Environmental Report In Support of Construction
Tailings Cell 4b
White Mesa Uranium Mill
Blanding, Utah

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April 30, 2008

Introduction

Denison Mines (USA) Corp. is seeking an amendment to its' Radioactive Materials License, No. UT1900479 in order to obtain UDEQ's approval to construct, operate and (when operations are complete) reclaim a proposed new tailings impoundment at its White Mesa Uranium Mill, Cell 4b. The construction of the Cell 4b is an essential element of future operations at the White Mesa Mill as its construction is necessary in order to continue providing sufficient impoundment surface area for the evaporation of Mill processes water. This Cell also provides additional tailings capacity which is necessary to accommodate the tailing volume associated with routine ore processing operations. While the new cell has not yet been constructed, it was contemplated, described and assessed previously, being a critical component of the initial 1978 NRC-FEIS and attendant licensing of the facility. More specifically, the initial environmental analysis and license application for the facility contemplated six tailing cells; operating cells 1, 2 and 3, as well as 3 additional 80 acre cells, Cells 4, 5 and 6. With the construction of Cell 4a (40 acres), Cell 4b will consume the second 40 acres of the previously authorized 80 acre Cell 4.

The information required for an amendment to the Mill's Radioactive Materials License is found at R313-24-3. More specifically, the regulations state the following:

> (1) Each new license application, renewal, or major amendment shall contain an environmental report describing the proposed action, a statement of its purposes, and the environment affected. The environmental report shall present a discussion of the following:
>
> (a) An assessment of the radiological and non-radiological impacts to the public health from the activities to be conducted pursuant to the license or amendment;
>
> (b) An assessment of any impact on waterways and groundwater resulting from the activities conducted pursuant to the license or amendment;
>
> (c) Consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to the license or amendment;
> and
>
> (d) Consideration of the long-term impacts including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to the license or amendment.

In order to fulfill the requirements above, Denison considered and used the information topics and format cited by NRC in its guidance document NUREG 1359 for its recent

License Renewal Application. Because the Renewal Application provided current environmental information and assessments, the scope of this Environmental Report can be limited in some respects, focusing on pathways and assessments directly related to the construction of the new tailings cell. Accordingly, topical headings suggested by NUREG 1359 have been included in this document; however, where previously provided information is sufficient and unaffected by this amendment request, the prior information is incorporated by reference. Denison's assessment of the pathways to be considered for construction of cell 4b is principally focused on the examination of potential airborne releases from the pond and the groundwater considerations typically attendant to the design of a tailing cell. It is important to note that UDEQ has approved the design and construction of directly adjacent and nearly completed Cell 4a. The liner design and underlying ground conditions for Cell 4b are identical to those of Cell 4a.

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1.0 Site Location and Layout

The Mill is regionally located in central San Juan County, Utah, approximately 6 miles (9.5 km) south of the city of Blanding. The Mill can be reached by taking a private road for approximately 0.5 miles west of Utah State Highway 191. See Figure 1.

Within San Juan County, the Mill is located on fee land and mill site claims, covering approximately 5,415 acres , encompassing all or part of Sections 21, 22, 27, 28, 29, 32, and 33 of T37S, R22E, and Sections 4, 5, 6, 8, 9, and 16 of T38S, R22E, Salt Lake Base and Meridian. See Figure 2.

All operations authorized by the License are conducted within the confines of the existing site boundary. The milling facility currently occupies approximately 50 acres and the current tailings disposal cells encompass another 250 acres. See Figure 2.

The resident currently nearest to the milling facility is located approximately 1.2 miles (1.9 km) north of the Mill site, just north of air sampling station BHV-1. See Figure 2.

2.0 Climate and Meteorology

2.1 Regional Climate

The climate of southeastern Utah is classified as dry to arid continental. Although varying somewhat with elevation and terrain, the climate in the vicinity of the Mill can be considered as semi-arid with normal annual precipitation of about 13.4 inches. Most precipitation is in the form of rain with snowfall accounting for about 29% of the annual total precipitation. There are two separate rainfall seasons in the region, the first in late summer and early autumn (August to October) and the second during the winter months (December to March). The mean annual relative humidity is about 44 percent and is normally highest in January and lowest in July. The average annual Class A pan evaporation rate is 68 inches (National Oceanic and Atmospheric Administration and U.S. Department of Commerce, 1977), with the largest evaporation rate typically occurring in July. This evaporation rate is not appropriate for determining water balance requirements for the tailings management system and must be reduced by the Class A pan coefficient to determine the later evaporation rate. Values of pan coefficients range from 60% to 81%. Denison assumes for a water balance calculations an average value of 70% to obtain an annual lake evaporation rate for the Mill area of 47.6 inches. Given the annual average precipitation rate of 13.4 inches, the net evaporation rate is 34.2 inches per year.

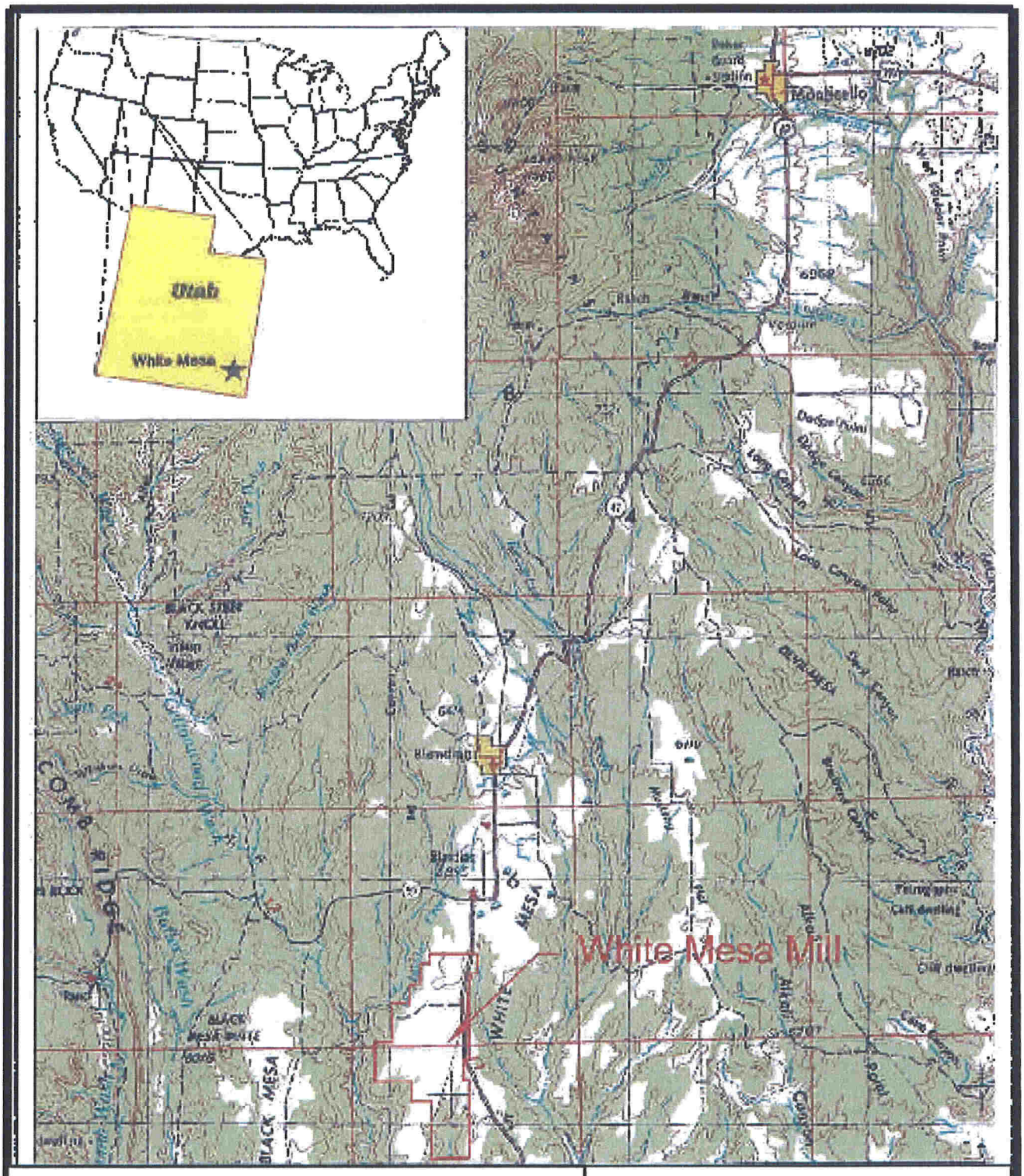

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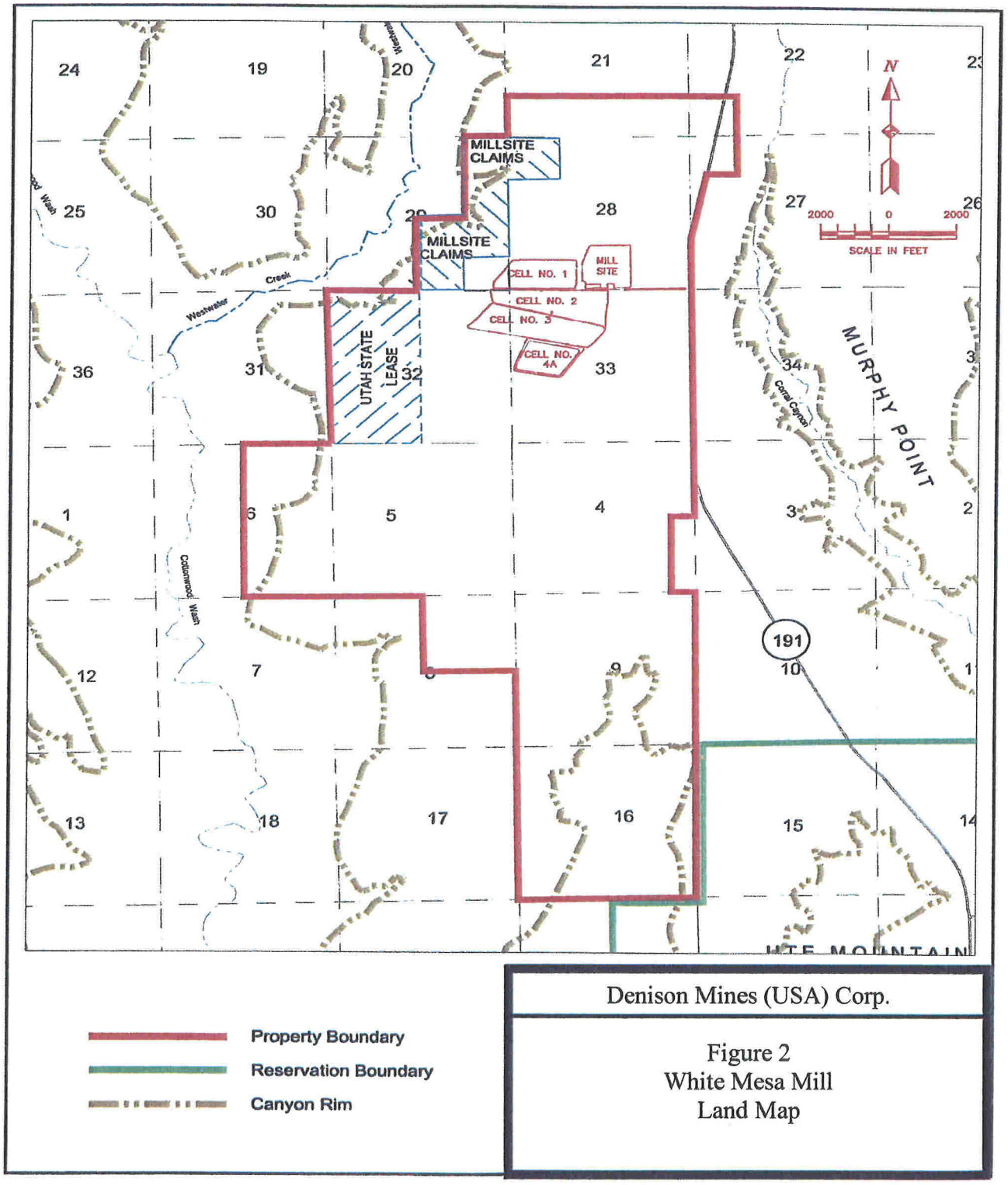
Figure 1
White Mesa Mill
Location Map



Denison Mines (USA) Corp.

Figure 2
White Mesa Mill
Land Map

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The weather in the Blanding area is typified by warm summers and cold winters. The mean annual temperature in Blanding is about 50° (F). January is usually the coldest month and July is usually the warmest month.

Winds are usually light to moderate in the area during all seasons, although occasional stronger winds may occur in the late winter and spring. The predominant winds are from the north through north-east (approximately 30 percent of the time) and from the south through south-west (about 25 percent of the time). Winds are generally less than 15 mph, with wind speeds faster than 25 mph occurring less than one percent of the time. The National Weather Service Station in Blanding, Utah is located about 6.25 miles north of the Mill. Data from the station is considered representative of the local weather conditions (1978 ER, Section 2.7.2). However, as an element of the pre-construction baseline study and ongoing monitoring programs, the Mill operates an onsite meteorological station, described in greater detail below. Further details about weather and climate conditions are provided in the 1978 ER (Section 2.7) and in the FES (Section 2.1). The 1978 ER and FEIS are resource documents, incorporated here by reference.

2.2 On Site Monitoring Program

On-site meteorological monitoring at the Mill was initiated in early 1977 and continues today. The original purpose of the meteorological monitoring program was to document the regional atmospheric baseline and to provide data to assist in assessing potential air quality and radiological impacts arising from operation of the Mill.

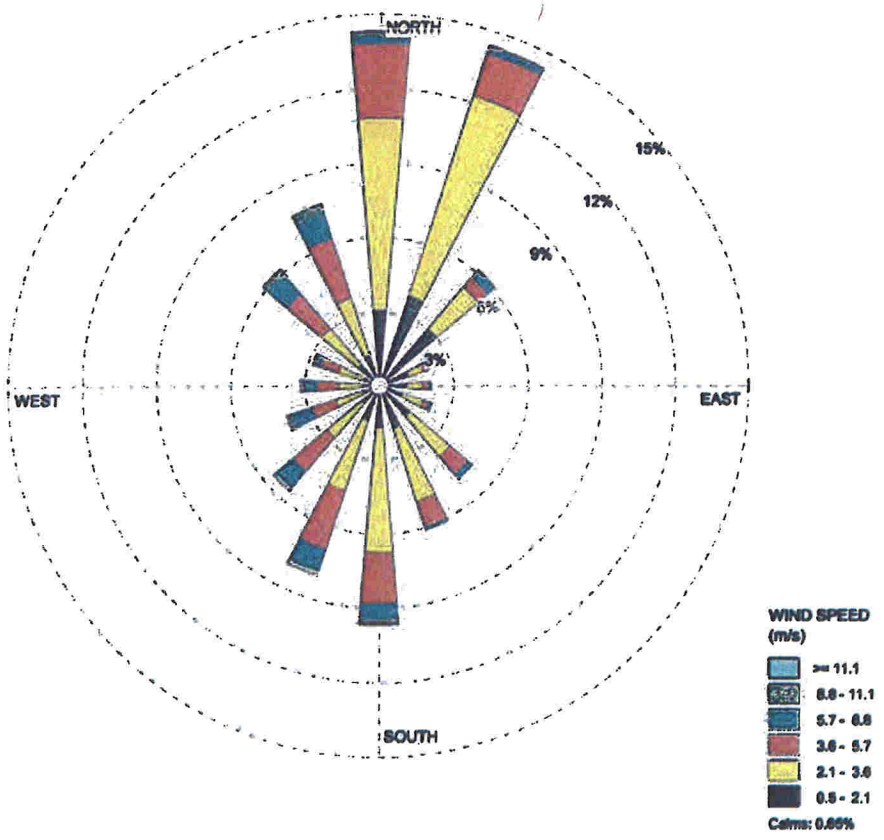
After the Mill construction was completed, the monitoring programs were modified to facilitate the assessment of Mill operations. The current meteorological monitoring program includes data collection for wind speed, wind direction, atmospheric stability according to the standard Pasquill scheme (via measurements of deviations in wind direction, referred to as sigma-theta), and precipitation as either rain or snow. The recorded on-site meteorological conditions are reported to Denison on a semi-annual basis and are described in semi-annual reports prepared for Denison and maintained at the Mill. Figure 3 shows the windrose for the Mill site during the period of January – December 2007, the most recent full year of compiled meteorological data.

3.0 Use of Adjacent Lands and Water

Approximately 65.8% of San Juan County is federally owned land administered by the U.S. Bureau of Land Management, the National Park Service, and the U.S. Forest Service. Primary land uses include livestock grazing, wildlife range, recreation, and exploration for minerals, oil, and gas. Approximately 22% of the county is Native American land owned either by the Navajo Nation or the Ute Mountain Ute Tribe. The area within 5 miles of the Mill site is predominantly range land owned by Blanding residents. The Mill site, including tailings cells, encompasses approximately 300 acres.

WIND ROSE PLOT:
White Mesa Mill
Blanding, Utah

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: 2007 Jan 1 - Dec 31 00:00 - 23:00	COMPANY NAME: Denison Mines (USA) Corporation	
		MODELER: McVehil-Monnett Associates	Figure 3
	CALM WINDS: 0.65%	TOTAL COUNT: 8753 hrs.	
	AVG. WIND SPEED: 3.36 m/s	DATE: 2/4/2008	PROJECT NO.: 2018-06

WRPLOT View - Lakes Environmental Software

A more detailed discussion of land use at the Mill site, in surrounding areas, and in southeastern Utah, is presented in the FES (Section 2.5). Results of archeological studies conducted at the site and in the surrounding areas as part of the 1978 ER are also documented in the FES (Section 2.5.2.3).

4.0 Population Distribution and Socioeconomic Profile

Demographic information is generally derived from information obtained by the U.S. Census Bureau. These records are updated on a five year frequency for population centers which exceed 65,000 people and on a ten year frequency for lesser populations. As such, the local population update for the area of interest was last recorded in the year 2000, and it is that data base which was utilized to formulate the demographic information provided in the recent license renewal effort and this report. According to the 2000 census, the population density of San Juan County, in which the Mill is located, is 1.8 individuals per square mile. By comparison, the statewide density is greater than 27.2 persons per square mile. The town of Blanding, Utah, approximately 6 miles north of the Mill, is the largest population center near the Mill site, with 3,162 persons. Approximately 5 miles southeast of the Mill site is the White Mesa community, where approximately 277 Ute Mountain Ute tribal members reside. See Figure 4. The Navajo Reservation is located approximately 19 miles southeast of the Mill. The nearest community on the Navajo Reservation is Montezuma Creek, a community of approximately 507 individuals in Utah. The nearest resident to the Mill is located approximately 1.5 miles to the north of the Mill, near air monitoring station BHV-1.
Table 1 provides population centers located within 50 miles of the Mill site.

Table 1-Population Centers Within 50 Miles of the Mill Site

Population Center	2000 Population	Distance From Site[2] (miles)
Blanding, UT	3,162	6
White Mesa, UT	277	4
Bluff, UT	320	15
Montezuma Creek, UT	507	20
Aneth, UT	598	27
Mexican Hat, UT	88	30
Monticello, UT	1,958	27
Eastland/Ucolo, UT	249[3]	32
Dove Creek, CO	698	37
Towaoc, CO	1,097	50

Source: http://factfinder.census.gov

[1] 2000 Census
[2] Approproximate distance from Mill site by air
[3] Based on 1978 population estimate

San Juan County, Utah, is the largest and poorest county in Utah. As of December 2006, the unemployment rate in San Juan County was 4.9%, compared to 2.6% for Utah as a whole, and 4.5% for the nation as a whole. When operating, the Mill is one of the largest private employers in San Juan County, employing up to 60-140 full time employees. As

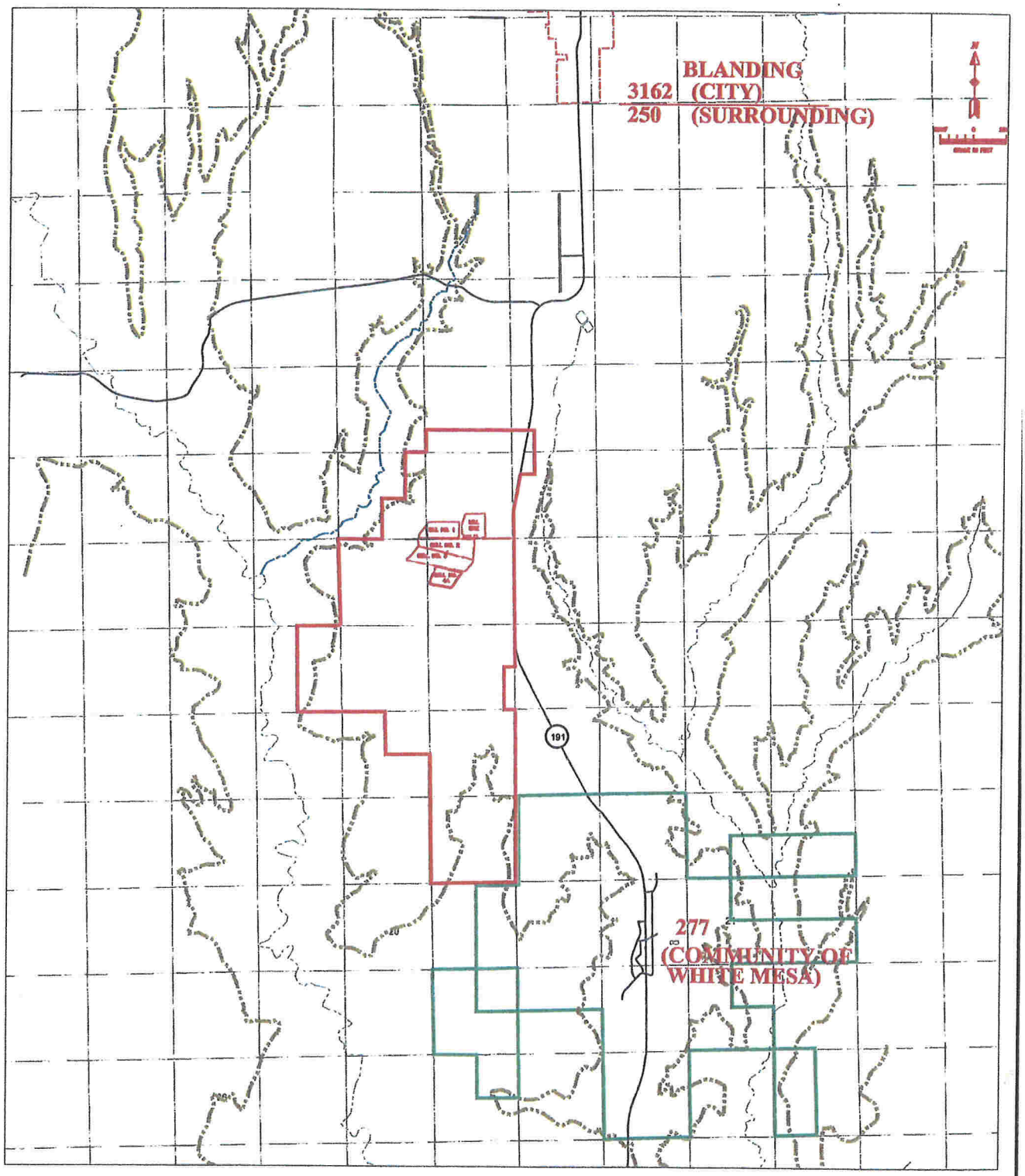


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Figure 4
Population in The Project Vicinity
2000 Census

such, the Mills employees represent a significant economic base for the city of Blanding and rural residents of San Juan County. In addition, the Company pays local taxes to San Juan County, further supporting the development of the local economic base. The Mill also provides income to local minorities, typically employing a high percentage of minority workers ranging from 45-75% Native Americans.

Since its inception in 1980, the Mill has run on a campaign basis, in each case remaining on standby pending accumulation of sufficient ore stockpiles to justify a milling campaign. Currently, Mill employees are predominantly residents of San Juan County, or residents of neighboring counties who commute to the Mill on a daily basis. Historically, the Mill has drawn upon such residents of San Juan County and neighboring counties for each milling campaign, rather than relying upon an influx of workers to the area. As a result, Mill campaigns have not given rise to any unusual demands on public services or resulted in any cultural or socioeconomic issues for the surrounding areas.

5.0 Topography

The Mill site is located on a gently sloping mesa that, from the air, appears similar to a peninsula, as it is surrounded by steep canyons and washes and is connected to the Abajo Mountains to the north by a narrow neck of land. On the mesa, the topography is relatively flat, sloping at less than one (1) percent to the south and nearly horizontal from east to west. See Figure 5.

6.0 Geologic Setting

6.1 Regional Geology

The Mill site lies within a region designated as the Canyon Lands section of the Colorado Plateau physiographic province. Elevations in the region range from approximately 3,000 feet in the bottom of canyons to over 11,000 feet among the peaks of the Henry, Abajo and La Sal Mountains. The average elevation for the area, excluding deeper canyons and isolated mountain peaks, is about 5,000 feet.

The sedimentary rocks exposed in southeastern Utah have a total thickness of approximately 6,000 to 7,000 feet. These sedimentary units range in age from Pennsylvanian to Late Cretaceous; older rock units which underlie those of Pennsylvanian age are not exposed in the Mill site area.

Structural features in the Mill site area have been divided into three main categories on the basis of origin or mechanism of the stress that created the structure. These categories are: (1) structures related to large-scale regional uplifting or downwarping directly related to movements in the basement complex (the Monument Uplift and the Blanding Basin); (2) structures due to diapiric deformation of thick sequences of evaporate deposits, salt plugs and salt anticlines (the Paradox Fold and Fault Belt); and (3) structures formed due to magmatic intrusions (the Abajo Mountains). A generalized stratigraphic column for the region is provided as Figure 6.

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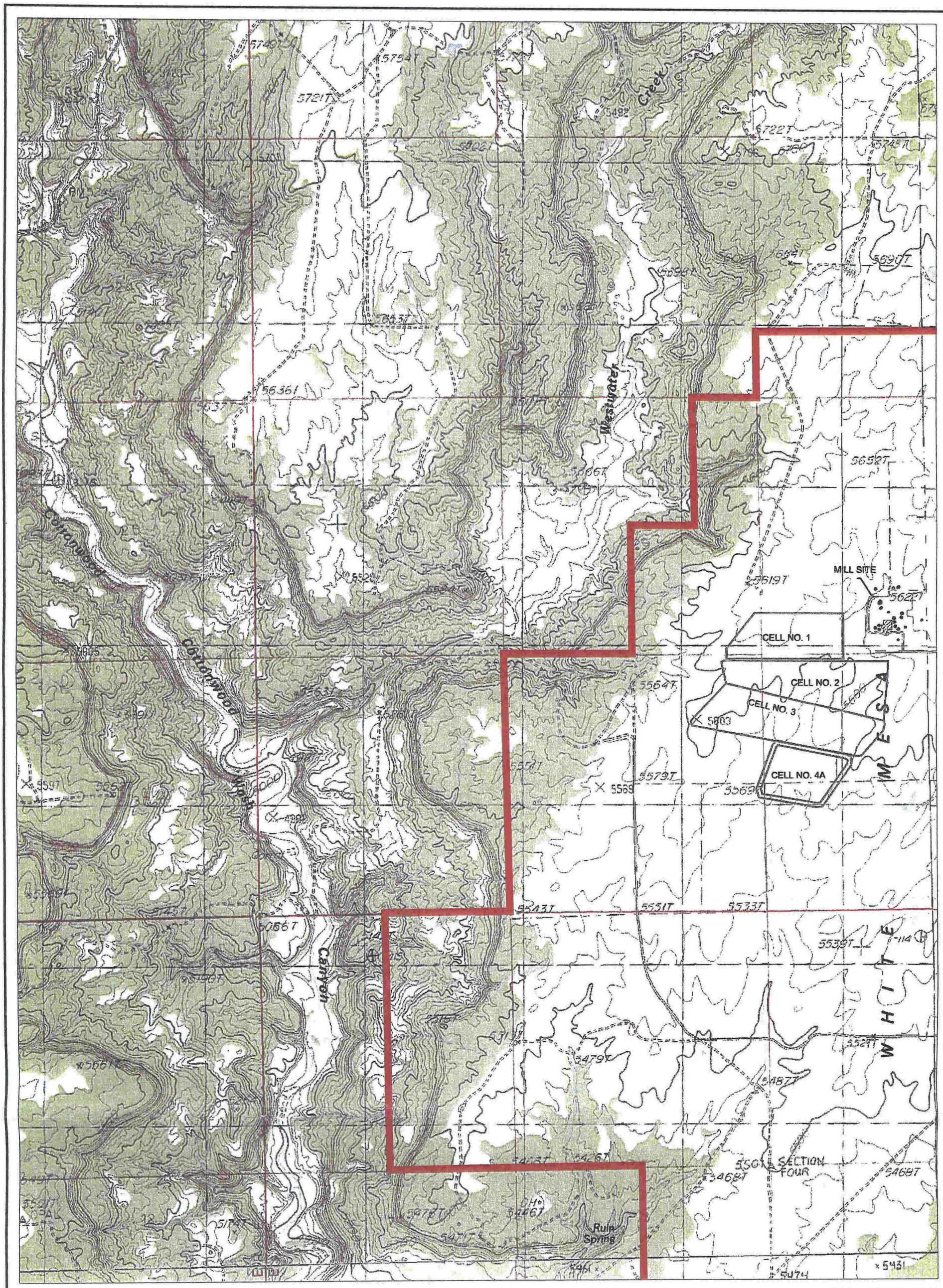

From USGS 7.5 minute quad sheet for Black Mesa

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Figure 5
Local Topography
And Location of Ruin Spring

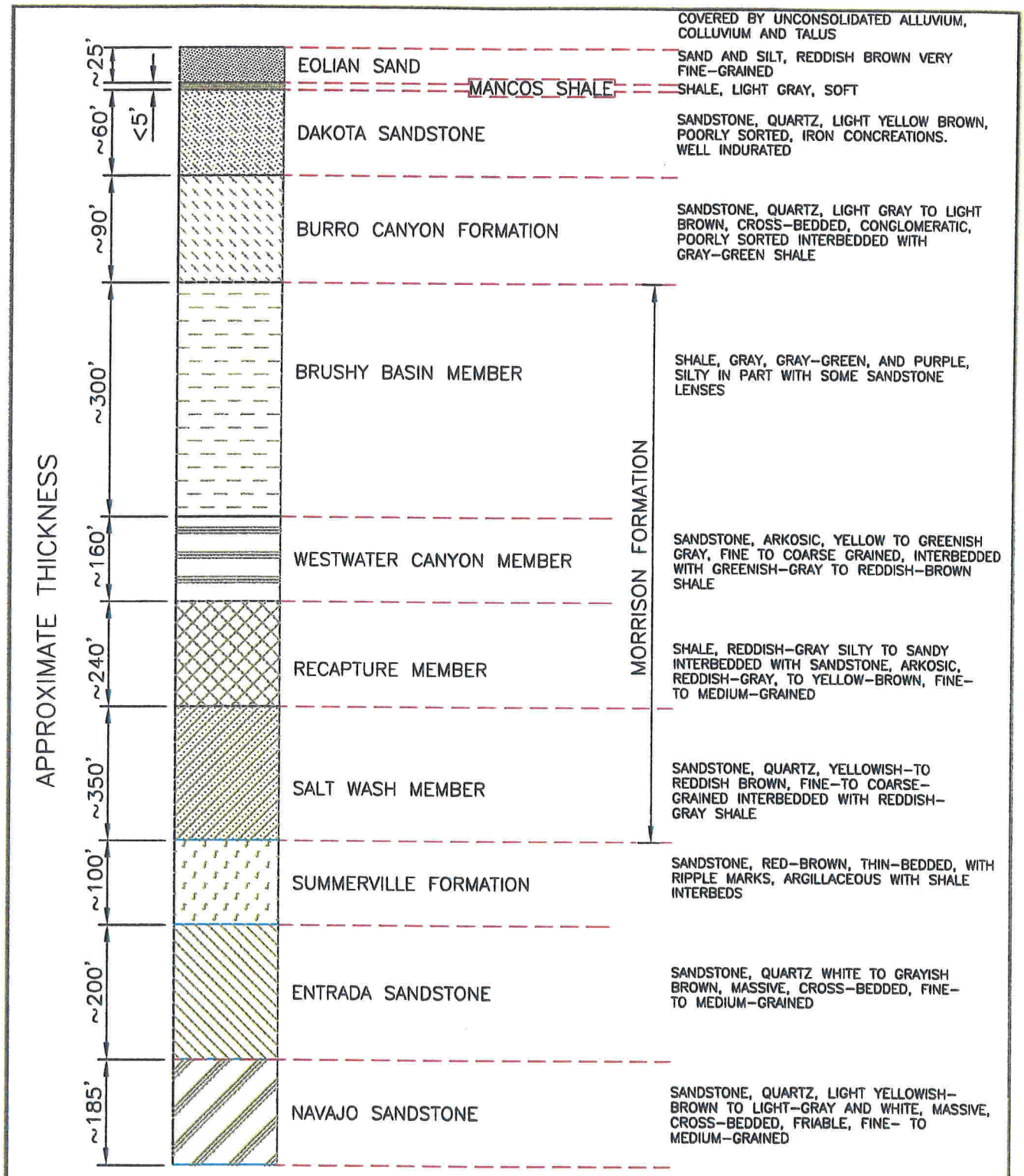

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Figure 6
Generalized Stratigraphy of
White Mesa Mill

The Summerville Formation, Entrada Sandstone, and Navajo Sandstone are the deepest units of concern encountered at the site.

6.2 Local Geology

The Mill site is located on the western edge of the Blanding Basin, sometimes referred to as the Great Sage Plain, lying east of the north/south-trending Monument Uplift, south of the Abajo Mountains and adjacent to the northwest-trending Paradox Fold and Fault Belt. The Abajo Mountains are the most prominent topographic feature in the region, rising over 4,000 ft above the surface of the plain. The lithology of the immediate area is composed of thousands of feet of multi-colored pre-Tertiary age marine and non-marine sedimentary rocks. Erosion on the regionally-uplifted sedimentary strata has produced an array of eroded canyons and mesas.

The Mill is more specifically located on White Mesa and rests on alluvial windblown silt and sand which covers sandstones and shales of Jurassic and Cretaceous age. The surface of the mesa is nearly flat, with a surface relief of 98 ft. The maximum relief between White Mesa and the adjacent Cottonwood Canyon is about 750 ft.

6.3 Site-Specific Geologic Setting

The Mill is located within the Blanding Basin of the Colorado Plateau physiographic province. Typical of large portions of the Colorado Plateau province, the rocks underlying the site are relatively underformed. The average elevation of the site is approximately 5,600 ft (1,707 m) above mean sea level (amsl).

The site is underlain by unconsolidated alluvium and indurated sedimentary rocks consisting primarily of sandstone and shale. The indurated rocks are relatively flat lying with dips generally less than 3°. The alluvial materials consist mostly of aeolian silts and fine-grained aeolian sands with a thickness varying from a few feet to as much as 25 to 30 ft (7.6 to 9.1 m) across the site. The alluvium is underlain by the Dakota Sandstone and Burro Canyon Formation, which are sandstones having a total thickness ranging from approximately 100 to 140 ft (31 to 43 m). Beneath the Burro Canyon Formation lies the Morrison Formation, consisting, in descending order, of the Brushy Basin Member, the Westwater Canyon Member, the Recapture Member, and the Salt Wash Member. The Brushy Basin and Recapture Members of the Morrison Formation, classified as shales, are very fine-grained and have a very low permeability. The Westwater Canyon and Salt Wash Members also have a low average vertical permeability due to the presence of interbedded shales. See Figure 6 for a generalized stratigraphic column for the region.

Beneath the Morrison Formation lies the Summerville Formation, an argillaceous sandstone with interbedded shales, and the Entrada Sandstone. Beneath the Entrada lies the Navajo Sandstone. The Navajo and Entrada Sandstones constitute the primary aquifer in the area of the site. The Entrada and Navajo Sandstones are separated from the Burro Canyon Formation by approximately 1,000 to 1,100 ft (305 to 335 m) of materials having a low average vertical permeability. Groundwater within this system is under

artesian pressure in the vicinity of the site, and is used only as a secondary source of water at the site.

7.0 Hydrogeologic Setting

The site is located within a region that has a dry to arid continental climate, with average annual precipitation of approximately 13.4 in. Recharge to aquifers occurs primarily along the mountain fronts (for example, the Henry, Abajo, and La Sal Mountains), and along the flanks of folds such as Comb Ridge Monocline.

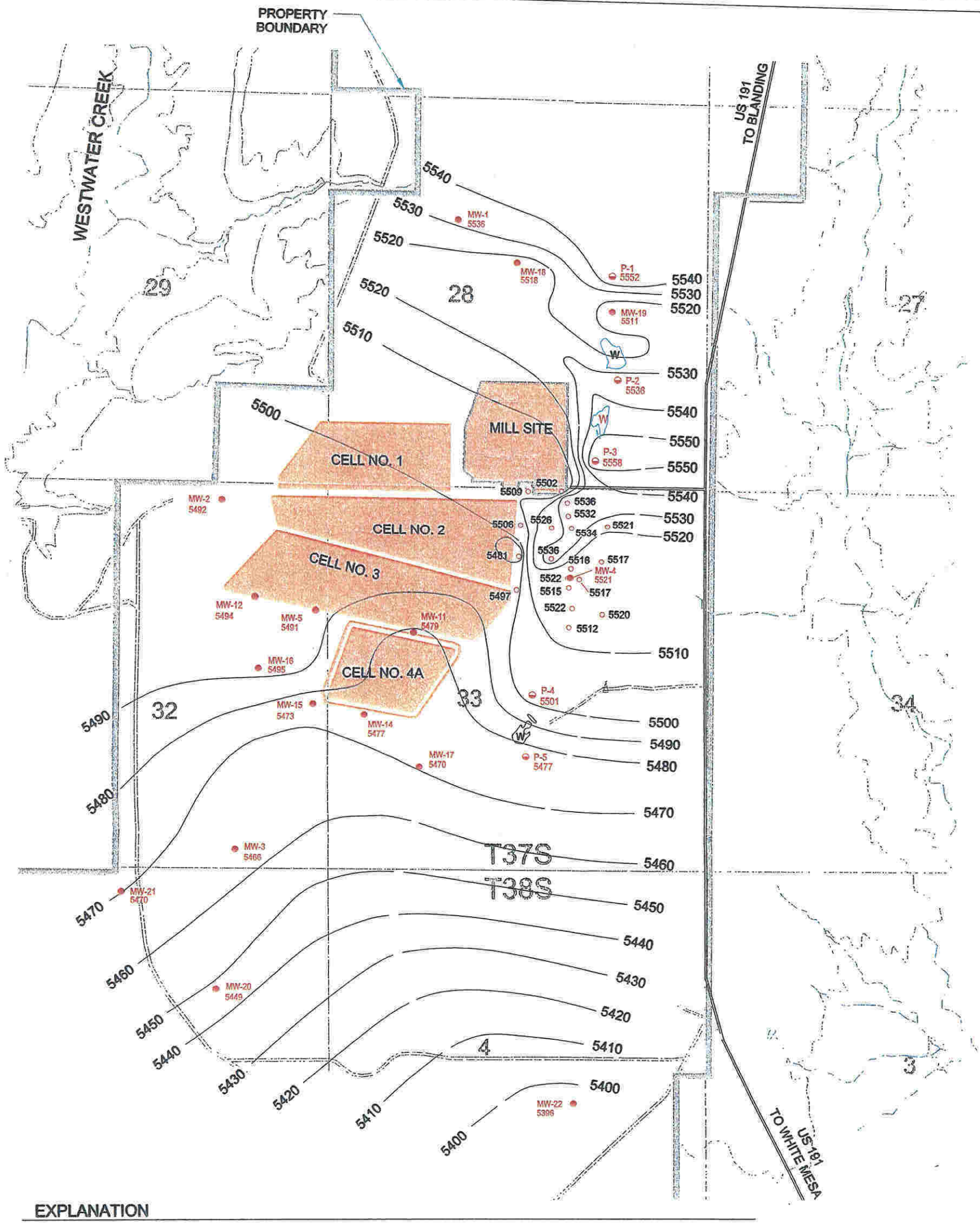
Although the water quality and productivity of the Navajo/Entrada aquifer are generally good, the depth of the aquifer (approximately 1,200 ft below land surface (bls)) makes access difficult. The Navajo/Entrada aquifer is capable of yielding significant quantities of water to wells (hundreds of gallons per minute (gpm)). Water in wells completed across these units at the site rises approximately 800 ft above the base of the overlying Summerville Formation.

7.1 Perched Zone Hydrogeology

Perched groundwater beneath the site occurs primarily within the Burro Canyon Formation. Perched groundwater at the site has a generally low quality due to high total dissolved solids (TDS) in the range of 1,200 to 5,000 milligrams per liter (mg/L), and is used primarily for stock watering and irrigation in the areas upgradient (north) of the site, The saturated thickness of the perched water zone generally increases to the north of the site, increasing the yield of the perched zone to wells installed north of the site. Perched water is supported within the Burro Canyon Formation by the underlying, fine-grained Brushy Basin Member. Figure 7 is a contour map showing the approximate elevation of the contact of the Burro Canyon Formation with the Brushy Basin Member, which essentially forms the base of the perched water zone at the site. Contact elevations are based on monitoring well drilling and geophysical logs and surveyed land surface elevations. As indicated, the contact generally dips to the south/southwest beneath the site.

The permeability of the Dakota Sandstone and Burro Canyon Formation at the site is generally low. No significant joints or fractures within the Dakota Sandstone or Burro Canyon Formation have been documented in any wells or borings installed across the site (Knight Piésold, 1998). Any fractures observed in cores collected from site borings are typically cemented, showing no open space.

Based on samples collected during installation of wells MW-16 and MW-17 (the locations of the various monitoring wells are indicated on Figure 7), located immediately downgradient of the tailings cells at the site, porosities of the Dakota Sandstone range from 13.4% to 26%, averaging 20%, and water saturations range from 3.7% to 27.2%, averaging 13.5%. The average volumetric water content is approximately 3%. The permeability of the Dakota Sandstone based on packer tests in borings installed at the site ranges from 2.71E-06 centimeters per second (cm/s) to 9.12E-04 cm/s, with a geometric average of 3.89E-05 cm/s.



EXPLANATION

MW-11 5479	PERCHED MONITORING WELL SHOWING APPROXIMATE ELEVATION OF BRUSHY BASIN CONTACT IN FEET AMSL
5536	TEMPORARY PERCHED MONITORING WELL SHOWING APPROXIMATE ELEVATION OF BRUSHY BASIN CONTACT IN FEET AMSL
P-5 5552	PIEZOMETER SHOWING APPROXIMATE ELEVATION OF BRUSHY BASIN CONTACT IN FEET AMSL
W	WILDLIFE POND
5410	CONTOUR LINE IN FEET AMSL, DASHED WHERE UNCERTAIN

N

0 3000

SCALE IN FEET

Denison Mines (USA) Corp

Figure 7
White Mesa Mill
Approximate Elevation
Top of Brushy Basin

The average porosity of the Burro Canyon Formation is similar to that of the Dakota Sandstone. Based on samples collected from the Burro Canyon Formation at MW-16, located immediately downgradient of the tailings cells at the site, porosity ranges from 2% to 29.1%, averaging 18.3%, and water saturations of unsaturated materials range from 0.6% to 77.2%, averaging 23.4%. Titan, 1994, reported that the hydraulic conductivity of the Burro Canyon Formation ranges from 1.9E-07 to 1.6E-03 cm/s, with a geometric mean of 1.1E-05 cm/s, based on the results of 12 pump/recovery tests performed in monitoring wells and 30 packer tests performed in borings prior to that time.

Hydraulic testing of wells MW-1, MW-3, MW-5, MW-17, MW-18, MW-19, MW-20, and MW-22 during the week of July 8, 2002, yielded average perched zone permeabilities ranging from approximately 4.0E-07 cm/s to 5.0E-04 cm/s, similar to the range reported by previous investigators at the site (HGC, 2002). Downgradient (south to southwest) of the tailings cells, average perched zone permeabilities based on tests at MW-3, MW-5, MW-17, MW-20, and MW-22 ranged from approximately 4.0E-07 to 4.0E-05 cm/s. Permeability estimates were based on pump/recovery and slug tests analyzed using several different methodologies.

A number of temporary monitoring wells have been installed at the site to investigate elevated concentrations of chloroform initially discovered at well MW-4 in 1999. Some of the conglomeratic zones encountered within the perched zone during installation of these wells are believed to be partly continuous or at least associated with a relatively continuous zone of higher permeability (IUSA and HGC, 2001). The higher permeability zone defined by these wells is generally located east to northeast of the tailings cells at the site, and is hydraulically cross-gradient to upgradient of the tailings cells with respect to perched groundwater flow. Relatively high permeabilities measured at MW-11, located on the southeastern margin of the downgradient edge of tailings Cell 3, and at MW-14, located on the downgradient edge of tailings Cell 4, of 1.4E-03 cm/s and 7.5E-04 cm/s, respectively (UMETCO, 1993), may indicate that this zone extends beneath the southeastern margin of the cells. This zone of higher permeability within the perched water zone does not appear to exist downgradient (south-southwest) of the tailings cells, however. At depths beneath the perched water table, the zone is not evident in lithologic logs of the southernmost temporary wells TW4-4 and TW4-6 (located east (cross-gradient) of Cell 3), nor is it evident in wells MW-3, MW-5, MW-12, MW-15, MW-16, MW-17, MW-20, MW-21, or MW-22, located south to southwest (downgradient) of the tailings cells, based on the lithologic logs or hydraulic testing of the wells.

Because of the generally low permeability of the perched zone beneath the site, well yields are typically low (less than 0.5 gpm), although yields of about 2 gpm may be possible in wells intercepting the higher permeability zones on the east side of the site. Sufficient productivity can, in general, only be obtained in areas where the saturated thickness is greater, which is the primary reason that the perched zone has been used on a limited basis as a water supply to the north (upgradient) of the site.

7.2 Perched Groundwater Flow

Perched groundwater flow at the site is generally to the south/southwest. Figure 8 displays the local perched groundwater elevation contours at the Mill. As indicated, the perched groundwater gradient changes from generally southwesterly in the western portion of the site to generally southerly in the eastern portion of the site.

Perched water discharges in springs and seeps along Westwater Creek Canyon and Cottonwood Canyon to the west-southwest of the site, and along Corral Canyon to the east of the site, where the Burro Canyon Formation outcrops. Perched water flowing beneath the tailings cells eventually discharges in springs and seeps located in Westwater Canyon, to the south-southwest of the cells. The primary discharge point for perched water flowing beneath the tailings cells is believed to be Ruin Spring, located approximately 10,000 ft south-southwest of the Mill site, as shown in Figure 9.

7.3 Perched Zone Hydrogeology (Beneath and Down-gradient Of the Tailings Cells)

As of the 4th Quarter, 2006, perched water has been encountered at depths of approximately 50 to 115 ft bls in the vicinity of the tailings cells at the site (Figure 10). Beneath tailings Cell 3, depths to water ranged from approximately 72 ft below top of casing (btoc) east of the cell (at MW-31), to approximately 115 ft btoc at the southwest margin of the cell (at MW-23). Assuming an average depth of the base of tailings Cell 3 of 25 ft below grade, this corresponds to perched water depths of approximately 47 to 90 ft below the base of the cell, or an average depth of approximately 70 feet beneath the base of the cell.

The saturated thickness of the perched zone as of the 4th Quarter, 2006 ranged from approximately 94 ft in the northeast portion of the site to less than 5 ft in the southwest portion of the site. Beneath tailings Cell 3, the saturated thickness varies from approximately 49 ft in the easternmost corner of the cell to approximately 6 ft in the westernmost corner of the cell. South-southwest of the tailings cells, the saturated thickness ranges from less than 1 ft at MW-21 to approximately 25 ft at MW-17. The average saturated thickness south-southwest of the tailings cells, based on measurements at MW-3, MW-5, MW-12, MW-14, MW-15, MW-17, and MW-20, is approximately 14 ft. The average saturated thickness based on measurements at MW-5, MW-15, MW-3, and MW-20, which lay close to a line between the center of tailings Cell 3 and Ruin Spring, is approximately 12 ft. By projecting conditions at these wells, the average saturated thickness is estimated to be approximately 10 to 15 ft between MW-20 and Ruin Spring.

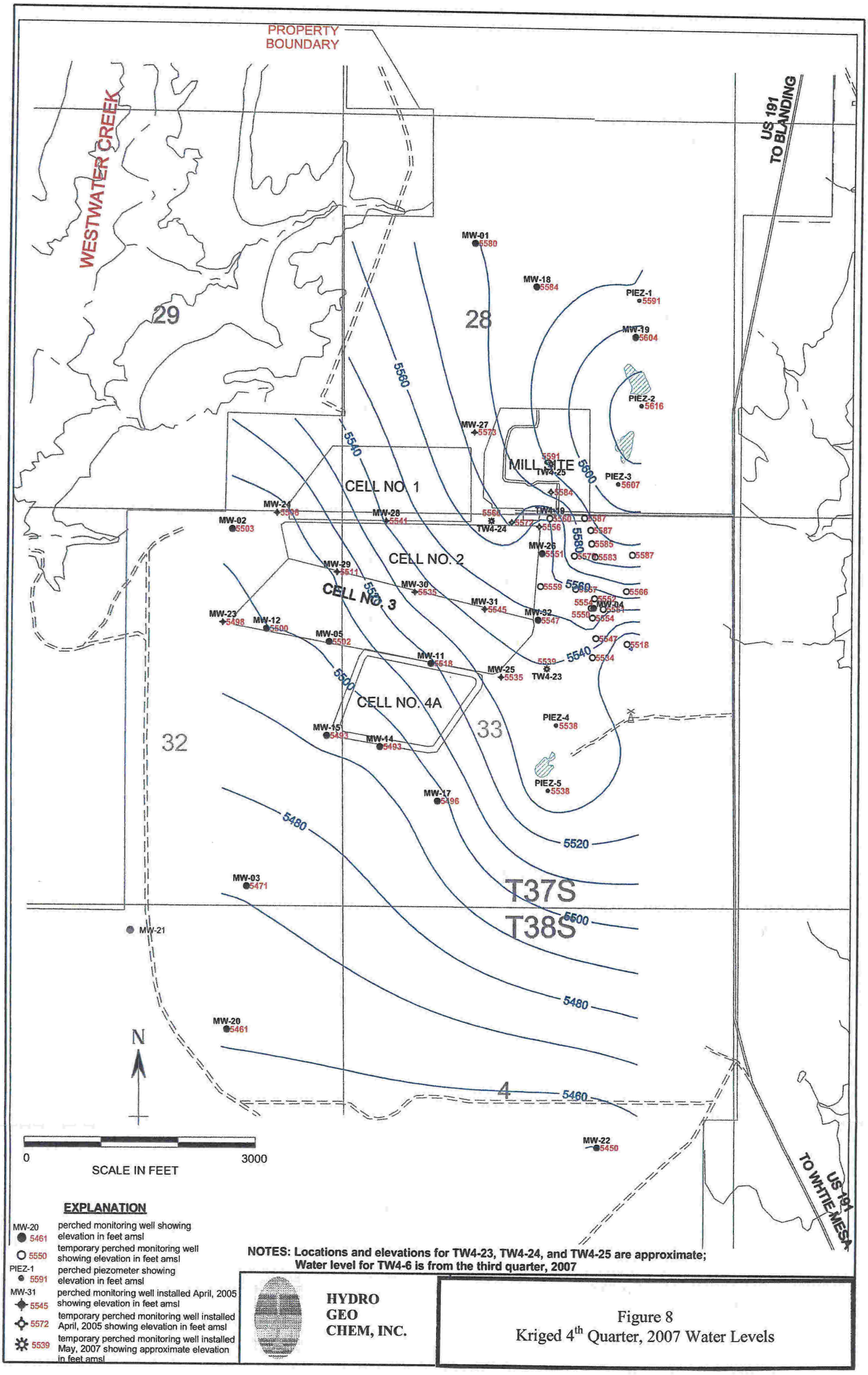


Figure 8
Kriged 4th Quarter, 2007 Water Levels

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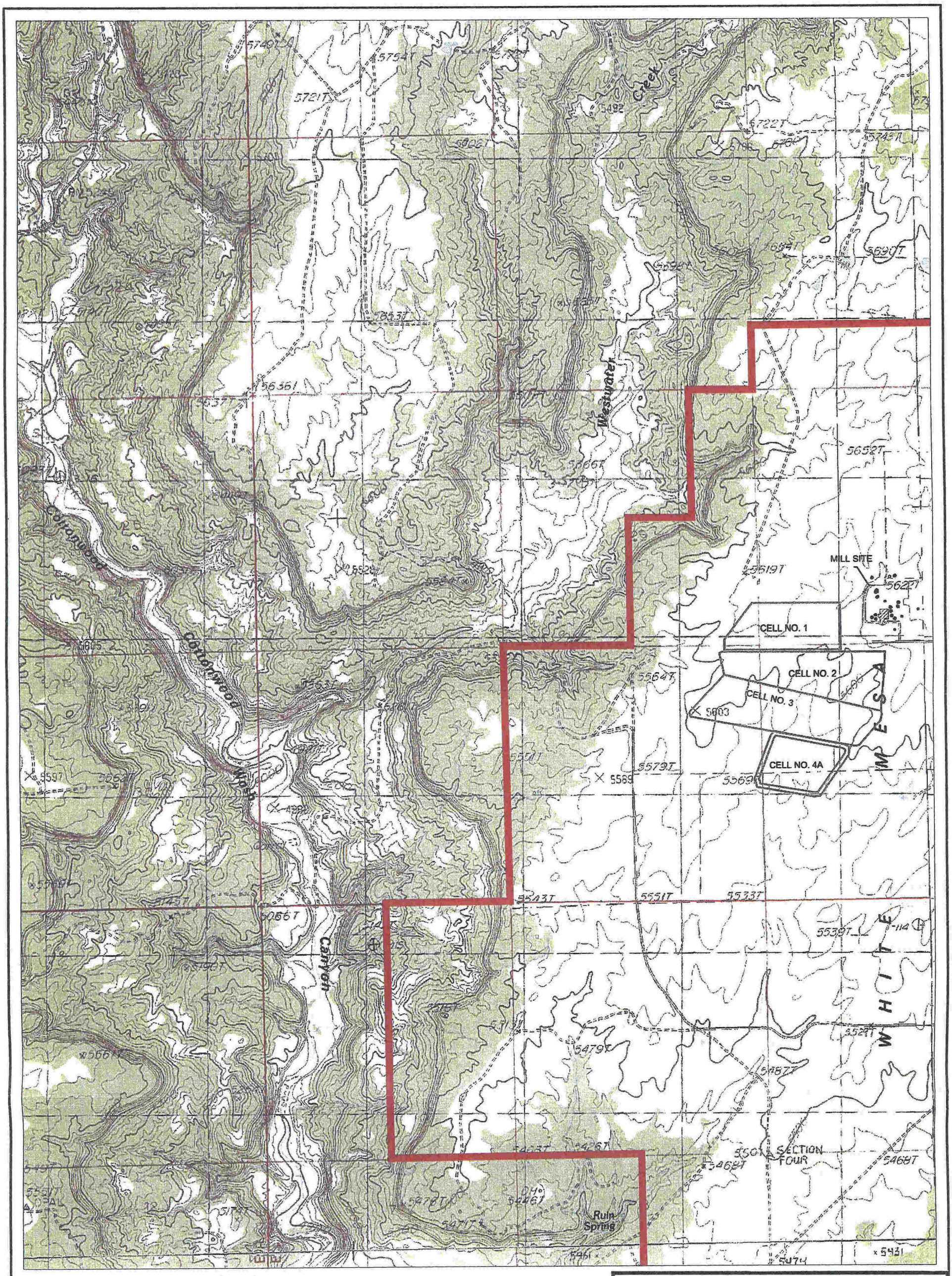

From USGS 7.5 minute quad sheet for Black Mesa

N

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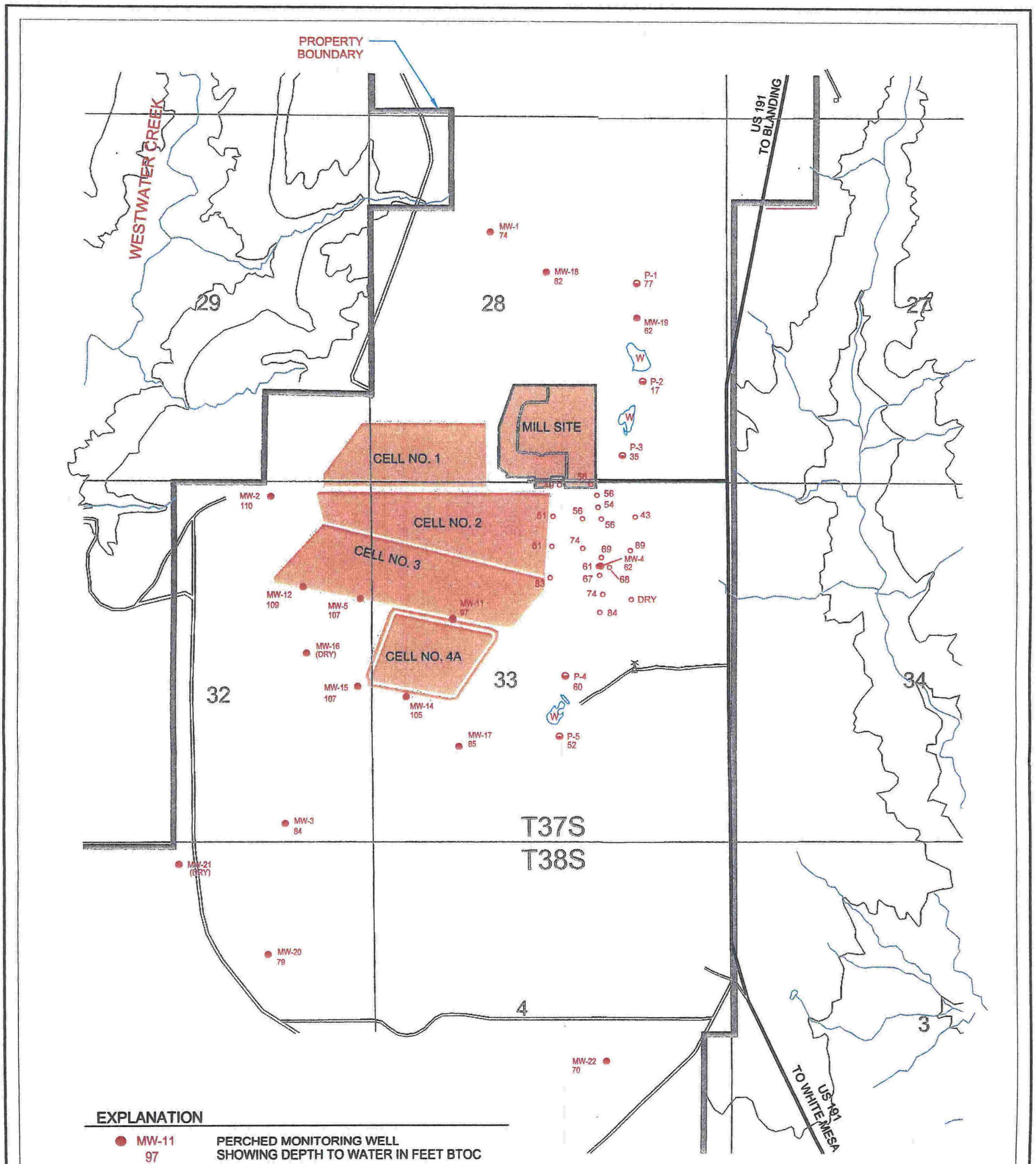
SCALE IN FEET

PROPERTY BOUNDARY

Denison Mines (USA) Corp

Figure 9
White Mesa Mill
Approximate Location
Ruin Spring



EXPLANATION

● MW-11 97	PERCHED MONITORING WELL SHOWING DEPTH TO WATER IN FEET BTOC
○ 84	TEMPORARY PERCHED MONITORING WELL SHOWING DEPTH TO WATER IN FEET BTOC
⊖ P-5 52	PIEZOMETER SHOWING DEPTH TO WATER IN FEET BTOC
W	WILDLIFE POND

NOTE: DATA FOR PIEZOMETERS ARE FROM AUGUST, 2002

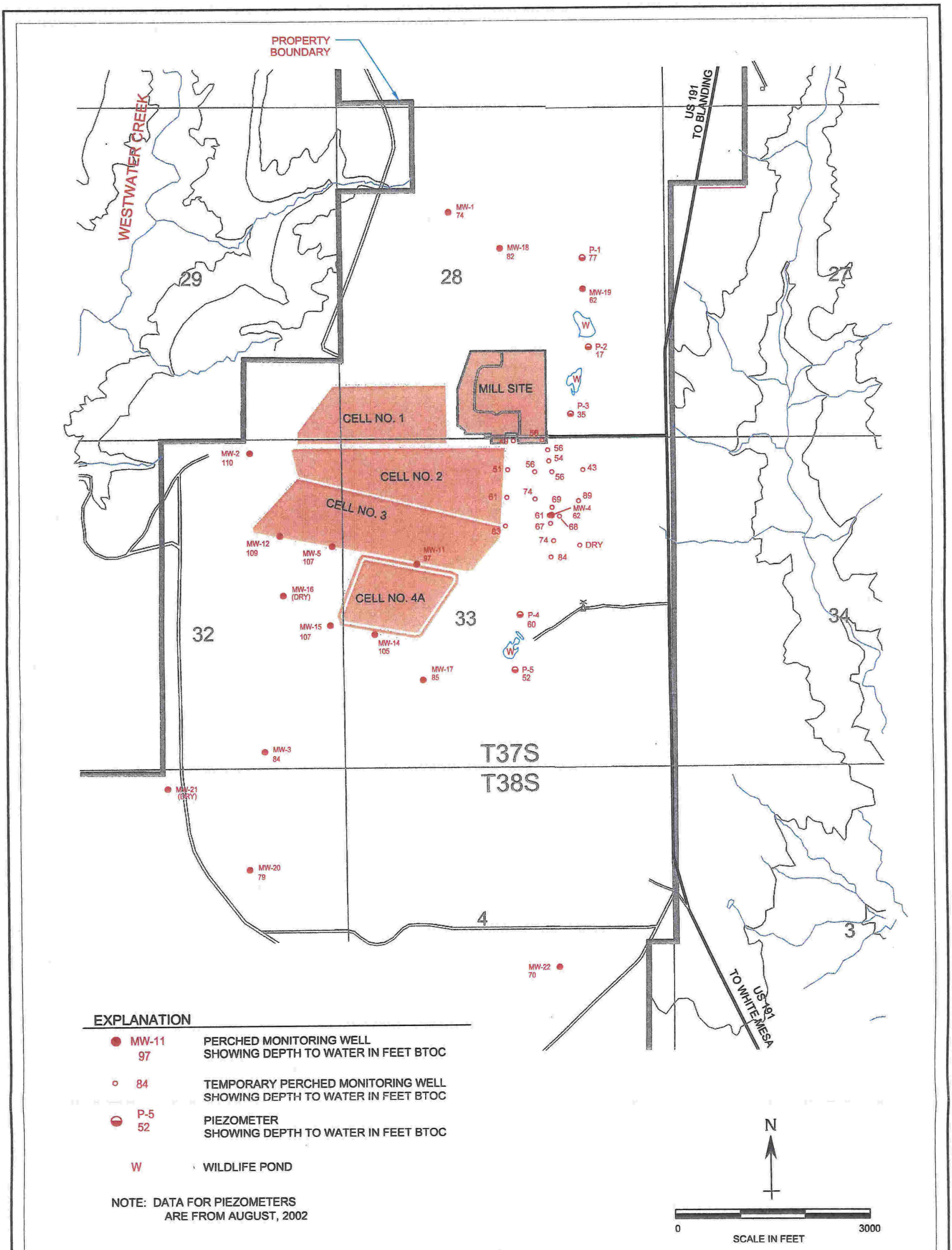
N

0 3000

SCALE IN FEET

Denison Mines (USA) Corp.

Figure 10
White Mesa Mill
Depth to Perched Water
September, 2002



Denison Mines (USA) Corp.

Figure 11
White Mesa Mill
Stock Watering Pond Locations

Perched zone hydraulic gradients currently range from a maximum of approximately 0.04 feet per foot (ft/ft) immediately northeast of tailings Cell 3 to less than 0.01 ft/ft downgradient of Cell 3, between Cell 3 and MW-20. The average hydraulic gradient between the downgradient edge of tailings Cell 3 and Ruin Spring was approximated by HGC to be approximately 0.012 ft/ft. HGC also estimated a hypothetical worst case average perched zone hydraulic gradient, assuming the perched water elevation to be coincident with the base of tailings Cell 3, to be approximately 0.019 ft/ft. See Section 3.2 of Appendix A.

HGC also estimated the average permeability of the perched zone downgradient of tailings Cell 3, based on pump/recovery test and slug test data obtained from perched zone wells located along the downgradient edge of and south of Cell 3, to be between 2.39E-05 cm/s and 4.3E-05 cm/s. See Section 3.3 of Appendix A to the February 28, 2007 Environmental Report incorporated here by reference.

7.4 Groundwater Quality

7.4.1 Entrada/Navajo Aquifer

The Entrada and Navajo Sandstones are prolific aquifers beneath and in the vicinity of the site. Water wells at the site are screened in both of these units, and therefore, for the purposes of this discussion, they will be treated as a single aquifer. Water in the Entrada/Navajo Aquifer is under artesian pressure, rising 800 to 900 ft above the top of the Entrada's contact with the overlying Summervillle Formation; static water levels are 390 to 500 ft below ground surface.

Within the region, this aquifer is capable of yielding domestic quality water at rates of 150 to 225 gpm, and for that reason, it serves as a secondary source of water for the Mill. Additionally, two domestic water supply wells drawing from the Entrada/Navajo Aquifer are located 4.5 miles southeast of the Mill site on the Ute Mountain Ute Reservation. Although the water quality and productivity of the Navajo/Entrada aquifer are generally good, the depth of the aquifer (>1,000 ft bls) makes access difficult.

Table 2 is a tabulation of groundwater quality of the Navajo Sandstone aquifer as reported in the FES and subsequent sampling. The total dissolved solids (TDS) range from 244 to 1,110 mg/liter in three samples taken over a period from January 27, 1977, to May 4, 1977. High iron (0.057 mg/liter) concentrations are found in the Navajo Sandstone. Because the Navajo Sandstone aquifer is isolated from the perched groundwater zone by approximately 1,000 to 1,100 ft of materials having a low average vertical permeability, sampling of the Navajo Sandstone is not required under the Mill's previous NRC Point of Compliance monitoring program or under the state's GWDP. However, samples were taken at two other deep aquifer wells (#2 and #5) on site (See Figure 11 for the locations of these wells), on June 1, 1999 and June 8, 1999, respectively, and the results are included in Table 2.

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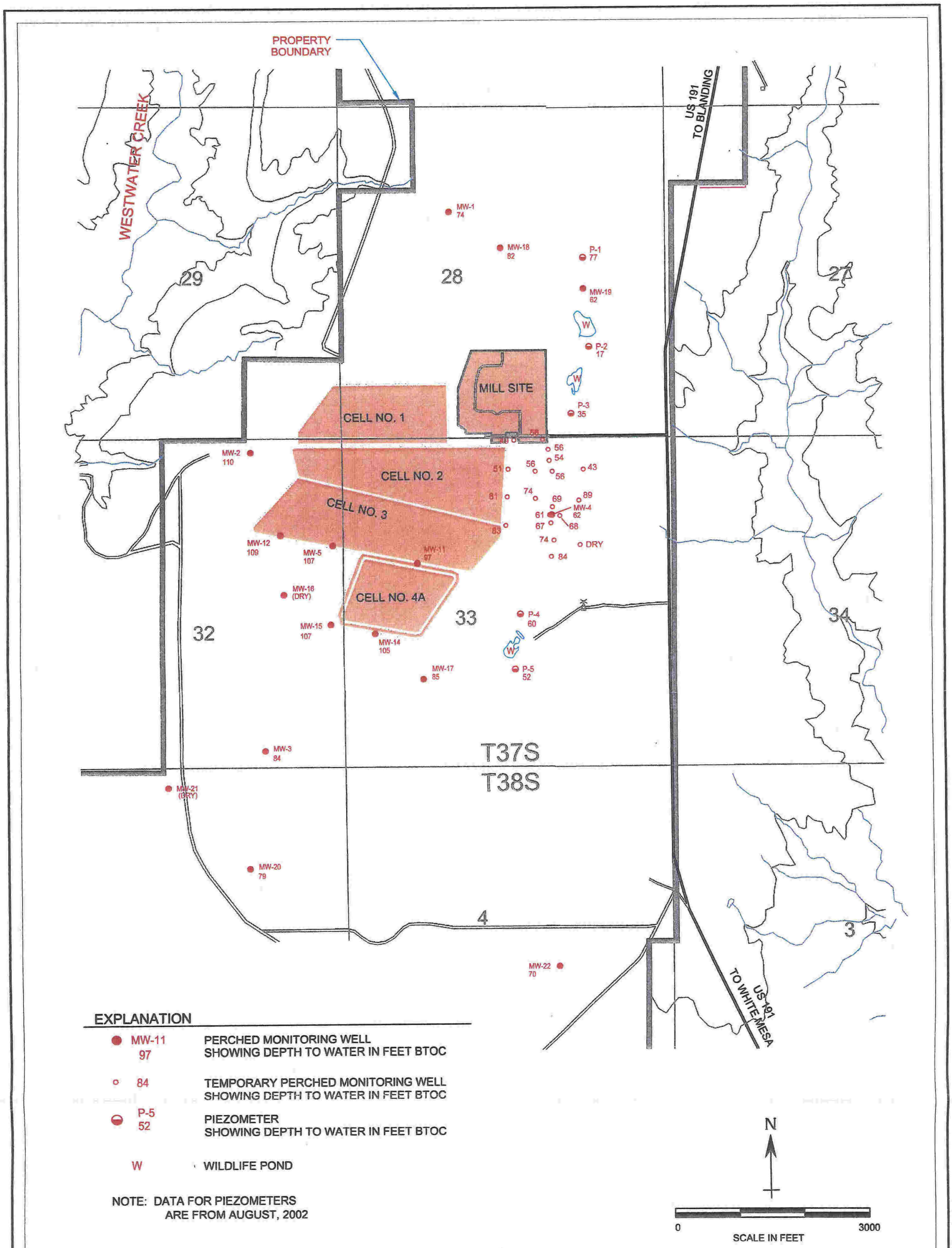

EXPLANATION

● MW-11 97	PERCHED MONITORING WELL SHOWING DEPTH TO WATER IN FEET BTOC
○ 84	TEMPORARY PERCHED MONITORING WELL SHOWING DEPTH TO WATER IN FEET BTOC
⊖ P-5 52	PIEZOMETER SHOWING DEPTH TO WATER IN FEET BTOC
W	WILDLIFE POND

NOTE: DATA FOR PIEZOMETERS ARE FROM AUGUST, 2002

Denison Mines (USA) Corp.

Figure 11
White Mesa Mill
Stock Watering Pond Locations

Table 2
Water Quality of Groundwater in the Mill Vicinity

Parameter	FES, Test Well (G2R) (1/27/77 - 3/23/78[1])	Well #2 6/01/99[1]	Well #5 6/08/99[1]
Field Specific Conductivity (umhos/cm)	310 to 400		
Field pH	6.9 to 7.6		
Temperature (°C)	11 to 22		
Estimated Flow m/hr (gpm)	109(20)		
pH	7.9 to 8.16		
Determination, mg/liter			
TDS (@180°C)	216 to 1110		
Redox Potential	211 to 220		
Alkalinity (as $CaCOS_3$)	180 to 224		
Hardness, total (as $CaCO_3$)	177 to 208		
Bicarbonate		226	214
Carbonate (as CO_3)	0.0	<1.0	<1.0
Aluminum		0.003	0.058
Aluminum, dissolved	<0.1		
Ammonia (as N)	0.0 to 0.16	<0.05	<0.05
Antimony		<0.001	<0.001
Arsenic, total	.007 to 0.014	0.018	<0.001
Barium, total	0.0 to 0.15	0.119	0.005
Beryllium		<0.001	<0.001
Boron, total	<0.1 to 0.11		
Cadmium, total	<0.005 to 0.0	<0.001	0.018
Calcium		50.6	39.8
Calcium, dissolved	51 to 112		
Chloride	0.0 to 50	<1.0	2.3
Sodium		7.3	9.8
Sodium, dissolved	5.3 to 23		
Silver		<0.001	<0.001
Silver, dissolved	<0.002 to 0.0		
Sulfate		28.8	23.6
Sulfate, dissolved (as SO_4)	17 to 83		
Vanadium		0.003	0.003
Vanadium, dissolved	<.002 to 0.16		
Manganese		0.011	0.032
Manganese, dissolved	0.03 to 0.020		
Chromium, total	0.02 to 0.0	0.005	0.005
Copper, total	0.005 to 0.0	0.002	0.086
Fluoride		0.18	0.18
Fluoride, dissolved	0.1 to 0.22		
Iron, total	0.35 to 2.1	0.43	0.20
Iron, dissolved	0.30 to 2.3		

[1] Zero values (0.0) are below detection limits.

Parameter	FES, Test Well (G2R) (1/27/77 - 3/23/78[1])	Well #2 6/01/99[1]	Well #5 6/08/99[1]
Lead, total	0.02 - 0.0	<0.001	0.018
Magnesium		20.4	21.3
Magnesium, dissolved	15 to 21		
Mercury, total	<.00002 to 0.0	<0.001	<0.001
Molybdenum		0.001	<0.001
Molybdenum, dissolved	0.004 to 0.010		
Nickel		<0.001	0.004
Nitrate + Nitrate as N		<0.10	<0.10
Nitrate (as N)	<.05 to 0.12		
Phosphorus, total (as P)	<0.01 to 0.03		
Potassium		3.1	3.3
Potassium, dissolved	2.4 to 3.2		
Selenium		<0.001	<0.001
Selenium, dissolved	<.005 to 0.0		
Silica, dissolved (as SiO_2)	5.8 to 12		
Strontium, total (as U)	0.5 to 0.67		
Thallium		<0.001	<0.001
Uranium, total (as U)	<.002 to 0.16	0.0007	0.0042
Uranium, dissolved (as U)	<.002 to 0.031		
Zinc		0.010	0.126
Zinc, dissolved	0.007 to 0.39		
Total Organic Carbon	1.1 to 16		
Chemical Oxygen Demand	<1 to 66		
Oil and Grease	1		
Total Suspended Solids	6 to 1940	<1.0	10.4
Turbidity		5.56	19.1
Determination (pCi/liter)			
Gross Alpha			<1.0
Gross Alpha ± precision	1.6±1.3 to 10.2±2.6		
Gross Beta			<2.0
Gross Beta ± precision	8±8 to 73±19		
Radium 226 ± precision			0.3±0.2
Radium 228			<1.0
Ra–226 ± precision	0.1±.3 to 0.6±0.4		
Th–230 ± precision	0.1±0.4 to 0.7±2.7		
Pb–210 ± precision	0.0±4.0 to 1.0±2.0		
Po–210 ± precision	0.0±0.3 to 0.0±0.8		

Source: Adapted from FES Table 2.25 with additional Mill sampling data

7.4.2 Perched Groundwater Zone

Perched groundwater in the Dakota/Burro Canyon Formation is used on a limited basis to the north (upgradient) of the site because it is more easily accessible. The quality of the Burro Canyon perched water beneath and downgradient from the site is poor and extremely variable. The concentrations of total dissolved solids (TDS) measured in water sampled from upgradient and downgradient wells range between approximately 1,200 and 5,000 mg/l. Sulfate concentrations measured in three upgradient wells varied between 670 and 1,740 mg/l (Titan, 1994). The perched groundwater therefore is used primarily for stock watering and irrigation.

The saturated thickness of the perched water zone generally increases to the north of the site. See the Background Groundwater Quality Report: Existing Wells For Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah dated December 2006 prepared by Intera, Inc., Appendix B.

At the time of renewal of the Mill license by the NRC in March, 1997 and up until issuance of the Mill's Groundwater Discharge Permit ("GWDP") in March 2005, the Mill implemented a groundwater detection monitoring program to ensure compliance to 10 CFR Part 40, Appendix A, in accordance with the provisions of Mill License condition 11.3A. The detection monitoring program was in accordance with the report entitled, "Points of Compliance, White Mesa Uranium Mill," submitted by letter to the NRC dated October 5, 1994. Under that program, the Mill sampled monitoring wells MW-5, MW-11, MW-12, MW-14, MW-15 and MW-17, on a quarterly basis. Samples were analyzed for chloride, potassium, nickel and uranium, and the results of such sampling were included in the Mill's Semi-Annual Effluent Monitoring Reports that were filed with the NRC up until August 2004 and with the DRC subsequent thereto.

Prior to 1997, commencing in 1979, the Mill monitored up to 20 constituents in up to 13 wells. That program was changed to the Points of Compliance Program in 1997 because:

- The Mill and tailings system had produced no impacts to the perched zone or deep aquifer; and

- The most dependable indicators of water quality and potential cell failure were considered to be chloride, nickel, potassium and natural uranium.

8.0 Ecological Resources and Biota

8.1 Terrestrial

a) Flora

The natural vegetation presently occurring within a 25-mile (40-km) radius of the Mill site is very similar to that of the region, being characterized by pinyon-juniper woodland intergrading with big sagebrush (Artemisia tridentata) communities. The pinyon-juniper community is dominated by Utah juniper (Juniperus osteosperma) with occurrences of pinyon pine (Pinus edulis) as a codominant or subdominant tree species. The understory of this community, which is usually quite open, is composed of grasses, forbs, and shrubs that are also found in the big sagebrush communities. Common associates include galleta grass (Hilaria jamesii), green ephedra (Ephedra viridis), and broom snakewood (Gutierrezia sarothrae). The big sagebrush communities occur in deep, well-drained soils on flat terrain, whereas the pinyon-juniper woodland is usually found on shallow rocky soil of exposed canyon ridges and slopes. See Section 2.9 of the 1978 ER.

Based on the work completed by Dames & Moore in the 1978 ER, no designated or proposed endangered plant species occur on or near the project site (1978 ER, Section 2.8.2.1). Of the 65 proposed endangered species in Utah at that time, six have documented distributions in San Juan

County. A careful review of the habitat requirements and known distributions of these species by Dames & Moore in the 1978 ER indicated that, because of the disturbed environment, these species would probably not occur on the project site. The Navajo Sedge has been added to the list as a threatened species since the Dames & Moore study.

In completing the 2002 EA, NRC staff contacted wildlife biologists from the BLM and the Utah Wildlife Service to gather local information on the occurrences of additional species surrounding the Mill. In the 2002 EA, NRC staff concluded that the Navajo Sedge has not been observed in the area surrounding Blanding, and is typically found in areas of moisture (2002 EA at 4).

b) Fauna

Wildlife data were collected by Dames & Moore through four seasons at several locations on the Mill site, prior to construction of the Mill. The presence of a species was based on direct observations, trappings and signs such as the occurrence of scat, tracks, or burrows. A total of 174 vertebrate species potentially occur within the vicinity of the Mill (1978 ER, Appendix D), 78 of which were confirmed (1978 ER, Section 2.8.2.2).

Although seven species of amphibians are thought to occur in the area, the scarcity of surface water limits the use of the site by amphibians. Eleven species of lizards and five snakes potentially occur in the area (1978 ER, Section 2.8.2.2).

Fifty-six species of birds were observed in the vicinity of the Mill site (1978 ER, Section 2.8.2.2).

The food habits of eagles vary depending on the season and the region in which they live. Fish, carrion and waterfowl such as mallard, are consumed by eagles when available to them. The FES indicates that mallards are both common and permanent in the vicinity of the Mill (FES, Table 2.28).

Raptors are prominent in the western United States. Five species were observed in the vicinity of the site. Although no nests of these species were located at the time of the FES, all (except the golden eagle, Aquila chrysaetos) have suitable nesting habitat in the vicinity of the site. The nest of a prairie falcon (Falco mexicanus) was found about 3/4 mile (1.2 km) east of the site. Although no sightings were made of this species, members tend to return to the same nests for several years if undisturbed (1978 ER, Section 2.8.2.2).

Of several mammals that occupy the site, mule deer (Odocoileus hemionus) is the largest species. The deer inhabit the project vicinity and adjacent canyons during winter to feed on the sagebrush and have been observed migrating through the site to Murphy Point (1978 ER, Section 2.8.2.2). Winter deer use of the project vicinity, as measured by browse utilization, is among the heaviest in southeastern Utah at 25 days of use per acre in the pinyon-juniper-sagebrush habitats in the vicinity of the project site. In addition, this area is heavily used as a migration route by deer traveling to Murphy Point to winter. Daily movement during winter periods by deer inhabiting the area has also been observed between Westwater Creek and Murphy Point. The present size of the local deer herd is not known.

Other mammals present at the site include the coyote (Canis latrans), red fox (Vulpes vulpes), gray fox (Urocyon cineroargenteus), striped skunk (Mephitis mephitis), badger (taxidea taxus), longtail weasel (Mustela frenata), and bobcat (Lynx rufus). Nine species of rodents were trapped or observed on the site, the deer mouse (Peromyscus maniculatus) having the greatest distribution and abundance. Although desert cottontails (Sylvilagus auduboni) were uncommon in 1977, black-tailed jackrabbits (Lepus californicus) were seen during all seasons.

In the 2002 EA, NRC staff noted that, in the vicinity of the site, the U.S. Fish and Wildlife Service had provided the list set out in Table 3.12-1, of the endangered, threatened, and candidate species that may occur in the area around the site.

Table 3 Endangered, Threatened and Candidate Species in the Mill Area

Common Name	Scientific Name	Status
Navajo Sedge	Carex specuicola	Threatened
Bonytail Chub	Gila elegans	Endangered
Colorado Pikeminnow	Ptychocheilus lucius	Endangered
Humpback Chub	Gila cypha	Endangered
Razorback Sucker	Xyrauchen texanus	Endangered
Bald Eagle	Haliaeetus leucocephalus	Threatened
California Condor	Gymnogyps californianus	Endangered
Gunnison Sage Grouse	Centrocercus minimus	Candidate
Mexican Spotted Owl	Strix occidentalis lucida	Threatened
Southwestern Willow Flycatcher	Empidonax traillii extimus	Endangered
Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	Candidate
Black-footed Ferret	Mustela nigripes	Endangered

Source: 2002 EA

The 2002 EA also noted that, in addition, the species listed on Table 3.12-2 may occur within the Mill area that are managed under Conservation Agreements/Strategies

Table 4
Species Managed Under Conservation Agreements/Strategies at the Mill Area

Common Name	Scientific Name
Colorado River Cutthroat Trout	Oncorhynchus clarki pleuriticus
Gunnison Sage Grouse	Centrocercus minimus

Source: 2002 EA

For the 2002 EA, NRC staff contacted wildlife biologists from the BLM and the Utah Wildlife Service to gather local information on the occurrences of these additional species surrounding the Mill. NRC staff made the following conclusions (2002 EA p. 4):

While the ranges of the bald eagle, peregrine falcon, and willow flycatcher encompass the project area, their likelihood of utilizing the site is extremely low. The black-footed ferret has not been seen in Utah since 1952, and is not expected to occur any longer in the area. The

California Condor has only rarely been spotted in the area of Moab, Utah, (70 miles north) and around Lake Powell (approximately 50 miles south). The Mexican Spotted Owl is only found in the mountains in Utah, and is not expected to be on the Mesa. The Southwestern Willow Flycatcher, Western Yellow-billed Cuckoo, and Gunnison Sage Grouse are also not expected to be found in the immediate area around the Mill site.

8.2 Aquatic and Wetlands Biota

Aquatic habitat at the Mill site ranges temporally from extremely limited to nonexistent due to the aridity, topography and soil characteristics of the region and consequent dearth of perennial surface water. Two small stockwatering ponds are located on the Mill site a few hundred yards from the ore pad area (See Figure 11). One additional small "wildlife pond", east of Cell 4A, was completed in 1994 to serve as a diversionary feature for migrating waterfowl. Although more properly considered features of the terrestrial environment, these ponds essentially represent the total aquatic habitat on the Mill site. These ponds probably harbor algae, insects, other invertebrate forms, and amphibians. They also provide a water source for small mammals and birds. Similar ephemeral catch and seepage basins are typical and numerous to the northeast of the Mill site and south of Blanding.

Aquatic habitat in the Mill vicinity is similarly limited. The three adjacent streams (Corral Creek, Westwater Creek, and an unnamed arm of Cottonwood Wash) are only intermittently active, carrying water primarily in the spring during increased rainfall and snowmelt runoff, in the autumn, and briefly during localized but intense electrical storms. Intermittent water flow most typically occurs in April, August, and October in those streams. Again, due to the temporary nature of these steams, their contribution to the aquatic habitat of the region is probably limited to providing a water source for wildlife and a temporary habitat for insect and amphibian species.

In the 2002 EA, NRC staff concluded that (p. 4) no populations of fish are present on the project site, nor are any known to exist in the immediate area of the site. Four species of fish designated as endangered or threatened (the Bonytail Chub, Colorado Pikeminnow, Humpback Chub and Razorback Sucker) occur in the San Juan River 18 miles south of the site, which Dames & Moore noted in the 1978 ER (Section 2.8.2) is the closest habitat suitable for these species. NRC staff further concluded that there are no discharges of mill effluents to surface waters, and therefore, no impacts are expected for the San Juan River due to operations of the Mill.

9.0 Background Radiological and Non-Radiological Characteristics

Background Radiological and Non-Radiological Effects have been evaluated, updated and reported extensively in Denison's February 28, 2007 License Renewal Application and accompanying Environmental Report, incorporated here by reference.

10.0 Environmental Effects Related Directly to the Construction of Cell 4b

The environmental effects of Cell 4b construction consist of those related to the release of airborne particulate (dusting), radon release from the operating cell, and the impact, if any, on

groundwater beneath the pond. In order to evaluate these environmental considerations two separate evaluations were completed, *Site Hydrogeology Estimation Of Groundwater Travel Times and Recommended Additional Monitoring Wells For Proposed Tailings Cell 4BWhite Mesa Uranium Mill Site Near Blanding, Utah, Hydro Geo Chem, Inc., 2008* and *Dose Assessment Pertaining to the Proposed Development of New Tailings Cells For the White Mesa Uranium Mill, SENES Consultants, Ltd, 2008.*

These evaluations are provided as Appendix A and Appendix B, respectively, and are discussed in summary in the pertinent subsections below.

10.1 Groundwater Pathway Impact

The evaluation provided by Hydro Geo Chem Inc. finds that travel time for any water exiting the pond to the perched water zone and then to the point(s) of perched zone discharge is very long, far exceeding the time period of milling operations and closure of the tailings cells when little free liquid is available for infiltration through the cell liner system. More specifically, HGC found that the time for fluids that could be released from the cells to reach the points of seepage and spring formation at ruin spring and Cottonwood seep are on the order of several thousand years. However, this analysis is very conservative in that travel time through the pond liner was not considered, and because the liner system is robust state-of-the art construction, travel time through the liner is a significant protective factor. In fact, this aspect has been evaluated extensively by MWH Americas, Inc. in their report *Infiltration and Contaminant Transport Modeling Report, White Mesa Mill Site, Blanding Utah, November, 2007,* incorporated here by reference. The infiltration modeling effort revealed that the construction design for Cells 4a and 4b will meet the "Closed Cell Performance Requirements" of the Groundwater Discharge Permit at Part 1.D.6. More specifically, MWH concluded that the approved reclamation plan for the cells will meet the following regulatory requirements for a period of not less than 200 years:

a) Minimize infiltration of precipitation or other surface water into the tailings, including but not limited to the radon barrier;
b) Prevent the accumulation of leachate head within the tailings waste layer that could rise above or over-top the maximum FML liner elevation internal to any disposal cell, i.e. create a "bathtub" effect; and,
c) Ensure that groundwater quality at the compliance monitoring wells does not exceed Ground Water Quality Standards or Ground Water Compliance Limits specified in Part 1.C.1 and Table 2 of the Permit.

10.2 Proposed Additional Groundwater Monitoring

In order to monitor the performance of Cell 4b, and consistent with EPA Guidance, it was concluded by Hydro Geo Chem Inc. that an additional well or wells will be needed to monitor the Cell's performance at the downgradient edge of the cell. This in addition to the many wells already incorporated into the Groundwater Discharge Permit for the facility. Accordingly, two additional wells are proposed, one at the southwest corner of proposed Cell 4b and one between the southwest corner well and existing well MW-15 (See Figure 10 of Appendix B. These

installations will conservatively maintain the approximate existing spacing as defined by the proximity of MW-14 to MW-15 along the downgradient edge of existing Cell 4a.

10.3 Radiological Impact

In February 2007, a dose assessment was prepared for DUSA by SENES Consultants, Ltd. in support of the license renewal application for the mill. MILDOS-AREA was used to estimate the dose commitments that could potentially be received by individuals and the general population within a 50 mile (80 km) radius for processing of conventional ores. The assessment was prepared for scenarios in which Colorado Plateau (0.25% U_3O_8 and 1.5% V_2O_5) or Arizona Strip (0.637%) ores are processed at the mill.

In order to evaluate the radiological impact of Cell 4b's operation the prior dose assessment analyses was extended from the previous report of February 2007 to incorporate the dose from the proposed development of new tailings cells anticipated in the future. The results of this extended assessment are provided as Attachment B to this report (*Proposed Development of New Tailings cells For The White Mesa Uranium Mill, SENES, 2008),* and reveal that the addition of Cell 4b to the facility will not impact the ability of the facility to comply with regulatory requirements

The U.S. NRC approved MILDOS-AREA was used to estimate the dose commitments received by individuals and the general population within a 50 mile (80 km) radius of the site for the processing of either Colorado Plateau or Arizona Strip ore separately. In each scenario, the doses arising from emissions of dust and radon from the mill area and ore pads were assumed to be the same as the previous 2007 report since the scenarios both involve the processing of Colorado Plateau and Arizona Strip ores. Therefore, MILDOS-AREA runs from the previous report were revised to exclude the tailings cells. The doses from the tailings cells were estimated in separate MILDOS-AREA runs and added to the dose from the mill area and ore pads. Table 4 provides a summary of the source terms included in Phases 1 and 2 of the development of new tailings cells including Cells 4a and 4b.

TABLE 4
SOURCE TERMS INCLUDED IN PHASE 1 AND 2

Source Term	Phase 1	Phase 2
Mill area	included	included
Ore Pads	included	included
Tailings Cell 2 with Interim Soil Cover	included	included
Tailings Cell 3	active	interim soil cover
Tailings Cell 4A	active	active
Tailings Cell 4B	excluded	active

The wind erosion and radon release rates from the tailings cells (active and with interim soil cover) were modeled by using a maximal worst case approach.

Each active tailings cell was modeled to have an active area of 10 acres (i.e., the maximum expected to be uncovered at any time since it is not possible to predict the distribution of uncovered tailings between the active cells at any given time. The release rate of wind-eroded tailings dust was estimated for 10 acres. The total annual radon release rate was estimated by assuming a radon release rate of 20 pCi/m^2s (i.e., maximum radon-222 emissions to ambient air from an existing uranium mill pile) over the entire area of each cell consistent with NESHAPs.

Emissions from the tailings cells (2 and 3) with interim soil cover were assumed to occur over the entire area of each cell; however, only radon is released at a rate of 10 pCi/m^2s after the application of the soil cover.

The calculated total annual effective dose commitments (including radon) calculated using MILDOS-AREA were compared to the Utah Administrative Code R313-15-301(1)(a) requirement that the dose to individual members of the public shall not exceed 100 mrem/yr (radon included). For proposed development of new tailings cells for the processing of Colorado Plateau ore, the maximum total annual effective dose commitments was calculated to be a maximum of 1.4 mrem/yr for an infant at the nearest potential resident, BHV-1 (Tables 6.1-1 and 6.1-3) (i.e., effective dose) and is about 1.4% of the R313-15-301(1)(a) limit of 100 mrem/yr (radon included) to an individual member of the public for Phases 1 and 2. For proposed development of new tailings cell for the processing of Arizona Strip ore, the total annual effective dose commitments were calculated to be a maximum of 3.1 mrem/yr for an infant at the nearest potential resident, BHV-1 (i.e., effective dose) and is about 3.1% of the 100 mrem/yr limit (radon included) to an individual member of the public for Phases 1 and 2. Overall, the predicted annual effective dose commitments for proposed development of new tailings cells during anticipated ore processing operations comply with R313-15.

In addition, our MILDOS-AREA calculated 40 CFR 190 annual dose commitments (excluding radon) were compared to the 40 CFR 190 criterion, which is 25 mrem/yr to the whole body (excluding the dose due to radon) and 25 mrem/yr to any other organ to any member of the public (U.S. EPA 2002). The 40 CFR 190 doses were also used to demonstrate compliance with R313-15-101(4) (10 CFR 20.1101(d)) (i.e., the licensee must demonstrate that total effective dose equivalent to the individual member of the public likely to receive the highest total effective dose equivalent will not exceed 10 mrem/yr (absent of the radon dose). For proposed development of new tailings cells for the processing of Colorado Plateau ore, the 40 CFR 190 annual dose commitments were

calculated to be a maximum of 4.8 mrem/yr for a teenage at the nearest potential resident, BHV-1 (i.e., dose to the bone) and is about 19% of the 40 CFR 190 dose criterion of 25 mrem/yr for Phases 1 and 2. Further, the 40 CFR 190 annual effective dose commitments demonstrate compliance with the R313-15-101(4) (10 CFR 20.1101(d)) limit of 10 mrem/yr to the individual member of the public likely to receive the highest total effective dose equivalent. For Arizona Strip ore, the 40 CFR 190 annual dose commitments were at most 12 mrem/yr for a teenage at the nearest potential resident, BHV-1 (i.e., dose to the bone) and is well within the 40 CFR 190 dose criterion of 25 mrem/yr for Phases 1 and 2. Further, the annual effective dose commitments demonstrate compliance with R313-15-101(4) (10 CFR 20.1101(d)) limit of 10 mrem/yr to the individual member of the public likely to receive the highest total effective dose equivalent.

10.4 Proposed Radiological Monitoring to Accommodate Cell 4b Operations

As an element of evaluating potential off-site doses related to the construction and operation of Cell 4b, Denison commissioned a review of its environmental monitoring programs in order to determine what, if any, additional monitoring would be needed to accommodate the operation of Cell 4b. The review was conducted by SENES Consultants, Ltd who concluded that the current environmental monitoring regime was sufficient and that added monitoring was not warranted due to the operation of Cell 4b. The results of the SENES review are attached here as Appendix C to this report.

11.0 Alternatives

The action under consideration is the construction of an already contemplated tailings Cell (Cell 4b) in order accomodate continued operation of the Mill. The alternatives available to the Executive Secretary are to:

a) Amend the License to include the construction of Cell 4b with its existing terms and conditions;

b) Amend the License to include the construction of Cell 4b with such additional conditions as are considered necessary or appropriate to protect public health, safety and the environment; or

c) Deny the addition of Cell 4b construction into the License.

As demonstrated in this ER, the environmental impacts associated with construction and operation of Cell 4b do not warrant either limiting the Mill's future operations or denying the Cell 4b construction approval request. As there are no significant public health, safety or environmental impacts associated with the construction of Cell 4b, Denison

asserts that alternatives with equal or greater impacts need not be evaluated, and alternative a) is the appropriate alternative for selection.

11.1 Issuance of Amendment for Cell 4a

The Mill is one of only two operating uranium mills in the Unites States and the only uranium mill on the western slope of the Rocky Mountains. As a result, the Mill is the only currently available opportunity for production of uranium from conventionally mined ore in San Juan County and in the four corners area of the United States. The Mill therefore provides a benefit to the regional community and to the uranium industry as a whole in the United States. The construction of Cell 4b would allow the Mill to continue to provide these benefits for many more years and as contemplated in the original licensing effort.

As was demonstrated in Section 3 of the ER accompanying the 2007 License Renewal Application, the Mill's equipment, facilities and procedures are adequate to minimize impacts to public health, safety and the environment. More importantly, UDEQ has already approved the construction of Cell 4a which is identical to Cell 4b with regard to its robust and state-of-the-art protective design features. Also, the Mill has operated since its inception in compliance with all applicable regulatory standards and ALARA goals and is capable of continuing to operate in compliance with such standards and goals.

In addition to the License, the Mill has been issued a Groundwater Discharge Permit, which provides additional protection for public health and the environment, including a rigorous groundwater monitoring program to monitor and assess the performance of tailings cells associated with the facility. The Mill has demonstrated that it is capable of continuing to operate in a manner that satisfies all regulatory standards and ALARA goals under the existing terms and conditions of the License and GWDP, this amendment application has assessed and proposed additional monitoring necessary to accommodate newly constructed Cell 4b. Based upon these factors and considerations Denison asserts that there is no need to add any additional conditions to the License in order to protect public health, safety or the environment as a result of Cell 4b construction.

11.2 No Action Alternative

A "no action" alternative would result in the amendment request being denied and the immediately available processing opportunities for mined uranium ore being lost in the short term, severely impacting independent uranium miners in the area and lessening the United States' capability to respond to the need for uranium for nuclear power generation.

Denying the request for construction of Cell 4b severely constrain the utilization of the Mill in the near term and eliminate its ability to operate over the longer term during a time when commodity prices for uranium are favorable, and the demand for uranium milling capacity is unprecedented. Permitting the Mill to continue processing

conventionally mined ore for the recovery of uranium and the construction of Cell 4b will provide the opportunity for regular employment in an economically depressed area of the United States. A large percentage of the workers at the Mill are Native American, and this employment opportunity has significant direct impact in the local Native American community. In addition to the direct hiring of employees at the Mill, local miners and other western United States mining companies require access to an operating uranium mill. The inability of these mining entities to gain access to local milling services will prevent the mining industry from responding to the current uranium supply shortage. Thus, secondary local economies will not enjoy the benefit of renewed mining income, and national demand for uranium will continue to be reliant primarily on foreign supplies of uranium for nuclear fuel. In order to respond to the current uranium market, conventional mining companies will be forced to license and construct new uranium milling facilities to engage in conventional ore processing, directly in opposition to the objective of non-proliferation of new uranium mill tailings disposal facilities embodied by 10 CFR Part 40 Appendix A, Criterion 2.

As has been demonstrated by the forgoing assessments, the impacts associated with the construction and operation of Cell 4b are well within the realm of impacts anticipated in the FES, the 1985 EA and the 1997 EA, and UDEQ's approval of Cell 4b construction will satisfy applicable criteria in R313-22-33 and R313-24. As a result, Denison asserts that the Executive Secretary should have no basis for denying the proposed action.

11.3 Alternatives Considered But Eliminated

a) Consideration of Alternative Sites

The Mill is already sited and in existence and has been operating for over 25 years. It is not feasible to consider moving the Mill to an alternative site or to construct additional tailing cells at a different location. Even if that were possible, it has been demonstrated in Section 3 of the February, 2007 ER accompanying the License Renewal Application that the Mill is sited in a good hydrogeologic setting and is otherwise well sited for its operations, including tailings cells contemplated at the time of the Mill's original licensure. This is evident from the fact that the Mill has operated since its inception in compliance with applicable regulatory standards and ALARA goals.

If the construction of Cell 4b is not approved as an element of continued milling operations, there can be no assurance that, as an alternative, an equally well-suited site for milling and tailings cell contruction, that complies with the applicable siting requirements of 10 CFR Part 40 Appendix A, can be identified and obtained. Even if a suitable alternative site were to be identified and obtained, licensing and construction of a new mill and tailings cells could not be accomplished in a time frame that would ensure production could commence in a period of suitable market conditions. Furthermore, as the existing Mill tailings would have to be decommissioned in place, creation of a new mill site would result in unnecessary proliferation of mill tailings disposal facilities in contravention of 10 CFR Part 40 Appendix A, Criterion 2.

b) Consideration of Alternative Engineering Methods

As will be demonstrated in Section 3, the existing Mill facilities, equipment, procedures and training of personnel have resulted in the Mill operating since inception in compliance with all applicable regulatory standards and ALARA goals. Current modeling demonstrates that the Mill is capable of continuing to operate under the existing terms and conditions of the License in a manner that will continue to comply with such standards and goals. Furthermore, the Mill's GWDP institutes additional protections and engineering controls, including the requirement that any new construction of tailings cells must meet current best available technology standards. Therefore, there is no need to consider alternative engineering methods. The existing equipment and facilities, together with the existing terms and conditions of the License and the GWDP are sufficient to ensure that all applicable requirements will continue to be satisfied.

11.4 Cumulative Effects

There are no past, present, or reasonably foreseeable future actions which could result in cumulative impacts that have not been contemplated and previously approved under the existing Mill License and the design of Cell 4b.

As stated throughout this License Amendment request, the Cell 4b construction will result in no activity with potential, significant, incremental impacts to public health, safety or the environment over and above the actions contemplated in the FES, the 1985 EA and the 1997 EA. The activities contemplated with regard to ore processing and disposal of tailings remain unchanged from those previously authorized under the License.

11.5 Comparison of the Predicted Environmental Impacts

There have been no observed significant impacts which were not previously quantified and addressed to public health, safety or the environment resulting from the proposed construction of Cell 4b. As there will be no significant changes in Mill operations if the License is amended to accommodate construction of Cell 4b, possible impacts to public health, safety or the environment will not exceed those predicted in the original License application and periodic renewals.

11.6 Updates & Changes to Factors That May Cause Reconsideration of Alternatives

As discussed in Section 12 below, Costs and Benefits, there have been no changes to factors that may cause reconsideration of alternatives. There have been no significant changes in the costs associated with operation of the Mill (including its impoundments), and the benefits associated with continued operation and construction of already contemplated tailing cells have become more evident over time as the number of uranium mills has dwindled and the demand for uranium milling service capacity from local miners and the industry as a whole has increased in recent years. Furthermore, no new

alternatives to the services provided by the Mill and its impoundments have been identified since the last License renewal in 1997.

12.0 Cost and Benefits

Appendix A to NUREG 1569 requires that the applicant for a license renewal describe any updates and changes to the economic costs and benefits for the facility since the last application.

There have been no significant changes to the costs associated with the Mill since the last License renewal in 1997. While there will a change to the currently disturbed area as a result of the Cell 4b construction, this additional Cell was contemplated, described and assessed, as a critical component of the initial 1978 NRC-FEIS and attendant licensing of the facility. As indicated in Section 3 of February, 2007 ER accompanying the renewal application, the Mill has operated in accordance with applicable regulatory standards and ALARA goals since its inception, and updated MILDOS AREA modeling indicates that the Mill is capable of continuing to operate well within those standards and goals. There have been no significant demographic changes that have impacted the ability of the Mill to operate in a manner that will result in no significant impacts to public health, safety or the environment. It is expected that continued Mill operations will continue to draw primarily upon the existing work force in the area with little impact on social services.

The Mill is one of only two operating uranium mills in the United States and is one of the largest private employers in San Juan County. The benefits of the Mill will continue to be the provision of well-paying jobs to workers in San Juan County and the support of the tax base in that County. Moreover, as the only operating uranium mill on the western slope of the Rocky Mountains, the Mill is relied upon by the large number of independent uranium miners in San Juan County and the Colorado Plateau as the only feasible uranium mill for their uranium ores. With the recent gap between the supply and demand for uranium and the increases in the price of uranium, the need for continued licensing of the Mill is crucial for such miners and for the uranium industry in the United States as a whole.

In sum, the costs associated with the operation of the Mill have not changed significantly, but the benefits have become more evident over time as the number of uranium mills has dwindled and the demand for uranium milling services from local miners and the industry as a whole has increased.

13.0 Mitigation of Impacts

NUREG 1569 requires that the ER provide the "results of effectiveness of any mitigation proposed and implemented in the original license". In the case of the White Mesa Mill, there have not been any mitigations proposed or implemented under the License.

14.0 Long Term Impacts

The long term impacts, including decommissioning, decontamination, and reclamation impacts associated with activities conducted pursuant to the License have been considered in detail in the FES, the Mill's Reclamation Plan, and the 2000 EA prepared by the NRC in connection with the Reclamation Plan.

The Mill's Reclamation Plan and financial surety arrangements, as well as the provisions in the Mill's GWDP that relate to final reclamation of the site are described in detail in Section 8 of the February, 2007 License Renewal Application, and are incorporated here by reference. The construction of Cell 4b will not result in any changes to operations at the Mill that would impact decommissioning, decontamination or reclamation aspect associated with Mill activities, or the previous analyses of such aspects. The grading contours and other reclamation features related to closure of Cell 4b at site closure are shown in Figure 20. All design features for Cell 4b are included in the Cell 4b Design Report prepared by Geosyntec Consultants which was transmitted to UDEQ in January of 2008.