Abandoned Uranium Mine Site Assessment for the Mitchell Price Mine (NM0250)

FINAL REPORT

Prepared For:

New Mexico Energy, Minerals and
Natural Resources Department
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1.0 INTRODUCTION

INTERA Incorporated (INTERA) has prepared this Abandoned Uranium Mine (AUM) Site Assessment Report for the Mining and Minerals Division (MMD) of the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) in compliance with the Professional Service Agreement dated November 2, 2009. INTERA visited the Mitchel Price Site (AUM Site), MMD ID: NM0250, on December 22, 2009.

1.1 PREVIOUSLY KNOWN INFORMATION ABOUT THE SITE

The AUM Site was mined by surface mining methods in 1955. An alias for the AUM Site is Mitchel Price No. 1-8. The area around the Mitchel Price AUM Site has been classified as the Cuchillo district which is characterized by sedimentary copper-type uranium deposits (McLemore and Chenoweth, 1989).

This AUM Site was included in the Anderson Report, NM-367-1-1. The Report stated that the prospecting in Section 12 was minor and only consisted of a few piles of rock. The Report also stated that the description given in the 1970 RME-160 report was that there is one small discovery pit, 4 ft by 6 ft and 10 ft deep in a recrystallized limestone member of the Magdalena formation. The rock piles and pit were not identified in this site assessment. Note: there is some conflict between the directions given in the Anderson Report and the AUM Site location given by MMD. The directions from the RME-160 report instruct to drive 6.7 miles up Cuchillo Negro Creek and then turn left out of the canyon to the south for 0.3 miles, which would put the site much further north than Section 12 (Anderson, 1980).

1.2 SITE LOCATION AND DIRECTIONS

The given Mitchel Price Site location is on Bureau of Land Management (BLM) land in the northern half of the Section 12, Township 13 south, Range 5 west. This AUM Site is located in Sierra County and is approximately 3 miles west of Interstate 25, and 5 miles northwest of Truth or Consequences (please see Figure 1).

To access this AUM Site from Albuquerque, drive south on Interstate 25 for approximately 146 miles. Take Exit 79 toward Truth or Consequences, crossing over the interstate. Merge onto Cemetery Road (which then turns into Date Street). After 0.8 miles, turn left onto NM-181 N (toward the City of Elephant Butte). Drive 0.5 miles and turn left onto County Road Ao07/Cuchillo Creek Road. After 0.5 miles follow Cuchillo Creek Road to the right and continue driving along Cuchillo Negro Creek bed under the interstate. Continue northwest along Cuchillo Negro Creek for about 3 miles. Just after crossing a cattle guard turn left on a small dirt road. Follow this road along a ridge for about 1 mile, passing a water tank on the right, and park. Proceed on foot northwest about 1 mile to the reported site, across two drainages (one small and one large). The site is unmarked and the coordinates are needed to locate the AUM Site. The given AUM Site location is near the top of a hill made up of east-dipping Paleozoic rocks.

Upon reaching the given AUM Site location, INTERA staff traversed the area on foot and found no evidence of any mine features.

1.3 SITE GEOLOGY

The AUM Site falls within the Mexican Highland Section of the Basin and Range Province. This area is characterized by dissected block mountains and aggraded desert plains. The AUM Site is located in the Magdalena formation of the Pennsylvanian Period. In this area, the Magdalena formation consists of fine-grained gray limestone with dark shale and coarse-grained gray sandstone interbeds (Lozinsky, 1982). Dark and light chert nodules and lenses occur throughout the formation. Marine fossils are present throughout the formation.

In the lower section of the Magdalena formation in the Mud Springs Mountains is a 45 to 50 foot thick latite sill (Lozinsky, 1982). The contact zone between the sill and the Magdalena formation is a 12 to 24 inch thick bake zone (Lozinsky, 1982). The location of this sill was not verified in this site assessment.

1.4 SITE HYDROGEOLOGY

The surface runoff at the AUM Site discharges to Cuchillo Negro Creek, which drains into the Rio Grande approximately 5.5 miles to the southeast. Cuchillo Negro Creek flows along the northeast edge of the Mud Springs Mountains and is topographically controlled by the fault-blocking geology of the region.

The AUM Site is located on the southwestern edge of the Middle Rio Grande Basin and the northeastern corner of the Hot Springs Artesian Basin. The Hot Springs Artesian Groundwater Basin was created for administrative purposes by the New Mexico State Engineer. This basin falls between the Middle Rio Grande Basin and the Lower Rio Grande Basin. The groundwater in the vicinity of the AUM Site is generally found in the alluvium aquifer and in Paleozoic aquifers (DBSA, 2003). The groundwater generally flows west to east, discharging into the Rio Grande (DBSA, 2003).

1.5 REGIONAL TOPOGRAPHY AND TERRAIN

The AUM Site may be found on the Cuchillo Quadrangle 7.5 minute United States Geological Survey topographic map at an elevation of approximately 4900 feet above mean sea level (please see Figure 2). The AUM Site is located in the Mud Springs Mountains northwest of Truth or Consequences. The elevation of the Mud Springs Mountains ranges from 4,500 to 5,749 feet (Julyan, 2006). The small mountain range trends northwest-southeast and is approximately 5 miles long and 2.5 miles wide. The range is an intrabasinal fault block tilting toward the northeast, part of the Basin and Range Province of block mountains. The Paleozoic sedimentary layers of varying erosional properties create a blocky terrain. Figure 3 shows an aerial photograph of the terrain surrounding the AUM Site.

2.0 MINE FEATURES

The mine features described below are based on the features provided to INTERA by MMD in the GIS Data Dictionary (MMD, 2009). INTERA marked the locations of the AUM Site features using a Trimble Global Positioning System (GPS), and entered details about the features into the GPS using the MMD data dictionary. No mine features were identified at the given AUM Site

location. Please see the Photo Log in Appendix A, Table 1 for a list of AUM Site features, and Figures 4a and 4b for the locations of the AUM Site features.

2.1 MINE SHAFTS, ADITS, AND DECLINES

No mine shafts, adits, and declines were evident at the AUM Site.

2.2 MINING AND EXPLORATION PITS AND OPEN CUTS

No mining and exploration pits were evident at the AUM Site.

2.3 WASTE AND ORE PILES AND DISTURBANCES

No waste and ore piles were evident at the AUM Site.

2.4 MINING RELATED BUILDINGS AND FOUNDATIONS

No mining related buildings and foundations were evident at the AUM Site.

2.5 OTHER MINE FEATURES

No other mine features were evident at the AUM Site.

2.6 BOREHOLES

No boreholes were evident at the AUM Site.

2.7 RECLAMATION ACTIVITIES

No apparent reclamation activities have taken place at the AUM Site.

3.0 ARCHEOLOGICAL SITES

No apparent archeological sites were identified at or near this AUM Site.

4.0 SITE GAMMA RADIATION READINGS

The background gamma radiation readings at the AUM Site were measured approximately 200 yards southwest of the site location, based on GPS location. The background gamma readings measured approximately 10 microroentgens per hour (µR/hr) at the ground surface. Please see Table 2 for all of the gamma radiation readings taken at the AUM Site and Figures 4a and 4b for the locations of the radiation readings.

The gamma radiation readings at the AUM Site were all less than 20 µR/hr, including readings taken at the ground surface of outcrops. The highest readings were rad-1 and rad-10, see Table 2,

with readings of 12 µR/hr at the ground surface. All of the readings ranged between 6 µR/hr and 12 µR/hr.

5.0 CURRENT LAND USES

5.1 HUMAN ACTIVITY AND RECREATIONAL SITE USE

No evidence of recent human activity was found at the AUM Site. The current land use of the area surrounding the AUM Site appears to be grazing, see Section 5.4, below.

5.2 NEARBY RESIDENTIAL, COMMERCIAL AND INDUSTRIAL STRUCTURES

There are no residential or commercial structures within a 1-mile radius of the AUM Site. Approximately 0.7 miles northeast of the AUM Site is an active gravel pit. The mining activity and trucks driving along the Cuchillo Negro Creek bed could be heard from the site.

5.3 NEARBY DOMESTIC WELLS

There are no domestic wells within a 1-mile radius of the AUM Site.

5.4 EVIDENCE OF GRAZING OR AGRICULTURE

During the site assessment evidence of the presence of cows was noted. A water tank was identified, approximately 1 mile from the AUM Site, along the access road. Fences and cattle guard crossings were present on the land.

Five stock wells were identified within 1 mile of the AUM Site. One well west of the AUM Site, RG-43843, is owned by the Bureau of Land Management. The date this well was drilled, the depth of the well, and depth to water information was not available. The second well west of the AUM Site, HS-00727, is in the Hot Springs Artesian Groundwater Basin and privately owned. Well HS-00727 was drilled in 1995 to a depth of 230 ft below ground surface (bgs) and the depth to water was unavailable. The remaining three wells are northeast of the AUM Site and all privately owned. Well RG-24235 appears not to be in use and information about the date it was drilled, depth, or depth to water is not available. Well RG-26351 was drilled in 1975 to a depth of 168 ft (bgs) and the depth to water was 70 ft. Well RG-58919 was drilled in 1994 to a depth of 125 ft (bgs) and the depth to water was 60 ft (NMOSE, 2008).

5.5 EVIDENCE OF WILDLIFE

There was very little evidence of wildlife in the area. There were, however burrow holes visible, which could be home to rodents or other burrowing animals. A Northern Flicker was identified north of the AUM Site. Other birds that may be present this time of year include species of geese, sparrows, warblers, quail, hawks, nighthawks and owls, although none were observed during the site visit.

6.0 VEGETATION

The vegetation of the Mitchel Price Site is characterized as Chihuahuan Desert ecosystem. The identified vegetation includes Juniper trees (*Juniperus*), Barrel Cactus (*Ferocactus wislizeni*), Pencil Cactus (*Cylindropuntia leptocaulis*), Purple Prickly Pear Cactus (*Opuntia macrocentra*), Candelabra Cholla (*Cylindropuntia imbricate*), Creosote Bush (*Larrea tridentate*), and Mesquite (*Prosopis*). Other small unidentified woody shrubs and forbs as well as various types of grasses were also present throughout the AUM Site (Carter, 1997).

7.0 POTENTIAL OFFSITE IMPACTS

7.1 EROSION

There are no notable erosional features at the given AUM Site location.

7.2 ENVIRONMENTAL IMPACTS

There is no evidence of soil staining from chemicals potentially brought to the AUM Site, or from constituents present in the ore or waste rock. Gamma radiation levels at the AUM Site are not imminently dangerous to humans, livestock, or wildlife potentially present at the AUM Site.

8.0 REFERENCES

Anderson, Orin J., 1980. Abandoned or Inactive Uranium Mines in New Mexico. New Mexico Bureau of Mines and Mineral Resources Open File Report 148.

Carter, Jack L., 1997. Trees and Shrubs of New Mexico. Johnson Books; Boulder, CO.

Daniel B. Stephens & Associates, Inc (DBSA), 2003. Socorro-Sierra Regional Water Plan. Prepared for: Socorro Soil and Water Conservation District, Socorro, New Mexico.

Julyan, Robert, 2006. The Mountains of New Mexico. University of New Mexico Press.

Lozinsky, Richard Peter, 1982. Geology and Late Cenozoic History of the Elephant Butte Area, Sierra County, New Mexico. Master Thesis, The University of new Mexico.

McLemore, Virginia T. and William L. Chenoweth, 1989. Uranium Resources in New Mexico. New Mexico Bureau of Mines & Mineral Resources, Resource Map 18.

Mining and Minerals Division (MMD), 2009. Mine Feature Data Dictionary.

New Mexico Office of the State Engineer (NMOSE), 2008. Wells and Surface Diversions in New Mexico. WATERS_PODS_may08.shapfile. OSE Waters Database.

TABLES

Table 1
Site Features

Mitchel Price – NM0250
Abandoned Uranium Mine Assessments

Feature Name	Feature Type	Material	Activity	Associated Photo	Depth of Height (ft)	Radius (ft)	Diameter (ft)	On Site?	Collapsed ?	Open?	Associated Feature	Notes
tank-1	Stock tank	NA	NA	Photo 16	--	--	--	No	--	--	--	Along access road

Notes:

-- No Information Available

Table 2
Gamma Radiation Survey Results

Mitchel Price – NM0250
Abandoned Uranium Mine Assessments

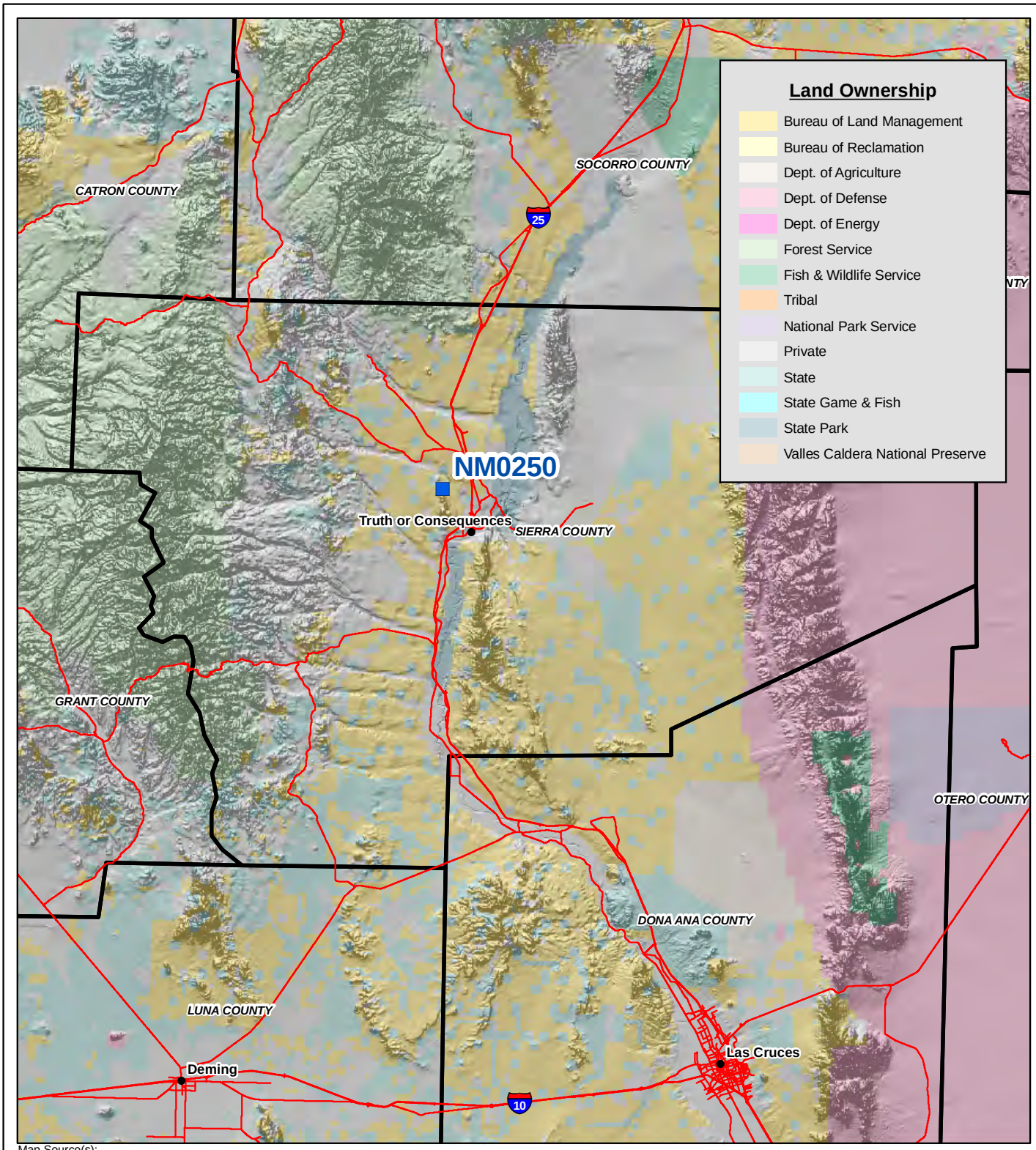
Reading ID	Reading at 0ft Above Ground (µR/hr)	Reading at 4ft Above Ground (µR/hr)	Associated Photos	Associated Features
background	10	10	None	None
rad-1	12	9	None	None
rad-2	8	6	None	None
rad-3	10	11	None	None
rad-4	9	11	Photo 6	On outcrop
rad-5	7	10	Photo 6	None
rad-6	8	7	Photos 7-8	None
rad-7	6	7	Photo 14	Drainage to the North
rad-8	9	10	None	None
rad-9	10	8	None	None
rad-10	12	10	None	None

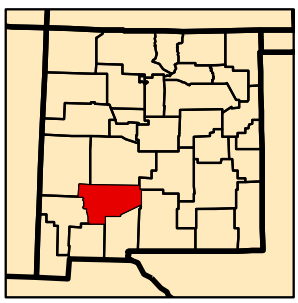
Notes:

All gamma readings at this Site were taken using a Ludlum 19 µR/Ratemeter.

µR/hr = microroentgens per hour

FIGURES





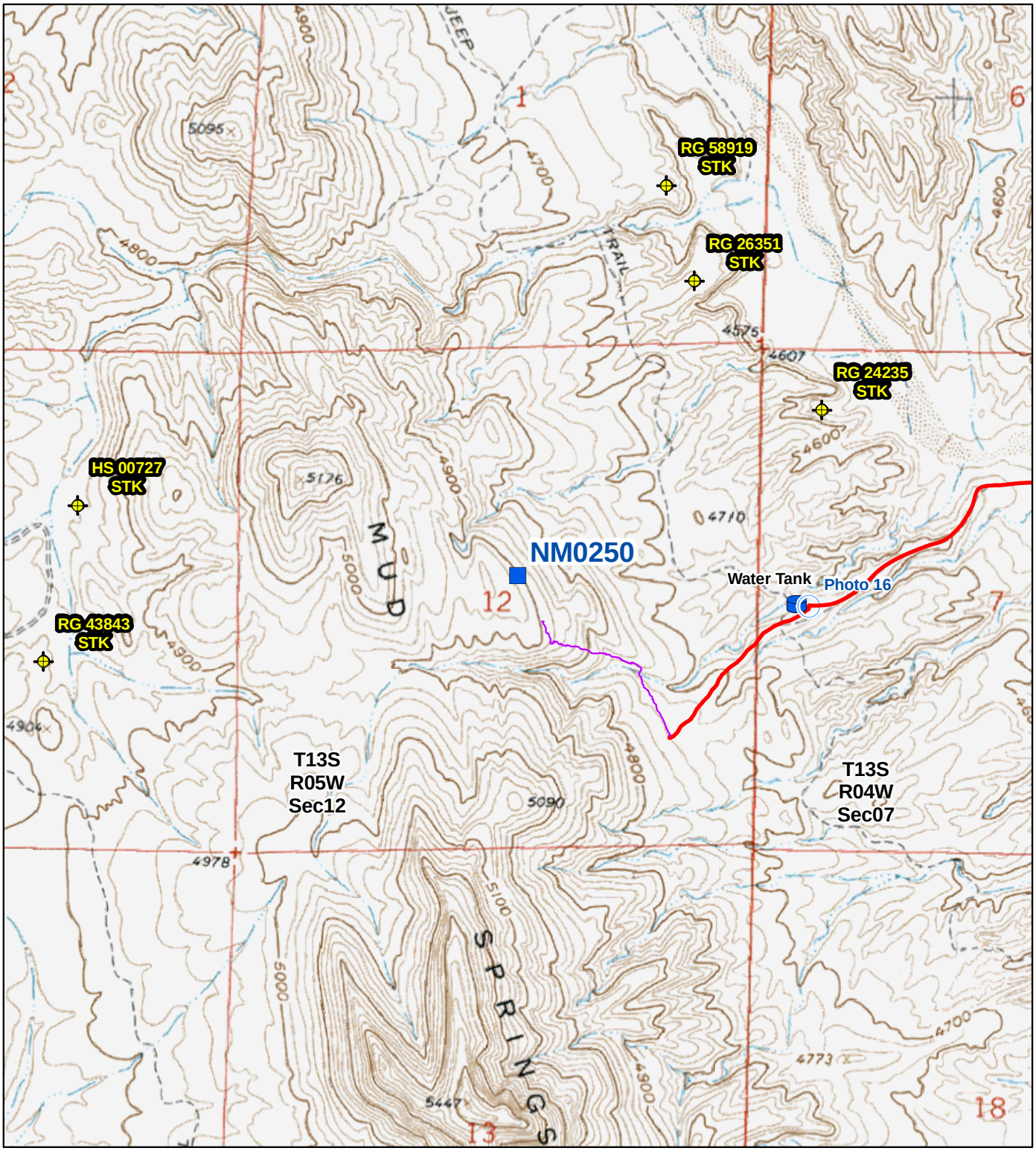
Legend

- AUM Location
- Road
- County Boundary

Figure 1
Site Location Map
NM0250-Mitchel Price

Abandoned Uranium Mine Assessment

File: S:\Projects\EMMD-001_Abandoned Uranium Mine Assessment\Sites\NM0250-Mitchel_Price\GIS\Map\Site_Map.mxd 01/08/2010



Map Source(s):
U.S. Geological Survey 7.5-Minute
Topographic Map
-Cuchillo, 1961-1980

0 750 1,500 3,000
Feet

NORTH

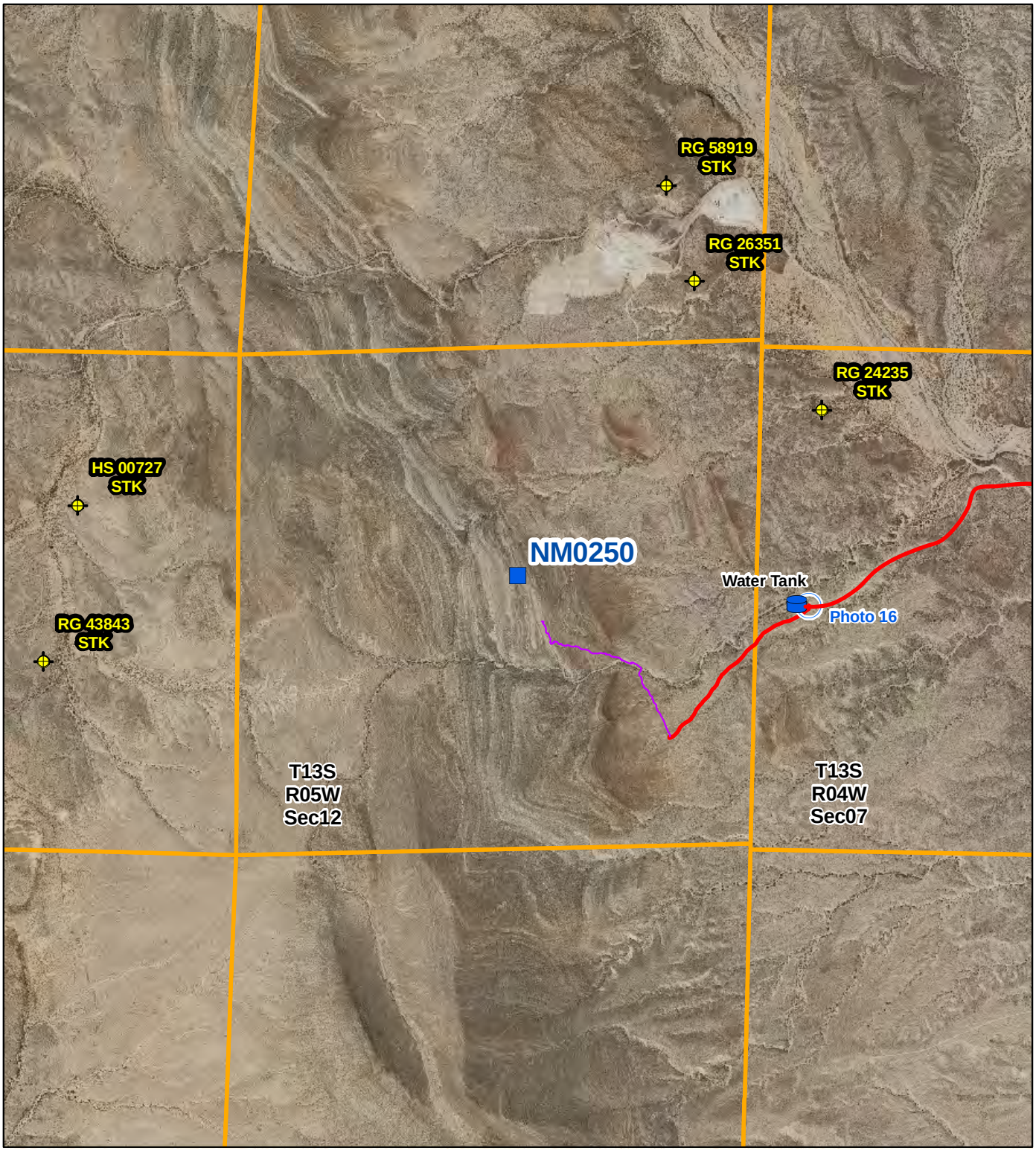
Legend

- Well Within 1 Mile of Site
- Approximate AUM Location
- Track
- Mine Road

Figure 2
Topographic Map
NM0250-Mitchel Price

Abandoned Uranium
Mine Assessment

File: S:\Projects\EMMD-001_Abandoned Uranium Mine Assessment\Sites\NM0250-Mitchel_Price\GIS\Map\Topo_Map.mxd 12/30/2009



Map Source(s):
U.S. Geological Survey 7.5-Minute
DOQQ County Mosaic
-Sierra County, 2009

0 750 1,500 3,000
Feet

NORTH

Legend

- Well Within 1 Mile of Site
- Approximate AUM Location
- Photo Location
- Track
- Mine Road
- Section Boundary

Figure 3
Aerial Photo
NM0250-Mitchel Price
Abandoned Uranium
Mine Assessment

File: S:\Projects\EMMD-001_Abandoned Uranium Mine Assessment\Sites\NM0250-Mitchel_Price\GIS\Map\Aerial_Map.mxd 12/30/2009

Map Source(s):
U.S. Geological Survey 7.5-Minute
DOQQ County Mosaic
-Sierra County, 2009

0 50 100 200
Feet

Note: No mining features found on the site.

NORTH

Legend

- Radiation Readings (µR/hr)
- Approximate AUM Location
- Photo Location
- Track

Figure 4a
Site Map on
Aerial Photo
NM0250-Mitchel Price
Abandoned Uranium
Mine Assessment

INTERA

File: S:\Projects\EMMD-001_Abandoned Uranium Mine Assessment\Sites\NM0250-Mitchel_Price\GIS\Map\Closeup_Map_Aerial.mxd 01/08/2010

rad-6
0 ft = 8
4 ft = 7

Photos 7-8

rad-7
0 ft = 6
4 ft = 7

Photo 14

rad-8
0 ft = 9
4 ft = 10

rad-5
0 ft = 7
4 ft = 10

rad-3
0 ft = 10
4 ft = 11

rad-4
0 ft = 9
4 ft = 11

Photo 6

Photos 1-5

rad-1
0 ft = 12
4 ft = 9

rad-2
0 ft = 8
4 ft = 6

rad-9
0 ft = 10
4 ft = 8

rad-10
0 ft = 12
4 ft = 10

rad-background
0 ft = 10
4 ft = 10

Map Source(s):
Ownership - BLM, 2007

0 50 100 200
Feet

Note: No mining features found on the site.

NORTH

Legend

- Radiation Readings (µR/hr)
- Approximate AUM Location
- Photo Location
- Track

Surface Ownership

- Bureau of Land Management

Figure 4b
Site Map with
Surface Ownership
NM0250-Mitchel Price
Abandoned Uranium
Mine Assessment

INTERA

File: S:\Projects\EMMD-001_Abandoned Uranium Mine Assessment\Sites\NM0250-Mitchel_Price\GIS\Map\Closeup_Map_LandUse.mxd 01/08/2010

APPENDIX A

PHOTO LOG

Note: Gaps in the numbering sequence of the photos is the result of removing photos not suitable for the report. A full set of photos will be provided in the final deliverable.

Photo 1 – Given AUM Site location, looking west.

Photo 2 – Given AUM Site location, looking north.

Photo 3 – Given AUM Site location, looking east.

Photo 4 – Given AUM Site location, looking south.

Photo 6 – Rock outcrop west of the given AUM Site location, looking west.

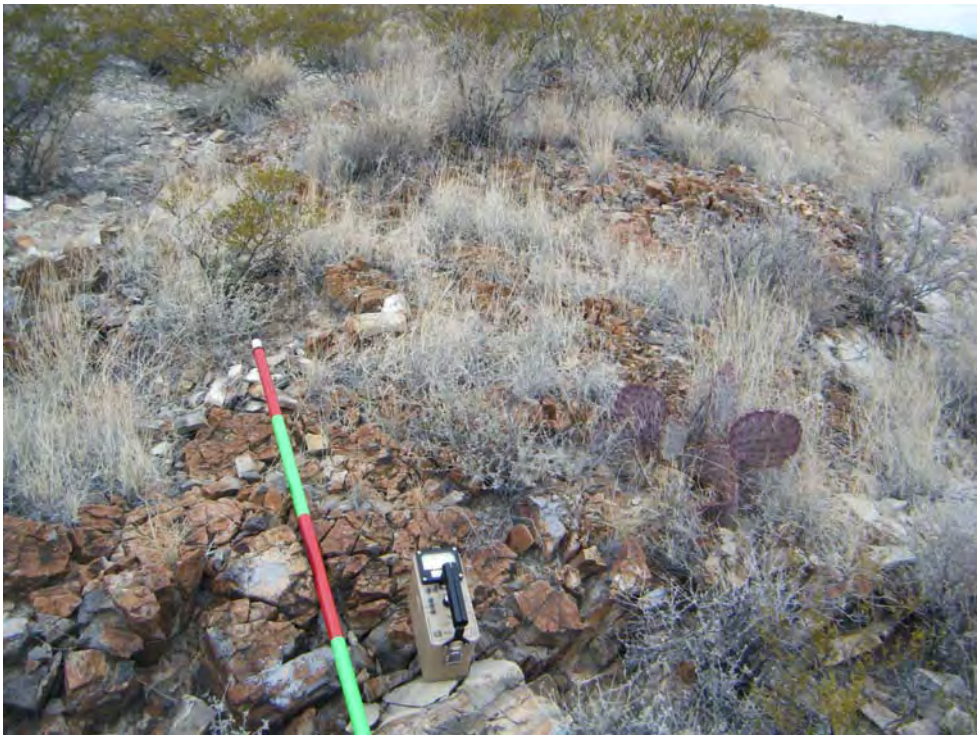


Photo 7 – Rock outcrop northeast of the given AUM Site location (rocks contained marine fossils).

Photo 8 – Ludlum reading for rock outcrop northeast of the given AUM Site location.

Photo 9 – Creosote Bush (*Larrea tridentate*).

Photo 10 – Winter vegetation and rocky surface, north of the given AUM Site location.

Photo 11 – Creosote Bush (*Larrea tridentata*) and Prickly Pear Cactus (*Opuntia*).

Photo 12 – Ocotillo (*Fouquieria splendens*) and grasses north of the given AUM Site location.

Photo 13 – Pincushion cactus and grasses.

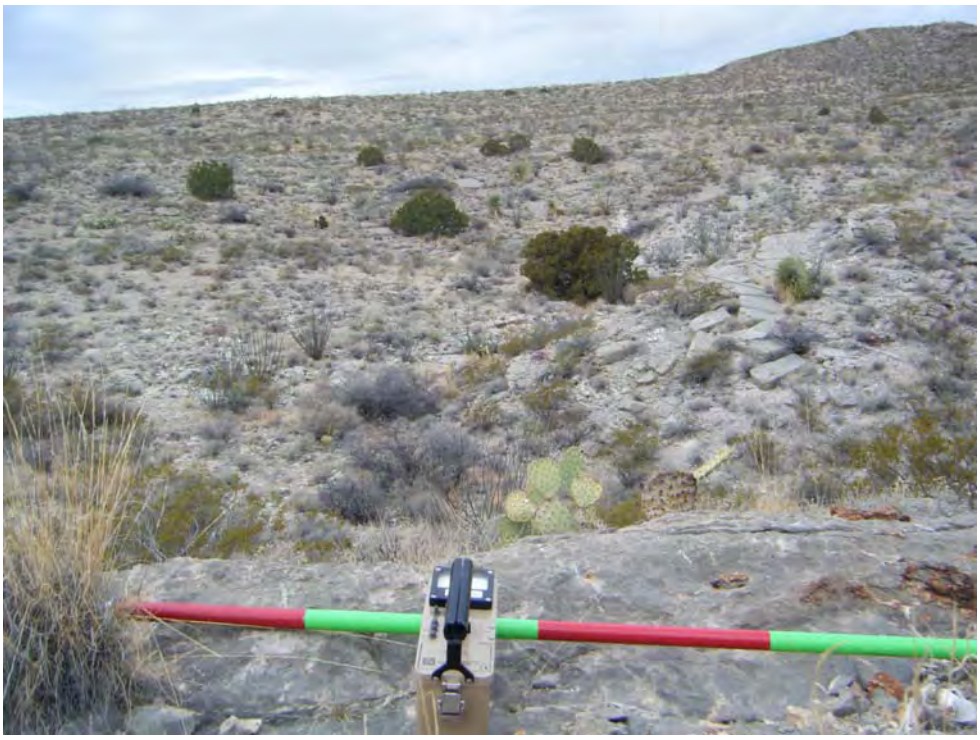


Photo 14 – Drainage north of the given AUM Site location, gray rock contained marine fossils, looking northeast.

Photo 15 – Pencil cactus (*Opuntia leptocaulis*).

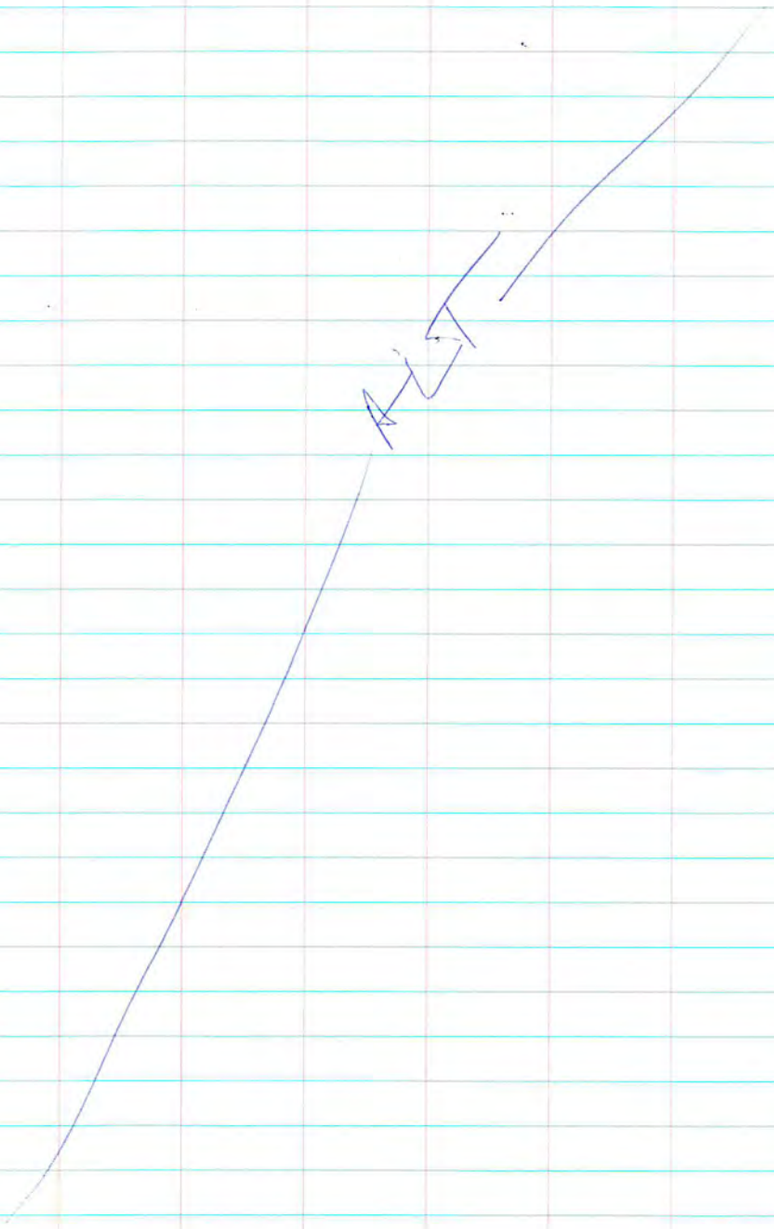
Photo 16 – Water tank south of the given AUM Site location along the access road.

APPENDIX B

FIELD NOTES

12/21/09 ALT Abandoned Uranium Mines

Soils: sandy, gravel, iron staining localized throughout the site, some ALT red clay soils



12/22/09 ALT Abandoned Uranium Mines

Site Name: NM250, Mitchell Price Prospect

Objective: Site Assessment

Personnel: Annelia Tinklenberg - INTERA
Amy Andrews - INTERA

Equipment: Rental truck, ~~borrowed~~ rental ALT Trimble GeoXH ((SN: 4712432344), PN: 60950-00, IC: 1756A-612, 2005 series), borrowed Ludlum (SN: 175926, Model 19), ~~rental GPS cam~~ ALT, digital camera, backup Garmin GPS, cell phone amplifier, field laptop

7:15 Left hotel for NM 250

7:45 Arrived at parking for NM 250

8:25 Arrived at approximate location for NM250 site.
Background gamma at site - 10 uR/hr
Given Site Location - GPS point for NM250 site
~~No foot visible features~~ ALT
No visible mine features
Rad 1 - Given Site Location - 0ft: 12 uR/hr, 4ft 9 uR/hr

Photo 1 - ~~West~~ East ALT of Given Site location, looking ~~East~~ West
Photo 2 - Looking north at Given Site Location, south of site

Photo 3 - Looking east at given site location

Photo 4 - Looking south at given site location

Photo 5 - Name of site at given site location, looking south west

Rad 2 - South of Given Site location - 0ft: ~~8~~ 9 ALT mR/hr, 4ft: ~~10~~ 6 ALT mR/hr

Rad 3 - East of Given Site location - 0ft: ~~20~~ 10 ALT mR/hr, 4ft: 11 mR/hr

Rad 4 - West of Given Site Location, on exposed rock outcrop - 0ft: 9 mR/hr, 4ft: 11 mR/hr

Photo 6 - Rock outcrop, west of Given Site location looking west

Rad 5 - North of Given site Location - 0ft: 7 mR/hr, 4ft: 10 mR/hr

Rad 6 - NE of site - 0ft: 8 mR/hr, 4ft: 7 mR/hr

Photo 7&8 - Rock outcrop NE of site, Rad 6 Reddish-tan limestone with fossilized shells

Rad 7 - Drainage N of site - 0ft: 6 mR/hr, 4ft: 7 mR/hr

Photo 9-13 - Vegetation

Photo 14 - Drainage N of site with Rad 7 Gray-tan limestone with crinoid fossils

9:20

Photo 15 - Vegetation and Rad 8

Rad 8 - NW of site - 0ft: 9 mR/hr, 4ft: 10 mR/hr

Rad 9 - 0ft: 10 mR/hr, 4ft: 8 mR/hr

Rad 10 - 0ft: 12 mR/hr, 4ft: 10 mR/hr

9:50 - Back to truck

9:55 -

Photo 16 - Water tank south of site along access road.

Soils: Rocky, gravely. Light tan clay-silt

Rocks: Grey limestone and red tan limestone, both had beds of marine fossils

No evidence of mine activities or any human disturbances.
Evidence of grazing in the past, nothing recent.

10:00 - offsite, heading to NM248, State Mining Lease 6173