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D-E&W-1 LAND USE

The Lost Creek Permit Area (Permit Area) is located in the northeastern corner of Sweetwater County, south-central Wyoming. The Permit Area is in an unpopulated area about 15 miles southwest of Bairoil, Wyoming, about 38 miles northwest of Rawlins, and about 90 miles southwest of Casper. The Permit Area covers approximately 4,254 acres. The main portion of the Permit Area consists approximately 4,194 acres, and it is described in detail in **Appendix D1** for the main Permit Area. The east and west access roads, described in this Appendix D for the East and West Roads, cover about 26 and 34 acres, respectively. They are existing two-track roads which will be upgraded by LC ISR, LLC for the Lost Creek Project.

In **Appendix D1** for the main portion of the Permit Area, [Figure D1-1b](#) shows the permit boundary superimposed on an aerial photo, taken in 1994. In this Appendix D for the East and West Roads, **Figure D1-E&W-1a** shows the location of the East Road, and **Figure D1-E&W-1b** shows the location of the West Road. **Figure D1-E&W-2a** includes photographs of the existing two-track East Road and its intersection with the Sooner Road (BLM Road 3215), and **Figure D1-E&W-2b** includes photographs of the existing two-track West Road and its intersection with the Wamsutter - Crooks Gap Road (County Road 23).

The regional landscape consists of rolling plains with some draws, rock outcroppings, ridges, bluffs, and some isolated mountainous areas. Vegetation is primarily sagebrush and rabbit brush. The weather is dry and windy, with short, hot summers and cold winters. There is no perennial surface water, although there are a few ephemeral drainages that can convey surface water during spring snowmelt and following intense rainstorms.

The land within the Permit Area is entirely publicly owned. The primary land use is rangeland for cattle and wildlife habitat, but the area is also used for dispersed recreation such as hunting, off-highway vehicle (OHV) use, and antler collecting. Regional land uses include grazing, industry, wildlife habitat, hunting and dispersed recreation, mining, oil and gas extraction, and energy infrastructure. The East and West road corridors are primarily used as access roads for ranchers, mineral exploration, and recreationists. More detail on the land uses is included in **Appendix D1** for the Main Permit Area.

D-E&W-2 HISTORY

The historic land uses of the Permit Area include livestock grazing and wildlife habitat as well as dispersed recreation. The discovery of uranium deposits in the Permit Area and consequential exploratory drilling and studies are described in more detail in Appendix D2 for the main portion of the Permit Area.

D-E&W-3 ARCHEOLOGICAL AND PALEONTOLOGICAL RESOURCES

Confidential. Section submitted separately.

D-E&W-4 METEOROLOGY, CLIMATOLOGY, AND AIR QUALITY

The Permit Area is located in the intermountain semi-desert ecoregion, which has cold winters and short, hot summers. The average annual temperatures range from 40 to 52 degrees Fahrenheit (°F), and the average annual precipitation ranges from five to 14 inches. More detail, including data from the on-site meteorological station, is included in **Appendix D4** for the main portion of the Permit Area.

D-E&W-5 GEOLOGY

The Permit Area is located near the north-central part of the Great Divide Basin, and the geologic formation at the surface is the Eocene Battle Spring Formation. The geology of the main portion of the Permit Area is described in more detail in **Appendix D5**. Because the only project-related activities along the east and west access roads will be improvements to the roads and extension of an above-ground transmission line, the materials of most interest are at shallow depths. These soils on the East and West Roads are described in more detail in **Section D-E&W-7**.

D-E&W-6 HYDROLOGY

The project-related activities along the east and west access roads are all at the surface (improvements to the roads and extension of an above-ground transmission line); therefore, the groundwater information provided in **Appendix D6** for the main portion of the Permit Area is applicable.

General information on surface runoff and channel morphology in **Appendix D6** is applicable to the East and West Roads, and analytical methods for the East and West Roads are identical to the methods described in **Appendix D6**. **Figure D6-E&W-1** shows the surface drainage for the East and West Roads, along with the main Permit area. The entire site, including the East and West Roads, drains into Battle Springs Flats, to the south of the Permit area.

The East Road is within the Stratton Draw and East Fork Stratton Draw watersheds. The Stratton Draw Watershed is 8,802 acres, of which 15.1 acres are in the Permit Area. The slope of main channel, as measured with a clinometer in the field, is 1% where it crosses the Permit Area. The East Fork Stratton Draw is 3,595 acres, of which 18.3 acres are within the Permit area. No substantial drainages cross the East Access Road within the East Fork Stratton Draw watershed.

The West Road is within the Eagles Nest Draw and Far Western Draw watersheds. The Eagles Nest Draw watershed is 16,021 acres, of which 16.6 acres are within the Permit area, and the Far Western Draw is 2,618 acres, of which 68.5 acres are within the Permit area. The road traverses the ridgeline that divides these watersheds, and does not cross any significant drainages.

Stratton Draw is the only significant channel that would generate substantial peak flows in the Permit Area. Based on the regression equations in **Table D6-1a**, the calculated 2-, 5-, 10-, 25-, 50-, and 100-year peak discharges for this watershed are 43, 108, 171, 274, 368, and 477 cubic feet per second, respectively. Two storm water samplers (example shown in **Figure D6-4**) were installed in Stratton Draw in September 2009 to capture runoff entering and leaving the Permit Area. There are no surface water rights within three miles of the East and West Roads that have not already been discussed in **Appendix D6**.

D-E&W-7 SOILS

An Order 3 soil survey of the East and West roads was conducted in September 2009. This Order 3 survey was conducted immediately after the Order 1 survey of the deep injection wells and road/pipeline corridors that is described in the **Operations Plan Attachment 5b**. The Order 3 survey of the East and West Access roads was conducted by Mr. Jim Nyenhuis.

Because the study area for the Order 3 survey of the East and West Roads was narrow, the survey was conducted by driving and walking along the existing 2-track that bisects the study area. All soils within five feet of each side of the centerline of the 2-track were classified as disturbed land. The remainder of the 100-foot-wide corridor was classified as Pepal Sandy Loam, Poposhia Loam, or Teagulf Sandy Loam, the three soil types that have previously been identified within the main Permit Area.

Surface indicators were used to identify each soil type. Based on previous field studies, Pepal Sandy Loam is the dominant soil type, found in areas of Upland Big Sagebrush habitat, where sagebrush is moderate to dense. The Poposhia Loam is found exclusively in drainages, where there is Lowland Big Sagebrush habitat and dense, larger sagebrush. The Teagulf Sandy Loam occurs in upland areas on subtle ridges and west-facing slopes where the sagebrush is sparse, cushion plants are common, and there is a concentration of pebbles and gravels on the soil surface due to aeolian erosion. Soil types were mapped on aerial photos, re-checked in the field, and then digitized in GIS. **Figure D7-E&W-1a** and **1b** are maps of the soils along the East and West roads, respectively. Pepal Sandy Loam comprises about 69 percent, Poposhia Loam comprises about 3 percent, Teagulf Sandy Loam comprises about 4 percent, and disturbed land comprises about 24 percent of the East and West road area.

D-E&W-8 VEGETATION

Vegetation communities along the East and West roads were delineated in August 2009 by Craig Severn, who also conducted a survey for rare plant habitat in July 2009. Both Upland Big Sagebrush and Lowland Big Sagebrush communities, as described in **Appendix D-8**, were present, and no additional plant communities were identified. The vegetation communities were mapped in the field on aerial photos, and then digitized in GIS. **Figure D8-E&W-1a** and **1b** are maps of the vegetation communities along the East and West roads, respectively. Upland Big Sagebrush comprises 96 percent and Lowland Big Sagebrush comprises 4 percent of the East and West road area. No rare plants or appropriate habitat for them were found along the roadways.

D-E&W-9 WILDLIFE

Baseline data for wildlife with respect to the East and West access road are included in **Appendix D-9** and **Attachment OP-A5**.

D-E&W-10 BACKGROUND RADIOLOGICAL CHARACTERISTICS

Naturally occurring gamma exposure rates were measured along the East and West access roads to the Lost Creek Permit Area. Gamma exposure rates were measured using a portable digital Ludlum Model 2350-1 gamma radiation Sodium Iodide (NaI) detector. The instrumentation was calibrated by the manufacturer in September 2008.

The detector was carried at a three-foot height. The gamma exposure rate (in $\mu\text{R/hr}$) was recorded at approximately every 100 feet along the road. The measurement location was recorded using a Global Positioning System (GPS). The results are presented in **Table D10-E&W-1** and **Figures D10-E&W-1a** and **1b**.

As described in **Appendix D10**, gamma exposure rates measured by NaI detectors are relative measurements, as response characteristics of NaI detectors are energy dependent. True gamma exposure rates are best measured with an energy independent system such as an HPIC. To provide an absolute measure of gamma exposure rates, these measurements were converted to a three-foot-HPIC-equivalent gamma exposure rate, according to the equation in **Figure D10-9** ($y = 0.57x + 6.97$). Three-foot-HPIC-equivalent gamma exposure rate are also presented in **Table D10-E&W-1** and in **Figures D10-E&W-2a** and **2b**.

D-E&W-11 WETLANDS

No potential wetlands were identified along either the east or west access road using the GIS layers from the National Wetlands Inventory (NWI) database (National Wetlands Inventory, 2006), and this was confirmed in the field by qualified personnel (see **Section D-E&W-8**).