudstone; brown, moderately carbonaceous	
65	71	Siltstone; grey, moderately firm	
71	73	Sandy; light grey, very fine grained	
73	90	Claystone; dark blue-grey firm	
90	120	Sandy siltstone; grey to brown, interbedded	
120	127	Claystone; grey-medium grey	
127	149	Siltstone; blue-grey, very clay rich, very cohesive, hard to 147-147.5	
149	164	Claystone; grey-brown, very cohesive	
164	181	Silty sandstone; light grey, silty interbeds, very, very fine grained, fining up	
181	185	Coaly claystone; grey, claystone with moderate small bright coal	
185	194	Clay siltstone; grey, friable	
194	199	Silty claystone; dark brown, moderately carbonaceous	
199	203	Silty sandstone; grey, firm	
203	209	Siltstone; grey, clay rich	
209	215	Sandy siltstone; grey	
215	218	Sandstone; grey, very, very fine grained, very hard, very well cemented	
218	245	Sandstone; grey silty interbeds, very, very fine grained, sand are mostly soft, siltstones more firm	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191682 NAME OF WELL/SPRING OZ 34-7

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82801 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,489,634.47 Easting 713,293.28 (Feet)
Land surface elevation (ft. above mean sea level) 4134.88 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 378.5 ft.
Depth to static water level 83.5 ft. (below land surface) Casing height 1.87 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from _____ ft. to _____ ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 318.5 ft.
Amount of grout used 74 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 318.5 ft. to 378.5 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 318.5 ft. to 378.5 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 26, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16S 20-18
Source of power Portable generator Horsepower 2.0 Depth of pump setting or intake 300 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191682 Book No. 1383 Page No. 82

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 380 ft.
Depth of completed well 378.5 ft. Diameter of well 5 inches.
Depth to first water bearing formation 46 ft.
Depth to principal water bearing formation Top 320 ft. to bottom 380 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	380	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolff - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191682

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-7 OZ** SEO Permit No.: 191682	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 320 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 308 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 320 Type: cement Depth: Type:
Location: SESE Section: 7 Township: 53N Range: 67W	Hole Depth: 380 Diameter: 8¾" Well Depth: 378.5 Diameter: 5"	Perforation Interval(s): 318.5 to 378.5 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,489,634.47 E: 713,293.28	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 318.5 to 378.5 Type: 10-20 CSS Quantity (ft^3): 130
Recorded By: Mike Wolf WYPG#614 Date Started: 11/19/09 Date Finished: 1/30/2010	Top of Casing Elevation: 4,136.75 M.P. Height: 1.87 Ground Elevation: 4,134.88	Protective Casing: (Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	10	Clayey sand; brown, loose, valley fill	
10	24	Siltstone; brown-grey, clay rich	
24	46	Claystone; dark grey, moderately firm, little silty	
46	50	Sandy siltstone; light grey, very, very fine grained, friable	
50	64	Claystone; dark grey	
64	100	Siltstone; grey-dark grey	
100	125	Sandy siltstone; light grey, extremely fine grained, friable	
125	135	Claystone; dark grey	
135	155	Siltstone; light grey, sandy, mostly quartz	
155	170	Silty claystone; dark grey	
170	193	Silty sandstone; light grey, very, very fine grained, moderately friable	
193	220	Silty claystone; dark grey-brown	
220	251	Silty sandstone; light grey, very, very fine grained	
251	320	Siltstone; grey with occasional very fine grained sandy interbeds	
320	327	Silty sandstone; grey	
327	338	Claystone; dark grey, silty	
338	350	Siltstone; grey with silty sand interbeds	
350	380	Silty sandstone; grey-light grey, very, very fine grained, silty	

Copy To U.S.G.S.: 1-15-71

M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7326

Temporary Filing No. 4-1-58

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Berger No 9

1. Owner Harry J Berger
2. Address Cabot Wyo P2124
3. Agent to receive correspondence Harry J Berger Cabot Wyo P2124
4. Name & address of driller W Moore Moorcroft Wyo
5. Well is constructed on lands owned by Harry J Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled ☒ cable (Type of Rig)
   Driven ☐ Jet ☐ Other Hand Pump
7. Use of Water—Domestic ☐ Stock ☒
8. Means of conveyance, distance and direction to point of use
   Tank & pump
9. Date started May 10, 1954.
10. Date completed May 15, 1954. (including pump)
11. Date after completion when water was used May 15, 1954.
12. WELL DESCRIPTION
    Total Depth 100 Depth to Water Level _____ ft.
13. TEST DATA
    Yield 5 GPM How Tested Pumped
    Drawdown _____ Length of Test _____
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source Hand Pump (Elec., Gas, etc.)
    Horsepower _____ Amount of Water Being Used Five GPM (Gallons per Minute)
15. CASING RECORD

Plain Casing

Size 6 in Kind Steel from 0 ft. to 100 ft.
Size _____ Kind _____ from _____ ft. to _____ ft.
Size _____ Kind _____ from _____ ft. to _____ ft.

Perforated Casing

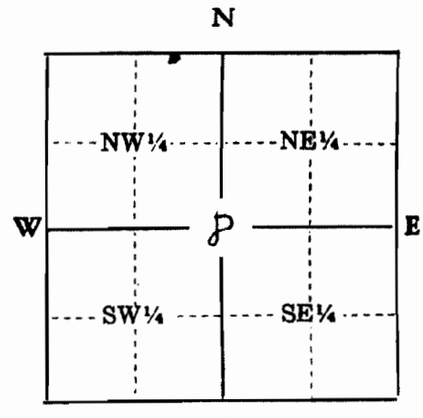
Size _____ Kind Unknown from _____ ft. to _____ ft.
Size _____ Kind _____ from _____ ft. to _____ ft.

WELL LOCATION

Crook County

NE ¼ of NW ¼ of Sec. 8

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac.
or
fill in the following:

Lot _____ & Block _____ or Tract _____

of the _____ (Subdivision or Addition)

of _____ (City, Town or County)

Section _____, T. _____ N., R. _____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7326

Book No. 41 Page No. 173

THE HILLS COMPANY, SHERIDAN 127214

U.W. 7326

16. Was surface seal provided? Yes ☐ No ☐ To What Depth_____ Material used: _____
Was well gravel packed? Yes ☐ No ☐

17. FLOWING WELL (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ Does well leak around casing? Yes ☐ No ☒

18. LOG OF WELL—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
90	100	unknown		water sand	

19. QUALITY OF WATER INFORMATION
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☐
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harry J. Berger
Signature of Owner or Authorized Agent

Dec 1, 1970
Date

Date of Receipt: December 11, 1970

Date of Priority: May 15, 1954

Sylvia H. Ross

Date of Approval: 21 December, 1970

Sylvia H. Ross
for State Engineer

FORM U W 6
REV 5-93

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BUILDING
CHEYENNE, WYOMING 82002
(307) 777-5959

MAR 27 19

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typ or print neatly with black ink.

103666

PERMIT NO. U.W. _____ NAME OF WELL (SPRING) WESLEY #1

1. NAME OF OWNER VESTA LOUISA WESLEY

2. ADDRESS 2869 NEW HAVEN RD.
Please check if address has changed from that shown on permit. ☐
City Osage State Wy. Zip Code 82724-8803 Phone No. 307-467-3

3. USE OF WATER: Domestic ☒ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneo
Explain proposed use (Example: One single family dwelling) One single family dwelli
and Stock water & lawn + shrubs

4. LOCATION OF WELL (SPRING): SW ¼ SW ¼ of Section 8, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M

Subdivision Name _____ Lot _____ Block _____

If surveyed, bearing, distance and reference point: _____

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Other[

Describe: _____

6. CONSTRUCTION: Total Depth of Well/Spring 160 ft. Depth to Static Water Level 22
(Below land surface)
a. Diameter of borehole (Bit size) 7 7/8 inches.

b. Casing Schedule New ☒ Used ☐

5 diameter from 0 ft. to 160 ft. Material SDR21 200psi Gage 40

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

c. Was casing cemented: Yes ☐ No ☒ Cemented Interval, From _____ feet to _____ fe

d. Number of sacks of cement used _____ type of cement _____

e. Perforations: Type of perforator used Slots
Size of perforations 5/32 inches by 4 inches.

Number of perforations and depths where perforated:
12 pft perforations from 120 ft. to 160 feet.
_____ perforations from _____ ft. to _____ feet.

STATE ENGINEER

f. Was well screen installed? Yes ☐ No ☒
Diameter: _____ slot size: _____ set from _____ feet to _____
Diameter: _____ slot size: _____ set from _____ feet to _____

g. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____

h. Was surface casing used: Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLING COMPANY Phillips Drlg Missouri Wyo 82723

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) Oct. 2 96

9. PUMP INFORMATION: Manufacturer Myers Type Sub
Source of power Elect Horsepower 1/2 Depth of Pump Setting or intake 106 ft.
Amount of Water Being Pumped 20 25 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Gallons Used Per Calendar Year. 100,000
per phone call 1-13-97 BL

10. FLOWING WELL (Owner is responsible for control of flowing well).
If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.
The flow is controlled by: valve ☐ cap ☐ plug ☐
Does well leak around casing? Yes ☐ No ☐

Permit No. U.W. 103666 Book No. 797 Page No. 67

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.) _____

12. PUMP TEST: Was a pump test made? Yes ☐ No ☒
If so, by whom _____ Address _____
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

13. LOG OF WELL: Total depth drilled 160 feet.
Depth of completed well 160 feet. Diameter of well 5" inches.
Depth to first water bearing formation 100 feet.
Depth to principal water bearing formation. Top 100 feet to Bottom 160 feet.

Ground Elevation, if known _____

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
0	23	Yellow Clay	Packer 40'		
23	40	Gravel & Fill			
40	100	Blue Shale			
100	160	Blue & Blue Sand		100-160 Black & Blue sand, Lance formation	100-160

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ☐ No ☐
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good ☑ Acceptable ☐ Poor ☐ Unusable ☐

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Vesta Lorraine Worley
Signature of Owner or Authorized Agent

10/14, 19 96
Date

JW 103e6e6p

FOR STATE ENGINEER'S USE ONLY

Date of Receipt OCT 16 1996, 19 _____

Date of Priority SEP 3 1996, 19 _____

Date of Approval Jan 16, 19 97

for State Engineer

Form U.W. 6
Rev. 2-83

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

MICRO FILMED MAY

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

MICRO FILMED MAR 3'88

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 76190 NAME OF WELL Oshoto Church #1

1. NAME OF OWNER Oshoto Community Bible Church, Inc.

2. ADDRESS General Delivery Oshoto, Wy Zip Code 82724

3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☑

4. LOCATION OF WELL: SE ¼ SW ¼ of Section 9, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically Just E of center and in N slightly (Bearing and Distance)

or 100 ft. North ~~South~~ and 1330 ft. East ~~West~~ from the SW corner of Section 9, T. 53 N., R. 67 W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ Small Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐

Other

6. CONSTRUCTION: Total Depth of Well 120 ft. Depth to Static Water Level 60 ft.

a. Casing Schedule New ☒ Used ☐

5" diameter from 0 ft. to 120 ft. Material PVC Gage Schedule 40

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

b. Perforations: Type of perforator used hacksaw

Size of perforations 4" inches by ⅛" inches.

Number of perforations and depths where perforated:

2/ft perforations from 80 ft. to 120 feet.

_____ perforations from _____ ft. to _____ feet.

c. Was well screen installed? Yes ☐ No ☑

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

d. Was well gravel packed? Yes ☑ No ☐ Size of gravel 3/4"

e. Was surface casing used? Yes ☒ No ☐ Was it cemented in place? Yes ☒ No ☐

7. NAME & ADDRESS OF DRILLER Murph Drilling Moorcroft, Wy 82721

8. DATE OF COMPLETION OF WELL (including pump installation) July 7, 1983

9. PUMP INFORMATION: Manufacturer Goulds Type Submersible

Source of power Electrical Horsepower ½ Depth of Pump Setting 110'

Amount of Water Being Pumped 12 15 Gallons Per Minute. (For springs or flowing wells, see item 11.)
(per Adjudication field inspection)

Permit No. U.W. 76190 Book No. 542 Page No. 28

10. PUMP TEST: Was a pump test made? Yes [ ] No [X]

If so, by whom _____ Address _____

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. FLOWING WELL (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve [ ] cap [ ] plug [ ]

Does well leak around casing? Yes [ ] No [ ]

12. LOG OF WELL: Total depth drilled _____ feet. No log

Depth of completed well 120 feet. Diameter of well _____ inches.

Depth to first water bearing formation 50 feet.

Depth to principal water bearing formation. Top 50 feet to Bottom 120 feet.

Ground Elevation, if known _____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	50	Black Shale & Bent.			
50	120	Black shale w/streaks of sand		X	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes [ ] No [X]

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good [ ] Acceptable [X] Poor [ ] Unusable

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Town-Ship	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
														X					

TOTAL NUMBER OF ACRES TO BE IRRIGATED

Original Supply acres

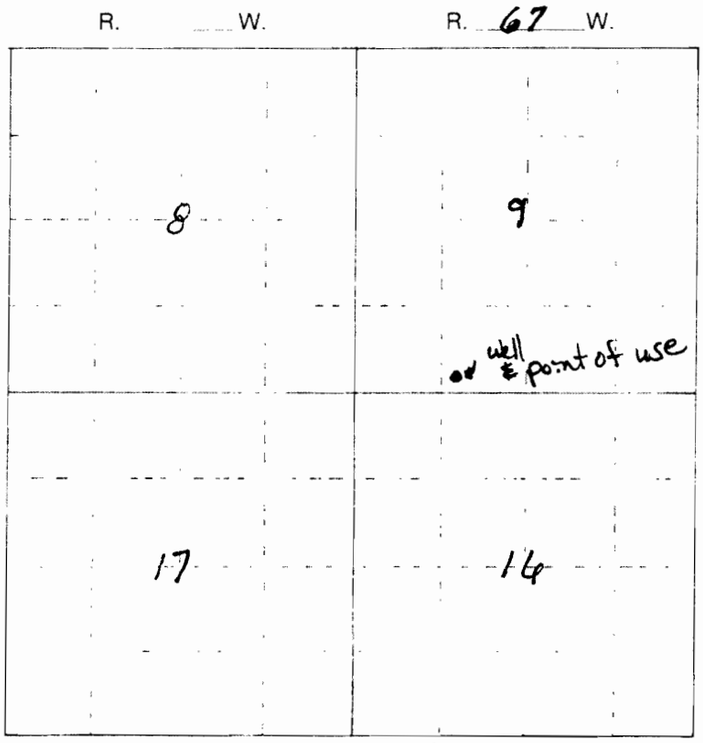
Additional Supply acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.



Scale: 2" = 1 Mile

REMARKS: Well #3 located in the lower level of the Ashoto Community Bible Church and is used in the internal plumbing of the Church.

15. **IF WELL IS TO BE ABANDONED**, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment and details of the plugging below.

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Carl Strong
Signature of Owner or Authorized Agent

April 22, 19 87
Date

Date of Receipt 1988, 19

Date of Priority Jan. 11, 1988

Date of Approval Jan. 26, 1988

for State Engineer

COPY TO U.S.G.S : 1-15-71

M

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7323

Temporary Filing No. 4-4-367

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Berger No 6

1. Owner Harry J Berger
2. Address Aladdin Wyo 82710
3. Agent to receive correspondence Harry J Berger
4. Name & address of driller Doyle F Moore Moorcroft Wyo
5. Well is constructed on lands owned by Harry J Berger
   (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled ☒ Cable Type of Rig
   Driven ☐ Jet ☐ Other Windmill
7. Use of Water—Domestic ☐ Stock ☒
8. Means of conveyance, distance and direction to point of use
   To tank at pump
9. Date started Aug 7, 1979
10. Date completed Aug 10, 1979 (including pump)
11. Date after completion when water was used Aug 10, 1979
12. WELL DESCRIPTION
    Total Depth 150 Depth to Water Level 14 ft.
13. TEST DATA
    Yield 3 GPM How Tested Pumped
    Drawdown — Length of Test —
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source Wind Mill (Elec., Gas, etc.)
    Horsepower — Amount of Water Being Used 3 (Gallons per Minute)
15. CASING RECORD

Plain Casing

Size 6 in	Kind Steel	from 0	ft. to 150	ft.
Size —	Kind —	from —	ft. to —	ft.
Size —	Kind —	from —	ft. to —	ft.

Perforated Casing

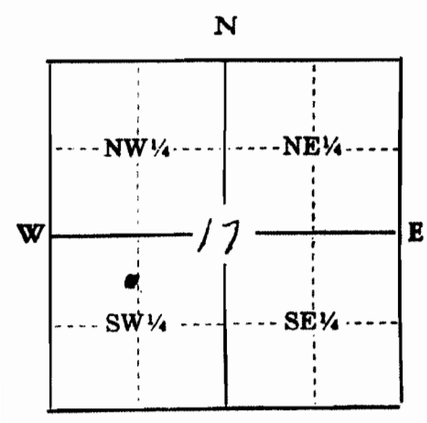
Size —	Kind Unknown	from —	ft. to —	ft.
Size —	Kind —	from —	ft. to —	ft.

WELL LOCATION

Crook County

NW¼ of SW¼ of Sec 17

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac. or fill in the following:

Lot — & Block — or Tract —

of the — (Subdivision or Addition)

of — (City, Town or County)

Section —, T. — N., R. — W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7323

Book No. 41 Page No. 170

THE NILES COMPANY, SHERIDAN 127214

U.W. 7323

16. Was surface seal provided? Yes ☐ No ☐ To What Depth_____ Material used: _____
Was well gravel packed? Yes ☐ No ☐

17. FLOWING WELL (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ Does well leak around casing? Yes ☐ No ☒

18. LOG OF WELL—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
140	150			Blue water sand	

19. QUALITY OF WATER INFORMATION
Was a chemical analysis made? Yes ☐ No ☒
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☒
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☒

20. IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harry J. Berger
Signature of Owner or Authorized Agent

Dec 1, 1970
Date

Date of Receipt: December 11, 1970

Sylvia H. Ross

Date of Approval: 21 December, 1970

Date of Priority: August 10, 1949

Sylvia H. Ross
for State Engineer

RECEIVED DEC 15 1980 STATE ENGINEER Cheyenne, Wyo.

RECEIVED DEC 8 1980 STATE ENGINEER Cheyenne, Wyo.

MICRO FILMED JAN 14 '81

Form U.W.-1

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 55052 NAME OF WELL WINDMILL WELL #2

1. NAME OF OWNER S. ELMO WESLEY
2. ADDRESS OSHOTO, Wyo. 82724 Zip Code 82724
3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
4. LOCATION OF WELL: NE ¼ NE ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically Not Known (Bearing and Distance)
   or _____ ft. North South and _____ ft. East West from the _____ corner of Section _____, T. _____ N., R. _____ W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled ☒ CABLE (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
   Other _____
6. CONSTRUCTION: Total Depth 128 ft. Depth to Water Level 25 ft.
   a. Casing Schedule New ☐ Used ☒

6 5/8	diameter from 0 ft. to 128 ft.	Material	Steel	Gage	15-#
	diameter from ft. to ft.	Material		Gage	
	diameter from ft. to ft.	Material		Gage	

   b. Perforations: Type of perforator used SLOTED
   Size of perforations _____ inches by _____ inches. Not Known
   Number of perforations and depths where perforated:
   _____ perforations from 90 ft. to 128 feet. Not Known
   _____ perforations from _____ ft. to _____ feet.
   c. Was well screen installed? Yes ☐ No ☐ Not Known
   Diameter: _____ slot size: _____ set from _____ feet to _____ feet.
   Diameter: _____ slot size: _____ set from _____ feet to _____ feet.
   d. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____
   e. Was surface casing used Yes ☒ No ☐ Was it cemented in place? Yes ☒ No ☐
7. NAME & ADDRESS OF DRILLER Gerald Brown, Moorcroft, Wyo. 82721
8. DATE OF COMPLETION OF WELL (including pump installation) 6/10/1965
9. PUMP INFORMATION: Manufacturer Aermotor Type Conventional
   Type of power Wind Horsepower Depth of Pump X 110 ft.
   Amount of Water Being Pumped X 10 Gallons Per Minute.

Permit No. U.W. 55052 Book No. 330 Page No. 84

U.W. 55052

PUMP TEST: Was a pump test made? Yes X No Bailed

If so, by whom Harold Ross Address Moorcroft, Wyo. 82721

Yield: 10 gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 128 feet.

Depth of completed well 128 feet. Diameter of well _____ inches. Not Known

Depth to first water bearing formation _____ feet. Not Known

Depth to principal water bearing formation Top _____ feet to Bottom _____ feet. Not Known

Ground Elevation, if known _____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	30	Surface Sand			
30	100	Sand Shale			
100	120	Sand			
120	128	Sandy Clay			

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☐ No ☒

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐

C.L.W. 55052

13. TABULATION

a. **If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.**

(Give irrigable acreage in each legal subdivision. If proposed use is for supplemental supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. **If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.**

Township	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
53	67	18	X																

TOTAL NUMBER OF ACRES TO BE IRRIGATED_____

Original Supply_____acres

Supplemental Supply_____acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. **For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.**

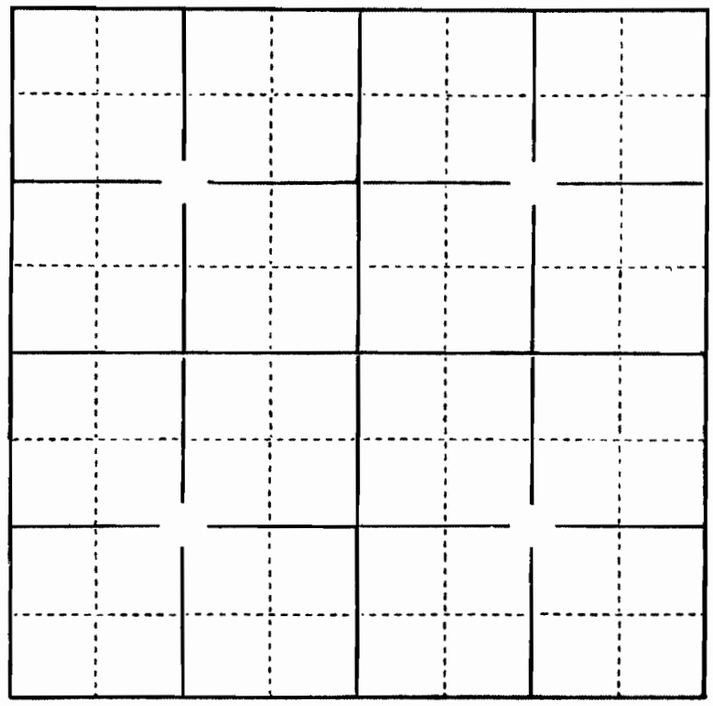
c. **A separate map may be submitted if the information required cannot be shown on this plat.**

R._____W. R._____W.

Scale: 2" = 1 Mile

T._____N.

T._____N.



REMARKS: _____

U.W. 55052

15. **IF WELL IS TO BE ABANDONED, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment below.**

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Edna O'Dell
Signature of Owner or Authorized Agent

12/3, 19 80
Date

Date of Receipt DEC 8 1980, 19____

DEC 15 1980

Date of Priority Dec. 15, 19 80

Date of Approval Jan. 5, 19 81

Richard B. Stanfield
for State Engineer

RECEIVED
JAN 2 1980
STATE ENGINEER
Cheyenne, Wyo.

MICRO-FILMED MAR 26 '80

MICRO-FILMED FEB 27 '80

Form U.W. 6

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 41449 NAME OF WELL Test Set # 1

1. NAME OF OWNER Nuclear Dynamics, Inc.

2. ADDRESS 200 S. Lowell, Casper, WY Zip Code 826 01

3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☒

4. LOCATION OF WELL: SESE ¼ SW ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically

(Bearing and Distance)

or 357 ft. North ~~South~~ and 2648 ft. East ~~West~~ from the SW corner of Section 18, T. 53 N., R. 67 W. (Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐

Other

6. CONSTRUCTION: Total Depth 550 ft. Depth to Water Level 150 ft.

a. Casing Schedule New ☒ Used ☐

4" diameter from 0 ft. to 509 ft. Material PVC Gage Schedule 40

____ diameter from ____ ft. to ____ ft. Material ____ Gage ____

____ diameter from ____ ft. to ____ ft. Material ____ Gage ____

b. Perforations: Type of perforator used

Size of perforations ____ inches by ____ inches.

Number of perforations and depths where perforated:

____ perforations from ____ ft. to ____ feet.

____ perforations from ____ ft. to ____ feet.

c. Was well screen installed? Yes ☒ No ☐

Diameter: 3" slot size: .013 set from 509 feet to 550 feet.

Diameter: ____ slot size: ____ set from ____ feet to ____ feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel

e. Was surface casing used Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLER Murph Drilling, Moorcroft, WY

8. DATE OF COMPLETION OF WELL (including pump installation) 4-28-78

9. PUMP INFORMATION: Manufacturer No pump Type

Source of power Horsepower Depth of Pump Setting

Amount of Water Being Pumped 0 Gallons Per Minute.

Permit No. U.W. 41449 Book No. 221 Page No. 83

UW 414449

10. **PUMP TEST:** Was a pump test made? Yes ☐ No ☒

If so, by whom_____ Address_____

Yield: _____gal./min. with_____foot drawdown after_____hours.

Yield: _____gal./min. with_____foot drawdown after_____hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is_____gal./min. Surface pressure is_____lb./sq. inch, or_____feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 550 feet.

Depth of completed well 550 feet. Diameter of well 7.5 inches. to 509'
5 1/8 inches to 550'

Depth to first water bearing formation 75 feet.

Depth to principal water bearing formation Top 470 feet to Bottom 550 feet.

Ground Elevation, if known 4238'

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	60	Cly & Sd, very fine, Yel-br	Cemented off		
60	120	Sd, fine, Tan-Lt Gy	" "	Yes	
120	188	Slt, very fine, MGY	" "	?	
188	461	Sd, Cly, Slt, very fine to	" "	?	
		fine, Lt Gy to Gy			
461	516	Sd, very fine to fine,	cemented off to 509'	Yes	screened 509'
		Lt Gy to Gy			to 550'
516	521	Slt, very fine, M Gy	Screened	"	
521	541	Sd, very fine to fine, Gy	"	"	
541	550	Slt, very fine, M Gy	"	"	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☒ No ☐

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good ☐ Acceptable ☒ Poor ☐ Unusable ☐

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191683 NAME OF WELL/SPRING DM 12-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,561.25 Easting 709,213.36 (Feet)
Land surface elevation (ft. above mean sea level) 4188.38 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 632 ft.
Depth to static water level 175 ft. (below land surface) Casing height 1.03 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.2 ft. to 612 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 612 ft.
Amount of grout used 142 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 612 ft. to 632 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 612 ft. to 632 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 9, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake 580 ft.
Amount of water being pumped 3-6 gal./min.* (For springs or flowing wells, see item 10) ~5 gpm at start
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191683 Book No. 1383 Page No. 83

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 640 ft.
Depth of completed well 632 ft. Diameter of well 5 inches.
Depth to first water bearing formation 62 ft.
Depth to principal water bearing formation Top 612 ft. to bottom 632 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	640	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191683

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **12-18 DM** SEO Permit No.: 191683	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 472 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 600 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 470 Type: cement Depth: Type:
Location: SWNW Section: 18 Township: 53N Range: 67W	Hole Depth: 640 Diameter: 8¾" Well Depth: 632 Diameter: 5"	Perforation Interval(s): 612 to 632 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,487,561.25 E: 709,213.36	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 612 to 632 Type: 10-20 CSS Quantity (ft^3): 7
Recorded By: Mike Wolf WYPG#614 Date Started: 11/20/09 15:00-20:15 Date Finished: 12/17/09	Top of Casing Elevation: 4,189.41 M.P. Height: 1.03 Ground Elevation: 4,188.38	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	10	Silty clay/clayey silt; buff brown, moderate salts	
10	20	Silty claystone; brown	
20	27	Siltstone; buff-brown, sandy, very fine grained with little interbedded grey, hard SS at 19-20	
27	56	Sandstone; buff, very, very fine grained, soft, friable	
56	62	Siltstone, grey, firm, moderately sandy, friable	
62	64	Sandstone; grey, very fine grained, moderately soft to very friable	
64	65	Sandstone; very light grey, very heard, very well cemented	
65	112	Sandstone; grey to light grey, very fine, moderately soft, hard 87-88 & 94-96	
112	135	Claystone: grey to dark grey, firm, moderately carbonaceous	
135	143	Sandstone; grey to light grey, very, very fine, soft, friable	
143	155	Siltstone; medium dark grey, firm	
155	170	Sandstone; light grey, very, very fine grained, soft	
170	177	Claystone; dark grey, silty, firm	
177	192	Siltstone; medium grey, firm but friable	
192	200	Sandstone; light grey, very, very fine grained, soft	
200	213	Siltstone; dark grey with some clay	
213	220	Siltstone; grey, firm, less clay	
220	224	Sandstone; grey to light grey, very, very fine grained, silty, friable	
224	230	Siltstone; grey, firm, fissile	
230	243	Sandstone; grey, very, very fine, silty, moderately friable	
243	251	Claystone; grey, silty	
251	284	Siltstone; grey, with sandy interbeds, very, very fine grained	
284	300	Claystone; grey to dark grey, silty, cohesive	
300	343	Siltstone; dark grey, clay rich with thin sandy interbeds	
343	354	Sandstone; light grey, very, very fine, silty, friable	
354	380	Claystone; medium dark grey fissile, moderately silty, moderately carbonaceous	
380	396	Sandy siltstone; grey, moderate claystone laminations, carbonaceous	
396	401	Siltstone; grey-brown, firm but friable	
401	428	Sandstone; light grey, very, very fine, friable	
428	437	Claystone; grey, silty, firm	
437	464	Siltstone; grey, very thin interbedded sandstone	
464	472	Claystone; dark brown, very silty, moderately carbonaceous	
472	494	Sandstone; grey-brown to green, very, very fine grained, friable	
494	506	Claystone; grey, fissile, cohesive	

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
506	530	Sandstone; grey, very, very fine, moderate silt, friable	
530	536	Claystone; very dark brown-grey, very carbonaceous, fissile	
536	563	Siltstone; grey, firm but friable	
563	584	Sandstone; light grey, very, very fine grained, silty, friable	
584	612	Claystone; grey, fissile	
612	632	Sandy siltstone; grey-light grey, firm but friable	
632	640	Claystone; grey-dark grey, fissile	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191684 NAME OF WELL/SPRING SA 12-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,493.96 Easting 709,207.06 (Feet)
Land surface elevation (ft. above mean sea level) 4184.96 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 103 ft.
Depth to static water level 49.9 ft. (below land surface) Casing height 1.0 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.0 ft. to 103 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 103 ft.
Amount of grout used 14 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 set from 63 ft. to 103 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 63 ft. to 103 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) December 9, 2009

9. PUMP INFORMATION Manufacturer No pump installed Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191684 Book No. 1383 Page No. 84

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 115 ft.
Depth of completed well 103 ft. Diameter of well 5 inches.
Depth to first water bearing formation 56 ft.
Depth to principal water bearing formation Top 63 ft. to bottom 103 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	115	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolff - WWC — Signature of Owner or Authorized Agent
April 15 — Date, 20 10

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191684

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **12-18 SA** SEO Permit No.: 191684	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 343 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals ~ 50 &10'
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 51 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 63 Type: cement Depth: Type:
Location: SWNW Section: 18 Township: 53N Range: 67W	Hole Depth: 115 Diameter: 8¾" Well Depth: 103 Diameter: 5"	Perforation Interval(s): 63 to 103 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,487,493.96 E: 709,207.06	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 63 to 103 Type: 10-20 CSS Quantity (ft^3): 10.5
Recorded By: Mike Wolf WYPG#614 Date Started: 11/20/09 13:12 11/21/09 cemented Date Finished: 12/20/09 13:25	Top of Casing Elevation: 4,185.965 M.P. Height: 1.0 Ground Elevation: 4,184.96	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks: Air to water table at ~70 feet. Bit booted up. Damp sand.

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	10	Silty clay; buff, moderate salts TS 0-1 Brown	
10	15	Silty claystone; grey-brown, cohesive	
15	17	Siltstone; buff	
17	19	Sandstone; buff, very fine grained, loose, weathered	
19	19.5	Siltstone, grey	
19.5	34	Sandstone; buff, very fine grained, loose, moist	
34	35	Sandstone; light grey, very hard, very well cemented	
35	39	Sandstone; buff, soft, very fine grained	
39	42	Sandstone; very light grey, very hard, very well cemented	
42	46	Sandstone; tan, very, very fine grained	
46	53	Sandstone; grey, very, very fine grained Sample 40-60	
53	56	Siltstone; grey, firm 60-62	
56	60	Sandstone; grey, very fine grained, soft, friable 62-70	
60	62	Sandstone; very light grey, very hard, very well cemented, very fine grained 70-80	
62	80	Sandstone; grey, very fine grained, moist to damp	
80	103	Sandstone; grey, very, very fine grained, damp, still no H_2O	
103	105	Sandy clay; grey, very soft, very cohesive	
105	115	Claystone; grey, soft, very cohesive	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191685 NAME OF WELL/SPRING SM 12-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,527.91 Easting 709,246.38 (Feet)
Land surface elevation (ft. above mean sea level) 4186.01 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 352 ft.
Depth to static water level 87.7 ft. (below land surface) Casing height 1.21 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.21 ft. to 342 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 342 ft.
Amount of grout used 79 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 342 ft. to 352 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1.5 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 342 ft. to 352 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Land Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 11, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable generator Horsepower 1/2 Depth of pump setting or intake 312 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191685 Book No. 1383 Page No. 85

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 370 ft.
Depth of completed well 352 ft. Diameter of well 5 inches.
Depth to first water bearing formation 57 ft.
Depth to principal water bearing formation Top 341 ft. to bottom 352.5 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	370	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191685

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **12-18 SM** SEO Permit No.: 191685	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 472 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 330 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 341 Type: cement Depth: Type:
Location: SWNW Section: 18 Township: 53N Range: 67W	Hole Depth: 370 Diameter: 8¾" Well Depth: 352 Diameter: 5"	Perforation Interval(s): 342 to 352 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,487,527.91 E: 709,246.38	Samples: Yes Material Samples: Y/N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 342 to 352 Type: 10-20 CSS Quantity (ft^3): 4.5
Recorded By: Mike Wolf WYPG#614 Date Started: 11/22/09 9:35 Date Finished: 12/18/09	Top of Casing Elevation: 4,187.31 M.P. Height: 1.21 Ground Elevation: 4,186.01	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	1	Top Soil; sandy silt, brown	
1	12	Clayey silt; light brown, moderate very, very fine sand	
12	26	Siltstone; buff-brown, moderately friable	
26	51	Sandstone; buff, very, very fine grained, soft	
51	57	Siltstone; grey, firm, little sandy	
57	109	Sandstone; grey to light grey, very fine to fine grained, friable	
109	130	Claystone; grey to dark grey, firm, moderately carbonaceous	
130	139	Sandy siltstone; medium grey, firm	
139	152	Siltstone; medium grey, firm	
152	166	Sandstone; light grey, very, very fine grained, little silty, soft	
166	183	Claystone; dark grey, silty, fissile	
183	195	Sandstone; light grey, very, very fine, moderately friable	
195	212	Claystone; dark grey, very silty	
212	218	Siltstone; grey, firm, moderately friable	
218	239	Sandstone; grey to light grey, very, very fine, silty, moderately friable	
239	247	Claystone; grey, minor silt content	
247	300	Siltstone; grey with dark clay interbeds	
300	335	Siltstone; dark grey, clay rich	
335	341	Claystone; grey-dark grey, soft, cohesive	
341	352.5	Sandstone; light grey, very, very fine grained, moderately friable	
352.5	360	Claystone; medium dark grey, fissile, moderately carbonaceous	
360	370	Sandy siltstone; grey, hard at 367	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE. Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191686 NAME OF WELL/SPRING OZ 12-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 NW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,487,530.22 Easting 709,175.71 (Feet)
Land surface elevation (ft. above mean sea level) 4186.64 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 584 ft.
Depth to static water level 168.5 ft. (below land surface) Casing height 1.42 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.42 ft. to 474 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 474 ft.
Amount of grout used 109 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 474 ft. to 584 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 474 ft. to 584 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 10, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2.0 Depth of pump setting or intake 444 ft.
Amount of water being pumped 20 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191686 Book No. 1383 Page No. 86

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 601 ft.
Depth of completed well 584 ft. Diameter of well 5 inches.
Depth to first water bearing formation 62 ft.
Depth to principal water bearing formation Top 471 ft. to bottom 584 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	601	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf – WWC
Signature of Owner or Authorized Agent

April 15, 2010
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191686

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

Hole/Well No.: **12-18 OZ** SEO Permit No.: 191686	Drilling Company: **Kid Pronghorn** Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 472 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 462 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 470 Type: cement Depth: Type:
Location: SWNW Section: 18 Township: 53N Range: 67W	Hole Depth: 600 Diameter: 8¾" Well Depth: 584 Diameter: 5"	Perforation Interval(s): 474 to 584 Type: PVC V-Wire Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,487,530.22 E: 709,175.71	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 474 to 584 Type: 10-20 CSS Quantity (ft^3): 12
Recorded By: Mike Wolf WYPG#614 Date Started: 11/22/09 9:00 Date Finished: 12/16/09	Top of Casing Elevation: 4,188.06 M.P. Height: 1.42 Ground Elevation: 4,186.64	Protective Casing: (Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks: Measuring Point (MP) = Top of PVC Casing

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	12	Clayey silt; light brown, moderate salts	
12	34	Siltstone; light brown, little sandy	
34	59	Sandstone; buff-brown, very fine, soft, moist	
59	62	Siltstone; grey, firm, little sandy	
62	110	Sandstone; grey, fine to very fine, mostly soft, moderately hard 65'-78' & 91'-97'	
110	130	Claystone; grey to very dark grey, firm, moderately carbonaceous, hard at 120'-121	
130	143	Sandstone; grey to light grey, very, very fine, silty, moderately friable	
143	155	Siltstone; medium grey, firm, little very, very fine sand	
155	171	Sandstone; light grey, very, very fine grained silty, friable	
171	182	Claystone; dark grey, silty, firm, moderately carbonaceous	
182	190	Siltstone; grey, firm, little friable	
190	199	Sandstone; light grey, very, very fine, soft, friable	
199	214	Siltstone; dark grey, firm, moderate clay content	
214	230	Siltstone; grey, firm, little sandy	
230	238	Sandstone; grey, very, very fine, fissile, moderately friable	
238	250	Claystone; grey, silty, firm	
250	281	Siltstone; grey, with sandy interbeds, very, very fine grained	
281	300	Claystone; grey to dark grey, silty soft cohesive	
300	308	Sandstone; grey to light grey, very, very fine, moderately friable	
308	317	Claystone; dark grey, moderately carbonaceous	
317	344	Siltstone; medium dark grey with thin sandy interbeds	
344	355	Sandstone; very light grey, very, very fine grained, friable	
355	380	Claystone; medium dark grey, moderately silty, moderately carbonaceous	
380	390	Siltstone; grey, moderate clay, little sandy	
390	430	Sandstone; grey to light grey, very, very fine grained, moderately friable	
430	435	Claystone; grey, silty, firm	
435	463	Siltstone; grey, thin interbedded, very fine grained sandstone	
463	471	Claystone; dark brown, silty, moderately soft	
471	495	Sandstone; very light grey to grey, very fine, very silty, friable	
495	506	Claystone; grey fissile, soft, very cohesive	
506	528	Sandstone; grey, very, very fine grained, silty	
528	534	Claystone; very dark grey-brown, very carbonaceous, fissile	
534	556	Siltstone; grey, firm, sandy	
556	584	Sandstone; light grey, very, very fine grained, moderately silty, friable	
584	597	Silty claystone; dark grey, firm	

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
597	601	Claystone; grey-dark grey, firm, moderate fissile	

Form U.W. 6

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

MICRO-FILMED NOV 26 '80

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 50243 NAME OF WELL Phase II - 1

1. NAME OF OWNER 1) Nuclear Dynamics, Inc. 2). State board of land commissioners
2. ADDRESS 1) 200 South Lowell Casper, WY 82601 2) 2424 Pioneer Avenue Cheyenne, WY 82002 Zip Code
3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☒
4. LOCATION OF WELL: SW ¼ NW ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically (Bearing and Distance) or 2871 ft. North ~~South~~ and 217 ft. East ~~West~~ from the SW corner of Section 18, T. 53 N., R. 67 W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐ Other
6. CONSTRUCTION: Total Depth of Well 580 ft. Depth to Static Water Level 28 ft.

a. Casing Schedule New ☒ Used ☐

5"	diameter from	0	ft. to	510	ft. Material PVC	Gage Schedule 40
	diameter from		ft. to		ft. Material	Gage
	diameter from		ft. to		ft. Material	Gage

b. Perforations: Type of perforator used

Size of perforations inches by inches.

Number of perforations and depths where perforated:

perforations from ft. to feet.

perforations from ft. to feet.

c. Was well screen installed? Yes ☒ No ☐

Diameter: 4 slot size: .013" set from 510 feet to 580 feet.

Diameter: slot size: set from feet to feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel

e. Was surface casing used Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLER Murph Drilling, Moorcroft, WY 82721
8. DATE OF COMPLETION OF WELL (including pump installation) 5-7-80
9. PUMP INFORMATION: Manufacturer Reda Type Submersible Portable Sampling Pump Only

Source of power Portable Power Plant Horsepower 5 Depth of Pump Setting 200'

Amount of Water Being Pumped 8 - 0 - Out Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 50243 Book No. 282 Page No. 76

10. **PUMP TEST:** Was a pump test made? Yes ☐ No ☒

If so, by whom_____ Address_____

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is N/A gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 580 feet.

Depth of completed well 580 feet. Diameter of well 5 inches.

Depth to first water bearing formation 28 feet.

Depth to principal water bearing formation Top 450 feet to Bottom 570 feet.

Ground Elevation, if known 4161.3'

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	35	SS,vf-fg,med to dk gy,bn		yes(surface)	
35	106	SS,vf-fg,med gy		" "	
106	157	MD,med to dk gy			
157	188	Mdy SS,vf-fg,med gy			
188	256	SS,vf-fg,med gy			
256	283	MD,med to dk gy			
283	414	Intbd SS & MD,vfg,lt to med gy			
414	445	SS,vfg,lt gy			
445	462	MD,med to dk gy			
462	508	MD,med to dk gy			
508	580	SS,vf-fg,lt to med gy		yes	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☒ No ☐

If so, please include a copy of the analysis with this form. Well 5Z - CDM #414-10412-10-2

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

Form U.W. 6

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

MICRO. FILMED NOV 21 '80

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 50244 NAME OF WELL Phase II - 2

1. NAME OF OWNER 1) Nuclear Dynamics, Inc. 2.) Seate Board of Land Commissioners
2. ADDRESS 1) 200 South Lowell Casper, WY 82601 2) 2424 Pioneer Avenue Cheyenne, WY 82002 Zip Code
3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☒
4. LOCATION OF WELL: SW ¼ NW ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically (Bearing and Distance) or 2721 ft. North ~~South~~ and 217 ft. East ~~West~~ from the SW corner of Section 18, T. 53 N., R. 67 W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
   Other
6. CONSTRUCTION: Total Depth of Well 434 ft. Depth to Static Water Level 28 ft.
   a. Casing Schedule New ☒ Used ☐
   5" diameter from 0 ft. to 415 ft. Material PVC Gage Schedule 40
   diameter from ft. to ft. Material Gage
   diameter from ft. to ft. Material Gage
   b. Perforations: Type of perforator used
   Size of perforations inches by inches.
   Number of perforations and depths where perforated:
   perforations from ft. to feet.
   perforations from ft. to feet.
   c. Was well screen installed? Yes ☒ No ☐
   Diameter: 4" slot size: .013" set from 415 feet to 434 feet.
   Diameter: slot size: set from feet to feet.
   d. Was well gravel packed? Yes ☐ No ☒ Size of gravel
   e. Was surface casing used Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐
7. NAME & ADDRESS OF DRILLER Murph Drilling, Moorcroft, WY 82721
8. DATE OF COMPLETION OF WELL (including pump installation) 4-30-80
   Portable Sampling Pump Only
9. PUMP INFORMATION: Manufacturer Reda Type Submersible
   Source of power Portable Power Plant Horsepower 5 Depth of Pump Setting 200'
   Amount of Water Being Pumped T-O-out Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 50244 Book No. 282 Page No. 77

10. **PUMP TEST:** Was a pump test made? Yes ☐ No ☒

If so, by whom_____ Address_____

Yield: _____gal./min. with_____ foot drawdown after_____hours.

Yield: _____gal./min. with_____foot drawdown after_____hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is N/A gal./min. Surface pressure is_____lb./sq. inch, or_____feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 434 feet.

Depth of completed well 434 feet. Diameter of well 5 inches.

Depth to first water bearing formation 28 feet.

Depth to principal water bearing formation Top 415 feet to Bottom 434 feet.

Ground Elevation, if known 4157.2'

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	40	SD & SH, lt gy, fg		Yes(surface)	
40	434	Shale w/intbd SD, gy		yes	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☒ No ☐

If so, please include a copy of the analysis with this form. Well 4Z - CDM #414-10412-10-1

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

Form U.W. 6

RECEIVED
OCT 1980
STATE ENGINEER
Cheyenne, Wyo.

(W)

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

MICRO-FILMED NOV 21 '80

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 50245 NAME OF WELL Phase II - 3

1. NAME OF OWNER 1) Nuclear Dynamics, Inc. 21) State Board of Land Commissioners
2. ADDRESS 1) 200 South Lowell Casper, WY 82601 2) 2424 Pioneer Avenue Cheyenne, WY 82002 Zip Code
3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☒
4. LOCATION OF WELL: SW ¼ NW ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically (Bearing and Distance) or 2615 ft. North ~~South~~ and 377 ft. East ~~West~~ from the SW corner of Section 18, T. 53 N., R. 67 W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled XX Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐ Other
6. CONSTRUCTION: Total Depth of Well 565 ft. Depth to Static Water Level 32 ft.
   a. Casing Schedule New ☒ Used ☐
   5" diameter from 0 ft. to 514 ft. Material PVC Gage Schedule 40
   ____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
   ____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
   b. Perforations: Type of perforator used
   Size of perforations ____ inches by ____ inches.
   Number of perforations and depths where perforated:
   ____ perforations from ____ ft. to ____ feet.
   ____ perforations from ____ ft. to ____ feet.
   c. Was well screen installed? Yes ☒ No ☐
   Diameter: 4" slot size: .013" set from 514 feet to 565 feet.
   Diameter: ____ slot size: ____ set from ____ feet to ____ feet.
   d. Was well gravel packed? Yes ☐ No ☒ Size of gravel
   e. Was surface casing used Yes ☐ No XX Was it cemented in place? Yes ☐ No ☐
7. NAME & ADDRESS OF DRILLER Murph Drilling, Moorcroft, WY 82721
8. DATE OF COMPLETION OF WELL (including pump installation) 5-6-80
   Portable Sampling Pump Only
9. PUMP INFORMATION: Manufacturer Reda Type Submersible
   Source of power Portable Power Plant Horsepower 5 Depth of Pump Setting 200'
   Amount of Water Being Pumped ~~8~~ 0 Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 50245 Book No. ~~282~~ Page No. ~~78~~

10. **PUMP TEST:** Was a pump test made? Yes ☐ No XX

If so, by whom _____ Address _____

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 565 feet.

Depth of completed well 565 feet. Diameter of well 5 inches.

Depth to first water bearing formation 32 feet.

Depth to principal water bearing formation Top 452 feet to Bottom 565 feet.

Ground Elevation, if known 4154.4'

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	40	SD & SLT,vfg,yel stn		yes(surface)	
40	93	SD & SLT,vfg,dk gy		" "	
93	215	SLT & MD w/ SD,vfg,dk gy			
215	348	SD & SLT w/ MD,vf-fg,m-lt gy			
348	485	SLT & MD,m-dk gy			
485	565	SLT w/ SS,vfg,m-dk gy		yes	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☒ No ☐

If so, please include a copy of the analysis with this form. Well 6Z - CDM #414-10412-10-3

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

Form U.W. 6

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

RECEIVED OCT 1980 STATE ENGINEER Cheyenne, Wyoming

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

MICRO. FILMED NOV 21 '80

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 50246 NAME OF WELL Phase II - 4

1. NAME OF OWNER 1) Nuclear Dynamics, Inc. 2) State Board of Land commissioners
2. ADDRESS 1) 200 South Lowell Casper, WY 82601 2) 2424 Pioneer Avenue Cheyenne, WY 82002 Zip Code
3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☒
4. LOCATION OF WELL: SW ¼ NW ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically (Bearing and Distance) or 2615 ft. North ~~South~~ and 87 ft. East ~~West~~ from the SW corner of Section 18, T. 53 N., R. 67 W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐ Other
6. CONSTRUCTION: Total Depth of Well 575 ft. Depth to Static Water Level 26 ft.

a. Casing Schedule New ☒ Used ☐

5"	diameter from 0 ft.	to 513 ft.	Material PVC	Gage Schedule 40
	diameter from ft.	to ft.	Material	Gage
	diameter from ft.	to ft.	Material	Gage

b. Perforations: Type of perforator used

Size of perforations inches by inches.

Number of perforations and depths where perforated:

perforations from ft. to feet.

perforations from ft. to feet.

c. Was well screen installed? Yes ☒ No ☐

Diameter: 4" slot size: .013" set from 513 feet to 575 feet.

Diameter: slot size: set from feet to feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel

e. Was surface casing used Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLER Murph Drilling, Moorcroft, WY 82721
8. DATE OF COMPLETION OF WELL (including pump installation) 5-6-80
9. PUMP INFORMATION: Manufacturer Reda Type Submersible Portable Sampling Pump Only

Source of power Portable Power Plant Horsepower 5 Depth of Pump Setting 200'

Amount of Water Being Pumped ~~8~~ 0 Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 50246 Book No. 282 Page No. 79

10. **PUMP TEST:** Was a pump test made? Yes ☐ No ☒

If so, by whom _____ Address _____

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 575 feet.

Depth of completed well 575 feet. Diameter of well 5 inches.

Depth to first water bearing formation 26 feet.

Depth to principal water bearing formation Top 461 feet to Bottom 575 feet.

Ground Elevation, if known 4158.3'

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	50	SS,vf-fg,lt to med gy-brn		yes(surface)	
50	100	SS,vfg,lt to med gy		" "	
100	198	MD,med to dk gy			
198	379	Intbd MD & SS,med to dk gy			
379	483	SS,vf-fg,lt to med gy			
483	510	Mdy SS,vf-fg,lt to med gy			
510	575	SS,vf-fg,lt to med gy		yes	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☒ No ☐

If so, please include a copy of the analysis with this form. Well 7Z - CDM #414-10412-10-4

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

Form U.W. 6

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

RECEIVED OCT 1 1980 STATE ENGINEER Cheyenne, WYO

MICRO-FILMED NOV 21 '80

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 50247 NAME OF WELL Phase II - 5

1. NAME OF OWNER 1) Nuclear Dynamics, Inc. 2) State Board of Land Commissioners
2. ADDRESS 1) 200 South Lowell Casper, WY 82601 2) 2424 Pioneer Avenue Cheyenne, WY 82002 Zip Code
3. USE OF WATER: Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☒
4. LOCATION OF WELL: SW ¼ NW ¼ of Section 18, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically (Bearing and Distance) or 2696 ft. North ~~South~~ and 217 ft. East ~~West~~ from the SW corner of Section 18, T. 53 N., R. 67 W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐ Other
6. CONSTRUCTION: Total Depth of Well 547.5 ft. Depth to Static Water Level 27 ft.
   a. Casing Schedule New ☒ Used ☐
   4.33" diameter from 0 ft. to 525 ft. Material Fiberglass Gage .200
   ____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
   ____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
   b. Perforations: Type of perforator used
   Size of perforations ____ inches by ____ inches.
   Number of perforations and depths where perforated:
   ____ perforations from ____ ft. to ____ feet.
   ____ perforations from ____ ft. to ____ feet.
   c. Was well screen installed? Yes ☒ No ☐
   Diameter: 3 slot size: .012" set from 525 feet to 547.5 feet.
   Diameter: ____ slot size: ____ set from ____ feet to ____ feet.
   d. Was well gravel packed? Yes ☐ No ☒ Size of gravel
   e. Was surface casing used Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐
7. NAME & ADDRESS OF DRILLER Murph Drilling, Moorcroft, WY 82721
8. DATE OF COMPLETION OF WELL (including pump installation) 5-7-80
   Portable Sampling Pump Only
9. PUMP INFORMATION: Manufacturer Reda Type Submersible
   Source of power Portable Power Plant Horsepower 5 Depth of Pump Setting 200'
   Amount of Water Being Pumped 8 (out) - 0 - Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 50247 Book No. 282 Page No. 80

10. **PUMP TEST**: Was a pump test made? Yes ☐ No ☒

If so, by whom_____ Address_____

Yield: _____gal./min. with_____foot drawdown after_____hours.

Yield: _____gal./min. with_____foot drawdown after_____hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is_____gal./min. Surface pressure is_____lb./sq. inch, or_____feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL**: Total depth drilled 547.5 feet.

Depth of completed well 547.5 feet. Diameter of well 4.33 inches.

Depth to first water bearing formation 27 feet.

Depth to principal water bearing formation Top 465 feet to Bottom 547 feet.

Ground Elevation, if known 4156.7

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	15	Md, med to dk brn			
15	40	SS,vf-fg,med gy		yes(surface)	
40	100	SS,vf-fg,med gy		" "	
100	188	MD,med to dk gy			
188	221	SS,vf-fg,med gy			
221	233	MD,med to dk gy			
233	243	SS,vf-fg,lt to med gy			
243	352	MD,med to dk gy			
352	366	SS,vfg,med gy			
366	476	SS,vf-fg,lt to med gy			
476	510	MD,med to dk gy			
510	547.5	SS,vf-fg,lt gy		yes	

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☒ No ☐

If so, please include a copy of the analysis with this form. Well 8Z - CDM #414-10412-10-5

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191691 NAME OF WELL/SPRING DM 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82801 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling)
Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 SE 1/4 of Section 7, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,760.14 Easting 712,451.60 (Feet)
Land surface elevation (ft. above mean sea level) 4186.64 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 620 ft.
Depth to static water level 268.4 ft. (below land surface) Casing height 1.42 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.42 ft. to 600 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from _____ ft. to _____ ft.
Amount of grout used 139 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 600 ft. to 620 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 600 ft. to 620 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 17, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191691 Book No. 1383 Page No. 91

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 640 ft.
Depth of completed well 620 ft. Diameter of well 5 inches.
Depth to first water bearing formation 85 ft.
Depth to principal water bearing formation Top 600 ft. to bottom 621 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	640	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191691

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-18 DM** SEO Permit No.: 191691	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 588 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 600 Type: cement Depth: Type:
Location: SWSE Section: 18 Township: 53N Range: 67W	Hole Depth: 640 Diameter: 8¾" Well Depth: 620 Diameter: 5"	Perforation Interval(s): 600 to 620 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,760.14 E: 712,451.60	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 600 to 620 Type: 10-20 CSS Quantity (ft^3): 6
Recorded By: Mike Wolf WYPG#614 *Date Started: 11/23/09 to 11/25/09* Date Finished: 1/12/2010	Top of Casing Elevation: 4,188.06 M.P. Height: 1.42 Ground Elevation: 4,186.64	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	1	TS; brown, silty sand	
1	20	Sandy silt; buff	
20	25	Sandstone; buff, very, very fine grained, silty, friable	
25	40	Sandstone; blue-grey, silty, very, very fine, soft	
40	45	Claystone; very dark grey, very cohesive, fissile, very carbonaceous	
45	50	Siltstone; grey, clay rich	
50	60	Claystone; medium grey	
60	65	Sandstone; light grey, very, very fine grained	
65	80	Siltstone; grey, clay rich	
80	85	Claystone; grey, fissle	
85	90	Sandstone; very light grey, very, very fine grained, extremely silty	
90	95	Sandstone; grey, very, very fine, clay rich	
95	119	Silty claystone; dark grey, cohesive	
119	124	Claystone; light grey, very cohesive	11:50 stop
124	135	Siltstone; grey to dark grey	
135	178	Claystone; dark grey, soft, fissile	
178	215	Siltstone; grey, moderately friable, very silty, few sandy stringers, abundant clay	
215	222	Sandstone; grey, very, very fine	
22	230	*Claystone; dark grey, fissile, soft, sticky*	
230	246	Siltstone; grey, firm but friable	
246	256	Sandstone; light grey, very, very fine grained, numerous hard stringers	
256	271	Claystone; grey to dark grey, very, soft, sticky	
271	295	Sandstone; grey, very, very fine grained, very silty, soft, clay rich	
295	315	Claystone; dark grey, fissile, soft sticky	
315	324	Sandstone; grey, very fine to fine, soft, friable	
324	410	Claystone; grey, very silty, some siltstone interbeds, hard streaks	
410	431	Claystone; grey to dark grey, soft, balling up	
431	449	Siltstone; grey friable, clay rich, thin sandy interbeds	
449	509	Siltstone; grey, moderately friable, clay rich, balling up	
509	536	Claystone; grey, balling, sand in part with thin silty and sandy interbeds	
536	557	Sandstone; grey to light grey, very, very fine grained, soft, friable, "poor returns, washing away"	

Hole No. 34-18 DM

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
557	560	Siltstone; grey, clay rich, friable	
560	562	Sandstone; light grey, very, very fine, very hard, very well cemented	
562	600	Claystone; grey to dark grey, sticky, very cohesive	
600	621	Sandstone; grey, very silty, very, very fine grained, some interbedded clay, dark	
621	640	Claystone; grey to dark grey, sticky, very cohesive	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191692 NAME OF WELL/SPRING SA 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SE 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,828.31 Easting 712,453.49 (Feet)
Land surface elevation (ft. above mean sea level) 4246.27 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 70 ft.
Depth to static water level Dry 3/10/10 ft. (below land surface) Casing height 1.38 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.38 ft. to 50 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 50 ft.
Amount of grout used 12 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 50 ft. to 70 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 50 ft. to 70 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) January 14, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191692 Book No. 1383 Page No. 92

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 80 ft.
Depth of completed well 70 ft. Diameter of well 5 inches.
Depth to first water bearing formation 47 ft.
Depth to principal water bearing formation Top 47 ft. to bottom 70 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	80	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☐ Unusable N/A

REMARKS Water apparent at time of drilling. Dry when probed 3/10/10.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191692

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-18 SA** SEO Permit No.: 191692	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 52 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 38 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 50 Type: cement Depth: Type:
Location: SWSE Section: 18 Township: 53N Range: 67W	Hole Depth: 80 Diameter: 8¾" Well Depth: 70 Diameter: 5"	Perforation Interval(s): 50 to 70 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,828.31 E: 712,453.49	Samples: Yes Material Samples: Y/N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 50 to 70 Type: 10-20 CSS Quantity (ft^3): 5
Recorded By: Mike Wolf WYPG#614 Date Started: 11/23/09 15:45 Date Finished: 1/14/2010	Top of Casing Elevation: 4,247.65 M.P. Height: 1.38 Ground Elevation: 4,246.27	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks: Drilled with air to detect static water level.

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	1	TS; brown, silty sand, very fine grained, moist	
1	18	Sandstone; buff, very fine grained, soft	
18	21	Claystone; dark brown, little silty, very cohesive	
21	25	Siltstone; light brown, clay rich	
25	30	Siltstone; grey, firm	
30	32	Sandstone; buff-brown, very fine grained, soft	
32	33	Sandstone; very light grey, very hard	
33	37	Sandstone; buff-tan, very, very fine, soft, friable, very silty	
37	41	Sandstone; grey, very fine to fine, soft	
41	43	Claystone; dark grey, firm, fissile	
43	45	Silty clay; brownish-grey	
45	47	Siltstone; grey-light grey, very firm	
47	60	Sandstone; grey, very fine grained to fine grained, soft, friable, hard 59.5'-60', 62.5'-63', wet by ~50 feet, out of water ~70	
60	70	Sandstone; grey, very fine to fine with hard streaks	
70	80	Siltstone; grey to dark grey, moderately thin interbedded, very, very fine grained, sand streaks	
		Scrub hole with water blast and blow air to detect yield! Makes a mist ~ ¼ gpm	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE. Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191693 NAME OF WELL/SPRING SM 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☐ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SE 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,792.02 Easting 712,489.64 (Feet)
Land surface elevation (ft. above mean sea level) 4246.86 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 298 ft.
Depth to static water level 135.7 ft. (below land surface) Casing height 1.08 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.08 ft. to 278 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 278 ft.
Amount of grout used 64 Sacks type II Plus Bentonite Powder
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 278 ft. to 298 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 278 ft. to 298 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane
Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 17, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 250 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191693 Book No. 1383 Page No. 93

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 307 ft.
Depth of completed well 298 ft. Diameter of well 5 inches.
Depth to first water bearing formation 90 ft.
Depth to principal water bearing formation Top 277 ft. to bottom 298 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	307	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191693

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-18 SM** SEO Permit No.: 191693	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 278 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 266 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 278 Type: cement Depth: Type:
Location: SWSE Section: 18 Township: 53N Range: 67W	Hole Depth: 307 Diameter: 8¾" Well Depth: 298 Diameter: 5"	Perforation Interval(s): 278 to 298 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,792.02 E: 712,489.64	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 278 to 298 Type: 10-20 CSS Quantity (ft^3): 5.5
Recorded By: Mike Wolf WYPG#614 Date Started: 11/24/09 12:05 Date Finished: 1/14/2010	Top of Casing Elevation: 4,247.94 M.P. Height: 1.08 Ground Elevation: 4,246.86	Protective Casing: (Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	1	Top soil; sandy silt, brown	
1	40	Sandstone; buff to grey, very fine, silty, moderately friable	
40	50	Claystone; very dark grey to grey, contains moderate siltstone	
50	70	Sandstone; grey, very, very fine grained, soft, hard streak at 70'	
70	90	Claystone; grey, soft, sticky	
90	100	Sandstone; grey, very silty, very fine grained, soft, friable, hard streak at ~99'-100'	
100	126	Claystone; grey, firm	
126	133	Silty sandstone; grey, very, very fine, friable	
137	152	Silty claystone; dark brownish-grey, moderately carbonaceous	
152	168	Claystone; dark grey, fissile, soft	
168	177	Claystone/siltstone; grey, very clay rich	
177	198	Sandstone; grey, very fine, soft, friable	
198	211	Siltstone; grey, friable	
211	222	Sandstone; grey, very, very fine, abundant clay, hard at 249'-251'	
222	244	Siltstone; grey, firm, slightly friable, clay rich	
244	256	Sandstone; light grey to grey, very fine to very, very fine, friable	
256	270	Silty claystone; grey, firm, fissile	
270	277	Siltstone; grey	
277	298	Sandstone; grey, very, very fine grained, clay rich, soft	
298	302	Claystone; grey, firm, very cohesive	
302	307	Claystone; brown, soft to very soft, little organics	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink

PERMIT NO. U.W. 191694 NAME OF WELL/SPRING OZ 34-18

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SE 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,796.90 Easting 712,419.26 (Feet)
Land surface elevation (ft. above mean sea level) 4246.14 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 565 ft.
Depth to static water level 276.8 ft. (below land surface) Casing height 1.51 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from 1.51 ft. to 460 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 460 ft.
Amount of grout used 107 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 460 ft. to 565 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☐ Yes ☒ No Size of sand/gravel N/A
Filter pack/gravel installed from _____ ft. to _____ ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 17, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2.0 Depth of pump setting or intake 430 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191694 Book No. 1383 Page No. 94

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 570 ft.
Depth of completed well 565 ft. Diameter of well 5 inches.
Depth to first water bearing formation 86 ft.
Depth to principal water bearing formation Top 456 ft. to bottom 565 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	570	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Ore Zone monitor well.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15 — Date , 20 10

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191694

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____ , 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **34-18 OZ** SEO Permit No.: 191694	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 460 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac	Formation Packer(s): K-Packer Location: 448 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 460 Type: cement Depth: Type:
Location: SWSE Section: 18 Township: 53N Range: 67W	Hole Depth: 570 Diameter: 8¾" Well Depth: 565 Diameter: 5"	Perforation Interval(s): 460 to 565 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,796.90 E: 712,419.26	Samples: Yes Material Samples: Y/N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: None Type: Quantity (ft^3):
Recorded By: Mike Wolf WYPG#614 Date Started: 11/30/09 9:00 Date Finished: 12/1/2010	Top of Casing Elevation: 4,247.65 M.P. Height: 1.51 Ground Elevation: 4,246.14	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	18	Sandy silt; buff, light brown	
18	41	Sandstone; buff-brown, very, very fine grained, silty, moderately friable	
41	45	Claystone; very dark grey, very cohesive, fissile, carbonaceous	
45	55	Siltstone; grey, clay rich, moderately soft	
55	64	Sandstone; light grey, very, very fine grained, moderately soft and silty	
64	78	Siltstone; grey, clay rich	
78	86	Claystone; grey, fissile, moderately soft	
86	95	Sandstone; very light grey, very, very fine, silty, friable	
95	105	Claystone; dark grey, very silty	
105	120	Claystone; very dark grey, very carbonaceous	
120	140	Siltstone; grey to dark grey	
140	147	Claystone; grey to dark grey	
147	180	Claystone; grey to dark grey, soft, fissile	
180	190	Sandy siltstone; grey, soft, friable	
190	211	Siltstone; grey to dark grey, moderate interbedded claystone	
211	219	Sandstone; light grey, very, very fine, very silty, moderately friable	
219	231	Claystone; dark grey, fissile, soft	
231	246	Siltstone; grey, moderately friable	
246	256	Sandstone; grey to dark grey, soft, sticky	
256	268	Claystone; grey to dark grey, soft, sticky	
268	295	Sandstone; grey, very, very fine, silty, soft	
295	313	Claystone; dark grey, fissile, soft, sticky, silty	
313	325	Sandstone; grey, very fine, soft, friable	
325	380	Claystone; grey, moderately silty	
380	410	Siltstone; grey, clay rich, several very thin hard streaks	
410	456	Claystone; grey to dark grey, moderate silt content	
456	472	Sandy clay; very light grey, soft	
472	514	Siltstone; grey	
514	538	Claystone; grey with sandy interbeds, very soft	
538	565	Sandstone; grey, very, very fine	
565	570	Claystone; grey to dark grey, soft	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191687 NAME OF WELL/SPRING DM 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,888.03 Easting 710,034.63 (Feet)
Land surface elevation (ft. above mean sea level) 4155.06 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 585 ft.
Depth to static water level 156.0 ft. (below land surface) Casing height 1.15 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.15 ft. to 570 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 570 ft.
Amount of grout used 132 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 570 ft. to 585 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 570 ft. to 585 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 25, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable generator Horsepower 1.0 Depth of pump setting or intake 540 ft.
Amount of water being pumped 2.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191687 Book No. 1383 Page No. 87

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 600 ft.
Depth of completed well 585 ft. Diameter of well 5 inches.
Depth to first water bearing formation 31 ft.
Depth to principal water bearing formation Top 569 ft. to bottom 584 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	600	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191687

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **14-18 DM** SEO Permit No.: 191687	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 572 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 558 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 572 Type: cement Depth: Type:
Location: SWSW Section: 18 Township: 53N Range: 67W	Hole Depth: 603 Diameter: 6¼" Well Depth: 585 Diameter: 5"	Perforation Interval(s): 570 to 585 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,484,888.03 E: 710,034.63	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 570 to 585 Type: 10-20 CSS Quantity (ft^3):
Recorded By: Mike Wolf WYPG#614 Date Started: 12/18/09 Date Finished: 1/21/2010	Top of Casing Elevation: 4,156.21 M.P. Height: 1.15 Ground Elevation: 4,155.06	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	16	Sandy silt; buff-brown, loose, unconsolidated	
16	21	Silty sandstone; buff, friable	
21	31	Claystone; olive-brown, silty, soft, very cohesive	
31	56	Sandstone; grey, very, very fine, silty, hard streak 37'-38'	
56	69	Sandstone; grey, very, very fine, less silt, friable, wet	
69	82	Siltstone; grey, sandy, firm	
82	103	Claystone; very dark, grey-brown, carbonaceous, fissile	
103	155	Sandy siltstone/silty sandstone; grey, very, very fine, firm	
155	180	Sandstone; light grey, very, very fine, several hard streaks	
180	187	Claystone; dark brown, very cohesive	
187	251	Sandstone; light grey, very fine, soft, friable, moderately silty	
251	283	Claystone; dark brownish grey, fissile, platy	
283	350	Sandstone; grey to very light grey, very, very fine, silty, mostly soft, friable	
350	365	Claystone; dark brown, very carbonaceous	
365	370	Siltstone; grey, transition to sand below, "fining up"	
370	407	Sandstone; grey to light grey, very, very fine to fine, silty, soft	
407	412	Claystone; dark brown, fissile	
412	416	Sandstone; grey, very, very fine, moderately friable	
416	425	Claystone; brown, moderately carbonaceous	
425	451	Sandstone; grey, very fine, friable	
451	468	Claystone; brown, firm but fissile	
468	538	Sandstone; grey to very light grey, very fine grained	
538	569	Claystone; dark grey brown, little silty, fissile, moderately soft	
569	584	Sandstone; grey, very, very fine with interbedded brown clay-mudstone	
584	600	Claystone; brown, moderately soft, fissile	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191688 NAME OF WELL/SPRING SA 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,962.12 Easting 710,028.44 (Feet)
Land surface elevation (ft. above mean sea level) 4155.82 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 65 ft.
Depth to static water level 22.1 ft. (below land surface) Casing height 1.21 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.21 ft. to 35 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 35 ft.
Amount of grout used 12 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 35 ft. to 65 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1.0 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 35 ft. to 65 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) January 23, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191688 Book No. 1383 Page No. 88

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST *Was a pump test conducted?* ☐ *Yes* ☒ *No*
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 70 ft.
Depth of completed well 65 ft. Diameter of well 5 inches.
Depth to first water bearing formation 33 ft.
Depth to principal water bearing formation Top 33 ft. to bottom 65 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	70	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ *Good* ☒ *Acceptable* ☐ *Poor* ☐ *Unusable*

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15 — Date, 2010

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191688

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **14-18 SA** SEO Permit No.: 191688	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 37 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: 10, 30
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 28 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 35 Type: cement Depth: Type:
Location: SWSW Section: 18 Township: 53N Range: 67W	Hole Depth: 70 Diameter: 8¾" Well Depth: 65 Diameter: 5"	Perforation Interval(s): 35 to 65 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,484,962.12 E: 710,028.44	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 35 to 65 Type: 10-20 CSS Quantity (ft^3): 5.5
Recorded By: Mike Wolf WYPG#614 Date Started: 12/21/09 12:00 Date Finished: 1/23/2010	Top of Casing Elevation: 4,157.03 M.P. Height: 1.21 Ground Elevation: 4,155.82	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	8	Sandy clay; fill, brown, little fine pebbles at base	
8	16	Siltstone; brown-buff, firm, friable	
16	33	Claystone; dark brown to black, very carbonaceous, fissile	
33	65	Silty sandstone; light grey, very, very fine, friable, wet	
65	70	Claystone; dark grey, fissile, cohesive	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink

PERMIT NO. U.W. 191689 NAME OF WELL/SPRING SM 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,923.77 Easting 710,066.28 (Feet)
Land surface elevation (ft. above mean sea level) 4155.12 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 327 ft.
Depth to static water level 65.7 ft. (below land surface) Casing height 1.25 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.25 ft. to 282 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 282 ft.
Amount of grout used 65 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 282 ft. to 327 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 282 ft. to 327 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 25, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 260 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191689 Book No. 1383 Page No. 89

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 330 ft.
Depth of completed well 327 ft. Diameter of well 5 inches.
Depth to first water bearing formation 33 ft.
Depth to principal water bearing formation Top 282 ft. to bottom 327 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	330	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191689

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **14-18 SM** SEO Permit No.: 191689	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 285 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 270 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 282 Type: cement Depth: Type:
Location: SWSW Section: 18 Township: 53N Range: 67W	Hole Depth: 330 Diameter: 8¾" Well Depth: 327 Diameter: 5"	Perforation Interval(s): 282 to 327 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,484,923.77 E: 710,066.28	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 282 to 327 Type: 10-20 CSS Quantity (ft^3): 9
Recorded By: Mike Wolf WYPG#614 Date Started: 12/20/09 set up & Date Finished: 1/22/2010 pilot	Top of Casing Elevation: 4,156.37 M.P. Height: 1.25 Ground Elevation: 4,155.12	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	11	Sandy clay; brown, moderately fine pebbles at base	
11	20	Siltstone; brown-buff, firm, little friable	
20	24	Claystone; dark brown to black, very carbonaceous, very cohesive	
24	63	Silty sandstone; light grey, very, very fine, friable, wet, hard streaks 39.5'-40.5' and 46.5'-47.5'	
63	67	Siltstone; grey, clay rich, coarsening up	
67	71	Claystone; dark grey, cohesive fissile	
71	89	Sandy siltstone; light grey, firm but little friable	
89	108	Claystone; grey to dark grey, firm, cohesive	
108	180	Sandy siltstone; grey, extremely fine grained, friable, low cohesion, little interbedded clay, hard streaks at 150' & 161'	
180	186	Claystone; dark brown, fissile, moderately organic	
186	200	Siltstone; light grey, firm but friable	
200	247	Sandstone; light grey, very, very fine, very silty, friable	
247	263	Claystone; dark grey-brown, fissile moderately carbonaceous	
263	267	Sandy siltstone; very light grey, very, very fine, friable	
267	280	Claystone; grey to medium dark grey, fissile, non organic!	
280	330	Silty sandstone/sandy siltstone; grey, very, very fine, friable, contains some fissile interbedded claystone, hard streaks 317'-318'	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191690 NAME OF WELL/SPRING OZ 14-18

1. NAME OF OWNER 1)STRATA ENERGY 2)SBOLC

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SW 1/4 SW 1/4 of Section 18, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,484,921.52 Easting 709,994.39 (Feet)
Land surface elevation (ft. above mean sea level) 4155.29 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 529 ft.
Depth to static water level 156.9 ft. (below land surface) Casing height 1.18 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.18 ft. to 499 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 499 ft.
Amount of grout used 116 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 499 ft. to 529 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 499 ft. to 529 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from 1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 25, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable generator Horsepower 2.0 Depth of pump setting or intake 480 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191690 Book No. 1383 Page No. 90

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 530 ft.
Depth of completed well 529 ft. Diameter of well 5 inches.
Depth to first water bearing formation 31 ft.
Depth to principal water bearing formation Top 500 ft. to bottom 530 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	530	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent

April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191690

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **14-18 OZ** SEO Permit No.: 191690	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 499 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): ⓎN Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 487 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 496 Type: cement Depth: Type:
Location: SWSW Section: 18 Township: 53N Range: 67W	Hole Depth: 530 Diameter: 8¾" Well Depth: 529 Diameter: 5"	Perforation Interval(s): 499 to 529 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,484,921.52 E: 709,994.39	Samples: Yes Material Samples: ⓎN E-Log: ⓎN Water Samples: ⓎN	Filter Pack Location: 499 to 529 Type: 10-20 CSS Quantity (ft^3): 6.5
Recorded By: Mike Wolf WYPG#614 Date Started: 12/19/09 13:00 Date Finished: 1/15/2010	Top of Casing Elevation: 4,145.47 M.P. Height: 1.18 Ground Elevation: 4,155.29	Protective Casing:ⓎN Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	15	Sandy clay; brown, valley fill, moderately cohesive	
15	21	Pebbly sand; brown, loose, likely wet with perched water	
21	31	Claystone; dark brown, carbonaceous, silty, fissile "Bedrock"	
31	68	Sandstone, light grey, very, very fine grained, silty, friable	
68	74	Claystone; grey, fissile	
74	91	Sandy-silty clay; grey, firm	
91	105	Claystone; very dark grey-brown, fissile	
105	181	Sandy siltstone; grey, little friable, more silty sandstone at base	
181	191	Claystone; grey, fissile	
191	198	Sandstone; very light grey, mostly hard and well cemented	
198	247	Silty sandstone; grey, very, very fine, moderately friable	
247	260	Claystone; brown to dark brown, moderately organic, fissile	
260	278	Sandy siltstone; very light grey, moderately hard and well cemented, carbonaceous	
278	286	Claystone; dark grey-brown, carbonaceous, fissile	
286	318	Silty sandstone; light grey, moderately friable	
318	322	Claystone; dark brown, carbonaceous, fissile	
322	326	Silty sandstone; light grey, very, very fine, little friable	
326	328	Claystone; dark brown, fissile	
328	350	Sandstone; light grey, very, very fine, silty, friable	
350	363	Claystone; dark grey to brown, fissile	
363	370	Siltstone; grey, firm	
370	408	Sandstone; light grey, very, very fine, sparse green colored matrix	
408	421	Claystone; dark brown, moderately carbonaceous, fissile	
421	451	Sandstone; light grey, very, very fine, silty, friable, specks, oxidation near top	
451	463	Claystone, very dark brown, very carbonaceous, fissile	
463	470	Siltstone; grey, little sandy	
470	496	Sandstone; light grey, very, very fine, friable	
496	500	Claystone; brown, fissile, soft, little oxidation	
500	530	Sandstone; light grey, very, very fine, very silty, little friable	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE. Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191695 NAME OF WELL/SPRING DM 21-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,261.04 Easting 710,663.72 (Feet)
Land surface elevation (ft. above mean sea level) 4168.84 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 565 ft.
Depth to static water level 195.3 ft. (below land surface) Casing height 1.25 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.25 ft. to 550 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 550 ft.
Amount of grout used 128 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 550 ft. to 565 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 550 ft. to 565 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable Generator Horsepower 1.0 Depth of pump setting or intake 520 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191695 Book No. 1383 Page No. 95

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 580 ft.
Depth of completed well 565 ft. Diameter of well 5 inches.
Depth to first water bearing formation 17 ft.
Depth to principal water bearing formation Top 535 ft. to bottom 566 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	580	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15 — Date, 20 10

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191695

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **21-19 DM** SEO Permit No.: 191695	Drilling Company: Kid Pronghorn Driller: Leo		Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 550 Gage: SDR-17	
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300		Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up	
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer		Formation Packer(s): K-Packer Location: 538 (ft)	
County: Crook, WY	Bit Types: 4-Blade Spade		Annular Seals: Depth: 0 to 550 Type: cement Depth: Type:	
Location: NENW Section: 19 Township: 53N Range: 67W	Hole Depth: 580 Well Depth: 565	Diameter: 6¼" Diameter: 5"	Perforation Interval(s): 550 to 565 Type:PVC V-Wire (3") Slot Sizes: 0.010"	
System Coordinates: WY83 E F N: 1,483,261.04 E: 710,663.72	Samples: Yes E-Log: (Y)N	Material Samples: (Y)N Water Samples: (Y)N	Filter Pack Location: 550 to 565 Type: 10-20 CSS Quantity (ft^3):	
Recorded By: Mike Wolf WYPG#614 Date Started: 12/21/09 15:00 Date Finished: 1/27/2010	Top of Casing Elevation: M.P. Height: Ground Elevation:	4,170.09 1.25 4,168.84	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)	

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	5	Sandy silt fill; brown, salts, clay rich	
5	17	Siltstone; buff-brown, little sandy	
17	29	Silty sandstone; grey-brown, very, very fine, friable, wet at base	
29	83	Silty claystone; dark grey, fissile	
83	93	Claystone; very dark grey, fissile, moderately carbonaceous	
93	161	Siltstone; grey, some thinly interbedded clay	
161	176	Sandy siltstone; very light grey, very, very fine, several hard streaks	
176	186	Claystone; dark grey, soft, fissile	
186	211	Sandstone; light grey, very, very fine, silty, friable	
211	239	Claystone; dark grey to grey, fissile	
239	252	Sandstone; very light grey, very fine grained, friable	
252	258	Claystone; dark grey, fissile	
258	316	Sandstone; light grey, very, very fine, silty, moderately friable	
316	325	Claystone; dark grey to very dark grey, fissile	
325	350	Silty and sandy claystone; dark grey to grey, hard streaks at 336'-336.5'	
350	388	Sandstone; light grey, very, very fine, silty, moderately friable	
388	403	Claystone; dark grey-brown, moderately carbonaceous	
403	427	Silty sandstone; grey, very, very fine	
427	432	Claystone; dark grey-brown, fissile	
432	491	Sandstone/claystone; "interbedded", light grey to dark grey-brown, moderate fissile and platy	
491	512	Sandstone; grey to very light grey, very, very fine, moderately friable	
512	535	Claystone; dark grey, fissile	
535	566	Sandstone/claystone; light grey to dark grey, very interbedded, sand is very, very fine, silty, claystone is fissile	
566	580	Claystone; dark grey, moderately cohesive, fissile	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191696 NAME OF WELL/SPRING SA 21-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,337.40 Easting 710,670.26 (Feet)
Land surface elevation (ft. above mean sea level) 4167.66 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 30 ft.
Depth to static water level 9.0 ft. (below land surface) Casing height 1.54 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.54 ft. to 20 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 3.0 ft. to 20.0 ft.
Amount of grout used 5 Sacks type Bentonite Chips
(example: 10 sacks) (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 20 ft. to 30 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pump How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 20 ft. to 30 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191696 Book No. 1383 Page No. 96

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 35 ft.
Depth of completed well 30 ft. Diameter of well 5 inches.
Depth to first water bearing formation 15 ft.
Depth to principal water bearing formation Top 15 ft. to bottom 35 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	35	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is *true, correct, and complete.*

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191696

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **21-19 SA** SEO Permit No.: 191696	Drilling Company: Kid Pronghorn Driller: Leo	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 20' Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: 1 at ~15'
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 13 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade & Tri Cone	Annular Seals: Depth: 0 to 20 Type: Bentonite Chips Depth: Type:
Location: NENW Section: 19 Township: 53N Range: 67W	Hole Depth: 35 Diameter: 8¾" Well Depth: 30 Diameter: 5"	Perforation Interval(s): 20 to 30 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,337.40 E: 710,670.26	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: Y/N	Filter Pack Location: 20 to 30 Type: 10-20 CSS Quantity (ft^3): 2.5
Recorded By: Ben Schiffer WYPG3446 Date Started: 1/4/2010 Date Finished: 1/29/2010	Top of Casing Elevation: 4,169.20 M.P. Height: 1.54 Ground Elevation: 4,167.66	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks: Piloted to 40'; ream 20'

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	15	Clay with moderate silt, weathered, dark brown (fill)	
15	35	Siltstone with trace very fine grained sand & clay, weathered, light brown, reduced 30'-35'	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191697 NAME OF WELL/SPRING SM 21-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,301.11 Easting 710,706.70 (Feet)
Land surface elevation (ft. above mean sea level) 4169.85 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 315 ft.
Depth to static water level 84.0 ft. (below land surface) Casing height 1.12 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.12 ft. to 260 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 260 ft.
Amount of grout used 60 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 260 ft. to 315 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pumping How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 260 ft. to 315 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +1.5 ft. to 3.5 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 240 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191697 Book No. 1383 Page No. 97

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 320 ft.
Depth of completed well 315 ft. Diameter of well 5 inches.
Depth to first water bearing formation 15 ft.
Depth to principal water bearing formation Top 260 ft. to bottom 320 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	320	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf – WWC — April 15, 2010
Signature of Owner or Authorized Agent — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191697

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: 21-19 SM SEO Permit No.: 191697	Drilling Company: Kid Pronghorn Driller: Leo	Casing Type: PVC Diameter: 5" Length: 20' Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 248 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade & Tri Cone	Annular Seals: Depth: 0 to 260 Type: cement Depth: Type:
Location: NENW Section: 19 Township: 53N Range: 67W	Hole Depth: 320 Diameter: 8¾" Well Depth: 315 Diameter: 5"	Perforation Interval(s): 260 to 315 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,301.11 E: 710,706.70	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: Y/N	Filter Pack Location: 260 to 315 Type: 10-20 CSS Quantity (ft^3): 10.5
Recorded By: Ben Schiffer WYPG3446 Date Started: 12/23/09 Date Finished: 1/28/2010	Top of Casing Elevation: 4,170.97 M.P. Height: 1.12 Ground Elevation: 4,169.85	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks: Rigging up at 13:22; on bottom (320') at 18:00; logging done at 19:05

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	15	Clay with moderate silt, weathered, dark brown (fill)	
15	35	Siltstone with trace very fine grained sand & clay, weathered, light brown, reduced 30'-35'	
35	100	Claystone; moderate silt, frequently carbonaceous, dark grey/brown black	
100	135	Siltstone, trace very fine grained sand, cemented 125'-130'	
135	220	Claystone; sporadic carbonaceous material, cement at ~ 170'-175'	
220	235	Carbonaceous claystone	
235	260	Claystone	
260	295	Siltstone with trace very fine grained sand, moderate clay, light grey	
295	300	Claystone	
300	320	Sandy siltstone; very fine grained sands with moderate clay, light grey	
		- Tripping out to log at 18:10	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191698 NAME OF WELL/SPRING OZ 21-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING NE 1/4 NW 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,483,294.95 Easting 710,634.93 (Feet)
Land surface elevation (ft. above mean sea level) 4167.16 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 468 ft.
Depth to static water level 215.2 ft. (below land surface) Casing height 1.38 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.38 ft. to 433 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 433 ft.
Amount of grout used 60 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 433 ft. to 468 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift and pumping How long was well developed? 3 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 433 ft. to 468 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 24, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2.0 Depth of pump setting or intake 420 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191698 Book No. 1383 Page No. 98

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 468 ft.
Depth of completed well 468 ft. Diameter of well 5 inches.
Depth to first water bearing formation 20 ft.
Depth to principal water bearing formation Top 440 ft. to bottom 460 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	468	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Well completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15, 2010 — Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191698

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **21-19 OZ** SEO Permit No.: 191698	Drilling Company: Kid Pronghorn Driller: Leo	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 435 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 421 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade & Tri Cone	Annular Seals: Depth: 0 to 433 Type: cement Depth: Type:
Location: NENW Section: 19 Township: 53N Range: 67W	Hole Depth: 468 pilot Diameter: 8¾" Well Depth: 468 Diameter: 5"	Perforation Interval(s): 433 to 468 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,483,294.95 E: 710,634.93	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: Y/N	Filter Pack Location: 433 to 468 Type: 10-20 CSS Quantity (ft^3): 6.5
Recorded By: Ben Schiffer WYPG#3446 Date Started: 12/28/09 Date Finished: 1/26/2010	Top of Casing Elevation: 4,168.56 M.P. Height: 1.38 Ground Elevation: 4,167.16	Protective Casing: (Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks: Moved on hole at 14:00 on 12/28/09; drilling at 09:00 on 12/29/09, reamed & logged on 12/29/09, cased on 12/30/09

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	10	Clay with moderate silt, weathered, dark brown	
10	20	Siltstone; trace very fine grained sand, rare pebble lithics, weathered, light brown	
20	25	Sandstone; very fine grained, moderately silty, weathered, (light brown) to ~23' then cleaner & reduced	
25	55	Claystone; reduced, dark grey	
55	65	Carbonaceous claystone	
65	75	Claystone	
75	90	Carbonaceous claystone	
90	100	Claystone	
100	105	Very fine grained sandstone, abundant silt	
105	115	Claystone	
115	125	Carbonaceous claystone	
125	175	Sandstone; very fine grained, moderately silty, rare organics, light grey	
175	190	Claystone; trace carbonaceous	
190	200	Sandy siltstone; very fine grained sands, light grey with moderate clay	
200	215	Claystone	
215	200	Carbonaceous claystone	
260	315	Sandstone; very fine grained with moderate silt & clay, dark grey	
315	320	Carbonaceous claystone	
320	327	Sandstone; very fine grained with abundant silty & clay, light grey	
327	355	Claystone; abundant silty & clay, light grey	
355	390	Sandstone; very fine grained with moderate silty & trace clay, light grey	
390	405	Claystone	
405	420	Sandstone; very fine grained with moderate silt & clay	
420	440	Carbonaceous claystone	
440	460	Sandstone; with abundant clay interbeds, moderately carbonaceous 440'-445', sand very fine grained, sands cleaner 455'-460'	
460	468	Carbonaceous claystone	
		*Logged once by Scott Holt, he was not happy with log and got another unit out from Gillette. Unable to get past 230'. Made casing pick from lith & poor E-log, table frozen at 16:30	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191699 NAME OF WELL/SPRING DM 42-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,221.38 Easting 713,097.40 (Feet)
Land surface elevation (ft. above mean sea level) 4283.38 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 610 ft.
Depth to static water level 284.8 ft. (below land surface) Casing height 1.21 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule: ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.2 ft. to 600 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 600 ft.
Amount of grout used 139 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 600 ft. to 610 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 600 ft. to 610 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 16, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S10-22
Source of power Portable Generator Horsepower 1.0 Depth of pump setting or intake 570 ft.
Amount of water being pumped 1.0 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191699 Book No. 1383 Page No. 99

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST *Was a pump test conducted?* ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 620 ft.
Depth of completed well 610 ft. Diameter of well 5 inches.
Depth to first water bearing formation 85 ft.
Depth to principal water bearing formation Top 600 ft. to bottom 610 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	620	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15 — Date, 2010

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191699

Date of Receipt _____ **Date of Approval** _____, 20____

Date of Priority 10/12/2009

_____
for State Engineer

WWC ENGINEERING

Hole/Well No.: **42-19 DM** SEO Permit No.: 191699	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 600 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 588 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 600 Type: cement Depth: Type:
Location: SENE Section: 19 Township: 53N Range: 67W	Hole Depth: 620 Diameter: 6¼" Well Depth: 610 Diameter: 5"	Perforation Interval(s): 600 to 610 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,481,221.38 E: 713,097.40	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 600 to 610 Type: 10-20 CSS Quantity (ft^3): 2.5
Recorded By: Mike Wolf WYPG#614 Date Started: 12/5/09 7:00 Date Finished: 12/30/09	Top of Casing Elevation: 4,284.59 M.P. Height: 1.21 Ground Elevation: 4,283.38	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	17	Silty sand; buff, brown, friable, soft	
17	36	Siltstone; buff, brown, moderately abundant clay	
36	47	Silty sandstone; light grey, very, very fine grained	
47	63	Silty claystone; grey to dark grey	
63	72	Silty sandstone; grey, very, very fine grained, soft	
72	85	Claystone; very dark grey, very carbonaceous, fissile	
85	102	Sandstone; grey, very, very fine, very silty, friable	
102	119	Silty claystone; dark grey	
119	135	Sandstone; grey to very light grey, very, very fine, very silty, considerabe hard streaks	
135	180	Siltstone; grey, friable, moderate, very, very fine grained sand content	
180	188	Sandy siltstone; grey, soft, friable	
188	201	Claystone; very dark grey fissle, moderately carbonaceous	
201	208	Sandstone; light grey, very, very fine, moderately hard, moderately well cemented	
208	225	Sandstone; grey, very fine, moderately friable	
225	243	Siltstone; grey, friable	
243	247	Claystone; grey, silty	
247	251	Sandstone; very light grey, very hard, very well cemented	
251	259	Claystone; grey, silty, little fissile	
259	286	Sandstone; grey to light grey, very, very fine, silty, moderately friable, hard streak at 268'	
286	337	Claystone; grey to very dark grey, silty, fissle, interbedded silt in part	
337	350	Sandstone; grey, very, very fine, friable	
350	354	Claystone; grey, moderately soft	
354	368	Sandstone; grey, very, very fine grained, firm but friable	
368	377	Claystone; grey	
377	405	Siltstone; grey to dark grey	
405	411	Sandstone; light grey, very, very fine, moderately hard, moderately well cemented	
411	421	Siltstone; grey, clay rich	
421	430	Sandstone; light grey, very, very fine, friable, hard from 427-428.5'	
430	455	Claystone; grey to dark grey, little silty	
455	481	Sandstone; grey, very, very fine, friable, silty	
481	487	Silty claystone; dark grey, fissle	

Hole No. 42-19 DM

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
487	509	Sandstone; light grey, very, very fine, moderately friable	
509	519	Clayey siltstone; grey, fissle	
519	524	Sandy siltstone; grey, friable	
524	535	Siltstone; grey, little sandy	
535	555	Sandstone; grey to light grey, very, very fine, moderately friable	
555	600	Claystone; grey-dark grey, moderately silty, fissle	
600	610	Sandstone; grey, very, very fine, very silty	
610	620	Claystone; dark grey, soft, fissle	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191700 NAME OF WELL/SPRING SA 42-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,294.66 Easting 713,094.83 (Feet)
Land surface elevation (ft. above mean sea level) 4283.48 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 108 ft.
Depth to static water level dry on 3/9/10 ft. (below land surface) Casing height 1.0 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +.95 ft. to 98 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 98 ft.
Amount of grout used 22 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☒ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations 0.010 inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 set from 98 ft. to 108 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 1 Hour
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 98 ft. to 108 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) January 9, 2010

9. PUMP INFORMATION Manufacturer No pump installed Type _____
Source of power _____ Horsepower _____ Depth of pump setting or intake _____ ft.
Amount of water being pumped _____ gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample Only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191700 Book No. 1383 Page No. 100

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 115 ft.
Depth of completed well 108 ft. Diameter of well 5 inches.
Depth to first water bearing formation 96 ft.
Depth to principal water bearing formation Top 96 ft. to bottom 108 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or *Description*	*Formation*	Water Bearing? (Yes or no)
Surface	115	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☐ Unusable

REMARKS Apparent uppermost groundwater at the time of drilling. No water when probed.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC
Signature of Owner or Authorized Agent

April 15, 2010
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191700

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **42-19 SA** SEO Permit No.: 191700	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 99 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: 90', 60', 20'
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 88 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 97 Type: cement Depth: Type:
Location: SENE Section: 19 Township: 53N Range: 67W	Hole Depth: 115 Diameter: 8¾" Well Depth: 108 Diameter: 5"	Perforation Interval(s): 98 to 108 Type: PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,481,294.66 E: 713,094.83	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 97 to 108 Type: 10-20 CSS Quantity (ft^3): 5.5
Recorded By: Mike Wolf, WYPG#614 Date Started: 12/16/09 Date Finished: 1/9/2010	Top of Casing Elevation: 4,284.43 M.P. Height: 0.95 Ground Elevation: 4,283.48	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	7	Siltstone; buff-brown, moderately friable	
7	12	Claystone; buff-grey, fissile	
12	35	Siltstone; buff-brown, moderate fissile	
35	40	Siltstone; grey, clay rich	
40	55	Sandy siltstone; grey to very light grey, very, very fine, hard streaks, hard streaks are very well cemented and very, very light grey, very light grey, very hard streaks	
55	65	Claystone; grey to dark grey, fissile, carbonaceous	
65	80	Claystone; blue-grey, fissile, carbonaceous from ~75'-80'	
80	96	Siltstone; grey with thin, hard sandy streaks	
96	108	Silty sandstone; grey, very, very fine, very silty, hard streaks, very silty, moderately interbedded clay	
108	115	Claystone; grey, soft, fissile, platy	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191701 NAME OF WELL/SPRING SM 42-19

1. NAME OF OWNER STRATA ENERGY, Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,260.94 Easting 713,131.72 (Feet)
Land surface elevation (ft. above mean sea level) 4284.95 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary (type of rig, and fluid used, if any) ☐ Dug ☐ Driven ☐ Other
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 290 ft.
Depth to static water level 154.3 ft. (below land surface) Casing height 1.35 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.35 ft. to 260 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 260 ft.
Amount of grout used 60 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 260 ft. to 290 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☒ Yes ☐ No Size of sand/gravel 10-20 Colorado Silica Sand
Filter pack/gravel installed from 260 ft. to 290 ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 16, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 5 S05-13
Source of power Portable Generator Horsepower 1/2 Depth of pump setting or intake 230 ft.
Amount of water being pumped 2 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191701 Book No. 1383 Page No. 101

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 300 ft.
Depth of completed well 290 ft. Diameter of well 5 inches.
Depth to first water bearing formation 92 ft.
Depth to principal water bearing formation Top 263 ft. to bottom 290 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	300	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☒ Acceptable ☐ Poor ☐ Unusable

REMARKS _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15 — Date, 2010

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191701

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **42-19 SM** SEO Permit No.: 191701	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: 260 Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Drispac/Alcomer	Formation Packer(s): K-Packer Location: 248 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 260 Type: cement Depth: Type:
Location: SENE Section: 19 Township: 53N Range: 67W	Hole Depth: 305 Diameter: 8¾" Well Depth: 290 Diameter: 5"	Perforation Interval(s): 260 to 290 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,481,260.94 E: 713,131.72	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: 260 to 290 Type: 10-20 CSS Quantity (ft^3): 9.5
Recorded By: Mike Wolf WYPG#614 Date Started: 12/12/09 16:00 Date Finished: 1/5/2010	Top of Casing Elevation: 4,286.30 M.P. Height: 1.35 Ground Elevation: 4,284.95	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	12	Sandy siltstone; buff-brown, loose	
12	13	Sandstone; very light grey, very fine, very hard, very well cemented	
13	18	Sandstone: buff-brown, very, very fine, silty, friable	
18	40	Silty clay; grey-brown, soft, fissile	
40	53	Sandstone; grey, very, very fine	
53	62	Claystone; medium dark grey, fissile	
62	66	Sandstone; light grey, very, very fine, very silty, friable	
66	80	Claystone; grey-dark grey, fissile, platy	
80	92	Siltstone; grey to light grey	
92	108	Sandstone; light grey, very, very fine, abundant silt, friable	
108	123	Claystone; very dark grey, soft, fissile, platy	
123	190	Siltstone; grey, little interbedded claystone	
190	204	Claystone; dark grey, fissile, platy	
204	232	Silty sandstone; grey to light grey, moderately friable	
232	238	Claystone; grey to dark grey-brown, fissile	
238	247	Silty sandstone/sandy siltstone	
247	263	Claystone; dark grey-brown, fissile	
263	290	Sandstone; light grey, very, very fine, very silty	
290	300	Claystone; very dark grey-brown, carbonaceous, fissile, platy	

FORM U.W.6
Rev. 2/07

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 191702 NAME OF WELL/SPRING OZ 42-19

1. NAME OF OWNER STRATA ENERGY , Inc.

2. ADDRESS P.O. Box 2318 406 W. 4th Street
☒ Please check if address has changed from that shown on permit.
City Gillette State WY Zip Code 82717 Phone No. (307) 689-4364

3. USE OF WATER ☐ Domestic ☐ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous
☒ Monitor or Test ☐ Coal Bed Methane Explain proposed use (Example: One single family dwelling) Groundwater Monitor Well

4. LOCATION OF WELL/SPRING SE 1/4 NE 1/4 of Section 19, T. 53 N., R 67 W., of the 6th P.M. (or W.R.M.)
Subdivision Name _____ Lot _____ Block _____
Resurvey Location Tract _____ or Lot _____ Datum ☐ NAD27 ☐ NAD83 _____
Geographic Coordinates: Latitude _____ N Longitude _____ W (degrees, minutes, seconds)
UTM: Zone _____ Northing _____ Easting _____ (meters)
State Plane Coordinates: Zone WY 83 EF Northing 1,481,259.02 Easting 713,060.86 (Feet)
Land surface elevation (ft. above mean sea level) 4281.24 Datum ☐ NAVD29 ☐ NAVD88
Source ☐ GPS ☐ Map ☒ Survey ☐ Unknown ☐ Other ☐ Altimeter (for elevation only)

5. TYPE OF CONSTRUCTION ☒ Drilled Mud Rotary ☐ Dug ☐ Driven ☐ Other
(type of rig, and fluid used, if any)
Describe Drispac and Alcomer; under ream and filter pack screen interval

6. CONSTRUCTION Total depth of well/spring 560 ft.
Depth to static water level 298.5 ft. (below land surface) Casing height 1.38 ft. above ground
a. Diameter of borehole (bit size) 8 3/4 inches
b. Casing schedule ☒ New ☐ Used Joint type ☐ Threaded ☐ Glued ☐ Welded
5" diameter from +1.38 ft. to 470 ft. Material PVC Certa-Lok Gage SDR-17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Cemented/grouted interval, from 0 ft. to 470 ft.
Amount of grout used 109 Sacks (example: 10 sacks) type II Plus Bentonite Powder (example: bentonite pellets)
d. Type of completion ☐ Customized perforations ☐ Open hole ☒ Factory screen PVC V-Wire
Type of perforator used _____
Size of perforations _____ inches by _____ inches
Number of perforations and depths where perforated
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
Open hole from _____ ft. to _____ ft.
Well screen details
Diameter 3 inch slot size 0.010 inch set from 470 ft. to 560 ft.
Diameter _____ slot size _____ set from _____ ft. to _____ ft.
e. Well development method Air-Lift How long was well developed? 2 Hours
f. Was a filter/gravel pack installed? ☐ Yes ☒ No Size of sand/gravel Under ream
Filter pack/gravel installed from _____ ft. to _____ ft.
g. Was surface casing used? ☒ Yes ☐ No Was it cemented in place? ☒ Yes ☐ No
Surface casing installed from +2.0 ft. to 3.0 ft.

7. NAME AND ADDRESS OF DRILLING COMPANY Kid Pronghorn, Ent., 28 Prairie Spring Lane Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) March 11, 2010

9. PUMP INFORMATION Manufacturer Grundfos Type 16 S20-18
Source of power Portable Generator Horsepower 2 Depth of pump setting or intake 440 ft.
Amount of water being pumped 15 gal./min.* (For springs or flowing wells, see item 10)
Total volumetric quantity used per calendar year.* N/A - Sample only

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well) N/A
If well yields artesian flow or if spring, yield is _____ gal./min.* Surface pressure is _____ lb./sq.inch, or _____ feet of water
The flow is controlled by ☐ Valve ☐ Cap ☐ Plug
Does well leak around casing? ☐ Yes ☐ No
*If these amounts exceed permitted amount an enlargement is required.

Permit No. U.W. 191702 Book No. 1383 Page No. 102

11. IF SPRING, HOW WAS IT CONSTRUCTED? (Some method of artificial diversion, i.e., springbox, cribbing, etc., is necessary to qualify for a water right) N/A

12. PUMP TEST Was a pump test conducted? ☐ Yes ☒ No
If so, by whom _____
Yield _____ gal./min. with _____ ft. drawdown after _____ hours
Yield _____ gal./min. with _____ ft. drawdown after _____ hours

13. LOG OF WELL Total depth drilled 570 ft.
Depth of completed well 560 ft. Diameter of well 5 inches.
Depth to first water bearing formation 80 ft.
Depth to principal water bearing formation Top 468 ft. to bottom 562 ft.

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Rock Type Or Description	Formation	Water Bearing? (Yes or no)
Surface	570	See Attached Log		

14. DOES A GEOPHYSICAL LOG ACCOMPANY THIS FORM? ☐ Yes ☒ No

15. QUALITY OF WATER INFORMATION
Does a chemical and/or bacteriological water quality analysis accompany this form? ☐ Yes ☒ No
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the quality of water as ☐ Good ☐ Acceptable ☐ Poor ☒ Unusable

REMARKS Completed in Ore Zone sand.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct, and complete.

Mike Wolf - WWC — Signature of Owner or Authorized Agent
April 15 — Date, 20 10

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 191702

Date of Receipt _____

Date of Priority 10/12/2009

Date of Approval _____, 20____

_____
for State Engineer

WWC ENGINEERING

WESTERN WATER CONSULTANTS – WWC ENGINEERING
Test Hole Log/Well

Hole/Well No.: **42-19 OZ** SEO Permit No.: 191702	Drilling Company: Kid Pronghorn Driller: Jake Kellogg	Casing Type: Certainteed Certa-Lok Diameter: 5" Length: Gage: SDR-17
Company: Strata Energy	Drilling Method: Mud Rotary Rig Type: Speed Star 2300	Centralizer(s): (Y)N Type: PVC Locations: every 60' intervals, bottom up
Project: ROSS ISR	Drilling Fluids: Water/Drispac/Alcomer	Formation Packer(s): K-Packer Location: 458 (ft)
County: Crook, WY	Bit Types: 4-Blade Spade	Annular Seals: Depth: 0 to 470 Type: cement Depth: Type:
Location: SENE Section: 19 Township: 53N Range: 67W	Hole Depth: 115 Diameter: 8¾" Well Depth: 108 Diameter: 5"	Perforation Interval(s): 470 to 560 Type:PVC V-Wire (3") Slot Sizes: 0.010"
System Coordinates: WY83 E F N: 1,481,259.02 E: 713,060.86	Samples: Yes Material Samples: (Y)N E-Log: (Y)N Water Samples: (Y)N	Filter Pack Location: none Type: Quantity (ft^3): 0
Recorded By: Mike Wolf WYPG#614 Date Started: 12/11/09 12:45 Date Finished: 12/22/09	Top of Casing Elevation: 4,282.62 M.P. Height: 1.38 Ground Elevation: 4,281.24	Protective Casing:(Y)N Dia: 8" Type: Locking Steel Depth: 3.0 (ft)

Remarks:

From	To	Drilling Log: (Geology, drilling and water conditions, and sampling)	Time
0	15	Sandy siltstone; buff-brown, clay rich, moderately friable	
15	36	Claystone; grey-brown-buff, moderate silt content	
36	52	Siltstone; grey, little sandy, moderately friable	
52	62	Claystone; grey, little silt content	
62	80	Siltstone; grey, little sandy, very, very fine grained	
80	101	Sandstone/siltstone; grey, very, very fine	
101	121	Claystone; dark grey, moderately carbonaceous, fissile	
121	204	Sandy siltstone; grey to dark grey, moderate clay content, hard 171'-173.5'	
204	245	Sandy siltstone; grey, very, very fine, friable, hard 206.5'-207.5' & 231'-232'	
245	265	Claystone; grey, fissile	
265	291	Sandy siltstone; grey to light grey, very, very fine, hard at 284'-286'	
291	300	Claystone; dark grey, carbonaceous, fissile	
300	312	Sandy/siltstone; light grey, very, very fine, little friable	
312	336	Claystone; grey to medium dark grey	
336	372	Sandstone; grey to light grey, very, very fine, very silty, hard 345'-346' & 350'-350.5'	
372	409	Claystone; grey to medium dark grey, fissile	
409	435	Sandstone; light grey, salt & pepper, very, very fine, friable to soft	
435	468	Claystone; dark grey, fissile, moderately carbonaceous	
468	562	Sandstone; light grey, very, very fine, very soft, very silty, very friable, moderately silty, clay rich 486'-492' & 519'-525'	
562	570	Claystone; grey, fissile	

3 WELLS

FORM U.W.6
Rev 8/00

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BUILDING
CHEYENNE, WYOMING 82002
(307) 777-6163

MAY 24 2002

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 132537 NAME OF WELL (SPRING) STRONG #1

1. NAME OF OWNER GEORGE & CAROL STRONG

2. ADDRESS 3003 New Haven Rd
Please check if address has changed from that shown on permit
City Oshoto State Wyoming Zip Code 82721 Phone No. 307 467-5765

3. USE OF WATER: Domestic [X] Stock Watering [X] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous [ ]
Monitor or Test [ ] Coal Bed Methane [ ] Explain proposed use (Example: One single family dwelling) One family dwelling and livestock watering

4. LOCATION OF WELL (SPRING): NW ¼ NW ¼ of Section 30, T 53 N., R. 67 W., of the 6th P.M. (or W.R.M.),

Subdivision Name _____ Lot _____ Block _____

If surveyed, bearing, distance and reference point: _____

5. TYPE OF CONSTRUCTION: Drilled [X] Rotary (Type of Rig) Dug [ ] Driven [ ] Other [ ]

Describe: _____

6. CONSTRUCTION: Total Depth of Well/Spring 330 ft.

Depth to Static Water Level 27 ft. (Below land surface)

a. Diameter of borehole (Bit size) 7 7/8 inches.

b. Casing Schedule New [X] Used [ ]

6" diameter from 0 ft. to 10 ft. Material PVC SCH 80 250 psi Gage SDR17

8" diameter from 10 ft. to 330 ft. Material PVC 250 psi Gage SDR17

c. Was casing cemented? Yes [ ] No [X] Cemented Interval. From _____ feet to _____ feet.

d. Number of sacks of cement used _____ type of cement _____

e. Perforations: Type of perforator used _____
Size of perforations _____ inches by _____ inches.

Number of perforations and depths where perforated:
_____ perforations from _____ ft. to _____ feet.
_____ perforations from _____ ft. to _____ feet.

f. Was well screen installed? Yes [X] No [ ]
Diameter: 5" slot size: 0.25 set from 260 feet to 330
Diameter: _____ slot size: _____ set from _____ feet to _____

g. Was well gravel packed? Yes [ ] No [X] Size of gravel _____

h. Was surface casing used: Yes [ ] No [X] Was it cemented in place? Yes [ ] No [ ]

7. NAME & ADDRESS OF DRILLING COMPANY Murphy Drilling Moorcroft Wyo. 82721

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) October 29, 2001

9. PUMP INFORMATION: Manufacturer Gould Type Submersible
Source of power Electricity Horsepower 1½ Depth of Pump Setting or intake 240 ft.
Amount of Water Being Pumped 12 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Gallons Used Per Calendar Year. Unknown 325,000 gallons

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well).
If well yields artesian flow or if spring, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of wate
The flow is controlled by: valve [ ] cap [ ] plug [ ]
Does well leak around casing? Yes [ ] No [ ]

Permit No. U.W. 132537 Book No. 990 Page No. 38

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.) _____

12. PUMP TEST: Was a pump test made? Yes ☐ No ☒
If so, by whom _____ Address _____
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

13. LOG OF WELL: Total depth drilled 330 feet.
Depth of completed well 330 feet. Diameter of well 5 inches.
Depth to first water bearing formation 265 feet.
Depth to principal water bearing formation. Top 265 feet to Bottom 330 feet.

Ground Elevation, if known _____

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
0	10	Bc Clay	packer 20'	260-330	260-330
10	30	Sand Tull River	packer 260'	LARAMIE Sand	
30	130	BL Clay with			
		streaks of blue			
		shale			
130	265	Dark Redish			
		Brown Clay			
265	330	White Sand			

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ☐ No ☒
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Carol F. Hong George Hong
Signature of Owner or Authorized Agent

November 8, 20 01
Date

U.W. 132537 FOR STATE ENGINEER'S USE ONLY

Date of Receipt NOV 13 2001, 20 ____

Date of Priority 2/8/2001, 20 ____

Date of Approval January 28, 20 02

Karen Fortin
for State Engineer

005

SCANNED

Permit No. U.W. 645

Form UW4

THE HALL COMPANY, SHERIDAN 10309

STATEMENT OF COMPLETION OR ABANDONMENT OF PERMIT NO. U. W. 645 UNDERGROUND WATERS

(Under Chapter 169, Session Laws of Wyoming, 1957)

WATER DIVISION NO. 2 UNDERGROUND WATER DISTRICT Crook County

We, X, Ray W. Robinson & Edna B. Robinson, of Sundance

County of Crook, State of Wyoming, being duly sworn according to law, upon ~~my~~ our oath say:

1. The name s of the permittee or present owners Ray W. Robinson
Edna B. Robinson.

2. The postoffice address of the permittee or present owners Sundance, Wyoming.

3. The name of the well is Robinson No. 3. (Designate by name and number)

4. Description of well: Location, _____ (Give course and distance) feet from the _____ corner of Section _____ T. _____ N., R. _____ W., and is in the NW¼, NW¼ (Designate Subdivision) of Section 20, T. 53 N., R. 67 W.; the type of well is drilled (Drilled, dug, driven or jetted); total depth, 120 feet; depth to water in the well below land surface is 70 feet; the diameter of well at top is 6 inches, and at bottom 6 inches; kind of casing, if any, is steel 9# per foot; if artesian, is well equipped with gate valve? _____; name and address of driller Doug Hitshew
Newcastle, Wyoming.

Date of commencement of well before Nov. 30, 1961.

Date of completion of well before Dec. 30, 1961.

5. If well under this permit is to be abandoned, please state reasons for abandonment. (If well has been abandoned, it will not be necessary to complete the balance of this form, except for log of well, Item 14, and signature before a Notary Public).

6. Description of pump: Make Avance; type semi-jet (Centrifugal, turbine, rotary, plunger); rated capacity of pump 20 (If known) gal. per minute.

7. Description of power plant: Method of operation Electric Motor (Electric motor, steam or gasoline engine, etc.); Horsepower of engine or motor 1/3 H.P.

8. Give date pump and power plant were installed and works completed before Dec. 30, 1961.

9. Record of Pumping Test (to be supplied by person or firm making test; Name and address of person making test) Doug Hitshew, Newcastle, Wyoming

date of test, before Dec. 30, 1961; depth to water before test, 16 feet, and immediately afterward 90 feet; Length of test, 1½ hours; average discharge, 20 Gal. per minute.

10. Actual cost of well and pumping equipment 600 Dollars.

Comp. No. U.W. 645

11. If well is for irrigation purposes, and acreage to be served by well differs from lands described in permit, please re-describe lands in space below:

12. Depth at which main source of water was encountered is 70 to 90 feet, and the water bearing formation is sand
(Sand, gravel, shale, clay, limestone, sandstone, etc.)

13. If other water sources were found give depth to each.

100 - 110 feet.

feet.

14. **LOG OF WELL**

TYPE OF MATERIAL ENCOUNTERED (Give color and tell whether hard or soft)	DEPTH IN FEET From	To	Thickness in feet	REMARKS (Especially information as to water found)
Sand Rock	0	10	10	
Clay	10	20	10	
Shale	20	70	50	
Water Sand	70	90	20	
Shale	90	100	10	
Water Sand	100	110	10	
Shale	110	120	10	

Remarks:

(Signed) Ray W. Robinson
Edna B. Robinson

THE STATE OF WYOMING,
COUNTY OF Crook } ss.

I hereby certify that the foregoing statement was signed in my presence and sworn to before me by Ray W. Robinson & Edna B. Robinson this 13th day of Feb., 1962.

(SEAL)

Ivan H. Cressman
Notary Public

My Commission expires April 26, 1962.

Date of Receipt February 14, 1962.

Earl Lloyd
Earl Lloyd, State Engineer.

Form U.W. 6
Rev. 2-83

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

MICRO FILMED MAR 26 '90

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 78471 NAME OF WELL Robinson #4

1. NAME OF OWNER George and Carol Strong

2. ADDRESS General Delivery Oshoto, Wy Zip Code 82724

3. USE OF WATER: Domestic ☒ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
Water to be used for domestic & stock watering on ranch

4. LOCATION OF WELL: NW ¼ NW ¼ of Section 20, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically 500 ft. South and 600 ft. West of property line. (Bearing and Distance)
or 500 ft. ~~North~~ South and 600 ft. ~~East~~ West from the NW corner of Section 20, T. 53 N., R. 67 W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
Other

6. CONSTRUCTION: Total Depth of Well 600 ft. Depth to Static Water Level 40 ft.

a. Casing Schedule New ☒ Used ☐

7"	diameter from 0 ft. to 600 ft.	Material	Steel	Gage	¼ thick
	diameter from ft. to ft.	Material		Gage	
	diameter from ft. to ft.	Material		Gage	

b. Perforations: Type of perforator used C/R - CCL

Size of perforations ⅜ inches by ⅜ inches.

Number of perforations and depths where perforated:

15 perforations from 448 ft. to 476 feet.

10 perforations from 183 ft. to 203 feet.

c. Was well screen installed? Yes ☐ No ☒

Diameter: slot size: set from feet to feet.

Diameter: slot size: set from . feet to feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel

e. Was surface casing used? Yes ☒ No ☐ Was it cemented in place? Yes ☒ No

7. NAME & ADDRESS OF DRILLER Cyclone Drilling Co. Gillette, Wy 82716

8. DATE OF COMPLETION OF WELL (Including pump installation) ~~November~~ December, 1988

9. PUMP INFORMATION: Manufacturer Gould Type Submersible

Source of power Electricity Horsepower ½ HP Depth of Pump Setting 300 ft.

Amount of Water Being Pumped 2 Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 78471 Book No. 565 Page No. 75

U.W. 78474

10. PUMP TEST: Was a pump test made? Yes ☐ No ☒

If so, by whom _____ Address _____

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. FLOWING WELL (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch. or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. LOG OF WELL: Total depth drilled 600 feet.

Depth of completed well 600 feet. Diameter of well 9½ inches.

Depth to first water bearing formation 183 feet.

Depth to principal water bearing formation. Top 448 feet to Bottom 476 feet.

Ground Elevation, if known ~~Approx~~ 4300 ft.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
183	203	Water sand		X	X
448	476	Black shale - sand		X	X
	600'		Cemented bottom		

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☐ No ☒

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good ☐ Acceptable ☒ Poor ☐ Unusable ☐

U.W. 78474

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Town-Ship	Range	Sec	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
53	67	20						X											

House & Stock tank

TOTAL NUMBER OF ACRES TO BE IRRIGATED _____

Original Supply _____ acres

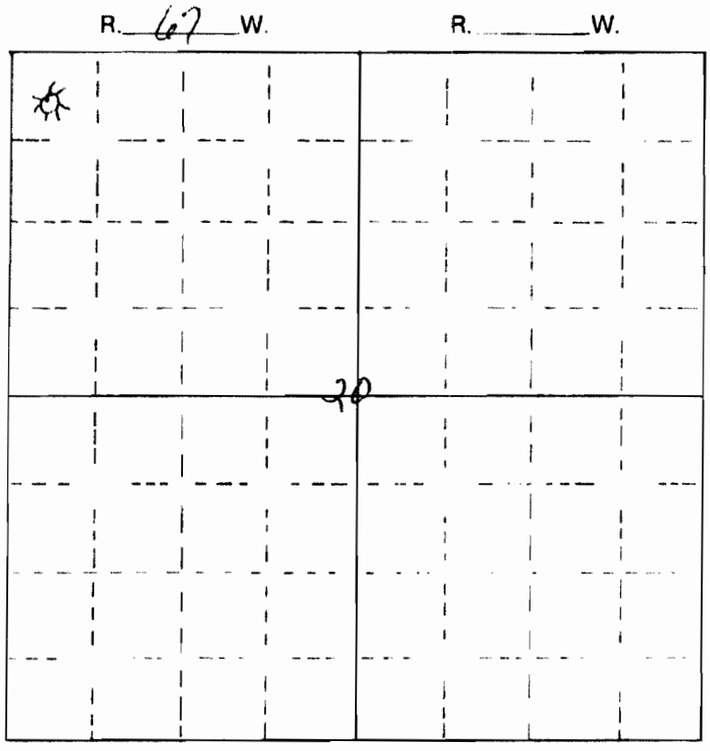
Additional Supply _____ acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.



REMARKS: _____

15. **IF WELL IS TO BE ABANDONED**, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment and details of the plugging below.

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Carol Stang
Signature of Owner or Authorized Agent

October 31, 1989
Date

U.W. 78474

Date of Receipt NOV 2 1989, 19

Date of Priority November 9, 19 88

Date of Approval DEC. 1 5 1989, 19

for State Engineer

COPY TO U.S.G.S.: 1-15-71

Form U.W. 7

IF WELL IS TO BE ABANDONED, SEE ITEM 20

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

for Domestic or Stock Watering Use Only

A preferred water right is given to such use when the yield or flow does not exceed .056 cubic feet per second or 25 gallons per minute. Domestic use refers to household use and the watering of lawns and gardens for family use, not to exceed one acre.

Permit No. U.W. 7320

Temporary Filing No. 4-1-367

Water Division No. 2 (7)

U.W. District Crook County

**Completed Prior to May 24, 1969 [X]

NAME OF WELL Berger No 3

1. Owner Harry J Berger
2. Address Estate c/o Box 22729
3. Agent to receive correspondence Harry J Berger Estate c/o Box 22729
4. Name & address of driller D Whitehouse unknown
5. Well is constructed on lands owned by Harry J Berger (Obtaining of easement or right of way is the responsibility of the applicant's. Include copy if land is privately owned and owner is not a co-applicant.)
6. Type of construction: Dug ☐ Drilled [X] R R Type of Rig
   Driven ☐ Jet ☐ Other Pump
7. Use of Water—Domestic ☐ Stock [X]
8. Means of conveyance, distance and direction to point of use Pipe to tank 4 ft West
9. Date started Aug 1, 1961
10. Date completed Aug 5, 1961. (including pump)
11. Date after completion when water was used Aug 5, 1961.
12. WELL DESCRIPTION
    Total Depth 434 Depth to Water Level 6 ft.
13. TEST DATA
    Yield 4 G.P.M., How Tested Pumped
    Drawdown ____ Length of Test 4
14. PUMP DATA
    Type Cylinder (Turbine, Centrifugal, etc.) Power Source Motor (Elec., Gas, etc.)
    Horsepower ____ Amount of Water Being Used 4 (Gallons per Minute)
15. CASING RECORD

Plain Casing

Size	6 in	Kind	Steel	from 0 ft. to	434 ft.
Size		Kind		from ____ ft. to	____ ft.
Size		Kind		from ____ ft. to	____ ft.

Perforated Casing

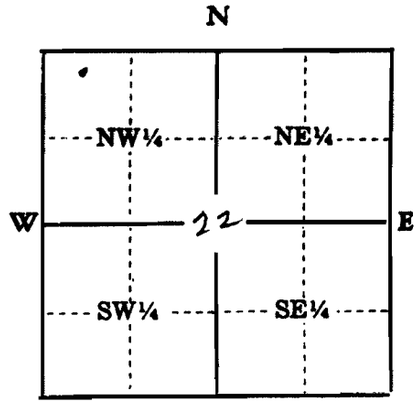
Size		Kind	Unknown	from ____ ft. to	____ ft.
Size		Kind		from ____ ft. to	____ ft.

WELL LOCATION

Croop County

NW ¼ of NW ¼ of Sec 22

T. 53 N., R. 67 W.



Scale: 2" = 1 mile

Above diagram represents one full section. Locate well accurately in small square representing 40 ac. or fill in the following:

Lot ____ & Block ____ or Tract ____

of the ____ (Subdivision or Addition)

of ____ (City, Town or County)

Section ____, T. ____ N., R. ____ W.

**For wells constructed after May 24, 1969, Application Form U.W. 5 must be submitted prior to construction.

Permit No. U.W. 7320

Book No. 41 Page No. 167

THE MILLS COMPANY, SHERIDAN 127214

U.W. 7325

16. Was surface seal provided? Yes ☐ No ☐ To What Depth_____ Material used: _____
Was well gravel packed? Yes ☐ No ☐

17. FLOWING WELL (Owner is responsible for installing control device on flowing well.)
Does well flow? Yes ☐ No ☒
Flow controlled by: Valve ☐ Cap ☐ Plug ☐ Does well leak around casing? Yes ☐ No ☒

18. LOG OF WELL—Clearly indicate first water bearing material and principal water bearing material.

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
90	100			Water sand	

19. QUALITY OF WATER INFORMATION
Was a chemical analysis made? Yes ☐ No ☐
If so, please include a copy of the analysis with this form.
If not, do you consider the water as: Good ☒ Acceptable ☐ Poor ☐ Unusable ☐
Was a bacteriological analysis made? Yes ☐ No ☐
If a domestic well, was the well disinfected by the driller? Yes ☐ No ☐

20. IF WELL IS TO BE ABANDONED, complete only Items 1 through 6, Item 10 and Item 18 (Log of Well) and state reason for abandonment below.
It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harry J. Berger
Signature of Owner or Authorized Agent

Dec 1, 1970
Date

Date of Receipt: December 11, 1970

Date of Priority: August 10, 1951

Sylvia H. Ross

Date of Approval: 21 December, 1970

Sylvia H. Ross
for State Engineer

299

SCANNED

Permit No. U.W. 619

Form UW4 THE HILLS COMPANY, SHERIDAN 101537

STATEMENT OF COMPLETION OR ABANDONMENT OF PERMIT NO. U. W. 619 UNDERGROUND WATERS

(Under Chapter 169, Session Laws of Wyoming, 1957)

WATER DIVISION NO. 2 UNDERGROUND WATER DISTRICT Crook County

We, X Ray W Robinson & Edna B. Robinson, of Sundance,

County of Crook, State of Wyoming, being duly sworn according to law, upon my oath say:

1. The names of the permittee or present owners Ray W. Robinson and Edna B. Robinson.

2. The postoffice address of the permittee or present owners Sundance, Wyoming.

3. The name of the well is Robinson No. 2. (Designate by name and number)

4. Description of well: Location, (Give course and distance) feet from the corner of Section T. N., R. W., and is in the NE¼, NE¼ (Designate Subdivision) of Section 30, T. 53 N., R. 67 W.; the type of well is drilled (Drilled, dug, driven or jetted); total depth, 120 feet; depth to water in the well below land surface is 90 feet; the diameter of well at top is 6 inches, and at bottom 6 inches; kind of casing, if any, is 9# per foot; if artesian, is well equipped with gate valve? ; name and address of driller Doug Hitshew Newcastle, Wyo.

Date of commencement of well before Nov. 15, 1961.

Date of completion of well before Dec. 15, 1961.

5. If well under this permit is to be abandoned, please state reasons for abandonment. (If well has been abandoned, it will not be necessary to complete the balance of this form, except for log of well, Item 14, and signature before a Notary Public).

6. Description of pump: Make Cylinder & Windmill; type (Centrifugal, turbine, rotary, plunger); rated capacity of pump (If known) gal. per minute.

7. Description of power plant: Method of operation Windmill (Electric motor, steam or gasoline engine, etc.); Horsepower of engine or motor .

8. Give date pump and power plant were installed and works completed before Dec. 15, 1961.

9. Record of Pumping Test (to be supplied by person or firm making test; Name and address of person making test) Doug Hitshew, Newcastle, Wyo.

date of test, before Dec. 15, 1961; depth to water before test, 60 feet, and immediately afterward 80 feet; Length of test, 1½ hours; average discharge, 25 Gal. per minute.

10. Actual cost of well and pumping equipment $750 Dollars.

COMP. NO. U.W. 619

11. If well is for irrigation purposes, and acreage to be served by well differs from lands described in permit, please re-describe lands in space below:

12. Depth at which main source of water was encountered is 90-110 feet, and the water bearing formation is Sand.
(Sand, gravel, shale, clay, limestone, sandstone, etc.)

13. If other water sources were found give depth to each.

.....feet.

.....feet.

14. LOG OF WELL

TYPE OF MATERIAL ENCOUNTERED (Give color and tell whether hard or soft)	DEPTH IN FEET From	To	Thickness in feet	REMARKS (Especially Information as to water found)
Sand Rock	0	10	10	
Shale	10	50	40	
Quicksand	50	90	40	
Water Sand	90	110	20	
Shale	110	120	10	

Remarks:

(Signed) Ray W Robinson
Edna B. Robinson

THE STATE OF WYOMING,
COUNTY OF Crook } ss.

I hereby certify that the foregoing statement was signed in my presence and sworn to before me by Ray W Robinson & Edna B Robinson this 13 day of Feb., 19 62

(SEAL)

Ivan H. Cressman
Notary Public

My Commission expires April 26, 19 62.

Date of Receipt February 14, 1962.

Earl Lloyd
Earl Lloyd, State Engineer.

Form U.W. 6
Rev. 2-83

STATE OF WYOMING

SCANNED AUG 0 1 2007

OFFICE OF THE STATE ENGINEER

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

FILMED AUG 6 '86

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 72004 NAME OF WELL Kiehl Water Well No 1 Overfiling

1. NAME OF OWNER ~~Petroleum Inc. Dave Reynolds~~ ASSIGNED: SEE CURRENT ENDORSEMENT

2. ADDRESS P.O. Box 60, Casper, WY Zip Code 82602-0060

3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ~~☒~~ delete Miscellaneous ☐ (per perm. 4) WF

4. LOCATION OF WELL: SE ¼ SE ¼ of Section 30, T. 53 N., R. 67 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically 1202.86' N 58°43'09" W of the SE corner Section 30 (Bearing and Distance)
or 623.37 ft. North ~~South~~ and 1032.9 ft. ~~East~~ West from the SE corner of Section 30, T. 53 N., R. 67 W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
Other

6. CONSTRUCTION: Total Depth of Well 662 ft. Depth to Static Water Level 220 ft.

a. Casing Schedule New ☒ Used ☐

7" O.D.	diameter from 0 ft. to 664.82 ft.	Material		Gage	
	diameter from ft. to ft.	Material		Gage	
	diameter from ft. to ft.	Material		Gage	

b. Perforations: Type of perforator used Wireline conveyed, 4" hollow steel carrier, jet shots

Size of perforations .40 inches by .40 inches.

Number of perforations and depths where perforated:

200	perforations from	390	ft. to	440 feet.
60		552		567
104	perforations from	590	ft. to	617 feet.

RECEIVED APR 2 1986 STATE ENGINEER Cheyenne, Wyo.

c. Was well screen installed? Yes ☐ No ☒

Diameter: N/A slot size: set from feet to feet.

Diameter: slot size: set from feet to feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel N/A

e. Was surface casing used? Yes ☒ No ☐ Was it cemented in place? Yes ☐ No ☒

7. NAME & ADDRESS OF DRILLER N.R. Bideau Drilling, 2131 Kingsboro Rd., Casper, WY 82604

8. DATE OF COMPLETION OF WELL (including pump installation) August 6, 1985

9. PUMP INFORMATION: Manufacturer Standard/Gould Type electric - submergible

Source of power Tri-county Horsepower 7½ Depth of Pump Setting 390

Amount of Water Being Pumped ~~30~~ 25 Gallons Per Minute. (For springs or flowing wells, see item 11.) per permit

Permit No. U.W. 72004 Book No. 500 Page No. 32

U.W. 72004

10. PUMP TEST: Was a pump test made? Yes X No

If so, by whom Petroleum, Inc. Address P.O. Box 60, Casper, WY 82602-0060

Yield: 42 gal./min. with 175 foot drawdown after 3 hours.

Yield: 30 gal./min. with 175 foot drawdown after 48 hours.

11. FLOWING WELL (Owner is responsible for control of flowing well). N/A

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve [ ] cap [ ] plug [ ]

Does well leak around casing? Yes No

12. LOG OF WELL: Total depth drilled 662 feet.

Depth of completed well 662 feet. Diameter of well 9" bore inches.
7" O.D. casing

Depth to first water bearing formation 40 feet.

Depth to principal water bearing formation. Top 390 feet to Bottom 440 feet.

Ground Elevation, if known 4295

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	6	Brown clay			
6	40	Shale			
40	70	Clean sand		Water	
70	90	Sand			
90	150	Greenish shale			
150	190	Sandy shale			
190	260	Shale			
260	280	Sand			
280	390	Shale with sand stringers			
390	440	Clean sand		Water	390-440
440	510	Sandy shale			
510	570	Shale			
570	620	Dirty sand			552-567 & 590-617
620	662	Shale			

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes X No

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good Acceptable Poor Unusable

U.W. 72004

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Town-Ship	Range	Sec	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
53N	67W	30												X				X	X Injection wells 2 total
																	X	X	X Stock tanks 2 total

TOTAL NUMBER OF ACRES TO BE IRRIGATED N/A

Original Supply ___ acres

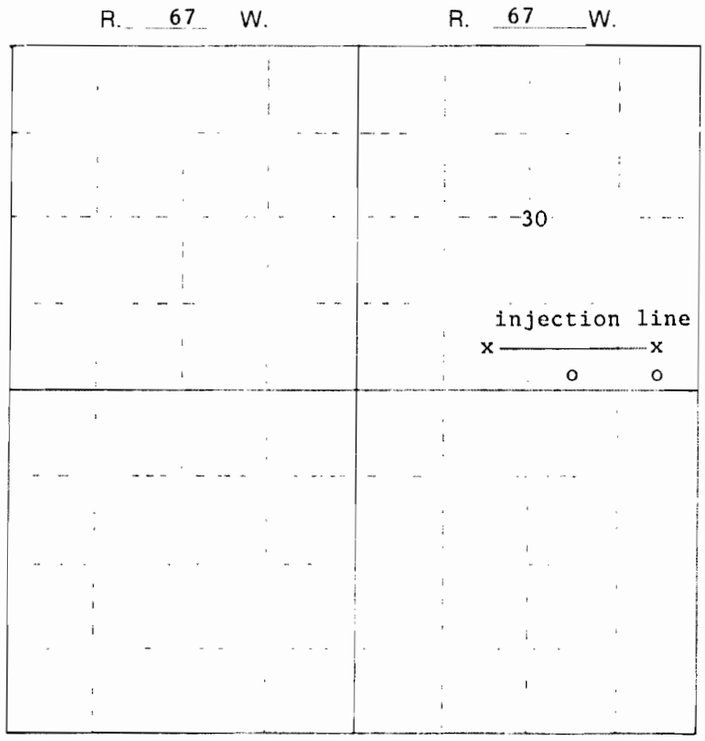
Additional Supply ___ acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.



Scale: 2" = 1 Mile

x = injection wells
o = stock tanks

REMARKS: The water is conveyed from Kiehl Water Well #1 to Kiehl Unit #2 and Kiehl Unit #3 via buried fiberglass injection lines.

15. **IF WELL IS TO BE ABANDONED**, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment and details of the plugging below.

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Thomas G. Smith
Signature of Owner or Authorized Agent

April 1, 1986
Date

U.W. 72004

Date of Receipt APR 1986 4pm, 19

Date of Priority Feb 24, 19 86

Date of Approval July 25, 1986

for State Engineer John L Flint

Form U.W. 6
Rev. 2-83

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

MICRO FILMED MAY 14 '86

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 71108 NAME OF WELL Goodlad #2

1. NAME OF OWNER Philena Blatt

2. ADDRESS 1381 Jamaica Dr. Casper, WY Zip Code ~~82609~~ 82609

3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐

4. LOCATION OF WELL: SE ¼ NE ¼ of Section 2, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically

(Bearing and Distance)

or _____ ft. North South and _____ ft. East West from the _____ corner of Section _____, T. _____ N., R. _____ W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐

Other _____

6. CONSTRUCTION: Total Depth of Well 220 ft. Depth to Static Water Level ~~80~~ 100 ft.

a. Casing Schedule New ☒ Used ☐

6" diameter from 0 ft. to 220 ft. Material Plastic PVC Gage 40

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

b. Perforations: Type of perforator used ~~1/8" slots 1"x1" on 3 sides from 100' to 220'~~ by Skil Saw

Size of perforations 1/8 inches by 12 inches.

Number of perforations and depths where perforated:

3 perforations from 100 ft. to 220 feet.

_____ perforations from _____ ft. to _____ feet.

RECEIVED FEB 6 1986 STATE ENGINEER Cheyenne, Wyo.

c. Was well screen installed? Yes ☐ No ☒

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

d. Was well gravel packed? Yes ☒ No ☐ Size of gravel 3/4"

e. Was surface casing used? Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☒

7. NAME & ADDRESS OF DRILLER Sullivan Drilling P.O. Box 3974 Gillette, WY 82716

8. DATE OF COMPLETION OF WELL (including pump installation) November 12, 1985

9. PUMP INFORMATION: Manufacturer FE MYERS Co. Type Submersible

Source of power Electric Horsepower 2½ Depth of Pump Setting 200'

Amount of Water Being Pumped 15 Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 71108 Book No. 491 Page No. 36

10. PUMP TEST: Was a pump test made? Yes [ ] No [X]

If so, by whom _____ Address _____

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. FLOWING WELL (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve [ ] cap [ ] plug [ ]

Does well leak around casing? Yes [ ] No [ ]

12. LOG OF WELL: Total depth drilled 220' feet.

Depth of completed well 220 feet. Diameter of well 6 inches.

Depth to first water bearing formation 100 feet.

Depth to principal water bearing formation. Top 100 feet to Bottom 210 feet.

Ground Elevation, if known _____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	5	Surface			
5	15	Clay			
15	80	Brown Sand			
80	100	Shale			✓
100	140	Water Sand		✓	✓
140	170	Shale			✓
170	210	Water Sand		✓	✓
210	220	Shale			

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes [ ] No [X]

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good [ ] Acceptable [X] Poor [ ] Unusable

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Township	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
53	68	2				X													

TOTAL NUMBER OF ACRES TO BE IRRIGATED

Original Supply _____ acres

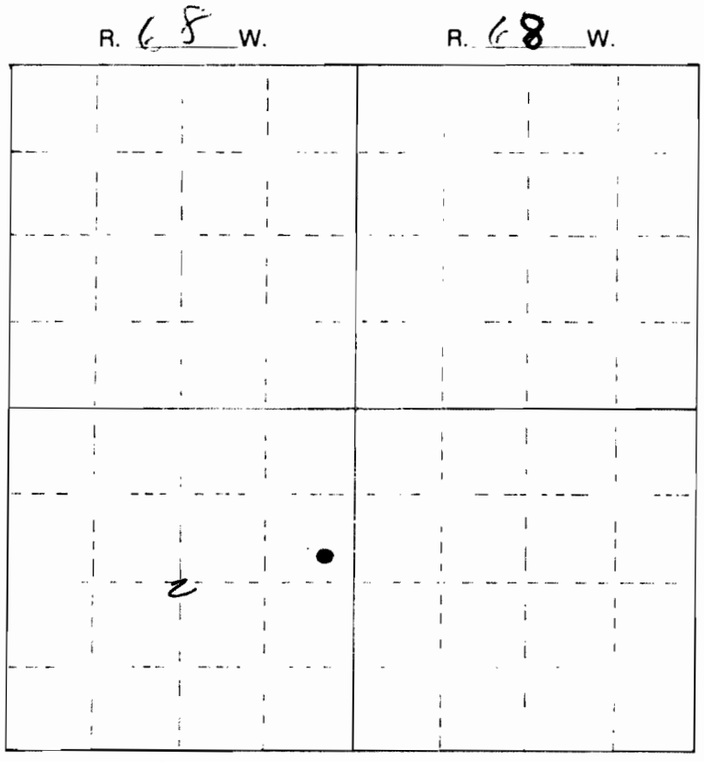
Additional Supply _____ acres

14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.



Scale: 2" = 1 Mile

REMARKS: Stock water

15. IF WELL IS TO BE ABANDONED, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment and details of the plugging below.

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harold J. Burch Jr. — Signature of Owner or Authorized Agent

January 28, 1986 — Date

Date of Receipt FEB 6 1986, 19

Date of Priority Sept 10, 19 85

Date of Approval May 14, 19 86

for State Engineer John L. Flint

Form U.W. 6

RECEIVED
DEC 13 1979
STATE ENGINEER
Cheyenne, Wyo.

MICRO. FILMED FEB 20 '80

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 50113 NAME OF WELL ~~Goodlad Well #3~~

1. NAME OF OWNER Harold Burch Jr. and Mrs. Philena Blatt
2. ADDRESS Oshoto, Wyoming Zip Code 82724
3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
4. LOCATION OF WELL: SW ¼ NE ¼ of Section 2, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically (Bearing and Distance) or 2640 ft. ~~North~~ South and 2640 ft. ~~East~~ West from the NE corner of Section 2, T. 53 N., R. 68 W. (Strike out words not needed).
5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
   Other
6. CONSTRUCTION: Total Depth of Well 40 ft. Depth to Static Water Level 8 ft.
   a. Casing Schedule New ☒ Used ☐
   5" diameter from 0' ft. to 40 ft. Material plastic Gage 3/8"
   diameter from ft. to ft. Material Gage
   diameter from ft. to ft. Material Gage
   b. Perforations: Type of perforator used hack saw
   Size of perforations 1/16 inches by 1 inches.
   Number of perforations and depths where perforated:
   120 perforations from 10 ft. to 40 feet.
   perforations from ft. to feet.
   c. Was well screen installed? Yes ☐ No ☒
   Diameter: slot size: set from feet to feet.
   Diameter: slot size: set from feet to feet.
   d. Was well gravel packed? Yes ☒ No ☐ Size of gravel 1" diameter
   e. Was surface casing used Yes ☐ No ☐ Was it cemented in place? Yes ☐ No ☐
7. NAME & ADDRESS OF DRILLER Mr. B.B. Murphee, Moorcroft, Wyoming 82721
8. DATE OF COMPLETION OF WELL (including pump installation) December 16, 1979
9. PUMP INFORMATION: Manufacturer Meyers Type Submersible
   Source of power electricity Horsepower ½ Depth of Pump Setting 25'
   Amount of Water Being Pumped 5 Gallons Per Minute. (For springs or flowing wells, see item 11.)
   per U.W.5 GW.

Permit No. U.W.

Book No. 281 Page No. 46

C.C. 5013

10. **PUMP TEST:** Was a pump test made? Yes ☐ No ☒

If so, by whom_____ Address_____

Yield: _____gal./min. with_____foot drawdown after_____hours.

Yield: _____gal./min. with_____foot drawdown after_____hours.

11. **FLOWING WELL** (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is_____gal./min. Surface pressure is_____lb./sq. inch, or_____feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL:** Total depth drilled 40 feet.

Depth of completed well 40 feet. Diameter of well 9 inches.

Depth to first water bearing formation 8 feet.

Depth to principal water bearing formation Top 8 feet to Bottom 40 feet.

Ground Elevation, if known_____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	40	2-20' joints plastic pipe	Packed around casing with 1" crushed rock	8' to 40'	10' to 40'

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☐ No ☒

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

Form U.W. 6
Rev. 2-83

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

MICRO FILMED SEP 07 '93

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 84665 NAME OF WELL Goodlad #3

1. NAME OF OWNER Philena Blatt

2. ADDRESS 1930 E. 12th Apt 326 Casper, WY Zip Code 82609

3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
Windmill

4. LOCATION OF WELL: SW ¼ NW ¼ of Section 2, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.),
Wyoming, being specifically _____ (Bearing and Distance)
or _____ ft. North South and _____ ft. East West from the _____ corner of Section _____, T. _____ N., R. _____ W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☐ Cable Tool (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
Other Drilled

6. CONSTRUCTION: Total Depth of Well 50 ft. Depth to Static Water Level 20' ft.

a. Casing Schedule New☐ Used ☐

6 5/8" diameter from 0 ft. to 43 ft. Material Steel Gage 14 # per ft

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____

b. Perforations: Type of perforator used Holes cut with Torch

Size of perforations 1/2 inches by 1/2 inches.

Number of perforations and depths where perforated:

40 perforations from 20 ft. to 43 feet.

_____ perforations from _____ ft. to _____ feet.

RECEIVED MAY 20 1991 STATE ENGINEER Cheyenne, Wyo. KK

c. Was well screen installed? Yes ☐ No ☒

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

Diameter: _____ slot size: _____ set from _____ feet to _____ feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____

e. Was surface casing used? Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLER Cook Bros Box 6 Manville Wyo

8. DATE OF COMPLETION OF WELL (including pump installation) May 13, 1991 per letter rec'd 6-11-91

9. PUMP INFORMATION: Manufacturer Wind mill (Aermotor) Type _____

Source of power _____ Horsepower _____ Depth of Pump Setting 30'

Amount of Water Being Pumped 5 Gallons Per Minute. (For springs or flowing wells, see item 11.)

Permit No. U.W. 84665 Book No. 627 Page No. 66

UU 34665

10. PUMP TEST: Was a pump test made? Yes ☒ No ☐

If so, by whom Bailed ____ Address [illegible]

Yield: 20 gal./min. with 10 foot drawdown after 1 hours.

Yield: ____ gal./min. with ____ foot drawdown after ____ hours.

11. FLOWING WELL (Owner is responsible for control of flowing well).

If well yields artesian flow, yield is ____ gal./min. Surface pressure is ____ lb./sq. inch, or ____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. LOG OF WELL: Total depth drilled 50 feet.

Depth of completed well 50 feet. Diameter of well [illegible] inches.

Depth to first water bearing formation 30' feet.

Depth to principal water bearing formation. Top 30 feet to Bottom 50 feet.

Ground Elevation, if known ____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	10	Brown clay			
10	20	Sandy clay Brown			
20	40	Sand - Gravel	[illegible]	Fox Hills	20' - 43

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☐ No ☒

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

LUC 84605

13. TABULATION

a. If for irrigation, the land proposed to be irrigated should be described in the following tabulation. Describe in the "Remarks" section, under Item 14, the means of conveying the water to the lands and the method of irrigation.

(Give irrigable acreage in each legal subdivision. If proposed use is for additional supply for lands with a right from another source, indicate in the tabulation the priority or permit number, the source of supply and the name of the ditch or other well.)

b. If not used for irrigation, show the area and point(s) of use and location of well in the tabulation below. Also describe the method of conveyance in the "Remarks" section under Item 14.

Town-Ship	Range	Sec.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
53	68	2							X										

TOTAL NUMBER OF ACRES TO BE IRRIGATED_____

Original Supply _____ acres

Additional Supply _____ acres

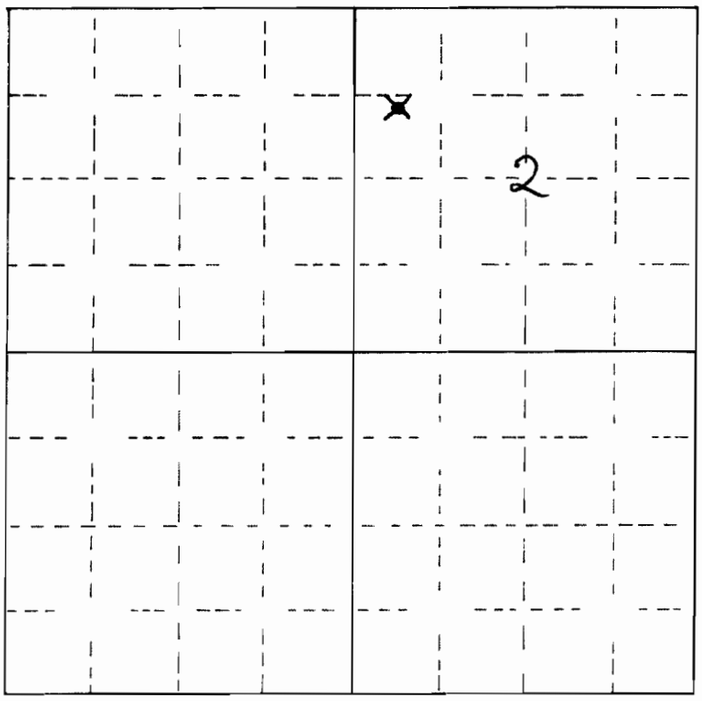
14. PLAT

a. If the well is to be used for irrigation, industrial, miscellaneous or municipal use, show the location of the well on the plat below. For such uses, a plat certified by a licensed engineer or land surveyor is required to be submitted at the time the Proof of Appropriation and Beneficial Use of Ground Water is submitted.

b. For other uses, accurately show the well location, point of use or uses and describe method of conveyance of water to points of use on plat and in "Remarks" section below. Make certain location on plat agrees with written description.

c. A separate map may be submitted if the information required cannot be shown on this plat.

R._____W. R. 68 W.



Scale: 2" = 1 Mile

T. 53 N.

T._____N.

REMARKS: _____

15. IF WELL IS TO BE ABANDONED, complete Items 1 through 8, Item 12 (Log of Well) and state reason for abandonment and details of the plugging below.

It is the responsibility of the owner to properly plug or fill in the well in order to prevent contamination of ground water and to cover or cap the well at ground level.

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Harold G. Burch Jr. — Signature of Owner or Authorized Agent

May 13 19 91 — Date

LIL 54662

Date of Receipt MAY 20 1991 , 19

Date of Priority March 25, 1991 , 19

Date of Approval JUL 5 1991 , 19

for State Engineer

FORM U.W.6
Rev. 8/00

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BUILDING
CHEYENNE, WYOMING 82002
(307) 777-6163

SCANNED JAN 16 2006

MICRO FILMED JUN [illegible]

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 148750 NAME OF WELL (SPRING) Z-1

1. NAME OF OWNER GRACE ZIMMERSCHIED

2. ADDRESS 300 Cabin Creek rd.
☐ Please check if address has changed from that shown on permit
City Carlile State Wyo. Zip Code 82721 Phone No. 756-3287

3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
Monitor or Test ☐ Coal Bed Methane ☐ Explain proposed use (Example: One single family dwelling) _____

4. LOCATION OF WELL (SPRING): SE ¼ SE ¼ of Section 10, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.),
Subdivision Name 0.5 = Resurvey Lot 15 - Per 610 Lot _____ Block _____ 1-9-2003
If surveyed, bearing, distance and reference point: 415 Ft. FEL 1225' Ft FSL

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Other ☐
Describe: midway 1500 Rotary - Air - Mud

6. CONSTRUCTION: Total Depth of Well/Spring 410 ft.
Depth to Static Water Level 200 ft. (Below land surface)
a. Diameter of borehole (Bit size) 7 7/8 inches.
b. Casing Schedule New ☒ Used ☐
5" diameter from Surface ft. to 410 ft. Material PVC Gage SDR 17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Was casing cemented: Yes ☐ No ☒ Cemented Interval, From _____ feet to _____ feet.
d. Number of sacks of cement used _____ type of cement _____
e. Perforations: Type of perforator used slotted Pipe -
Size of perforations _____ inches by _____ inches.
Number of perforations and depths where perforated:
_____ perforations from 3 ft. to _____ feet.
_____ perforations from _____ ft. to _____ feet.

RECEIVED FEB 5 2003 STATE ENGINEER CHEYENNE, WY

f. Was well screen installed? Yes ☐ No ☒
Diameter: _____ slot size: _____ set from _____ feet to _____.
Diameter: _____ slot size: _____ set from _____ feet to _____.
g. Was well gravel packed? Yes ☒ No ☐ Size of gravel 3/8 Chip / Bentonite Chip Sealed on top of Gravel
h. Was surface casing used: Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☒

7. NAME & ADDRESS OF DRILLING COMPANY Northern Services

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 1-20-03

9. PUMP INFORMATION: Manufacturer Gould Type Submersible
Source of power Generator Horsepower 1 Depth of Pump Setting or intake 300'
Amount of Water Being Pumped 8 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Gallons Used Per Calendar Year. 250,000 gal. ?

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well).
If well yields artesian flow or if spring, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.
The flow is controlled by: valve ☐ cap ☐ plug ☐
Does well leak around casing? Yes ☐ No ☐ NA

Permit No. U.W. 148750 Book No. 1098 Page No. 100

SEE REVERSE SIDE

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.) _____

12. PUMP TEST: Was a pump test made? Yes ☒ No ☐
If so, by whom Kyle Gutierrez. Address 300 Pine Ridge rd. Moorcroft, Wyo. 82721
Yield: 8 gal./min. with NO foot drawdown after 24 hours.
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

13. LOG OF WELL: Total depth drilled 410 feet.
Depth of completed well 410 feet. Diameter of well 7 7/8 inches.
Depth to first water bearing formation 210 feet. 2gal per min - not enough
Depth to principal water bearing formation. Top 320 feet to Bottom 405 feet.

Ground Elevation, if known _____

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
Surface	30'	Sandy Top Soil			
30'	210	[redacted] GRAY SHALE			
210	215	Sandstone -	wet 2gal per min.		
215	320	GRAY SHALE			
320	405	Sand stone -	wet - Appox 25gal Permin.		Slotted
405	410	GRAY SHALE			
					to TD

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ☐ No ☒
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good ☐ Acceptable ☒ Poor ☐ Unusable ☐

REMARKS: Stock Watering only

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Kyle Walker
Signature of Owner or Authorized Agent

2-3-, 2003
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 148750

Date of Receipt FEB 05 2003, 20

Date of Priority JANUARY 8, 2003, 20

Date of Approval December 29, 20 03

Scott A. Hagen
for State Engineer

FORM U.W.8
Rev. 6/00

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BUILDING
CHEYENNE, WYOMING 82002
(307) 777-6163

MICRO FILMED JUL 21 2004

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 146029 NAME OF WELL (SPRING) EVERETT NO. 1

1. NAME OF OWNER GRACE ZIMMERSCHIED

2. ADDRESS 300 Cabin Creek Rd
Please check if address has changed from that shown on permit
City Carlile State Wy. Zip Code 82721 Phone No. 307-756-3287

3. USE OF WATER: Domestic ☐ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
Monitor or Test ☐ Coal Bed Methane ☐ Explain proposed use (Example: One single family dwelling) _____

4. LOCATION OF WELL (SPRING): NE ¼ SW ¼ of Section 11, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.),
Subdivision Name _____ Lot _____ Block _____
If surveyed, bearing, distance and reference point: _____

5. TYPE OF CONSTRUCTION: Drilled ☐ Rotary (Type of Rig) Dug ☐ Driven ☐ Other ☐
Describe: AIR DRILLED

6. CONSTRUCTION: Total Depth of Well/Spring 260 ft.
Depth to Static Water Level 120 ft. (Below land surface)
a. Diameter of borehole (Bit size) 7 7/8 inches.
b. Casing Schedule New ☒ Used ☐
5 diameter from 0 ft. to 260 ft. Material PVC Gage SDR 17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Was casing cemented: Yes ☒ No ☐ Cemented Interval, From 0 feet to 50 feet.
d. Number of sacks of cement used 10 type of cement Redimix
e. Perforations: Type of perforator used Dozz
Size of perforations 1/2 inches by 1/2 inches.
Number of perforations and depths where perforated:
80 perforations from 140 ft. to 160 feet. Shale packer set @ 140 ft
80 perforations from 240 ft. to 260 feet. Shale packer set @ 240 ft
f. Was well screen installed? Yes ☐ No ☒
Diameter: _____ slot size: _____ set from _____ feet to _____.
Diameter: _____ slot size: _____ set from _____ feet to _____.
g. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____
h. Was surface casing used: Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☒

RECEIVED DEC 23 2003 STATE ENGINEER CHEYENNE, WY

RECEIVED NOV 25 2003 STATE ENGINEER CHEYENNE, WY

7. NAME & ADDRESS OF DRILLING COMPANY Powder River Services, LLC
PO Box 7070 Sheridan, WY 82801

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) X Oct 2002

9. PUMP INFORMATION: Manufacturer Duplex Type Pump Jack
Source of power gasoline Motor Horsepower 5.5 Depth of Pump Setting or intake X 192 Feet
Amount of Water Being Pumped X 3 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Gallons Used Per Calendar Year. 75,000 - 90,000

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well).
If well yields artesian flow or if spring, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.
The flow is controlled by: valve ☐ cap ☐ plug ☐
Does well leak around casing? Yes ☐ No ☐

146029

Permit No. U.W. _____ Book No. 1080 Page No. 93

SEE REVERSE SIDE

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.) _____

12. PUMP TEST: Was a pump test made? Yes ☒ No ☐
If so, by whom Powder River Services Address _____
Yield: 5 gal./min. with 100 foot drawdown after 1 hours.
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

13. LOG OF WELL: Total depth drilled 260 feet.
Depth of completed well 260 feet. Diameter of well 7 7/8 inches.
Depth to first water bearing formation 140 feet.
Depth to principal water bearing formation. Top 240 feet to Bottom 260 feet.

Ground Elevation, if known _____

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
0	140	Grey Shale			
140	160	Grey SAND		SAND STRINGER	X
160	240	Grey Shale			
240	260	Grey & White SAND		Top of Lance Creek	X
260	265	Grey Shale			

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ☐ No ☐
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Grace Zimmerschied
Signature of Owner or Authorized Agent

Nov 19, 2003
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 146029

Date of Receipt ~~NOV 25 2003~~ DEC 23 2003

Date of Priority JULY 25, 2002

Date of Approval June 20, 2009

for State Engineer

RECEIVED
JUN 22 1978
STATE ENGINEER
Cheyenne, Wyo.

MICRO-FILMED AUG 8 '79

Form U.W. 6

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

IF WELL IS TO BE ABANDONED, SEE ITEM 15, PAGE 4

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL

PERMIT NO. U.W. 42868 NAME OF WELL Bess # 1

1. NAME OF OWNER James and Bessie Hahn

2. ADDRESS OSHOTO, WYO. (PER U.W.-5) Zip Code 82712

3. USE OF WATER: Domestic ☒ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐

4. LOCATION OF WELL: NW ¼ SE ¼ of Section 14, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.), Wyoming, being specifically
(Bearing and Distance)
or ____ ft. North South and ____ ft. East West from the ____ corner of Section ____, T. ____ N., R. ____ W.
(Strike out words not needed).

5. TYPE OF CONSTRUCTION: Drilled ☒ ROTARY MUD (Type of Rig) Dug ☐ Driven ☐ Jetted ☐
Other ____

6. CONSTRUCTION: Total Depth 243 ft. Depth to Water Level 100 ft.

a. Casing Schedule New ☒ Used ☐

5½" diameter from 0 ft. to 243 ft. Material PLASTIC Gage PVC 200

____ diameter from ____ ft. to ____ ft. Material ____ Gage ____

____ diameter from ____ ft. to ____ ft. Material ____ Gage ____

b. Perforations: Type of perforator used ROUND HOLES

Size of perforations ½ inches by ½ inches.

Number of perforations and depths where perforated:

100 perforations from 180 ft. to 243 feet.

____ perforations from ____ ft. to ____ feet.

c. Was well screen installed? Yes ☐ No ☒

Diameter: ____ slot size: ____ set from ____ feet to ____ feet.

Diameter: ____ slot size: ____ set from ____ feet to ____ feet.

d. Was well gravel packed? Yes ☐ No ☒ Size of gravel ____

e. Was surface casing used Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLER WILLIAMS DRILLING GILLETTE, WYO 82716

8. DATE OF COMPLETION OF WELL (including pump installation) JUNE 12, 1978

9. PUMP INFORMATION: Manufacturer FLINT & WALLING Type SUBMERSIBLE

Source of power ELECTRICITY Horsepower 3/4 Depth of Pump Setting 220 FT

Amount of Water Being Pumped 15 Gallons Per Minute.

Permit No. U.W. 42868 Book No. 230 Page No. 150

U.W. 42868

10. **PUMP TEST: Was a pump test made? Yes ☒ No ☐**

If so, by whom WILLIAMS DRLG, INC Address GILLETTE, WYO

Yield: 25 gal./min. with 80 foot drawdown after 4 hours.

Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

11. **FLOWING WELL (Owner is responsible for control of flowing well).**

If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.

The flow is controlled by: valve ☐ cap ☐ plug ☐

Does well leak around casing? Yes ☐ No ☐

12. **LOG OF WELL: Total depth drilled** 243 **feet.**

Depth of completed well 243 feet. Diameter of well 5½ inches.

Depth to first water bearing formation 140 feet.

Depth to principal water bearing formation Top 180 feet to Bottom 243 feet.

Ground Elevation, if known _____

From Feet	To Feet	Material Type, Texture, Color	REMARKS (Cementing, Shutoff, Packing, etc.)	Indicate Water Bearing Formation	Indicate Perforated Casing Location
0	20	BROWN SAND			
20	30	BROWN SHALE			
30	60	RIVER GRAVEL			
60	140	SANDY SHALE			
140	170	GREY SAND		X	
170	180	SANDY SHALE			
180	243	GREY SAND		X	X

QUALITY OF WATER INFORMATION:

Was a chemical analysis made? Yes ☐ No ☒

If so, please include a copy of the analysis with this form.

If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

FORM U.W.6
Rev. 6/00

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BUILDING
CHEYENNE, WYOMING 82002
(307) 777-6163

MICRO FILMED JUN

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 144030 NAME OF WELL (SPRING) TOWER #2

1. NAME OF OWNER ANTONE SWANDA

2. ADDRESS 486 DEADMAN RD
☐ Please check if address has changed from that shown on permit
City Oshoto State WY Zip Code 82721 Phone No. 467-5299

3. USE OF WATER: Domestic ☒ Stock Watering ☒ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
Monitor or Test ☐ Coal Bed Methane ☐ Explain proposed use (Example: One single family dwelling) ~~one single~~ family dwelling and 3 stock tanks & pipeline

4. LOCATION OF WELL (SPRING): SE ¼ SW ¼ of Section 23, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.),
Subdivision Name N/A Lot _____ Block _____
If surveyed, bearing, distance and reference point: _____

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotary (Type of Rig) Dug ☐ Driven ☐ Other ☐
Describe: Drilled & Cased to 401 ft

6. CONSTRUCTION: Total Depth of Well/Spring 401 ft.
Depth to Static Water Level 200 ft. (Below land surface)
a. Diameter of borehole (Bit size) 7 7/8 inches.
b. Casing Schedule New ☒ Used ☐
5 diameter from 0 ft. to 401 ft. Material PVC Sch 80 Gage SDR 17
_____ diameter from _____ ft. to _____ ft. Material _____ Gage _____
c. Was casing cemented: Yes ☒ No ☐ Cemented Interval, From 0 feet to 10 feet.
d. Number of sacks of cement used 5 type of cement _____
e. Perforations: Type of perforator used slots
Size of perforations ___ inches by ___ inches.
Number of perforations and depths where perforated:
_____ perforations from ___ ft. to ___ feet.
_____ perforations from ___ ft. to ___ feet.

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f. Was well screen installed? Yes ☒ No ☐
Diameter: 5 slot size: 1/8 set from 360 feet to 401.
Diameter: _____ slot size: _____ set from _____ feet to _____.
g. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____
h. Was surface casing used: Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLING COMPANY Powder River Services LLC
P.O Box 7070 Sheridan, WY 82801
8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 7-24-02

9. PUMP INFORMATION: Manufacturer FRANKLIN Type _____
Source of power Electrical Motor Horsepower 15 Depth of Pump Setting or intake 320'
Amount of Water Being Pumped 12 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Gallons Used Per Calendar Year. _____

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well).
If well yields artesian flow or if spring, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.
The flow is controlled by: valve ☐ cap ☐ plug ☐
Does well leak around casing? Yes ☐ No ☐

56

Permit No. U.W. 144030 Book No. 1067 Page No. _____

SEE REVERSE SIDE

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.)

12. PUMP TEST: Was a pump test made? Yes [ ] No [X]
If so, by whom Address
Yield: gal./min. with foot drawdown after hours.
Yield: gal./min. with foot drawdown after hours.

13. LOG OF WELL: Total depth drilled 401 feet.
Depth of completed well 401 feet. Diameter of well inches.
Depth to first water bearing formation 227 feet.
Depth to principal water bearing formation. Top 350 feet to Bottom 395 feet.

Ground Elevation if known

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
0	18	Grey Shale			
18	20	Red Sandstone			
20	30	Red sand			
30	130	Grey Shale			
130	140	Red/Brown Sandstone			
140	227	Grey Shale			
227	235	Grey & Black Sand			
235	350	Grey Shale			
350	352	Rose colored Kyalite			
352	395	white Sand			
395	401	Grey Shale			

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes [ ] No [X]
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good [ ] Acceptable [ ] Poor [ ] Unusable [ ]

REMARKS:

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Signature of Owner or Authorized Agent

11-11, 2003
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W.

Date of Receipt , 20
1/23/2002

Date of Priority , 20

Date of Approval March 19, 2004

for State Engineer

FORM U.W.6
REV. 5-93

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BUILDING
CHEYENNE, WYOMING 82002
(307) 777-5959

MICRO FILMED JUN 20 1996

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

99263

PERMIT NO. U.W. _____ NAME OF WELL (SPRING) REYNOLDS #2

1. NAME OF OWNER DAVID A/BETTY J REYNOLDS

2. ADDRESS 1754 D Road
Please check if address has changed from that shown on permit. ☐
City Moorcroft State Wy Zip Code 82721 Phone No. 307-467-5539

3. USE OF WATER: Domestic ☒ Stock Watering ☐ Irrigation ☐ Municipal ☐ Industrial ☐ Miscellaneous ☐
Explain proposed use (Example: One single family dwelling) _____

4. LOCATION OF WELL (SPRING): NE ¼ SE ¼ of Section 24, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.),
Subdivision Name _____ Lot _____ Block _____
If surveyed, bearing, distance and reference point: _____

5. TYPE OF CONSTRUCTION: Drilled ☒ Rotory (Type of Rig) Dug ☐ Driven ☐ Other ☐
Describe: _____

6. CONSTRUCTION: Total Depth of Well/Spring 100 ft. Depth to Static Water Level 60 ft. (Below land surface)
a. Diameter of borehole (Bit size) 6 inches.

b. Casing Schedule New ☒ Used ☐

4" diameter from 0 ft. to 100 ft. Material Plastic Gage ¼"

4" diameter from 0 ft. to 100 ft. Material Plastic Gage ¼"

c. Was casing cemented: Yes ☐ No ☒ Cemented Interval, From _____ feet to _____ feet.

d. Number of sacks of cement used _____ type of cement _____

e. Perforations: Type of perforator used Slots
Size of perforations 3/4" inches by 3/4" inches.

Number of perforations and depths where perforated:
Continuous perforations from 75 ft. to 100 feet.
_____ perforations from _____ ft. to _____ feet.

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f. Was well screen installed? Yes ☐ No ☒
Diameter: _____ slot size: _____ set from _____ feet to _____
Diameter: _____ slot size: _____ set from _____ feet to _____

g. Was well gravel packed? Yes ☐ No ☒ Size of gravel _____

h. Was surface casing used: Yes ☐ No ☒ Was it cemented in place? Yes ☐ No ☐

7. NAME & ADDRESS OF DRILLING COMPANY Murph Drilling

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) July 1995

9. PUMP INFORMATION: Manufacturer Myers Type Subm.
Source of power Elec. Horsepower ½ Depth of Pump Setting or intake ~~100~~ 75 per letter recd 4-26-96 AJ
Amount of Water Being Pumped 10 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Gallons Used Per Calendar Year. _____

10. FLOWING WELL (Owner is responsible for control of flowing well).
If well yields artesian flow, yield is _____ gal./min. Surface pressure is _____ lb./sq. inch, or _____ feet of water.
The flow is controlled by: valve ☐ cap ☐ plug ☐
Does well leak around casing? Yes ☐ No ☐

Permit No. U.W. 99263 Book No. 768 Page No. 14

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.) _____

12. PUMP TEST: Was a pump test made? Yes ☒ No ☐
If so, by whom Proctor Address Hulett
Yield: 15 gal./min. with None foot drawdown after 2 hours.
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

13. LOG OF WELL: Total depth drilled 100 feet.
Depth of completed well 100 feet. Diameter of well 4 inches.
Depth to first water bearing formation 80 feet.
Depth to principal water bearing formation. Top 80 feet to Bottom 100 feet.

Ground Elevation, if known _____

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
0	20	Yellow sAND & clay			
20	80	Blue gray shale			
80	100	Blue white sand		Fort Union	80-100

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ☐ No ☐
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good ☐ Acceptable ☐ Poor ☐ Unusable ☐

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

David A. Reynolds
Signature of Owner or Authorized Agent

3-24-, 19 96
Date

FOR STATE ENGINEER'S USE ONLY

UW 992603

Date of Receipt MAR 26 1996, 19 _____

Date of Priority MAY 22 1996, 19 _____

Date of Approval May 21, 19 96

for State Engineer

FORM U.W.6
Rev. 12/2002

STATE OF WYOMING

OFFICE OF THE STATE ENGINEER
HERSCHLER BLDG., 4-E
CHEYENNE, WYOMING 82002
(307) 777-6163

MICRO FILMED JUN

STATEMENT OF COMPLETION AND DESCRIPTION OF WELL OR SPRING

NOTE: Do not fold this form. Use typewriter or print neatly with black ink.

PERMIT NO. U.W. 150688 NAME OF WELL (SPRING) TOWER #3

1. NAME OF OWNER ANTONE SWANDA

2. ADDRESS 436 DEADMAN RD
Please check if address has changed from that shown on permit. ☐

City OSHOTO State WYOMING Zip Code 82721 Phone No. 467-5299

3. USE OF WATER [X] Domestic [X] Stock Watering [ ] Irrigation [ ] Municipal [ ] Industrial [ ] Miscellaneous
[ ] Monitor or Test [ ] Coal Bed Methane Explain proposed use (Example: One single family dwelling) One single family swelling and 4 stock tanks and pipeline.

4. LOCATION OF WELL (SPRING): NE 1/4 SW 1/4 of Section 25, T. 53 N., R. 68 W., of the 6th P.M. (or W.R.M.)
Subdivision Name N/A Lot _____ Block _____
If surveyed, bearing, distance and reference point: _____
Longitude (degrees, minutes, seconds) _____ Latitude (degrees, minutes, seconds) _____
Datum: [ ] 1927 [ ] 1983 Source: [ ] GPS [ ] Map [ ] Survey

5. TYPE OF CONSTRUCTION: DRILLED [X] _____ Dug [ ] Driven [ ] Other [ ]
(type of rig, and fluid used if any)
Describe: _____

6. CONSTRUCTION: Total Depth of Well/Spring 460 ft.
Depth to Static Water Level 205 ft. (Below land surface) Casing Height above ground (ft.) _____
a. Diameter of borehole (Bit size) 7 7/8 inches. per phone call, 3-19-04 ad
b Casing Schedule: New [X] Used [ ] Joint type: [ ] threaded [ ] glued [ ] welded
5" diameter from 0 ft. to 460 ft. Material PVC Gage SDR17
____ diameter from ____ ft. to ____ ft. Material ____ Gage ____
c. Grouted interval, from ____ ft. to ____ ft.
Amount of grout used: ____ (example: 10 sacks) type: ____ (example: bentonite pellets)
d. Type of completion: [ ] factory screen [ ] open hole [ ] customized perforations
Perforation: Type of perforator used _____
Size of perforations ____ inches by ____ inches.
Number of perforations and depths where perforated:
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
Open hole from ____ ft. to ____ ft.
Well screen details:
Diameter .025 slot size: ____ set from 300 ft. to 460 ft.
Diameter ____ slot size: ____ set from ____ ft. to ____ ft.
e. Well development method _____ How long did development last? _____
f. Was a filter pack installed? Yes [ ] No [ ] Size of sand/gravel _____
Filter pack installed from ____ ft. to ____ ft.
g. Was surface casing used: Yes [ ] No [ ] Was it cemented in place? Yes [ ] No [ ]
Surface casing installed from ____ ft. to ____ ft.

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7. NAME AND ADDRESS OF DRILLING COMPANY Ruby Drilling Co., PO Box 339, Gillette, WY 82717-0339

8. DATE OF COMPLETION OF WELL (including pump installation) OR SPRING (first used) 5-17-03

9. PUMP INFORMATION: Manufacturer Sta-Rite Type _____
Source of power Electrical Motor Horsepower 1 1/2 Depth of Pump Setting or intake 360 ft.
Amount of Water Being Pumped 10 Gallons Per Minute. (For Springs or flowing wells, see item 10.)
Total Volumetric Amount Used Per Calendar Year. _____

10. FLOWING WELL OR SPRING (Owner is responsible for control of flowing well).
If well yields artesian flow or if spring, yield is ____ gal./min. Surface pressure is ____ lb./sq.inch, or ____ feet of water.
The flow is controlled by: valve [ ] cap [ ] plug [ ]
Does well leak around casing? Yes [ ] No [ ]

Permit No. U.W. 150688 Book No. 1111 Page No. 80

SEE REVERSE SIDE

11. If spring, how was it constructed? (Some method of artificial diversion, i.e., spring box, cribbing, etc., is necessary to qualify for a water right.) _____

12 PUMP TEST: Was a pump test made? Yes ___ No X
If so, by whom _____
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.
Yield: _____ gal./min. with _____ foot drawdown after _____ hours.

13. LOG OF WELL: Total depth drilled 460 feet.
Depth of completed well 460 feet. Diameter of well 3 3/4 inches.
Depth to first water bearing formation 290 feet.
Depth to principal water bearing formation. Top 441 feet to Bottom 460 feet.

Land surface elevation (ft. above mean sea level) _____ Datum: | 1929 | 1988
How determined: | map | altimeter | survey | other

DRILL CUTTINGS DESCRIPTION:

From Feet	To Feet	Material Type, Texture Color	Remarks (Cementing, Shutoff)	Indicate Water Bearing Formation & Name	Indicate Perforated Casing Location
(See attached drilling description)					

14. QUALITY OF WATER INFORMATION:
Does a chemical and/or bacteriological water quality analysis accompany this form? Yes ___ No X
It is recommended that chemical and bacteriologic water quality analyses be performed and that the report(s) be filed with the records of this well. (Contact Department of Agriculture, Analytical Lab Services, Laramie, 742-2984.)
If not, do you consider the water as: Good ___ Acceptable ___ Poor ___ Unusable ___

REMARKS: _____

Under penalties of perjury, I declare that I have examined this form and to the best of my knowledge and belief it is true, correct and complete.

Carlos Leanis
Signature of Owner or Authorized Agent

11-11, 2005
Date

FOR STATE ENGINEER'S USE ONLY

Permit No. U.W. 150688

Date of Receipt NOV 13 2003, 20____

Date of Priority MAY 2, 2003, 20____

Date of Approval March 19, 2004

for State Engineer

ATTACHMENT SHEET FOR STATEMENT OF COMPLETION
PERMIT No. U.W. 150688

MICRO FILMED JUN 2014

150688

RUBY DRILLING CO.

2901 4J RD
P.O. BOX 339
GILLETTE, WYOMING 82717-0339

PHONE 307-682-5343
FAX 307-687-7155

TONY SWANDA Water Well Tower #3 Crook County

May 17, 2003

0	-	88	Top Soil, Clay, Sandstone, & Rock
88	-	106	Sand
106	-	164	Clay
164	-	193	Rock Sandstone
193	-	197	Clay
197	-	252	Sandy w/ Sandstone Str.
252	-	290	Sandy Clay
290	-	302	Sandstone Rock
302	-	345	Clay
345	-	353	Sandy Clay
353	-	387	Clay
387	-	398	Sandy Clay
398	-	417	Clay
417	-	424	Sandy Clay
424	-	428	Sandstone Rock
428	-	441	Clay
441	-	445	Sandstone Rock
445	-	460	Clay

Drilled 8 ¾" borehole 0 – 460 ft.
Casing 5" PVC SDR17 0 – 460 ft.
Perforated casing .025 screen set from 300 – 320 ft.
340 – 360 ft.
400 – 460 ft.
Gravel Packed 3/8" gravel from 160 – 460 ft.
1.5HP Sta-Rite 10GPM Pump & Motor set at 360 ft.
Static Water Level 205 ft.
Air Lift 25GPM at 420 ft.

Water, Gas, Oil & Mineral Explorations