Sheep Mountain Project – Mine Permit 381C

APPENDIX D-3 – CULTURAL RESOURCES
2011 ADDENDUM

Cultural Resource surveys for the Sheep Mountain Project have been completed and/or are in progress within all areas of proposed disturbance.

Refer to Cultural Resource Area Map.

Due to their sensitive nature cultural resource surveys have been submitted directly to the BLM and SHPO for review and comment and are not included in this document. However, cultural resource surveys completed to date have not identified any eligible sites within the project area.

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PALEONTOLOGICAL FIELD SURVEY

Sheep Mountain Mine

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Introduction

TYPE OF SURVEY

A paleontological survey was required by BLM-Lander in connection with proposed modifications to an existing uranium mine owned by Titan Uranium USA, Inc. near Sheep Mountain south of Jeffery City, Fremont Co, WY. The project is located T 28 N, R 92 W and include sections (some partially) 16, 17, 20, 21, 22, 27, 28, 29, 32, and 33 (See Map #1). Maps of the area were provided by Titan Uranium USA, Inc. The project includes surface disturbance from road modifications, stockpile staging areas, and other disturbances associated with mining activity.

METHOD OF SURVEY

This report reflects the pedestrian survey of the proposed changes and improvements to an already established uranium mine. Based on the maps provided, the survey covered road areas, stockpile areas, and access sites for shafts and other mining operations. The survey is designed to identify any possible disturbance of paleontological sites. Inspection include sites that crossed land surfaces with exposed bedrock or otherwise having high potential for impacting fossils of BLM administered land. This survey also included inspections of nearby outcrops to determine the density of fossil remains for the area. Prior to field work, aerial photographs were consulted to identify exposed outcrops and other areas of interest. Also, a preliminary literature search was done to identify any possible historical paleontological finds in the area.

Any paleontological sites would have been recorded using a GPS. For this project, no fossil remains were collected.

Report of findings

GEOLOGICAL DESCRIPTION

A recognizance paleontological survey was performed for the Sheep Mountain Uranium mine covering more than 4,000 acres of BLM, state, and private land south or Jeffery City. This area shown on Map # 2 contains 5 major stratigraphic units.

- Alluvial and colluvial deposits (Quaternary) – These deposits are unconsolidated material of rock, sand, and soil. Most of this material was covered with vegetation.
- Crooks Gap Conglomerate (Oligocene?) - Giant boulders of granite in arkosic sandstone matrix. Reynolds (1976) considers age of eastern exposures to be Oligocene(?). See Figure 1.
- Tertiary Battle Springs Formation (Eocene)--Equivalent to, and lithologically similar to locally derived basin-margin conglomerate of Wasatch Formation; merges southward into main body of Wasatch Formation. Lower part is Paleocene. (Love and Christianson, 1985). Beahm et.al (2010) describes the area as having two members in the Battle Springs Formation.
    - Member A (Lower member) is the target member and contains uranium mineralization is characterized as being a fluvial deposit. “The A member contains considerable granitic detritus near its top with increasing amounts of sedimentary detritus derived from Mesozoic and Paleozoic rocks as the section is descended or as outcrop is followed northward towards the Emigrant Trail thrust fault. There is a marked coarsening northward in the lower member, with conglomerates becoming the dominant rock type.” See Figure 2.

- o “The B member (upper member) of the Battle Springs Formation consists primarily of granitic detritus, although chert and quartzite clasts presumably derived from older sedimentary rocks are present. The B member thins toward the northern portion of the area.” Member B may be equivalent to the Crooks Gap Conglomerate listed above.

- Fort Union Formation(Paleocene) - Clay shale, siltstone, and sandstone; local lenses of impure limestone, and numerous lignitic beds; contains Tertiary plant and vertebrates; base generally placed at the lowest of the succession of lignite beds within it.
- Cody Shale (Cretaceous) - Dull-gray shale, gray siltstone, and fine-grained gray sandstone.

FINDINGS

- The historic mine area had a high degree of surface alteration. In addition, unaltered areas were covered with native vegetation (Figure 3). Although the area was well covered, there was enough exposure to get a good ‘feel’ for the amount of fossil material that may be present in the area due to the amount of previous disturbance and exposed outcrops. The majority of the area contains outcrops of the Battle Springs Formation and the Crooks Gap Conglomerate. The nature of these sedimentary features is not very conducive in the preservation of vertebrate remains. Conglomerates containing the large clasts as seen in Figure 1 suggest a depositional environment that could destroy or poorly preserve any bone material. Inspection of these outcrops did not produce any macro fossil evidence.
- The Fort Union Formation and the Cody Shale Formation are known to host vertebrate fossil remains. However, these finds tend to be sporadic with a low concentration. The Fort Union

Formation and Cody Shale are located in the north east portion of the mine. According to the maps provided by Titan Uranium USA, Inc. there is no planned activity in that area. The closest site is the Congo pit, which will be accessed through an existing road south of the pit. Inspection of this area did not reveal any fossil evidence.

RECOMMENDATIONS

The majority of the Sheep Mountain Mine contains formations that have a low probability of producing vertebrate fossil remains. Pedestrian survey of these formations did not produce any fossil evidence. In addition, the area has been heavily disturbed be previous mining activity and what has not been disturbed is covered with native vegetation. Therefore, it is my opinion that mining activities in this area will have little to no impact on fossil vertebrates. However, major construction could impact remains that cannot be detected by a surface survey. Construction workers should be advised to watch for and report any unexpected vertebrate finds.

RESEARCH AND REFERENCES

Preliminary literature review and paleontological references were researched prior to the site visit. A brief literature review did not mention fossil remains from this area, although some of the formations are known to be fossil bearing.

Bibliography

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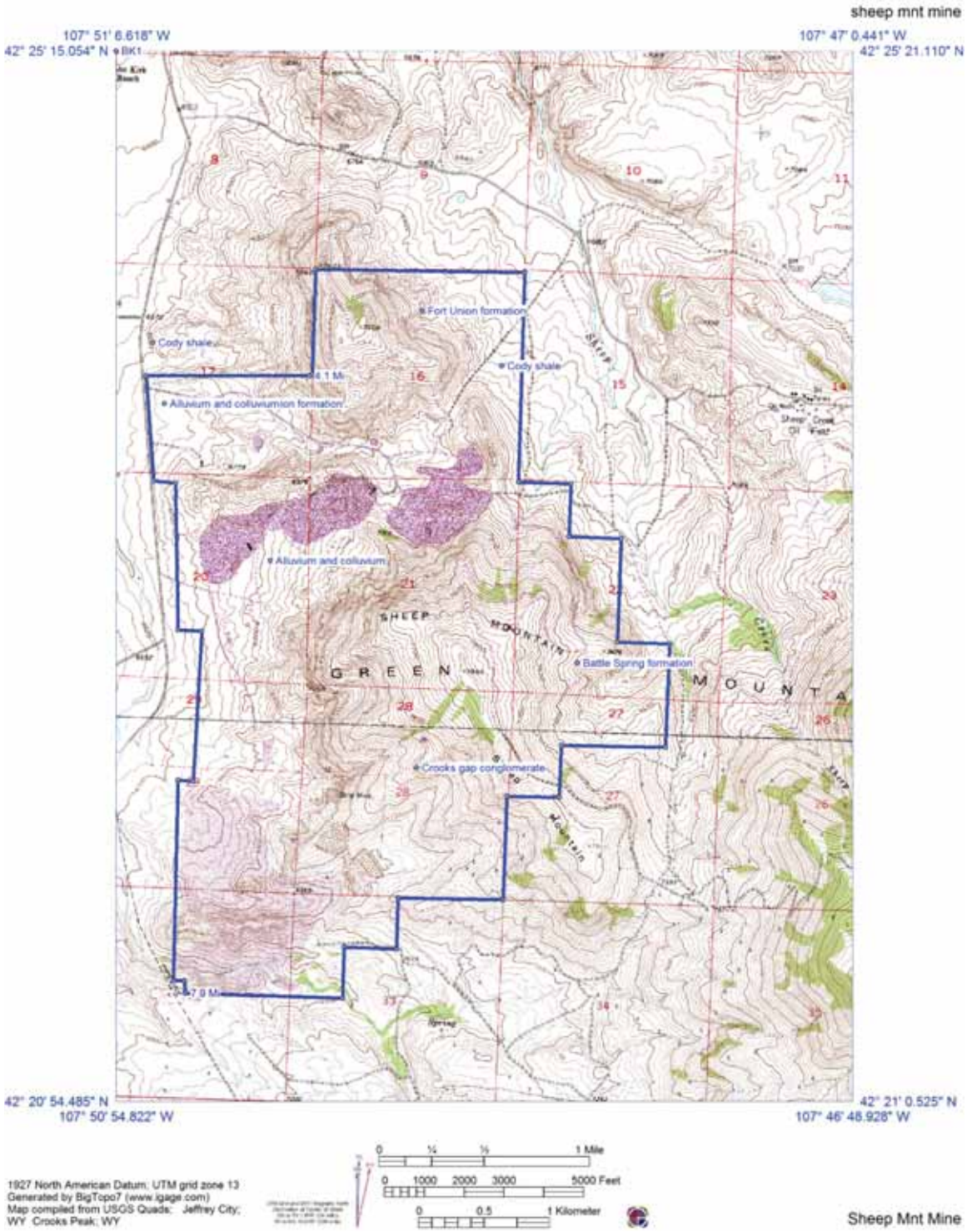
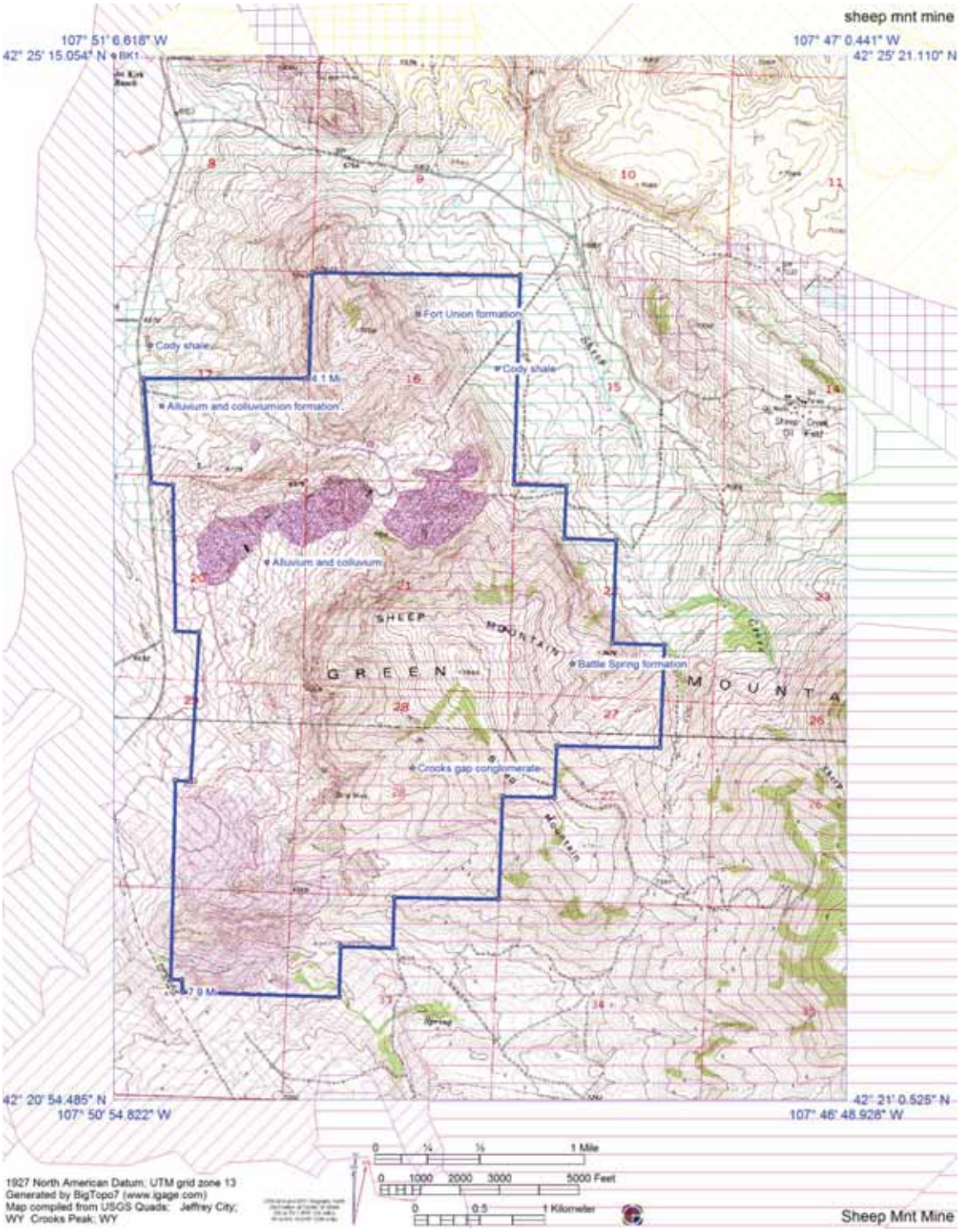


Map # 1 – Mine area outlined in blue.



Map # 2 – Area of mine activity showing geological units. Map created by using AllTopo mapping software (by iGage) with a shape file overlay of bedrock geology from the Wyoming State Geological Survey

Figure 1 – Photo of Crooks Gap Conglomerate (or Member B of the Battle Springs Fm.) from the mine area. Notice the large boulders and poorly sorted matrix.

Figure 2 – Member A of the Battle Springs Formation from a previous mining pit. Even from a considerable distance you can still make out some of the large clasts.

Figure 3 – Areas disturbed by previous mining activity. Quaternary sediments in the foreground are heavily covered with vegetation.