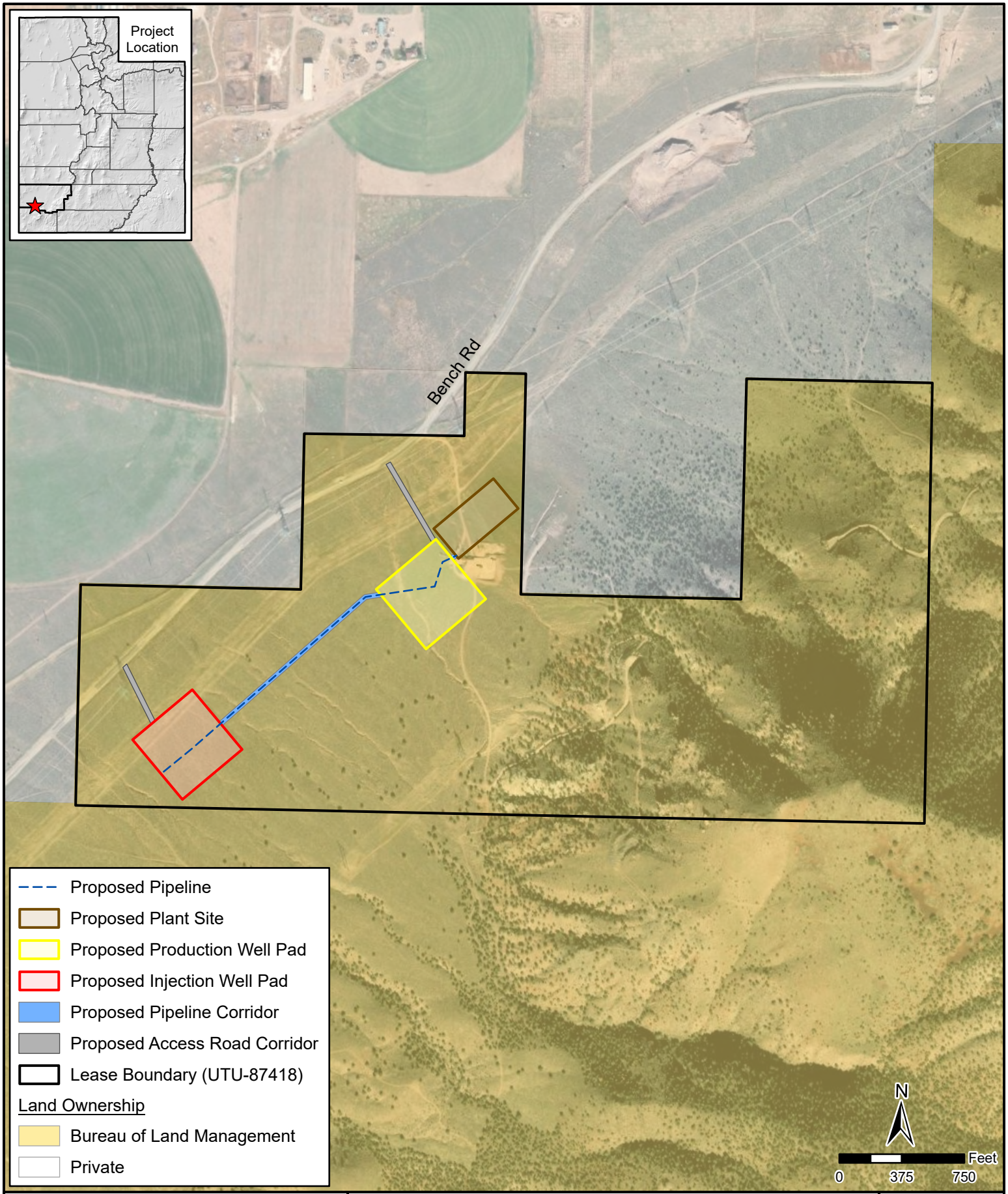
Appendix A. Maps



Jones & DeMille Engineering

Utah Geothermal Energy Partners

Proposed Newcastle Geothermal Power Facility
Overview Map

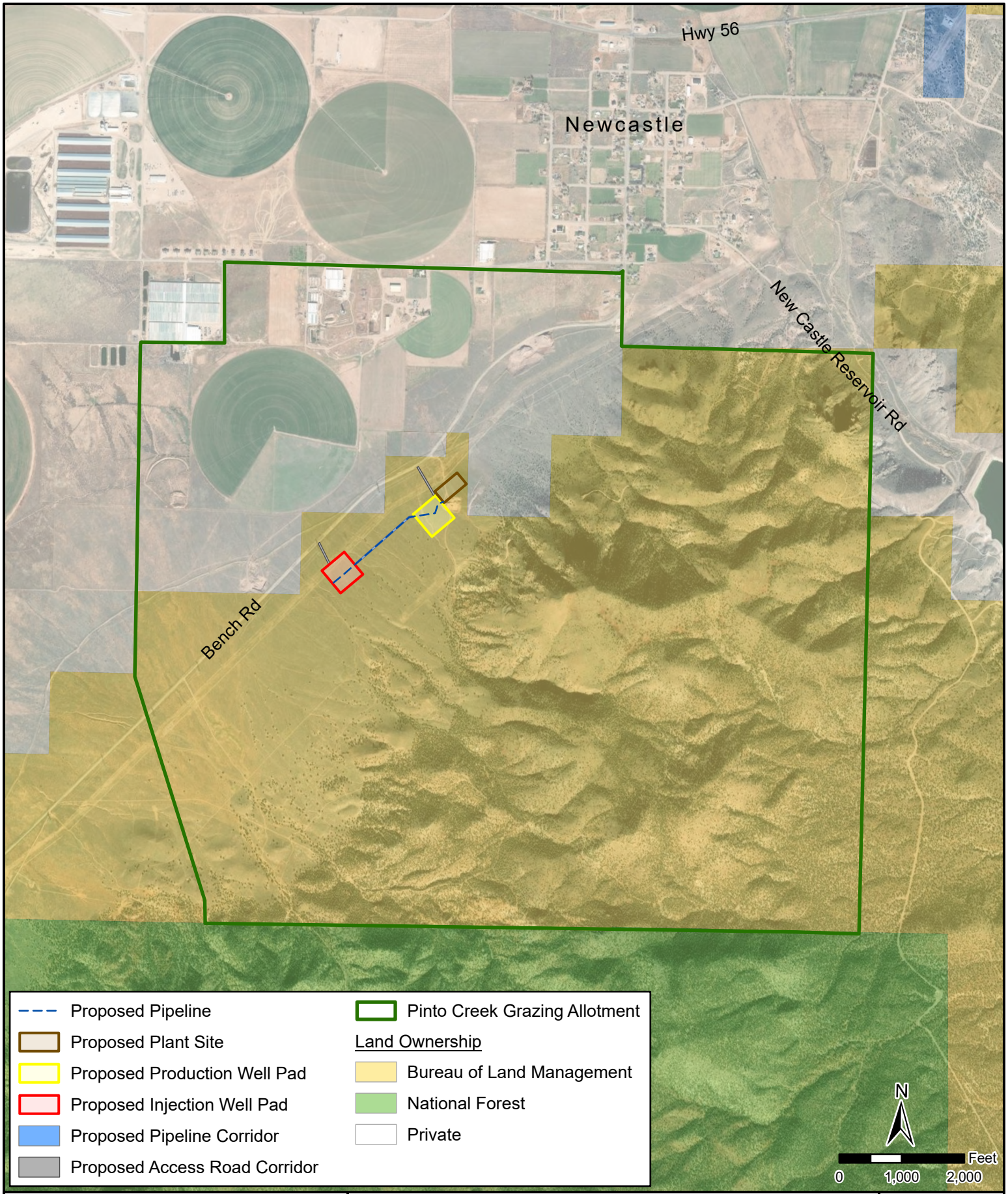
Map Name: H:\JD\Proj\2407-039\GIS\Projects\2407-039_Env\2407-039_Env.aprx - Overview Map

Project Number: 2407-039 | Drawn by: ALP 11-24 | Last Edit: 11/11/2024

Iron County, Utah

Scale: 1" = 750'

1



Jones & DeMille Engineering

Utah Geothermal Energy Partners

Proposed Newcastle Geothermal Power Facility
Livestock Grazing Cumulative Impact Area

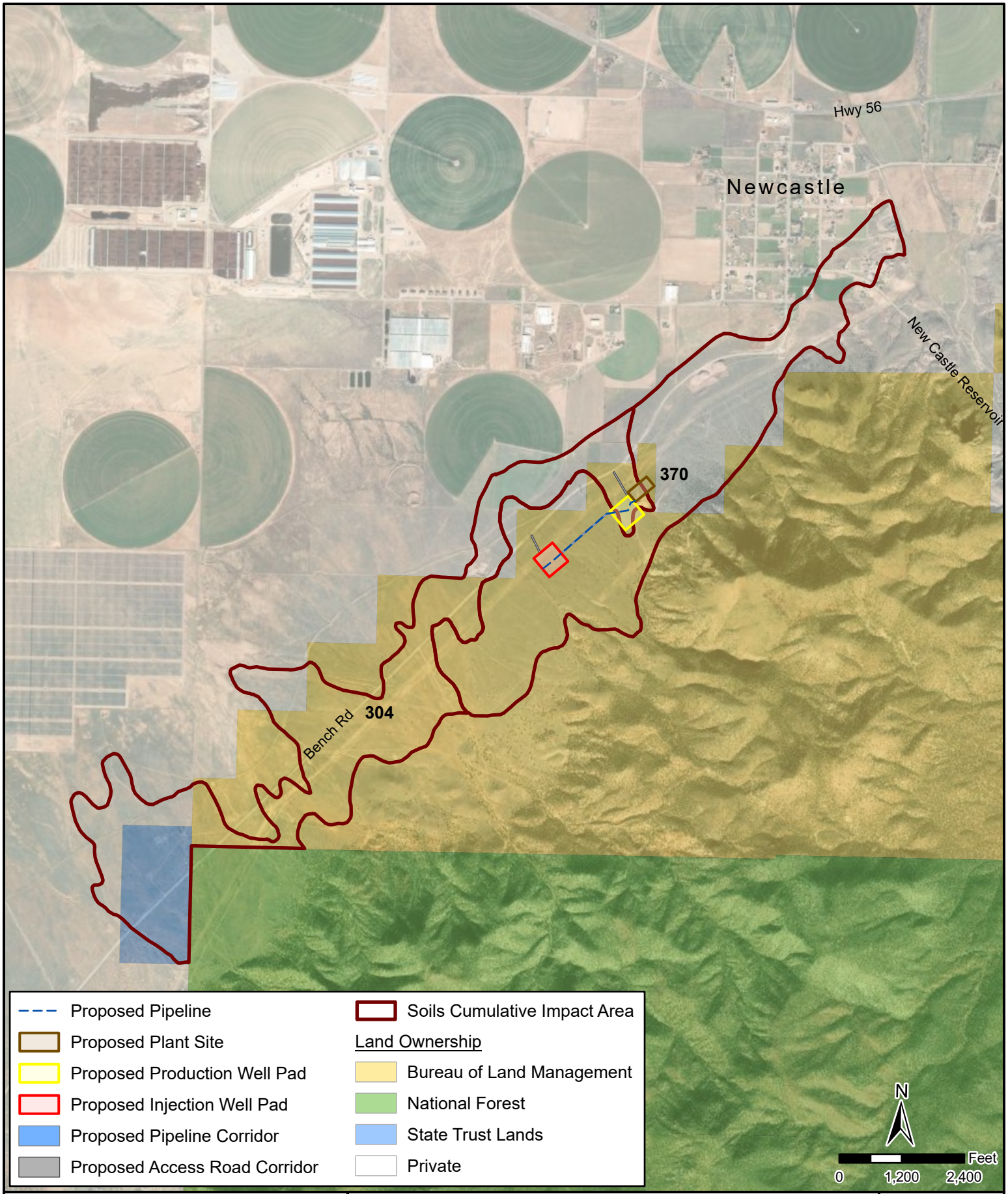
Map Name: H:\JD\Proj\2407-039\GIS\Projects\2407-039_Env\2407-039_Env.aprx - 2 - Livestock Grazing

Project Number: 2407-039 | Drawn by: ALP 1-25 | Last Edit: 1/13/2025

Iron County, Utah

Scale: 1" = 2,000'

2



Jones & DeMille Engineering

Utah Geothermal Energy Partners

Proposed Newcastle Geothermal Power Facility
Soils Cumulative Impact Area

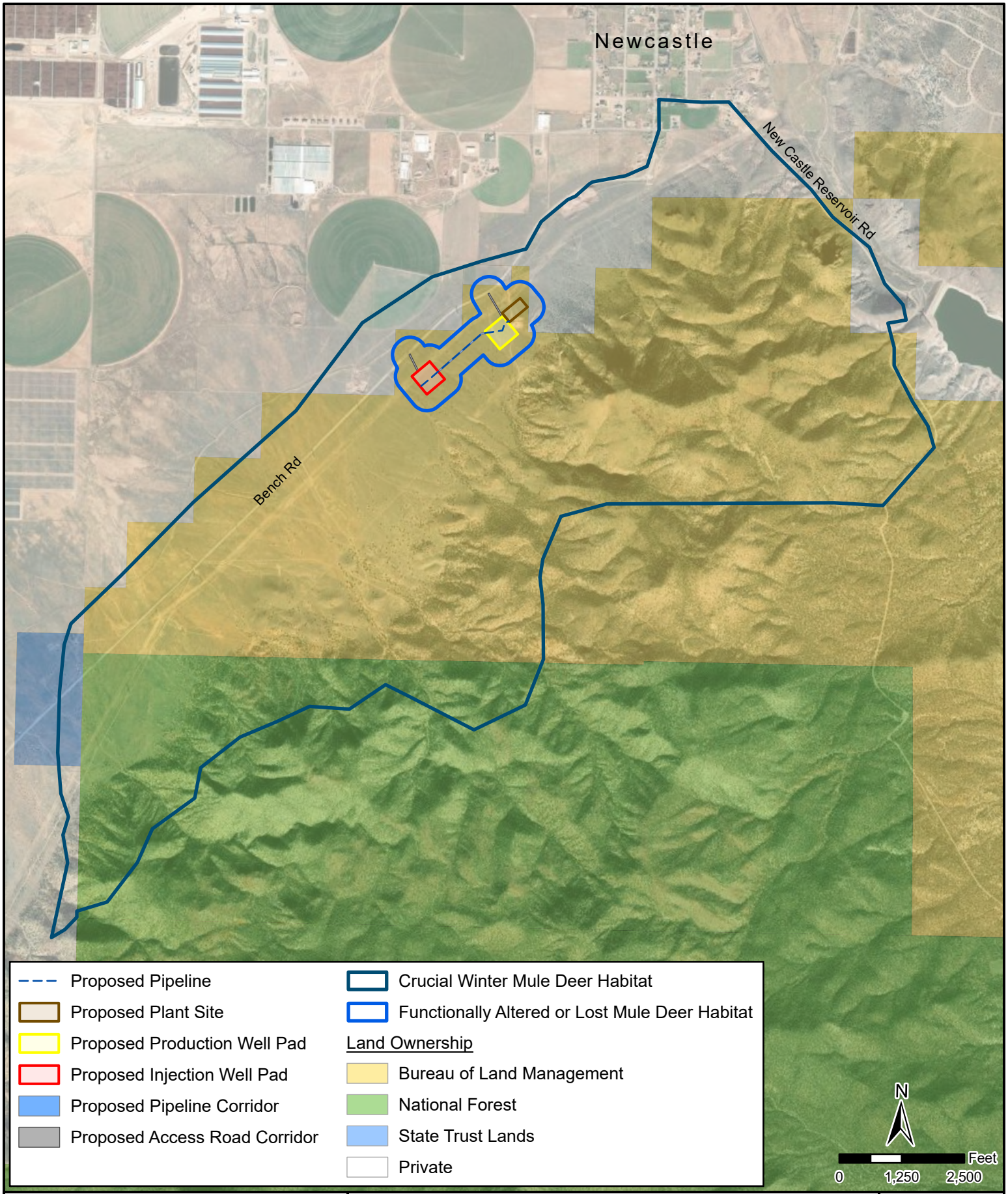
Map Name: H:\JD\Proj\2407-039\GIS\Projects\2407-039_Env\2407-039_Env.aprx - 3 - Soils

Project Number: 2407-039 | Drawn by: ALP 1-25 | Last Edit: 1/13/2025

Iron County, Utah

Scale: 1" = 2,400'

3



Jones & DeMille Engineering

Utah Geothermal Energy Partners

Proposed Newcastle Geothermal Power Facility
Mule Deer Crucial Winter Habitat Cumulative Impact Area

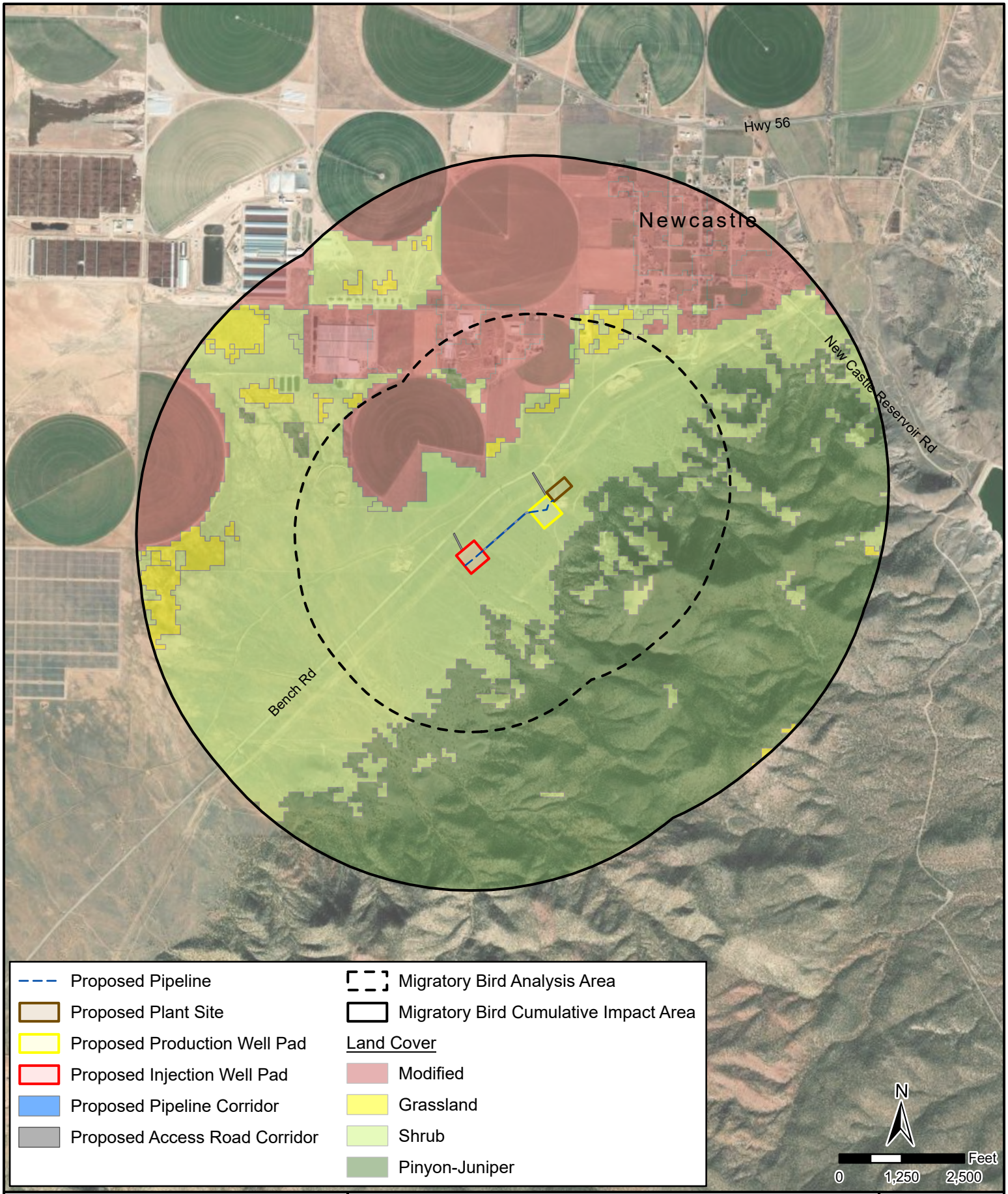
Map Name: H:\JD\Proj\2407-039\GIS\Projects\2407-039_Env\2407-039_Env.aprx - 4 - Mule Deer Habitat

Project Number: 2407-039 | Drawn by: ALP 1-25 | Last Edit: 1/13/2025

Iron County, Utah

Scale: 1" = 2,500'

4



Jones & DeMille Engineering

Utah Geothermal Energy Partners

Proposed Newcastle Geothermal Power Facility
Migratory Bird Cumulative Impact Area

Map Name: H:\JD\Proj\2407-039\GIS\Projects\2407-039_Env\2407-039_Env.aprx - 5 - Migratory Birds

Project Number: 2407-039 | Drawn by: ALP 1-25 | Last Edit: 1/15/2025

Iron County, Utah

Scale: 1" = 2,500'

5

Appendix B. Newcastle Geothermal Project Operation Plan

NEWCASTLE DEVELOPMENT AND OPERATION PLAN

Abstract

The Geothermal potential at Newcastle, Utah has been studied for at least four decades. Recent investigations and test drilling by Utah Geothermal Energy Partners demonstrates that the resource has significant commercial potential. This document provides a summary of the plans for development and operation of a geothermal power facility for the area from initial studies through power generation. The area of focus is defined by an existing Bureau of Land Management lease area and includes both the BLM lease and surrounding private lands. Power generation capacity is expected to reach 20 MWs. All produced fluids will be injected to maintain reservoir pressure and avoid consumptive use of produced waters. This document is presented to align with the National Environmental Policy Act (NEPA) process and seek approval from the BLM for our plan for utilization.

Table of Contents

Project Overview and Proposed Action

The proposed actions for the Newcastle geothermal project are to develop a 20MW geothermal power generation facility using binary-cycle power generation, drill four wells, and construct a pipeline and access roads. The power substation will be built within the plant footprint. A surface use water well for drilling fluids and sanitary water use for the plant will be located within the production well pad footprint. Geothermal fluids will be produced from production wells drilled on the BLM lease located approximately one (1) mile southwest of the town of Newcastle, in Iron County, Utah (see Figure 1). Two injection wells will also be drilled. The development lease is approximately 30 miles west from Cedar City and south of State Highway 56. Access to the Site from Cedar City is along State Highway UT-56; through Main Street in Newcastle, which then becomes Bench Road. The turnoff to the Site is on the southeast side of Bench Road, approximately 1 mile from the turnoff of UT-56.

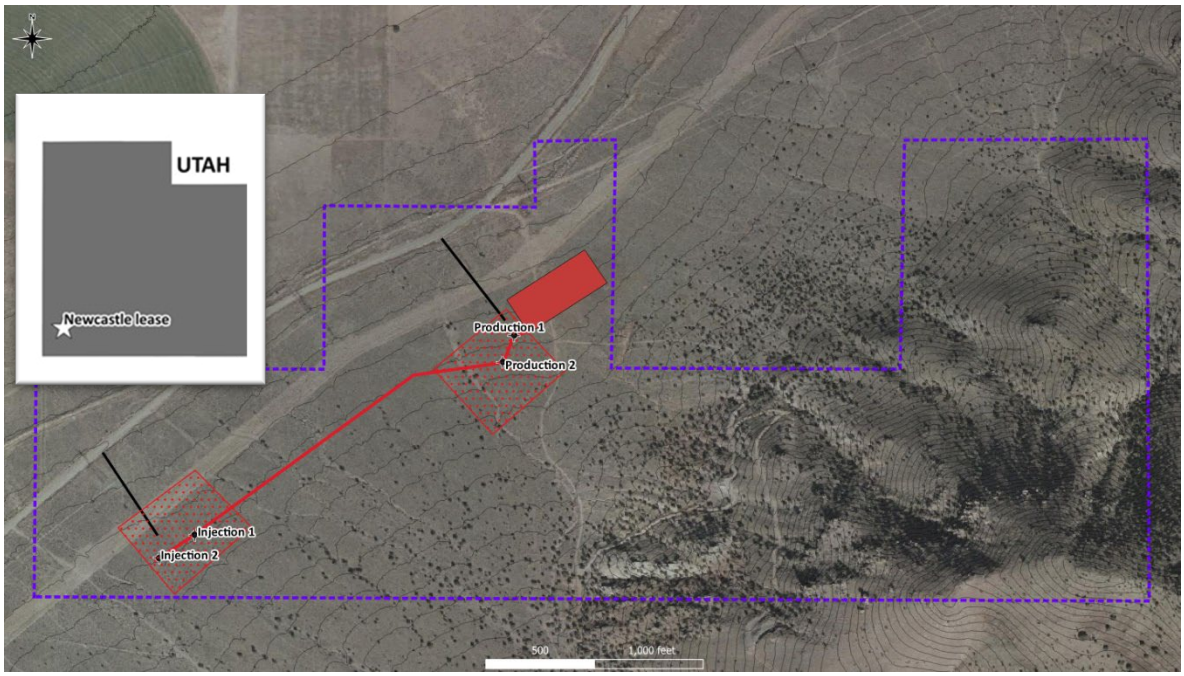


Figure 1 Project location in Newcastle, Utah with the BLM lease outline shown in purple dashed line and the geothermal plant location in a red rectangle, the injection and production well locations and the pipeline as a red line is also shown.

Table 1 Area of disturbance for each project element for the Newcastle BLM lease.

Project Element	Acres
Production Wells Pad (467 ft X 467 ft)	5
Injection Wells Pad (467 ft X 467 ft)	5
Pipeline (30-foot corridor)	3.3
Plant	2.5
Access Roads (30-foot corridor)	1.5
Total	17.3

Site Assessment and Scoping

The Newcastle Geothermal Project lies within the Basin-and-Range geologic province and near the southeastern boundary of the uplifted Colorado Plateau. The lease area lies over the Antelope Range Fault Zone (ARFZ), a major fault system bounding the southeastern side of the Escalante Desert area of the Great Basin (see Figure 2). This fault zone is characterized by multiple near-vertical normal faults that provide pathways for deep circulation of geothermal fluids. There are a number of active geothermal projects developed along this geological structure. The US Geological Survey (USGS), as well as State and University researchers, have conducted investigations of this area. The investigations included collection of well water samples, geothermal gradient sampling, geophysical surveys, geological mapping, and installation of test wells. Since 1970, 25 private water wells with high temperatures have been monitored by the USGS and 6 geothermal exploration and test wells were drilled on or within a mile of the project area. These wells clearly show a geothermal plume originating along the ARFZ and flowing outward (generally toward the west and southwest), downgradient, towards the central valley. Measured well water temperatures as high as 266°F at depths as shallow as 300 feet below ground surface indicate a geothermal plume of a deeper, hotter up-flow zone rising along the ARFZ.

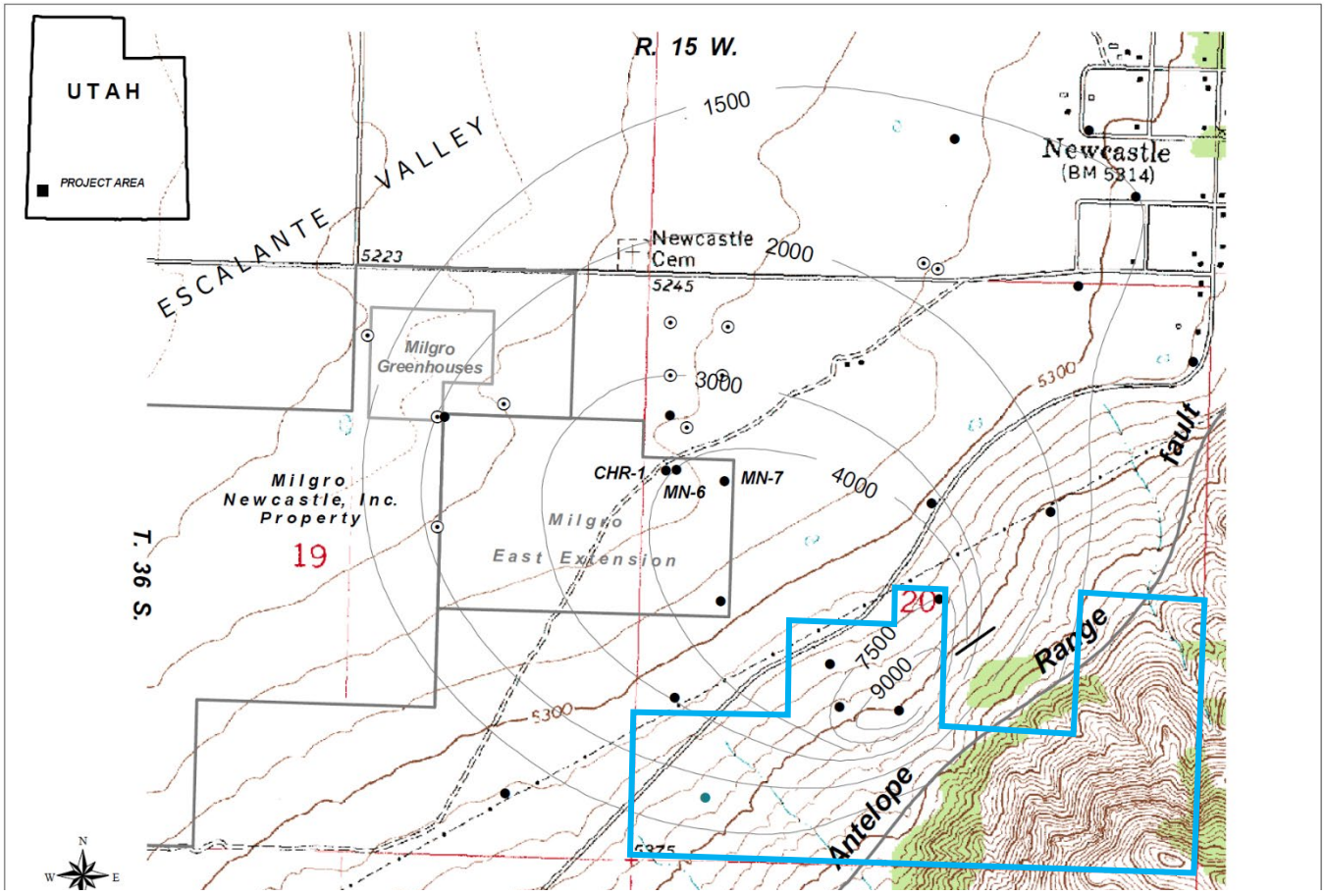


Figure 2 Location of previous drill holes in the Newcastle area in Utah. Heat flow contour lines are from previous studies (mW/m2). Wells are shown as open and filled dots. Base map is the USGS Newcastle 7.5-minute quadrangle (1:24,000).

Geochemical analysis performed on samples from the deeper CHR-1 well, after pumping for 6 hours, yielded equilibrium temperatures of 331°F, indicating the presence of a hotter resource at depth. The recent test well, 46a-20 drilled by Renewable Energies LLC hit a lost circulation zone at a depth of 303 ft, losing 5,000 gallons of drilling fluid within minutes before dry steam vented at a constant 22 psi pressure and 260°F temperature, indicating that the well reached the steam cap over the shallow portion of the geothermal plume. The nearby Gardner well (bottom hole temperature 230°F) flowed at 450 gpm during a 10-hour test, showing a highly conducive formation.

The combination of high temperatures at shallow depths and high flow rates gives Utah Geothermal Energy Partners the confidence to proceed with the development of the geothermal resource found at the Newcastle BLM lease.

Regulatory and Environmental Compliance

The comprehensive federal regulations that cover geothermal resources on Federal lands is 43 CFR 3200. Within that series of regulations, the sections pertaining to carrying out exploration operations on a Federal geothermal lease are “43 CFR 3250 Exploration Operations”, “43 CFR 3251 Getting BLM Approval”, “43 CFR 3252 Conducting Exploration Operations”, and “43 CFR 3253 Exploration Operations”. We will closely follow these regulations. The table below lists all Federal, State, and Local agencies that have an interest in the development of the geothermal resource in Iron County, Utah.

Agency	Land Use Planning	Geothermal Leasing	Land Access	NEPA	State Environmental Review	Federal ESA	Other Species Act	NHPA	CWA 401 Water Quality	CWA 402 NPDES Permit	CWA 404 Dredge and Fill	Water Access Rights	Underground Injection Control Permit	Air Quality	Geothermal Exploration	Geothermal Drilling	Geothermal Utilization
BLM	●	●	●	●				●							●	●	●
ONRR												●			●		●
USFS	●	○	●	●											●		
DoD	●		●	○													
BOT			●	○													
USACE				○							●						
USFWS			●	○		●	●										
NPS			●	○													
BIA			●	○													
Utah		●	●	○	●			●	●	●		●	●	●	●	●	●
Local	●	●	●					●									

Table 2 List of agency roles in the geothermal regulatory process for Utah from the National Renewable Energy Laboratory (NREL). Solid dot is a primary permitting role and an open dot is a cooperating permitting role.

Plans to Identify Issues for Analyses and Proposed Actions

Development of the Newcastle Lease will proceed in a phased approach. Phase 1 will install an initial two production wells and two injection wells (see Figure 1). Phase 2 will add two additional production wells and a third injection well. The discharged waters produced from the much deeper geothermal wells and used in the geothermal power plant will be reinjected back into the deep subsurface to recharge and maintain the geothermal reservoir. Well depths are targeted at a temperature of 350°F which is expected to correspond to a vertical depth of +/- 4,000 feet. Wells will be slightly deviated from vertical to follow the highest permeability and temperature zones of the upwelling zone. The injection wells will be located 2,500 feet away from the production wells to prevent thermal breakthrough at the producing zones while simultaneously recharging the deep geothermal reservoir (see Figure 3). Depending on the permeability of the reservoir layers, the injection wells will terminate at suitable vertical and horizontal distances from the producing zone. The wellheads will be clustered at the surface location on a single pad for the production wells and a single pad for the injection wells. After reaching into the Antelope Range Fault Zone (at a depth of approximately 2,000 ft), the wells will follow along the fault's damage zone, angling away from each other to expand the capture zones from each well to maximize flow.

The production wells will capture the hot water (+350°F under pressure) rising up along the Antelope Range Fault Zone. Each well will be designed to produce between 1,100 and 1,200 gallons

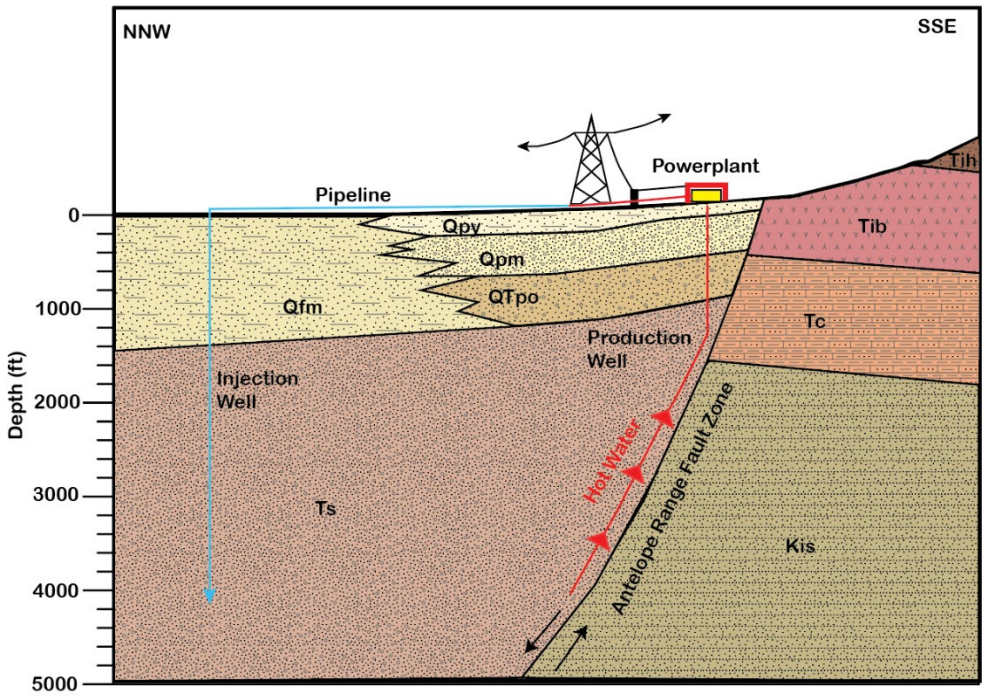


Figure 3 Project schematic illustrating the full cycle from production well through the powerplant then to the injection well. The geologic formations are described in the Geologic map of the Newcastle Quadrangle, Iron County, Utah (Siders et al, 1989 : https://www.usgs.gov/publications/geologic-map-newcastle-quadrangle-iron-county-utah-0)

per minute or 40,000 barrels per day, resulting in a net power output per well of 5 net MWs. The power plant will be an air-cooled binary cycle plant using Organic Rankine Cycle ("ORC") generators to generate electricity. The hot geothermal fluid passes through a heat exchange system and heats a working fluid that has a lower vaporization temperature than water. Once through the heat exchanger, the cooler geothermal fluid departs the plant for reinjection. The working fluid, now a vapor, drives the turbines which, in turn, produce electricity. The secondary fluid (vapor) departs the turbine and is run through a cooling system to re-condense the working fluid, currently in its gaseous state, back to a fluid. The two cycles, consisting of the geothermal fluid and the working fluid, are completely closed to the atmosphere thereby resulting in a system with zero emissions. The geothermal fluid will be re-injected into the subsurface to recharge the geothermal reservoir.

Environmental Protection

Below is a brief summary of the anticipated impacts of the project. A formal Environmental Assessment (EA) will be completed and provided to the appropriate agencies. It is an important objective of ours that the proposed geothermal development be implemented with continuous attention to environmental compliance and the minimization of any potential impacts. We will retain an outside consulting firm to conduct the initial Environmental Assessment, and, to continue to provide the required environmental monitoring and reporting.

The BLM lease area is sparsely vegetated and is designated as grasslands (Figure 4). There is also a partially cleared site, covering approximately 1 acre where gravel mining occurred in the past. This same site is the location for the drilling pad for the installation and testing of well 46A-20.

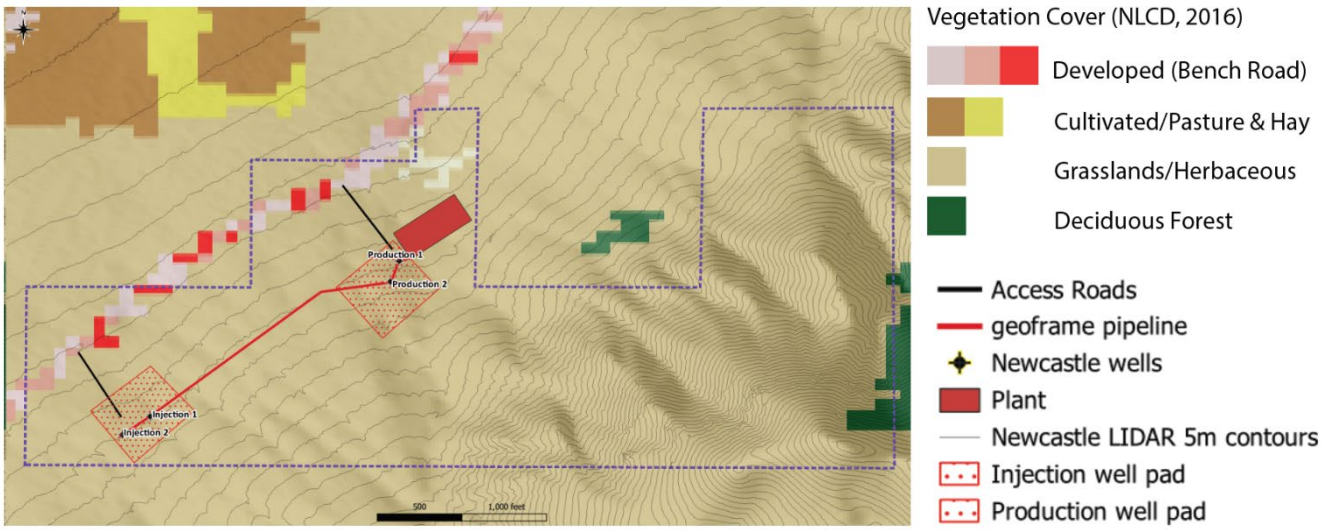


Figure 4 Vegetation cover basemap for the Newcastle BLM lease area.

The following categories will be covered in the EA:

VISUAL IMPACTS AND AESTHETICS

The development site is located east of Bench Road approximately 100 feet in elevation above the nearby valley floor. Visual lines of sight are uninterrupted from the valley floor and the site will be visible from Bench Road and to the residents west of Bench Road. Drilling, well testing, and construction will require approximately 17 to 18-months and will be visible to the area west of the site for the construction period. Upon completion, residents west of Bench Road will also have direct views of the low-lying geothermal facilities, wells, and pipelines.

FLORA AND FAUNA

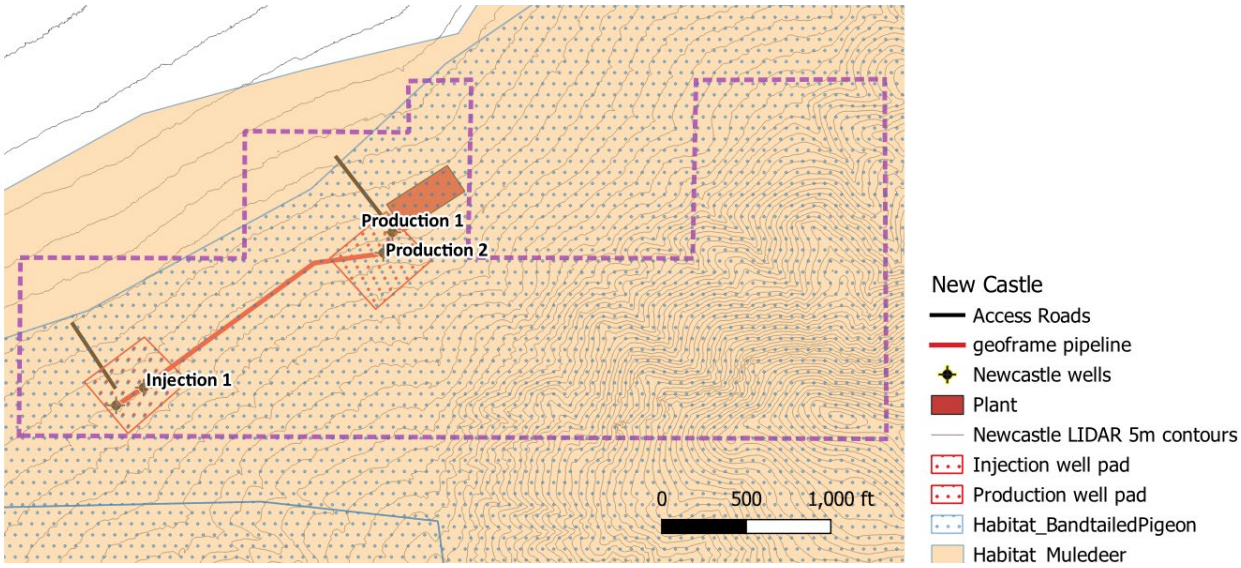


Figure 5 Identified wildlife habitats for the Newcastle BLM lease.

Project construction will involve clearing and grading of approximately 5 acres of mostly scrub regrowth vegetation, on land that has been previously disturbed by other agricultural and grazing activities, grazing, and geothermal exploration or road development. The BLM lease does not contain unique or sensitive habitats, and does not contain endangered or threatened plant or wildlife species. Project construction will remove common scrub regrowth habitat, but within the area of interest there are no mature trees. The construction activities will minimize the unnecessary clearing of land to preserve existing habitat where feasible, and provide landscaping that will continue to provide habitat for wildlife near the plant vicinity. Project construction will temporarily increase local noise levels that could disturb noise sensitive wildlife, but geothermal operational activities and equipment noise will be minimized in order that wildlife may continue their normal activities with minimal disruption.

CLIMATE AND AIR QUALITY

Construction equipment will create dust and emit criteria pollutants in the form of normal diesel and gasoline powered equipment exhaust. Drilling and testing will have short-term releases of steam that may contain trace concentrations of gases such as carbon dioxide, nitrogen and hydrogen.

Binary plant operations will have virtually no emissions during normal operations. Should a power plant emergency shutdown be required, the production wells will be diverted into a rock muffler for a brief period of time; most likely less than 2 hours. This disturbance would be limited to a few hours at most. The binary plant will have virtually no greenhouse gas emissions during normal operations.

CULTURAL AND HISTORIC RESOURCES

The project area does not contain significant cultural or historic resources, but ground-disturbing activities during construction could encounter buried resources, including human remains. Construction of the geothermal plant and pipelines will pause if such a situation should arise until local authorities can clear the situation for operations to continue.

HAZARDS AND HAZARDOUS MATERIALS

Petroleum fuels and lubricants (POL) will be stored on site during construction and operations. Temporary, above ground tanks used during construction will be surrounded by a berm with internal storage equivalent to at least 120% of the tank volume. Normal silt fencing and runoff controls will be in place during construction. During operations, the secondary working fluid may be listed or classified as a hazardous substance. These materials will be stored in designated areas with secondary containment to contain any accidental spills or releases. Storage and use of cyclopentane as a working fluid will increase the risk of fire at the site. All appropriate monitoring equipment and fire suppression systems will be incorporated into the plant design. The plant site will be fenced to avoid unauthorized trespassers.

LAND USE

The production wells will be on the BLM lease. The injection wells for re-injection of the geothermal discharge fluids will also be located on the BLM lease (see Figure 3). These wells will occupy a very small footprint (see Figure 1 and Table 1). Additionally, the substation for power generation will be located within the plant footprint and a surface and sanitary water use well will also be drilled and located within the production well pad area of disturbance.

NOISE

Well drilling will occur 24-hours per day for all wells. Drilling activities will extend for an estimated 40 days at each location and will result in predicted noise levels of up 71 dBA at the drilling site. The nearest resident is located approximately 2,400 feet (nearly ½ mile) straight-line distance from the drilling site. Decibels are measured on a log scale and perceived noise levels decrease rapidly with distance. Therefore, the noise levels at the closest residents will be significantly lower than those levels measured directly at the drill site. Other project construction activities could produce temporary and intermittent daytime noises levels between 50 and 62 dBA (nondrilling) at the site boundary.

Utah Geothermal Energy Partners will notify nearby residents of planned construction activities, provide a construction noise coordinator, and implement mechanisms to resolve construction noise concerns. In the event of a noise complaint, Utah Geothermal Energy Partners will coordinate with local authorities as necessary to monitor noise levels and identify additional measures and activities that could be undertaken to reduce and avoid potential operational noise levels.

PUBLIC HEALTH AND SAFETY

No activities will occur on site without a comprehensive Safety Plan in Place and a designated Site Safety Officer on site. No pedestrian or unauthorized visitors will be allowed on site without attending a full safety briefing and being accompanied by the Site Safety Officer or his/her designated representative. Public health and safety may be divided into two areas of concern: worker health and safety on site; and potential events on site that could adversely impact the public in off-site areas. Drilling and construction activities are relatively safe and have safety records consistent with national statistics for these activities. We will comply with all required State and OSHA procedures for worker health and safety.

Potential onsite events that could potentially impact offsite areas include an uncontrolled well or an event such as a catastrophic release of the geothermal working fluid. In the case of an uncontrolled well, the contracted driller will have a separate onsite safety plan, trained and experienced supervisory and general staff, and equipment and planned contingencies in place to immediately kill an uncontrolled well. To protect against events such as a catastrophic failure of the working fluid tank, the working fluid tank will be surrounded by a containment structure capable of holding, at a minimum, 120% of the tank volume. Onsite fire suppression systems will be incorporated into the plant design, and local emergency responders will be notified. On-site personnel will respond to natural disasters such as earthquake, flooding, or slope failures as needed to ensure worker health and safety and safety of the surrounding community.

RECREATION

The project will not impact any recreational activities on the BLM land such as hiking in the area that is outside of the fenced well pads and plant site.

SOCIO-ECONOMICS AND ENVIRONMENTAL JUSTICE

The proposed well drilling will not displace existing development or require relocation of nearby residences or indigenous people or resources. Construction of the binary geothermal plant will require approximately 75 local workers and create 17 permanent jobs. The construction and operation of the plant will have little impact on tourism, since the facilities would not have a noticeable aesthetic, air quality, or noise impact on the tourist areas. The proposed geothermal power plant will provide more affordable and reliable power without creating or adding to emissions of carbon dioxide. The proposed project will not affect indigenous people.

SOILS, GEOLOGY, AND MINERALS

Project construction will clear and grade up to 13 acres (see Table 1), potentially resulting in top soil loss and exposing bare soil to wind and water erosion during the construction process. Post-construction, the plant and grounds will be landscaped to prevent soil erosion, dust generation or sediment transport to local drainage pathways. There are no permanent water courses on or in the immediate vicinity of the development site or the included access roads. The proposed facility could be subject to earthquakes and will be designed to International Building Code (IBC) requirements for seismic safety (see earthquake probability map: https://geology.utah.gov/apps/hazards/). The project is not expected to encounter unconsolidated soils that could lead to ground failure and the groundwater in the area is not expected to cause liquefaction. The potential for landslides and subsidence in the project area is considered low and can be related to flooding (see the flood zone map: https://floodhazards.utah.gov/). The risk of settlement is low due to the lack of a high-water table and subsurface saturated soils. The binary power plant will not result in substantial changes in reservoir pressures or subsurface stress conditions that could lead to induced seismicity, or to structural damage from micro-fracturing of the receiving rock formations. The soils at the project area do not have the potential to shrink and swell.

TRANSPORTATION AND TRAFFIC

The proposed project will cause a slight to moderate increase in traffic on the main road (Bench Road), predominately during shift-change periods. During construction, workers will be arriving and departing along the main road. During operation, the plant will have a minimal impact on traffic; plant operators will work in shifts and will not all commute at the same time. Transmission line construction equipment will be placed on the side of the road and should not interfere with traffic.

WATER RESOURCES

The natural drainage patterns of the project area will not be altered and the project area will not impede drainage flows or otherwise increase the rate of off-site storm water flows. Parking areas will be gravel surfaced to allow for the infiltration of rainwater. Stormwater retention areas will be included in site development. Project construction and drilling activities will not degrade surface or groundwater quality because Utah Geothermal Energy Partners have designed the project to minimize and control spills, leaks, and other releases of potentially hazardous material via site design and containment systems. Drilling will require approximately 10,000 gallons of water per day from the water supply system for an estimated 25 days at each well. The proposed project will not require substantial water use during plant operation and will have a low potential to affect surface or groundwater resources during production or injection of geothermal fluids because fluids will be contained within well casings. During emergency shutdowns, fluids will be directed to an on-site lined brine containment pond. The project is not anticipated to affect surface thermal manifestations. Project operation will not degrade surface or groundwater quality because Utah Geothermal Energy

Partners has designed the project to minimize and control spills, leaks, and other releases of potentially hazardous material via site design and containment systems.

Community and Stakeholder Communication

A critical component to success is a communication plan both internally within the project team and externally with the community. Utah Geothermal Energy Partners began this plan early and has already conducted face-to-face meetings with neighboring land owners as well as with Iron County and State of Utah representatives. Throughout the course of this project, Utah Geothermal Energy Partners will maintain open communications with local community representatives and stakeholders to address concerns and provide regular project updates.

Development Process

Development of the Utah Geothermal Energy Partners project will proceed in the following steps:

1. Collection of information to complete an Environmental Assessment of the development and potentially impacted area
2. Preparation of site and drilling pads
3. Design and installation of the production and injection wells
4. Construction of plant (commences simultaneously with the well installations)
5. Construction and installation of the Resource Gathering System
6. Construction of the substation and transmission intertie
7. Testing and commissioning of the Plant

The following sections provide greater detail of the onsite development process.

Pre-Construction

The following guidelines will be followed in the pre-construction phase:

1. Proposed roads to be constructed, improved or reclaimed as part of the Project will be submitted for review by the BLM and will conform to the requirements of BLM Manual 9113 and the "Gold Book", as applicable to the intended Project Use.
2. Proposed surface disturbance and vehicular travel will be limited to the approved well location and access route.
3. Any changes in well location, facility location, and access or site expansion must be approved by the authorized BLM officer in advance.
4. The underside of all heavy equipment will be cleaned by water before entering and upon leaving BLM lands to do work. Driving through or parking on noxious weed infestations will be avoided.

Production Well Design

Production wells will initially be drilled vertically to a depth between 1,500 and 2,000 feet below ground surface at which point they will be directionally drilled, deviating toward the west to follow the major fault zone to a depth of approximately 4,000 feet. A schematic of the well design is shown in Figure 5. This is a simplified view with a vertical wellbore merely for illustrative purposes: the actual production and injection wells that will be drilled for this project will be deviated. The conductor casing will be 30" diameter to a depth of 40 to 100 feet. The surface casing will be 20" diameter to a depth of 1,000 feet. The intermediate casing will be 13 3/8" diameter to a depth of 2,000 feet where the well path will begin to deviate. The production casing will be 9 5/8" diameter to a total depth of 4,000 feet.

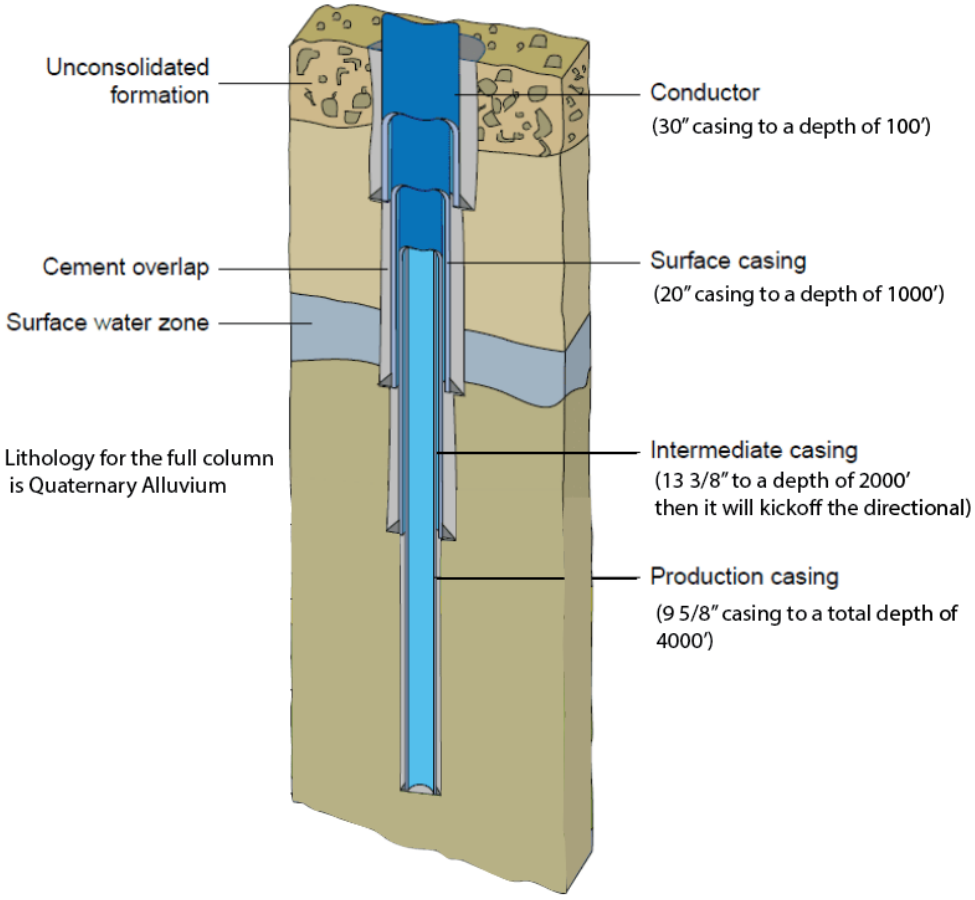


Figure 6 Production well design

Utah Geothermal Energy Partners emphasizes that the design of the production and injection geothermal wells, including hole and casing diameters, are tailored to the specific geothermal reservoir conditions and the technology being employed at the Newcastle site. Geological surveys and well design play a crucial role in determining the appropriate sizes and materials for the wellbore and casing. Additionally, local regulations and industry standards are followed for the designing and drilling of geothermal wells to ensure safety and environmental compliance.

Operational Timeline and Drilling Process

In outlining the drilling process step-by-step, Utah Geothermal Energy Partners considers the full process from pre-development to power generation. This includes, but is not limited to, mobilization and setup of drilling equipment, drilling of the well- including the use of drilling fluids, monitoring and control of drilling parameters, handling and disposal of drilling cuttings, installation of casing and cementing, and well completion procedures. Plant construction will commence after the initial production well is drilled. Utah Geothermal Energy Partners considers seasonal and weather-related factors that may affect drilling.

The following table is a projected timeline to perform all tasks associated with Phase I through V. This timeline is dependent upon several factors, including, but not limited to:

- Permitting requirements
- Availability of MT Survey analysts
- Drilling contractor availability
- Availability of testing materials
- Drilling materials
- Rig Availability
- Availability analyst

Utah Geothermal Energy Partners shall work diligently to identify, as soon as practicable, various points in the schedule which could cause delays and will take all possible actions to minimize delays without sacrificing quality.

Table 1 Timeline for the Operation Plan

Task	Description (Quarters)	1	2	3	4	5	6	7	8	9
Phase I: Pre-Development Surface Data Analysis										
1.00	Preliminary studies & permitting (outside party)									
2.00	Geo-spacial mapping and geothermal gradient studies									
3.00	Geophysics MT survey (acquisition, processing and reporting)									
4.00	Groundwater sampling and thermochemistry									
5.00	Summary report of preliminary geothermal potential									
Phase II: Pre-Development well drilling, testing and analysis										
6.00	Permitting, site access, well plan development									
7.00	Drilling									
8.00	West logging, analyses, and evaluation									
9.00	Estimation of geothermal energy reserves									
10.00	Analyses of behind-the-meter connections									
11.00	Reporting for external requirements									
Phase III: Development Resource Modeling										
12.00	3D Subsurface modeling									
13.00	Production modeling									
14.00	Process flow chart									
Phase IV: Development Well Design and Engineering										
15.00	Production well design									

16.00	Injection well design										
17.00	Environmental Permitting										
Phase V: Power production											
18.00	Production well drilling and connection to plant										
19.00	Injection well drilling and connection to plant										
20.00	Power tie-in										

Field Operation

1. Operations shall be done in a manner which prevents damage, interference, or disruption of water flows and improvements associated with all springs, wells, or impoundments. It is the operator's responsibility to enact the precautions necessary to prevent damage, interference, or disruptions.
2. The operator shall regularly maintain all roads used for access to and within the lease units. A Maintenance and Dust Management Plan may be required. A regular maintenance program may include, but not be limited to: BLM authorized upgrading of existing roads, blading, ditching, culvert, drainage installation, and graveling or capping of the roadbed.
3. Noxious weeds which may be introduced due to soil disturbance and reclamation will be treated by methods to be approved by the authorized BLM officer. These methods may include biological, mechanical, or chemical. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the authorized BLM officer 60 days prior to the planned application date.
4. All drill rig and well facility lights will be limited to those required to safely conduct the operations, and will be shielded and/or directed in a manner which focuses direct light on the immediate work area.
5. If previously unrecorded cultural resources are encountered during grading or other surface disturbing activities, all grading or other surface disturbing activities at the location of the discovery will cease within 100 meters/330 feet of the discovery, and the BLM will be notified. No surface disturbing activities will be allowed until the BLM Authorized Officer issues a Notice to Proceed (NTP) based upon the evaluation, mitigation (as necessary), and the acceptance of a summary description of the fieldwork performed for the discovery situation.
6. Petroleum products such as gasoline, diesel fuel or waste oils, lubricants, or cleaning products used to fuel, lubricate, and clean on-site equipment will be stored in a safe manner and in an area designed and built to contain minor or catastrophic spills.
7. Containment structures sufficiently impervious to prevent a discharge to waters of the State, such as containment dikes, containment walls, drip pans, or equivalent protection

actions are to be constructed and maintained around all qualifying bulk oil and liquid hydrocarbon tanks. The containment structure will have sufficient volume to contain, at a minimum, the content of the largest storage tank containing liquid hydrocarbons within the facility and sufficient freeboard to contain precipitation, unless more stringent protective requirements are deemed necessary by the authorized officer. Drip pans will be routinely checked and cleaned of petroleum or chemical discharges and designed to prevent access by wildlife and livestock. Containment dikes are NOT to be constructed with topsoil or coarse, insufficiently impervious spoil material. Chemicals will be placed within secondary containment and stored so that the containers are not in contact with soil or standing water and product and hazards labels are not exposed to weathering.

8. Hazardous material shall be properly stored in separate containers to prevent mixing, drainage or accidents. Hazardous materials shall not be drained onto the ground or into streams or drainage areas.
9. Totally enclosed containment shall be provided for all solid construction waste including trash, garbage, petroleum products. Waste materials and related litter will be removed to an authorized sanitary landfill approved for the disposal of these classes of waste.
10. All construction, operation, and maintenance activities shall comply with all applicable federal, state, and local laws and regulations regarding the use of hazardous substances and the protection of air, soil and water quality.
11. In construction areas where recontouring is not required, vegetation will be left in place wherever possible and the original contour will be maintained to avoid excessive root damage and allow for resprouting.
12. Watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) will be repaired or replaced if they are damaged or destroyed by construction activities to its pre-disturbed condition as required by the authorized BLM officer.

Drilling Equipment and Personnel

Drilling a 4,000-foot geothermal well in Newcastle, Iron County, Utah, will require a combination of specialized drilling equipment and trained personnel. An overview of the equipment and personnel to be utilized is included below:

Drilling Equipment:

1. **Drilling Rig:** For the required depth of 4,000 feet, based on the geological conditions, budget constraints, and drilling method, Utah Geothermal Energy Partners will use a rotary drilling rig.

2. **Drill Pipe and Drill Bits:** Drill pipes are used to connect the drilling rig to the drilling bit. The choice of drill pipe and drill bit are the tri-cone roller bit and graduated diameter steel pipe due to the rotary drilling methods utilized in previously drilled geothermal wells and the valley fill alluvium sediments being drilled through.
3. **Casing and Casing Shoes:** Casing pipes and casing shoes are used to line the wellbore and provide structural support. The size of the steel casings are illustrated in Figure 6 to align with the well design and local geological conditions.
4. **Mud and Drilling Fluids:** Drilling fluids are used to lubricate the drill bit, cool the drill string, and carry cuttings to the surface. The compositions of drilling fluids are both oil and air-based fluid depending on the formation to ensure success when drilling within elevated pressure and temperatures.
5. **Geothermal Logging Tools:** Specialized tools will be used to log for temperature, pressure, and lithology during the drilling process.
6. **Wellhead Equipment:** Wellhead equipment is used to control the flow of geothermal fluids and gases once the well is operational. Additionally, blowout prevention system will be utilized during drilling for safety.

Personnel:

1. **Drilling Crew:** A skilled drilling crew is essential to operate the drilling rig, handle drilling equipment, and ensure safe and efficient drilling operations.
2. **Geologists:** At all times during the drilling process, Utah Geothermal Energy Partners geologists will be on-site to evaluate the geological conditions, identify potential geothermal resources, and provide guidance on drilling locations.
3. **Drilling Engineer:** The Utah Geothermal Energy Partners drilling engineer is responsible for planning the drilling operation, selecting the appropriate equipment, and ensuring that drilling proceeds according to plan.
4. **Safety Personnel:** Safety personnel will be onsite to ensure compliance with safety regulations and to address any safety concerns during drilling.
5. **Environmental Expert:** Utah Geothermal Energy Partners environmental specialists will be involved in the drilling process to assess and mitigate the environmental impact of drilling operations, including groundwater protection and waste management.
6. **Project Manager:** The Utah Geothermal Energy Partners project manager has the critical role to oversee the entire drilling project, including logistics, budgeting, and scheduling and maintains an active role for the full execution timeline.

7. **Regulatory and Permitting Specialist:** Utah Geothermal Energy Partners works closely with local authorities to ensure full compliance to local and federal regulations. All activities will begin after obtaining the necessary permits and ensuring compliance throughout the project.

The specific equipment and personnel requirements are identified based on the unique geological and regulatory conditions in Iron County, Utah. Utah Geothermal Energy Partners engages with experienced drilling contractors and consults with local authorities to ensure that all necessary resources and permits are in place for a successful geothermal well drilling project.

Geothermal Resource Evaluation

The results of the previous studies established that the area under BLM lease has high heat flow values and the capacity to flow at a high rate. Utah Geothermal Energy Partners plans to drill the first production well to 4,000’ depth to evaluate the geothermal profile with depth, the porosity and permeability of the formation, and the extent of fracturing within the fault damage zone of the ARFZ.

To evaluate this resource, all available information will be integrated into a 3D model and flow simulated to forecast performance into the future. The evaluation to be completed after the first production well is drilled will include:

- Confirmation of a large, high-temperature geothermal resource
- Utilization of only a portion of the greater resource area, which increases the long-term sustainability of the project
- Confirmation (by drilling and testing) that the reservoir permeability, temperature, and reservoir fluid chemistry are suitable for commercial power generation
- Adequate separation between injection and production wells, allowing the project to balance the need for pressure support while minimizing the risk of thermal degradation

Furthermore, during drilling, Utah Geothermal Energy Partners will continuously monitor and evaluate geothermal resource parameters to ensure the project's success.

Data Collection

During the drilling of a geothermal well, various types of data are collected to assess geological conditions, well performance, and the potential for geothermal resource extraction. These data help in well design, resource evaluation, and ongoing monitoring. Here are some of the key types of data collected during the drilling of a geothermal well:

1. **Geological Data:** Geological data provide information about the subsurface formations encountered during drilling. This includes details on rock types, stratigraphy, fault zones, and geological structures. Data such as core samples, cuttings, and well logs (e.g., gamma ray logs, resistivity logs) are collected to characterize the geology.
2. **Temperature Data:** Temperature measurements are crucial in geothermal drilling. Temperature logs are recorded at various depths to determine the temperature gradient and identify potential geothermal reservoirs. These logs help estimate the geothermal resource's temperature and potential.
3. **Pressure Data:** Pressure measurements are taken to assess reservoir pressure and determine if it's suitable for geothermal fluid extraction. This data helps in understanding the resource's productivity and sustainability.
4. **Fluid Properties:** Geothermal fluid samples are collected to analyze their chemical composition and properties. This includes measurements of pH, salinity, mineral content, and gas composition. Understanding the fluid characteristics is essential for designing a geothermal power plant and managing potential scaling or corrosion issues.
5. **Flow Rate Data:** Flow rate measurements are taken to estimate the well's production capacity. This involves measuring the rate at which geothermal fluids flow to the surface during drilling or testing.
6. **Wellbore Data:** Data related to the wellbore itself, such as wellbore deviation surveys, casing integrity, and cement bond logs, are collected to ensure the well's structural integrity and prevent potential issues like casing leaks.
7. **Geophysical Surveys:** Geophysical surveys may be conducted during or after drilling to further assess the subsurface. These surveys can include seismic surveys, magnetotelluric surveys, and gravity surveys to refine the understanding of subsurface conditions and locate potential resource zones.
8. **Hydrogeological Data:** Information about the groundwater aquifers, their depths, and characteristics are collected to assess potential interactions with geothermal fluids and to ensure that groundwater resources are protected.
9. **Environmental Data:** Environmental monitoring may be conducted to assess the impact of drilling on the surrounding environment. This includes monitoring air and water quality, noise levels, and other environmental factors.
10. **Wellbore Integrity Data:** Monitoring the integrity of the wellbore over time is critical for safety and performance. This includes regular measurements of wellhead pressure, casing condition, and any potential leaks.

Collecting and analyzing these data sets is essential for making informed decisions throughout the drilling process and for optimizing the design and operation of a geothermal well and associated power plant. The data also helps in complying with regulatory requirements and managing the sustainability of the geothermal resource.

Monitoring and Evaluation

Utah Geothermal Energy Partners will continuously monitor well performance and resource sustainability both during and post-drilling activities. Regular well maintenance and remediation will be conducted if needed.

Reclamation and Abandonment

On the Newcastle BLM lease, once each well (production wells and injection wells) are drilled, all disturbed soil will be leveled, holding tanks will be emptied and filled, and all regulatory compliance standards will be met upon completion of each drilling activity.

The following steps will be followed for reclamation and abandonment:

1. The operator will contact the authorized BLM officer 48 hours prior to reclamation work.
2. Disturbed areas will be recontoured to blend as closely as possible with the natural topography prior to revegetation with a BLM approved seed mix. This includes removing all berms and refilling all cuts. Compacted portions of the pad will be ripped to a depth of 12 inches unless in solid rock.
3. Site preparation for reclamation may include contour furrowing, terracing, and reduction of steep cut and fill slopes, installation of water bars, etc.
4. All portions of the access roads not needed for other uses, as determined by the authorized BLM officer, will be reclaimed.
5. The stockpiled topsoil will be spread evenly over the disturbed area.
6. The operator will be required to construct water bars and re-open drainages on abandoned access roads and pipeline routes to minimize erosion as required. Water bars will be spaced appropriately, dependent upon topography and slope. Pipeline routes shall be water-barred perpendicular to the fall-line of the slope.
7. The area is considered to be satisfactorily reclaimed when all disturbed areas have been recontoured to blend with the natural topography, erosion stabilized, and an acceptable vegetative cover has been established.
8. Rehabilitation shall be planned on the sites of producing, injecting, and abandoned wells. The entire site or portion thereof not required for the continued operation of the well should be restored as closely as practical to its original condition. Final grading of

back-filled and cut-slopes will be done to prevent erosion and to encourage establishment of vegetation.

9. When sites are abandoned, they will be inventoried for the presence of noxious weeds and treated if noxious weeds are present.
10. Seed and mulch used to reclaim disturbed areas must be weed free. Mulching of the seedbed following seeding will be required under certain conditions (i.e., expected severe erosion), as determined by the authorized BLM officer.
11. Seed will be broadcast between October 1 and March 15 using a site-specific seed mixture and depth of planting as determined by the authorized BLM officer. Seed may be applied with a rangeland drill at half the rate of broadcast seeding. All seeding application rates will be in pounds of pure live seed per acre. Seed should be adapted varieties.

Documentation and Reporting

Agreements will be put in place between the BLM and Utah Geothermal Energy Partners to ensure that the appropriate level of communication is provided including compilation of all project data, reports, and documentation. Utah Geothermal Energy Partners will prepare a final project report summarizing the drilling operation and its results.

Lease Notices and Required Notifications

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43 CFR parts 3200, 3260 and 3280), lease/agreement terms, Geothermal Resource Orders, Notice to Lessees (NTLs), the Approved Plan of Operation and this permit.

A complete copy of the approved application and these conditions shall be maintained on location during all construction and drilling operations. Deviation from the approved plan without prior approval is not allowed.

The operator is fully responsible for the actions of his subcontractors. Operators have the responsibility to assure that activities authorized by this permit are conducted in a manner that complies with other applicable Federal, State, and local laws and regulations.

Required Notifications include:

1. The operator and contractor shall contact the BLM, Cedar City Office (435) 865-3040, at least 48 hours prior to the start or continuation of drilling activities or reclamation activities. (Contact: Ed Ginouves)

2. The Operator shall contact the BLM, Utah State Office, Branch of Fluid Minerals, (801) 539-4072, at least 24 hours prior to the following operations (Contact: Robin Hansen):
    - spudding (including dry hole digger or rat hole rigs);
    - running and cementing all casing strings;
    - pressure testing of BOPE or any casing string;
    - pressure integrity test (mud weight equivalence test) of each casing shoe.
3. In any emergency situation, after hour authorization may be obtained by contacting: Robin Hansen, Petroleum Engineer or Donna Kenney, I&E Coordinator at the phone numbers listed above.

Utah Geothermal Energy Partners will comply with all Notices defined within the lease agreement. These Notices are included here:

AUTHORITY. 30 USC 1000 et seq

PRINCIPAL PURPOSE. The information is to be used to process geothermal lease applications.

ROUTINE USES. (1) The adjudication of the lessee's rights to the land or resources. (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources. (3) Transfer to appropriate Federal agencies when concurrence is required prior to granting uses or rights in public lands or resources. (4) Transfer to the appropriate Federal, State, local or foreign agencies when relevant to civil, criminal, or regulatory investigations or prosecutions.

Appendix C. Interdisciplinary Team Checklist

DETERMINATION OF STAFF: ***(Choose one of the following abbreviated options for the left column)***

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA. **The NEPA Handbook states that issues need to be analyzed in detail if: 1) Analysis of the issue is necessary to make a reasoned choice between alternatives; 2) The issue is significant...or where analysis is necessary to determine the significance of impacts.**

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form.

RESOURCES AND ISSUES CONSIDERED:

Determination	Resource	Rationale for Determination	Signature	Date
NI	Air Quality	The proposed project is within an area that has attained ambient air quality standards or is unclassified. Nothing in the project proposal is anticipated to alter the current situation. Some expected dust would occur during construction, heavy vehicle traffic, etc., but would quickly settle, resulting in no air quality exceedances.	M. Bayles	3/5/2024
NP	Areas of Critical Environmental Concern	There are no ACECs within the Cedar City Field Office.	M. Innes	3/13/2024
NI	Cultural Resources	The BLM has determined the Area of Potential Effect (APE) for this undertaking to be the footprints of the facilities, roads, and pipelines all buffered by 30 meters (100 feet). The total APE is approximately 35 acres. A Class III inventory of the APE was completed April 4, 2024. The results of this inventory indicated three sites determined by the BLM to be not eligible for listing on the National Register of Historic Places. The BLM has assigned a No Historic Properties Affected determination to this undertaking.	J. LaValley	4/5/2024
NI	Environmental Justice	To comply with EO 12989, the BLM Environmental Justice Mapping Tool is used to identify low-income and minority populations within or near the project area. The proposed action is located in U.S Census Bureau Tract 110300, Block Group (BG) 1 in Iron County, Utah. The identified low-income population that resides in the BG is considered to be 18% of the BG population. In comparison to the state, the low-income population is 25%. The low-income population does not exceed the 50% BG threshold and is not 10% greater than the reference area (State of Utah) low-income population. The identified minority population in the identified tract is 9% of the BG population. This also does not exceed the 50% threshold and the 10% or greater than the reference area threshold (23%) and would not require further analysis. The proposed action would provide additional renewable energy options to low-income, minority, or tribal populations in the area and would be expected to be a net positive in relation to Environmental Justice outcomes.	H. Houston	5/6/2024

Determination	Resource	Rationale for Determination	Signature	Date
NP	Farmlands (Prime or Unique)	No prime or unique farmlands occur within disturbance area.	M. Bayles	3/5/2024
NP	Floodplains	No floodplains occur within disturbance area.	M. Bayles	3/5/2024
NI	Fuels/Fire Management	There would be no impact to fuels or fire management as a result of the proposed action. Precautions should be taken to prevent any fire ignition with construction activities or vehicles.	E. Ginouves	3/14/24
PI	Geology / Mineral Resources/ Energy Production	Other than existing geothermal lease on which the wells, pipelines, and powerplant would be placed, there are no other mineral leases, claims, or permits in the proposed project area. Surficial mineral materials would be temporarily displaced as part of the project construction activity. Engineered construction materials necessary for construction of the project would be obtained from existing suppliers in the Iron County area and required quantities would be minor. If successful, the powerplant would extract heat from geothermal fluid for conversion into an estimated 10 MW of electricity. The well field could reasonably be expected to last 30 years before significant temperature decline in the geothermal well field.	E. Ginouves	3/14/24
NI	Greenhouse Gas Emissions	The project proposal involves burning of fossil carbon-based fuels for clearing, drilling, hauling, reclamation, etc., which would produce byproducts such as CO, CO_2, water vapor, etc. Ongoing research has identified the potential effects of so-called “greenhouse gas” (ghg) emissions (including CO_2, methane, nitrous oxide, water vapor, and several trace gases) on global climate. The lack of scientific tools to predict climate change on local or regional scales limits the ability to quantify potential future impacts as a result of this singular project or cumulatively with other activities within the analysis area with any confidence. This is a relatively small project in a relatively remote area where substantial ghg emissions do not occur. The geothermal heat recovery and conversion to electricity, in and of itself, would not release any greenhouse gases as the conversion plant would be a closed loop binary-cycle plant. No gases that might be part of the geothermal fluid would be released to the atmosphere.	E Ginouves	3/14/24

Determination	Resource	Rationale for Determination	Signature	Date
NI	Invasive Species/Noxious Weeds	With any disturbance, the possibility exists for the establishment of invasive and non-native species. Standard measures for rehabilitation such as reseeding, washing vehicles to prevent the spread of weed seed, avoidance of noxious weed areas, and control efforts following seeding. Proponent responsible for noxious and invasive weed control during the term of the ROW. As long as noxious weed stipulations are adhered there would be no impact. The proponent is responsible for noxious weed control of any noxious weeds that are deemed noxious within the State of Utah and the county within the term of the ROW. They must submit a pesticide use proposal with the local BLM weed specialist or submit their own and get approved and turn pesticide application records to local specialist, it is required that the personnel hold a State of Utah pesticide applicator license. There are 2 acres of known Scotch thistle areas within the project proposal. Noxious weed infestations are spread in part by the movement of vehicles, humans, animals, including livestock, by the transport of seed through physical contact and/or ingestion, as well as spread from acts of Mother nature such as: wind and water. The small, isolated noxious weed infestations should eventually be reduced in the future with the continuation of the noxious weed program which is implemented by the Cedar City Field Office and having proponents being diligent in keeping up with noxious weed and invasive weed control. The Cedar City Field Office currently has an aggressive noxious weed control program and annually removes large quantities of noxious weeds throughout BLM administered lands in Iron County. The BLM coordinates with county, state, and federal agencies in order to locate, treat, and monitor noxious weed infestations throughout both counties.	J. Bulloch	3/5/2024
PI	Lands/Access	With this project area location there are potential impacts on multiple ROWs. These ROWs range from gas pipelines, power transmission lines, telephone transmission line, and a county landfill. Listed are the ROWs MLRS serial numbers and the case customer: UTUT105889521, UTUT106264060 and UTUT106282512 – PacifiCorp. UTUT105869208 – UNEV Pipeline, UTUT106100855 – Questar Gas, UTUT106153564 – Kern River Gas, UTUT106103867 – Level 3 Communication LLC, UTUT106257914 – Qwest Communications, and UTUT106262797 – R&PP Landfill, Iron County. All ROW holders must be notified in writing about the potential impacts of their existing ROWs in this project area. Access to the project area is along State Highway UT-56, through Main Street in Newcastle, which then becomes Bench Road. The turnoff to the project area is on the southeast side of Bench Road, approximately 1 mile from the turnoff of UT-56.	L. McConnell	3/25/2024
NP	Lands with Wilderness Characteristics	There are no LWCs within or near the project area. The Antelope Range LWC Unit is approximately 7.5 miles from the project.	M. Innes	3/13/2024

Determination	Resource	Rationale for Determination	Signature	Date
PI	Livestock Grazing	The project would occur in the Pinto Creek grazing allotment. The livestock grazing season of use within the project area is August 1st to November 15th. The project would most likely need to be fenced to exclude livestock from utilizing the area. This could potentially exclude 14 acres currently available for livestock use. If fenced, AUMs may need to be adjusted.	M. Bayles	3/5/2024
NP	National Historic Trails	There are no NHTs within the project area.	M. Innes	3/13/2024
NI	Native American Religious Concerns	Request for consultation letters were sent by the BLM on March 20, 2024, to the following Tribes: Paiute Indian Tribe of Utah as well as the Cedar Band, Indian Peaks Band, Kanosh Band, Koosharem Band, and Shivwits Band; Kaibab Band of Paiute Indians of the Kaibab Indian Reservation; Moapa Band of Paiute Indians of the Moapa River Indian Reservation; Ute Indian Tribe of the Uintah & Ouray Reservation; Navajo Nation; Ute Mountain Ute Tribe; Ute Mountain Ute Tribe – White Mesa Community; Pueblo of Zuni; and The Hopi Tribe. On April 1, 2024, the Moapa Band of Paiute Indians Tribal Historic Preservation Officer, Darren Daboda, sent the following email reply: "I appreciate the Bureau of Land Management (BLM) Cedar City Field Office (CCFO) for contacting the Moapa Band of Paiutes Tribal Historic Preservation Officer THPO). Currently, THPO has reviewed the report and has no comments: BLM CCFO Eleven NEPA Projects (...Newcastle Geothermal Development...). We, however, THPO would like to stay informed/contacted if there are any adverse effects or finding of cultural significance during construction within the APE." No other responses have been received from other Tribes as of April 22, 2024. Issuing this permit would not limit access or impede the ceremonial use of known Indian sacred sites, nor would it adversely affect the integrity off any known sacred sites.	J. LaValley	4/22/24
NI	Paleontology	The surficial geology of project area is alluvium derived from adjacent mountain-front exposures of Tertiary volcanics. The PFYC Class is believed to be Class 1, No Potential. The surficial geologic unit would not contain vertebrate fossils and is unlikely to contain significant invertebrate fossils. No assessment or mitigation is recommended.	E. Ginouves	3/14/24
NI	Rangeland Health Standards	Approximately 14 acres within the Pinto Creek grazing allotment are expected to be disturbed during the construction and production of the Geothermal facility. The allotment has a total of 1,951 acres that RHS. The 14 acres of disturbance would not be expected to have a large enough impact to affect the overall RHS on the Pinto Creek grazing allotment.	M. Bayles	3/5/2024 Updated 4/1/2024
NI	Recreation	There is no developed recreation in the project area. Recreation use in the vicinity of the project area would not be impacted.	M. Innes	3/13/2024

Determination	Resource	Rationale for Determination	Signature	Date
NI	Socio-Economics	There would be minor increases in local service sector revenue from the temporary workforce involved in the well field drilling and powerplant construction project. Local contractors would be part of the construction labor force. Operation of the proposed geothermal plant would provide about 5-6 jobs for the life of the project and property taxes would provide a small increase in revenues to Iron County.	E. Ginouves	3/14/24
PI	Soils	14 acres of soil disturbance are expected from the proposal. Erosion and reclamation mitigation measures will need to be included within the design features of the EA.	M. Bayles	3/5/2024
NI	Special Status Plants	No special status plants species are known to occur within the proposed project area according to both an IPaC report from the U.S. Fish & Wildlife Service and shared occurrence data provided by the Utah Natural Heritage Program and BLM.	M. Bayles	3/5/2024
PI	Vegetation	The proposed project would result in the loss of approximately 14 acres from new disturbance. Design features will be included to mitigate impacts. A reclamation plan should also be included for site rehab.	M. Bayles	3/5/2024
NI	Visual Resources	Project area is VRM Class IV. The project meets VRM class objectives.	M. Innes	3/13/2024
NI	Wastes (hazardous or solid)	There are no known waste issues in the proposed area. The Project Operation Plan addresses the storage of hazardous materials in that any release of reportable quantities will follow state and federal regulation should a release occur. In such a case, notifications will be made to the appropriate agencies. In addition to the notifications, regulation will require mitigation to follow. Use of construction equipment introduces a threat only if an unforeseen incident or malfunction occurs with the equipment. However, this threat is unlikely due to the probability and minimal quantities of product utilized.	T. Carlson	3/5/2024
NI	Water Resources/ Quality (drinking/surface /ground)	There are no groundwater protection zones in the vicinity of the proposed project. The project would utilize state of the art, permitted exploration and drilling techniques that, when properly exercised, have been proven to protect underground water quality. Minor amounts of groundwater would be produced via a shallow on-lease water well to meet domestic water needs at the powerplant project office.	E. Ginouves	3/14/24
NP	Wetlands/ Riparian Zones	There are no wetland/riparian areas with the project area.	E. Ginouves	3/14/24
NP	Wild and Scenic Rivers	There are no Wild and Scenic Rivers in the project area.	M. Innes	3/13/2024
NP	Wilderness/WSA	There is no designated Wilderness/WSA within the project area.	M. Innes	3/13/2024
NP	Wild Horses	The proposed projects are not within a Herd Area (HA) or Herd Management Area (HMA). Chloride HMA is the closest Wild Horses HMA, it is 2 miles from the project area.	J. Bulloch	3/5/2024
PI	Wildlife & Fish	The project area is within crucial mule deer winter range. Construction would not be allowed Dec 1 to Apr 30 to avoid disturbance to wintering mule deer.	D. Schaible	3/20/24

Determination	Resource	Rationale for Determination	Signature	Date
NP	Wildlife - Greater Sage-Grouse	The proposed project is not within sage grouse habitat.	K. Willardson	3/5/2024
PI	Wildlife – Migratory Birds	Various migratory bird species occupy and utilize the habitat within and near the proposed project area including foraging habitat for golden eagles. Plan project activities outside of migratory bird nesting season, January 1 – August 31, to the greatest extent possible. If this is not possible, then avoid any habitat alteration, removal, or destruction during the primary nesting season for migratory birds, March 1 – July 31. If project disturbance activities must occur during primary bird nesting season, then nesting surveys will be required by a certified biologist. Any active nests found would have appropriate timing restrictions and spatial buffers would be applied until nests are no longer active. At least a 100 ft buffer for passerine species and a 0.25 - 1.00 mi buffer for raptor species (Romin and Muck, 2002). Any power lines constructed in the area will meet APLIC standards (APLIC, 2006). Long-term impacts to migratory bird populations in the area should be analyzed in the EA from geothermal development. See attached wildlife stipulations for additional stipulations to avoid and minimize negative impacts to migratory birds. If the project could result in the take of migratory birds, the proponent should coordinate with the USFWS.	D. Christensen	3/26/2024
NI	Wildlife-Special Status (not TEC)	Sensitive species that may occupy the area include bald eagle, burrowing owl, ferruginous hawk, fringed myotis, pygmy rabbit, short-eared owl, spotted bat, and Townsends big-eared bat. Preconstruction surveys would be required for pygmy rabbit following Ulmschneider 2004.	D. Schaible	3/20/2024
NI	Wildlife T&E and Candidate	According to USFWS Information for Planning and Consultation (IPaC) the California condor (endangered) and monarch butterfly (candidate) are species that have the potential to be impacted by the proposed project. California condors have the potential to frequent the area for foraging purposes but are unlikely. There would be no effect to the California condor. Monarch butterfly has the potential to occupy the area for foraging, migrating, and breeding. There are no known milkweed species that grow in or near the proposed project area. However, the USFWS recommends the BLM to follow conservation guidelines found in Western Monarch Butterfly Conservation Recommendations (USFWS 2023).	D. Christensen	3/13/2024
NI	Woodland / Forestry	Only one or two scattered PJ are within the proposed project area and may need to be removed.	C. Peterson	3/06/24

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
Environmental Coordinator			
Authorized Officer			

Appendix D. Geothermal Sale Lease Stipulations

UTU87418

T. 36 S., R. 15 *W.,* Salt Lake Meridian
Sec. 20, Lots, 3, 4, NESW, S2SW, SWSE.
228.04 Acres
Iron County, Utah
Cedar City Field Office

CONDITIONAL SURFACE USE AND TIMING LIMITATION STIPULATION - FERRUGINOUS HAWK NESTING

In habitat for raptor species, no surface disturbances or occupancy would be conducted during the breeding and nesting season (March 1 - August 1 for ferruginous hawk) within spatial buffers (0.5 mile for ferruginous hawk) of known nesting sites.

Purpose: To protect raptor habitat.

Exception: An exception would be granted if protocol surveys determine that nesting sites, breeding territories, and winter roosting areas are not occupied.

Modification: The Field Manager may modify the boundaries of the stipulation area if portions of the area do not include habitat or are outside the current defined area, as determined by the BLM.

Waiver: May be granted if it is determined the habitat no longer exists or has been destroyed.

TIMING LIMITATION STIPULATION: CRUCIAL WINTER MULE DEER AND ELK HABITAT

Do not allow surface-disturbing activities from December 1 to April 30 in crucial winter mule deer and elk habitat.

Purpose: To minimize stress and disturbance to deer and elk during critical winter months.

Exception: An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not being utilized during the winter period for any given year.

Modification: The Field Manager may modify the boundaries of the stipulation area (1) if a portion of the area is not being used as winter range by deer/elk or (2) if habitat is being utilized outside of stipulation boundaries as winter range and needs to be protected or (3) if the migration patterns have changed causing a difference in the season of use.

Waiver: May be granted if the winter range habitat is unsuitable during winter months by deer/elk and there is no reasonable likelihood of future winter range use.

LEASE NOTICE: BALD EAGLE WINTER ROOST SITES

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from November 1 through March 31 which would disrupt bald eagle roosting activities within 0.5 mile of known roosts, unless the area has been surveyed according to protocol and determined to be unoccupied. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: GOLDEN EAGLE NEST SITES

The lessee/operator is given notice that this lease has been identified as containing golden eagle habitat. Exploration, drilling and other development activities would not be allowed from January 1 through August 31 which would disrupt golden eagle breeding activities within 0.5 mile of an occupied nest. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: BURROWING OWL HABITAT

The lessee/operator is given notice that this lease has been identified as containing bald eagle habitat. Exploration, drilling and other development activities would not be allowed from March 1 through August 31 which would disrupt burrowing owl breeding activities within 0.25 mile of an occupied nest. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: BALD EAGLE HABITAT

The Lessee/Operator is given notice that the lands in this parcel contains nesting/winter roost habitat for the bald eagle. Avoidance or use restrictions may be placed on all or portions of the lease. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e. creation of a permanent structure. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts.

LEASE NOTICE: BALD EAGLE NEST OR WINTER ROOST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.5 mile of known bald eagle winter roost areas or known bald eagle nest site, which has been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: GOLDEN EAGLE NEST SITES

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.5 mile of known golden eagle nests, which have been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: BURROWING OWL HABITAT

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility within 0.25 mile of known burrowing owl nests, which have been active within the past 3 years. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: RAPTORS

Surveys will be required whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within potential raptor nesting areas. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: PYGMY RABBIT

The lessee/operator is given notice that surface use or otherwise disruptive activity would not be allowed which would result in an aboveground facility or semi-permanent (eg., roads, pipelines, reservoirs, etc) within 300 feet of pygmy rabbit habitat. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

LEASE NOTICE: UTAH SENSITIVE SPECIES

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act. Migratory Bird Treaty Act and 43 CFR 3262.11. This notice may be waived, accepted, or modified by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Cedar City Field Office, Color Country District
Cedar City, UT 84721
https://www.blm.gov/office/cedar-city-field-office

November 12, 2024

In Reply Refer To:
DOI-BLM-UT-C010-2024-0014-EA

MEMORANDUM FOR: Newcastle Geothermal Development and Utilization Plan EA Record

FROM: Jacqueline J. Russell, Acting Field Manager, Cedar City Field Office

Subject: Clarification of Ferruginous Hawk Stipulation - Newcastle Geothermal Project

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This memorandum serves to clarify an error in the stipulations attached to the lease for the Newcastle Geothermal Project. Specifically, there is a stipulation in the Final July 14, 2009 Geothermal Sale that prohibits both surface occupancy and construction/surface disturbing activities during the Ferruginous Hawk nesting period if an occupied nest exists within a 0.5-mile buffer. After further evaluation, it has been determined that this stipulation is erroneous.

The Record of Decision for the Cedar Beaver Garfield Antimony Resource Management Plan which covers the Cedar City Field Office, Cedar City, UT, does not include a "No Surface Occupancy" (NSO) provision for Ferruginous Hawks. Therefore, the NSO stipulation is not standard practice for drafting stipulations and supports the conclusion that the NSO aspect is erroneous. However, the timing limitation on construction and surface-disturbing activities during the Ferruginous Hawk nesting period remains valid and is in alignment with our standard operational procedures, especially considering the significant number of raptor nests in the project area.

The Bureau of Land Management is committed to protecting raptor habitat while ensuring that stipulations are accurately and appropriately applied to projects.

Please contact Ryan Oberhelman at 435-865-3047 or via email at roberhelman@blm.gov.

Appendix E. Migratory Bird and Raptor Stipulations

Migratory Birds

- No surface use, ground disturbance or otherwise disruptive maintenance activities would be allowed from March 1 through July 31 based on surveys and species occupancy (refer to species-specific dates). Surveys are required for all migratory bird species protected under the Migratory Bird Treaty Act if project activities occur during active nesting season.

  If project activities are unavoidable during this timeframe, then:

  - Migratory bird nest surveys shall be conducted prior to any project disturbance activities.
  - Migratory bird nest surveys shall be completed 7 days prior to any disturbance activities.
  - Field surveys shall be conducted according to protocol and determined to be unoccupied by the BLM authorized officer prior to surface disturbance activities.
  - Active nests that are found will have at least a 100-foot buffer, or species-specific seasonal nesting restrictions and appropriate nesting buffers shall be applied.
  - When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will suspend wholly until the fence is satisfactorily repaired.
  - Biological monitors will continue to monitor active nests until such time as it is determined that the nest is no longer active and buffers can be lifted, allowing activities to occur.
  - The BLM will be contacted prior to any maintenance activities, with the possible exception of emergency maintenance.

Raptors

- Avoid surface use, ground disturbance, vegetation clearing, or disruptive maintenance activities during raptor nest season from January 1 through August 31 based on surveys and species occupancy (refer to species-specific dates). Surveys are required for all raptor species if project disturbance activities occur during the active nesting season.

  If project activities are unavoidable during this timeframe, then:

  - Field surveys shall be conducted according to protocol and determined to be unoccupied by the BLM authorized officer prior to surface disturbance activities. If nesting sites are identified as a result of the surveys, appropriate buffers and timing limitations would be implemented in accordance with BLM's Best Management Practices for Raptors.
  - Raptor nest surveys shall be conducted within priority habitats prior to any project disturbance activities.
  - Migratory bird nesting surveys shall be completed 72 hours prior to any disturbance activities.
  - Field surveys shall be conducted according to protocol and determined to be unoccupied by the BLM authorized officer prior to surface disturbance activities.

- Species-specific seasonal nesting restrictions and appropriate nesting buffers shall be applied to known active nests (Romin and Muck 2002).[1]
- When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will be suspended until the fence is satisfactorily repaired.
- Approved perch deterrents and guyed wire markers shall be utilized.
- The BLM will be contacted prior to any maintenance activities, with the possible exception of emergency maintenance.

Migratory Birds (All Species)

- Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife.
- Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) or the Bald and Golden Eagle Protection Act (BGEPA). Nests protected under ESA or BGEPA cannot be removed without a valid permit.
- Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit.
- Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor.
- Report any incidental take of a migratory bird to the local USFWS office of Law Enforcement.
- Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).
- Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).
- Implement standard soil erosion and dust control measures. For example:
    - Establish vegetation cover to stabilize soil.
    - Use erosion blankets to prevent soil loss.
    - Water bare soil to prevent wind erosion and dust issues.
- Results of migratory bird surveys are subject to spatial and temporal variability. Birds with eggs or young cannot be hazed, and nests with eggs or young cannot be moved until young are no longer dependent on the nest. Confirmation that all young have fledged should be made by a qualified biologist.

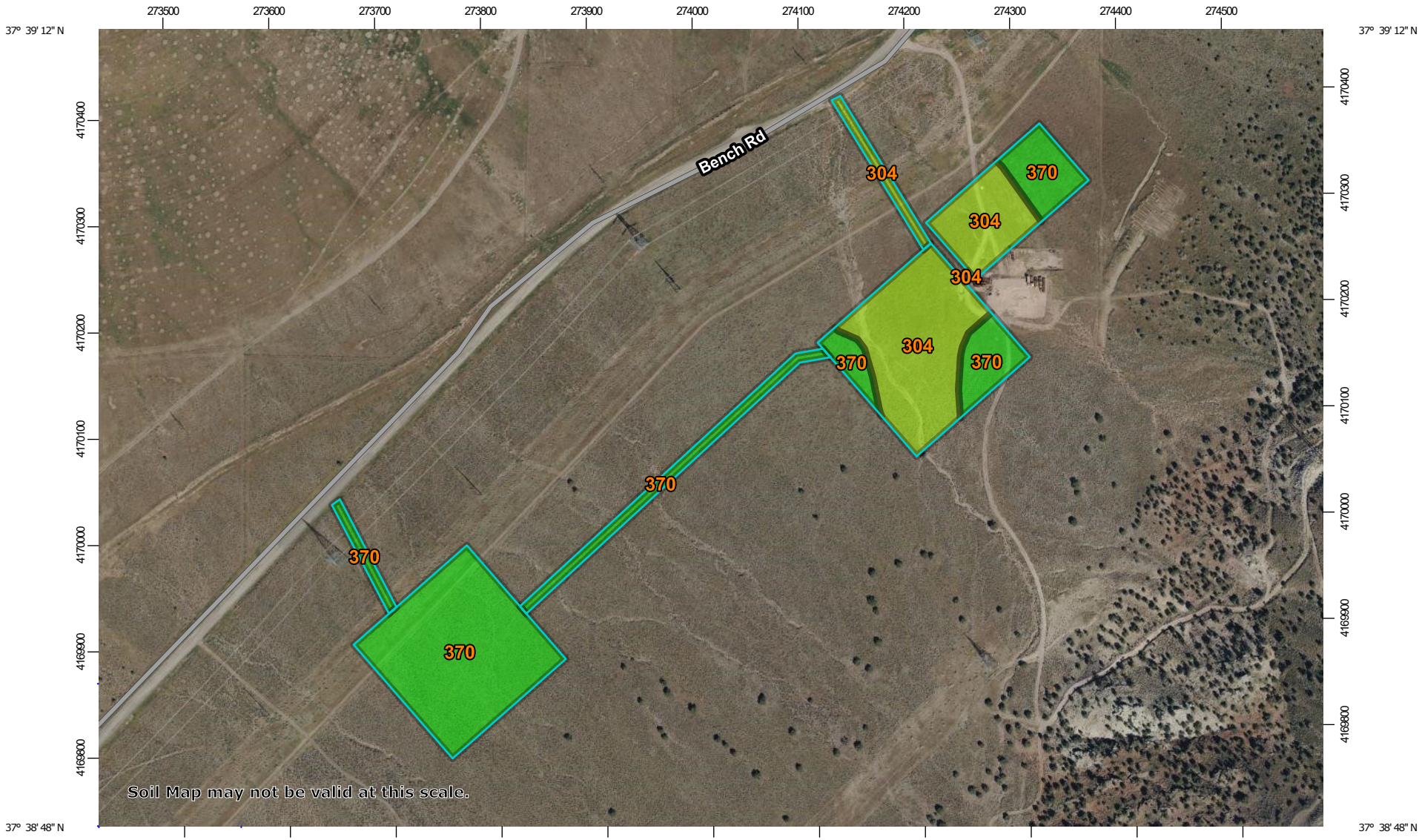
[1] Romin, L., and J. Muck. 2002. Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances. U.S. Fish and Wildlife Service, Utah Field Office, Salt Lake City.

- Confirmation that all young have fledged should be made by a qualified biologist before the restriction within the buffer is lifted.
- When project activities must be scheduled during the nesting season, appropriate steps to prevent migratory birds from establishing nests in the potential impact area may be taken. These steps could include covering equipment that may be stationary and could provide a nesting structure for a bird and covering or excluding birds from any supplies (e.g., pipes) where birds may nest.
- Minimize migratory bird mortality at water tanks on BLM-administered land through the use of functional wildlife escape ramps. Use new tanks with built in escape ramps and/or install effective escape ramps in existing tanks.
- Minimize migratory bird mortalities from collisions with fences, towers, and powerlines through marking of potential problem areas.
- Remove, permanently cap, or otherwise prevent bird entry into vertical pipes.
- Consider use of native local species of plants for reclamation. Reclamation should also provide for proper planting techniques to ensure the highest rate of success.
- Minimize migratory bird habitat disturbance.
- Prepare a weed abatement plan that outlines the areas where weed abatement is required and the schedule and method of activities to ensure bird impacts are avoided.
- Remove invasive/exotic species that pose an attractive nuisance to migratory birds.
- To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.
- If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat (i.e., use a 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed). To the maximum extent practicable, while allowing for public safety, low-intensity energy-saving lighting (e.g., low-pressure sodium lamps) will be used. Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.
- Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.
- Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps, should not be used.
- Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging roadkill on the roadway.
- Remove road-kill carcasses regularly to prevent scavenging and bird congregations along roadways.
- Avoid planting “desirable” fruited or preferred nesting vegetation in medians or rights-of-way.

- Minimize entrapment and entanglement hazards through project design measures that may include:
    - Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch.
    - Covering or enclosing all potential nesting surfaces on the structure with mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 19 mm and must be maintained until the structure is removed.
    - Cap pipes and cover/seal all small dark spaces where birds may enter and become trapped.
- Use appropriate deterrents to prevent birds from nesting on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.
- During the time that the birds are trying to build or occupy their nests (generally, between April and August, depending on the geographic location), potential nesting surfaces should be monitored at least once every 3 days for any nesting activity, especially where bird use of structures is likely to cause take. It is permissible to remove non-active nests (without birds or eggs), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.
- If an active nest becomes established (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properly disposed of.

Appendix F. NRCS Web Soil Survey Report

Mechanical Site Preparation (Surface)—Iron-Washington Area, Utah, Parts of Iron, Kane, and Washington Counties
(Proposed_Newcastle_Features)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Unsuited
- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Soil Rating Lines
- Unsuited
- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Soil Rating Points
- Unsuited
- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Iron-Washington Area, Utah, Parts of Iron, Kane, and Washington Counties
Survey Area Data: Version 17, Aug 28, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 8, 2022—Sep 29, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Mechanical Site Preparation (Surface)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
304	Annabella very gravelly loam, 2 to 15 percent slopes	Moderately suited	Annabella (85%)	Rock fragments (0.50)	5.6	40.0%
370	Dixie gravelly loam, 2 to 8 percent slopes	Well suited	Dixie (85%)		8.4	60.0%
Totals for Area of Interest					**14.0**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Well suited	8.4	60.0%
Moderately suited	5.6	40.0%
Totals for Area of Interest	**14.0**	**100.0%**

Description

FOR - Forestry

The ratings in this interpretation indicate the suitability for use of surface-altering soil tillage equipment during site preparation in forested areas. The ratings are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

The ratings are both verbal and numerical. Rating class terms indicate the degree to which the soils are suited to this aspect of forestland management. The soils are described as "well suited," "poorly suited," or "unsuited" to this management activity. "Well suited" indicates that the soil has features that are favorable for the specified kind of site preparation and has no limitations. Good performance can be expected, and little or no maintenance is needed. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for the specified kind of site preparation. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. "Unsuited" indicates that the expected performance of the soil is unacceptable for the specified kind of site preparation or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher