ENVIRONMENTAL ASSESSMENT
RELATED TO THE ISSUANCE OF A LICENSE AMENDMENT FOR CONSTRUCTION OF A THIRD EVAPORATION POND, HOMESTAKE MINING COMPANY OF CALIFORNIA, GRANTS, NEW MEXICO PROJECT

SOURCE MATERIAL LICENSE SUA-1471
DOCKET NO. 040-08903

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Division of Waste Management and Environmental Protection

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1.0 Introduction

1.1 Background

Homestake Mining Corporation (HMC), through a variety of partnerships and joint venture associations, operated a uranium milling operation in Cibola County, New Mexico, beginning in 1958, and continuing through 1990. The site is north of the City of Grants in Section 26, Township 12 North, Range 10 West. Since 1990, the site has been in reclamation. Site reclamation includes facility decommissioning, tailings impoundment area restoration, groundwater restoration and monitoring, and post-closure care and monitoring. The site is licensed under NRC License SUA-1471. During operations, approximately 22 million tons of ore was milled at the site, using a conventional alkaline leach process (NRC, 1993). From 1993 to 1995, the mill was decommissioned and demolished. After the mill was demolished, final surface reclamation commenced in accordance with the amended U.S. Nuclear Regulatory Commission (NRC) requirements (NRC, 2006). Surface reclamation is nearly complete, with final reclamation and stabilization to be completed after groundwater restoration is completed. Groundwater contamination from past mill activities remains, and groundwater restoration is the primary activity occurring at the site. Once groundwater quality restoration is complete and approved, the site will be transferred to the U.S. Department of Energy (DOE), which will have the responsibility for long-term site care and maintenance.

HMC currently manages a groundwater restoration program, as defined by NRC License SUA-1471, and New Mexico Environment Department (NMED) Discharge Plan, DP-200 and DP-725 (HMC, 2007b). The current groundwater restoration program is also under the oversight of EPA Region VI Superfund Program. The restoration program is a dynamic ongoing strategy based on a groundwater reclamation plan, which began in 1977. Additional evaluation of the groundwater restoration program recently has identified the need to extend the program, by approximately four years, to 2017 to finish cleanup objectives. HMC's long-term goal is to restore the groundwater aquifer system in the area, as close as practicable, to the up-gradient groundwater quality background levels. The restoration program is designed to remove target contaminants from the groundwater through use of injection and collection systems, utilizing deep-well supplied fresh water or water produced from the reverse osmosis (RO) plant. A groundwater collection area has been established and is hydraulically bounded by a down-gradient perimeter of injection and infiltration systems comprising groundwater wells and infiltration lines (NRC, 2007b). The RO plant has operated at the site since late 1999 to augment groundwater clean-up activities. A series of collection wells is used to collect the contaminated water, which is pumped to the RO plant for treatment or, alternatively, pumped to a series of evaporation ponds.

HMC seeks NRC approval to increase its evaporation and storage capacity to increase the rate of groundwater restoration by constructing a third evaporation pond (EP3). To construct EP3, an amendment to the NRC License SUA-1471 is required. The amendment request addresses the construction of EP3 and site boundary expansion associated with locating EP3 north of the mill tailings impoundment and north of County Road 63. The site is regulated by the NRC pursuant to the requirements of Title 10 of the Code of Federal Regulations Part 40 (10 CFR Part 40), "Domestic Licensing of Source Material." This Environmental Assessment (EA) was prepared in accordance with NRC requirements in 10 CFR 51 and with the associated guidance in NRC report NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with

NMSS Programs." This EA assesses the likely impacts to the environment from HMC's proposal to expand the current licensed boundary and to construct EP3 for groundwater reclamation.

1.2 The Proposed Action (Alternative B)[1]

The proposed action is to amend Source Material License SUA-1471 to permit the expansion of the permitted operations boundary and to permit construction of EP3 for groundwater reclamation activities. The NRC-licensed boundary would be expanded by approximately 185 acres (HMC, 2006b).

The proposed amendment to SUA - 1471 would allow HMC to construct EP3 on HMC property north of the large tailings impoundment at a location in Sections 22 and 23, approximately 1,800 feet north of County Road 63. A 50-foot wide access corridor would be constructed to access the proposed pond and to locate piping and associated infrastructures to the proposed pond area. The proposed area of impact for EP3 is approximately 33 acres, including the service corridor and earthen containment dike. The evaporative surface area of the proposed pond is approximately 26.5 acres. The pond would be constructed as an at-grade facility, with cut and fill designed to be in rough balance. Therefore, no significant quantities of soil would be imported or exported from the site. The pond would have a double High Density Polyethylene (HDPE) liner with a leak detection/collection system. After groundwater remediation is complete, the pond would be removed and the area reclaimed (HMC, 2006b).

1.3 Need for the Proposed Action

Additional evaporation pond capacity is needed to enhance groundwater restoration and complete the approved groundwater restoration program (HMC, 1991; NRC, 1993). Additional evaporation pond capacity would allow HMC to pump approximately 33 percent more contaminated groundwater than can be currently pumped under existing conditions. Further, additional evaporative capacity would allow the groundwater restoration to be completed by 2017, although this date may change based on the performance of the restoration program (HMC, 2006b). Construction of an additional evaporation pond would result in increased initial costs for HMC, but would shorten the time required to implement the groundwater corrective action plan (CAP). Additional benefits would include increased hydraulic control of the contaminant plume and faster restoration of contaminated groundwater. Faster completion of the groundwater CAP would result in earlier completion of surface reclamation and the placement of a final cover on the large tailings impoundment. Many of the groundwater reclamation wells are on the large tailings impoundment which will not have a final cover until the groundwater restoration is complete.

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1 Alternatives are analyzed in this EA in the order that they are addressed in the HMC Environmental Report (Bridges and Meyer, 2007) for consistency. Alternative A is the No Action Alternative, Alternative B is the Proposed Action, and Alternatives C and D are alternate evaporative pond locations.

As discussed in Section 2, HMC has analyzed the impacts of placing EP3 at two additional locations on HMC property. The Alternative B location is preferred because it minimizes the dust and noise impacts to the local residents during construction and the evaporative odors during operation of EP3.

2.0 Alternatives to the Proposed Action

HMC's objective is to increase its evaporation and storage capacities to aid in groundwater restoration. To meet this objective, HMC would like to add an additional evaporation pond. HMC has three available location alternatives for EP3 as can be seen on the figures below (copied from Homestake, 2006b). HMC is the property owner of lands associated with each of the three siting alternatives. Construction details and evaporation pond designs are the same for each of the siting alternatives. The No Action Alternative (Alternative A) and Alternatives C and D are described below.

2.1 No Action Alternative (Alternative A)

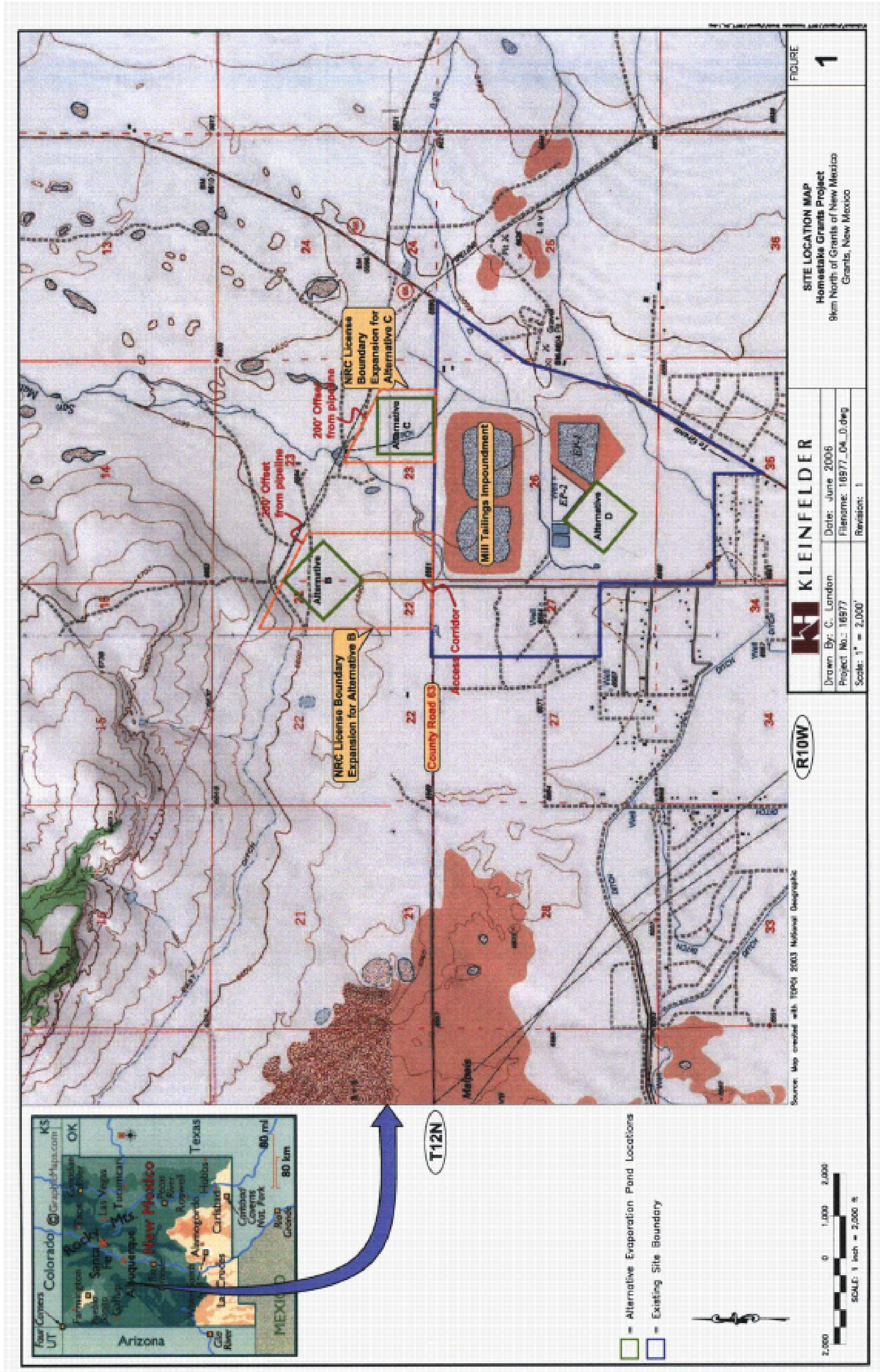
The no action alternative would be continued groundwater reclamation at the HMC facility under current capacities. No changes to the NRC license or site boundary expansion would occur. All current operations and maintenance programs would continue as planned according to the general provisions of the HMC Closure Plan approved May 12, 1993 (NRC, 1993).

2.2 Alternative Evaporative Pond Location (Alternative C)

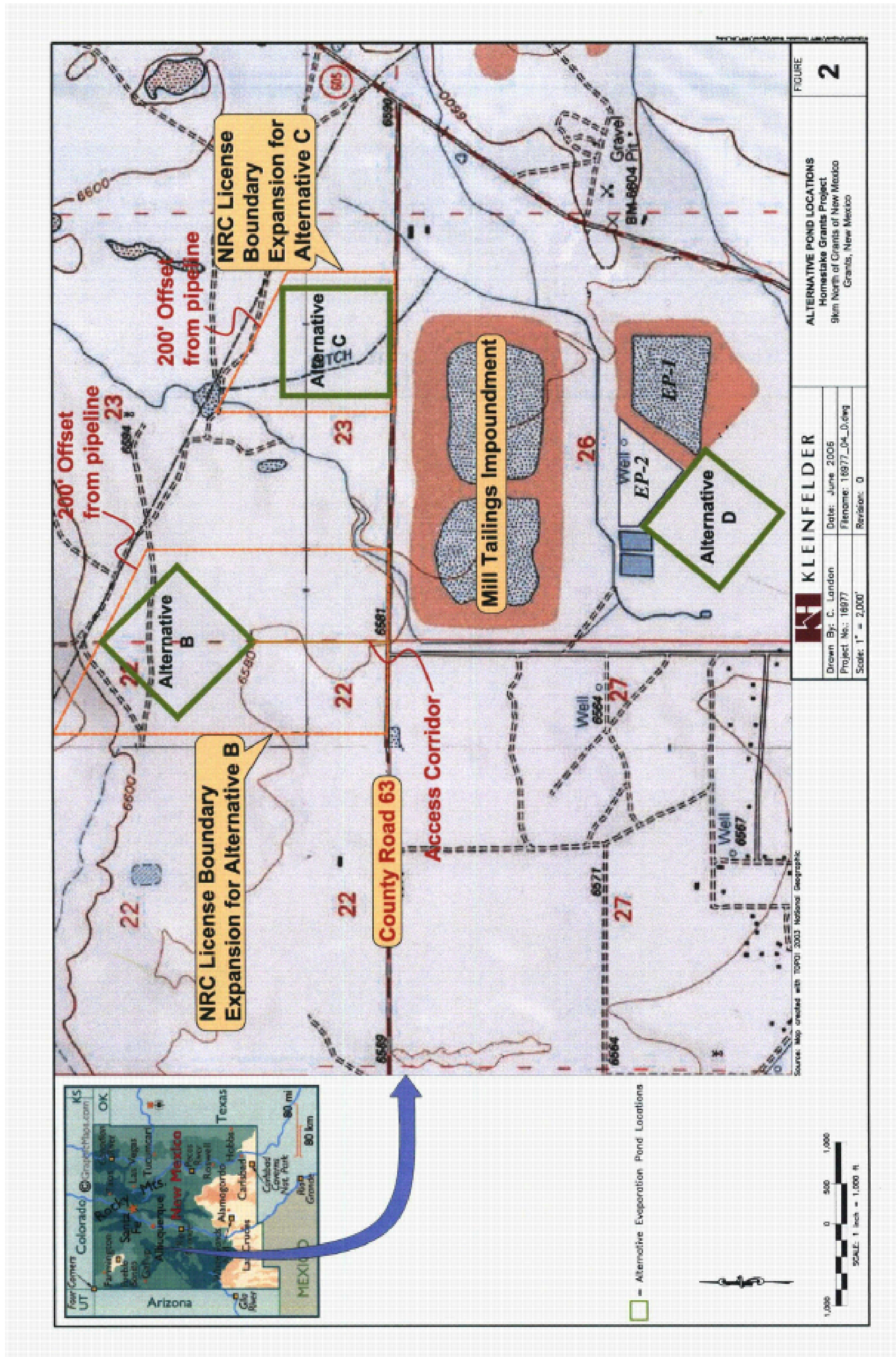
Alternative C: This alternative involves constructing EP3 within the SE quarter of Section 23 along County Road 63 and within 1,800 feet of NM 605. The NRC-licensed boundary would be expanded by approximately 68 acres. The pond is proposed to be square in shape and disturb approximately 33 acres of land, including the access corridor and earthen containment dike. The pond is anticipated to provide 26.5 acres of surface area for the evaporation and water storage purposes. The pond would be constructed as an at-grade facility, with cut and fill designed to be in rough balance. Therefore, no significant quantities of soil would be imported or exported from the site. The pond would have a double HDPE liner with a leak detection/collection system.

2.3 Alterative Evaporative Pond Location (Alternative D)

Alternative D: This alternative involves constructing EP3 on the southwest side of Evaporation Pond # 2 (EP2) located south of the large tailings pile impoundment in the SW ¼ of Section 26. Under this alternative, EP3 would share the southwest dike wall of EP2 within the existing licensed boundary. The pond would be sized and constructed as described in Alternative C. This alternative would not require an NRC-licensed boundary expansion, as EP3 would be within the boundary of the present NRC-licensed area.



NRC License Boundary Expansion for Alternative C
200' Offset from pipeline
Alternative C
Alternative B
Alternative D
NRC License Boundary Expansion for Alternative B
Mill Tailings Impoundment
County Road 63
Access Corridor
T12N
R10W
= Alternative Evaporation Pond Locations
= Existing Site Boundary
Source: Map created with TOPO! 2003 National Geographic
KLEINFELDER
Drawn By: C. London
Date: June 2006
Project No.: 16977
Filename: 16977_04_D.dwg
Scale: 1" = 2,000'
Revision: 1
SITE LOCATION MAP
Homestake Grants Project
9km North of Grants of New Mexico
Grants, New Mexico
FIGURE
1


NRC License Boundary Expansion for Alternative B
NRC License Boundary Expansion for Alternative C
200' Offset from pipeline
200' Offset from pipeline
Alternative B
Alternative C
Alternative D
Mill Tailings Impoundment
County Road 63
Access Corridor
EP-1
EP-2
Well
Gravel Pit
22
23
26
27
Alternative Evaporation Pond Locations
ALTERNATIVE POND LOCATIONS
Homestake Grants Project
9km North of Grants of New Mexico
Grants, New Mexico
KLEINFELDER
Drawn By: C. London
Project No.: 16977
Scale: 1" = 2,000'
Date: June 2006
Filename: 16977_04_0.dwg
Revision: 0
FIGURE
2
Source: Map created with TOPO! 2003 National Geographic
Colorado
New Mexico
Arizona
Texas
MEXICO
Albuquerque
Santa Fe
Rocky Mts.
SCALE: 1 inch = 1,000 ft

3.0 Affected Environment

The affected environment is very similar for Alternatives B, C, and D. Alternatives B, C, and D are relatively close to one another, each separated by approximately two miles or less.

3.1 Land Use

3.1.1 Site Location

The HMC Mill is located in Cibola County, about five and one-half miles (8.8 kilometers, km) north of the City of Grants and the Village of Milan, New Mexico. The site is situated in the San Mateo drainage at an elevation of 6,600 feet (1980 meters) above Mean Sea Level (MSL). The project area is surrounded by mesas ranging in elevation from 7,000 to 8,600 feet (2100 to 2580 meters) above MSL. The mesas define a roughly circular valley about 10 miles (16 km) in diameter. The San Mateo drainage is an ephemeral arroyo, which drains an area of approximately 291 square miles (75,369 hectares) and connects with the Rio San Jose near the Village of Milan.

The U.S. Census estimated the total population of Cibola County for 2000 at 25,595, and the Northwest New Mexico Council of Governments estimated the County population to increase to 26,509 by 2010. The adjacent incorporated areas of Grants and Milan contain the largest population in the area. The 2000 U.S. Census estimated the population of the Grants-Milan community to be about 11,000, with about 2000 of these people located near the site in Milan. There are several subdivisions located approximately one-half-mile (0.8 km) south and southwest of the site. There are currently nearby residences located to the south and west of the facility. The majority of the land in the vicinity of the current mill site is undeveloped rangeland. The ARCO Bluewater uranium mill site is located approximately five miles (8.05 km) west of the HMC site (Bridges and Meyer, 2007).

Residential areas are estimated to account for approximately three-percent of the area. The only surface water bodies in the vicinity of the site are several stock ponds and some small ephemeral ponds. Drinking water for the Grants-Milan area is obtained from deep wells drilled into the San Andres aquifer. Domestic water for the subdivisions south and west of the site is also obtained primarily, but not exclusively, from the Grants-Milan public water system.

3.1.2 On-Site Land Use – HMC Properties

Uranium milling operations at the Grants site began in 1958, and were terminated in February 1990. Two separate mills were originally located at the site. The smaller mill operated until January 1962, after which all milling activities were conducted in the larger facility. Both mills utilized alkaline leach circuits, with a nominal capacity for the two mills of 3,400 tons of ore per day. The alkaline leach circuit employed at the Grants Mill required a finer grind of the material to be leached than does an acid leach circuit. As a result, up to 60 percent of the tailings solids are finer than a No. 200 sieve size (NRC, 1993). Finer materials are more susceptible to migration or transport through natural mechanisms such as wind and water erosion (Bridges and Meyer, 2007).

Following extraction of the uranium, the tailings were discharged to either the small or the large tailings impoundment. Both impoundments were constructed using an earth fill containment dike into which the tailings were discharged. The small impoundment contains approximately 1.8 million tons of tailings, while the large impoundment contains approximately 21 million tons. HMC owns and controls a sizeable land area in and around the Grants Reclamation Project. Over the years, additional lands have been acquired as opportunity has arisen and acquisition of such lands is deemed appropriate in relation to ongoing groundwater remediation, restoration activities and final reclamation of the site.

The windblown tailings clean-up project began in 1995 and involved mechanical disturbance and the removal of tailings imported by wind for placement within the sites tailings pile area. During the 35 years of milling and processing operations at the site, windblown tailings were deposited over approximately 1200 acres immediately surrounding the tailings pile. Deposition of windblown tailings over the HMC property occurred during high wind conditions.

Heavy machinery was used in removing the contaminated deposits, which sometimes reached a depth of more than three feet (one meter). After removal of the contaminated deposits, seed and mulch were spread on the remaining soils to assist in revegetation efforts (Byszewski, 2006).

HMC lands owned in the area that are not within the immediate proximity of the tailings pile complex have been, and are continuing to be, utilized for livestock grazing on a lessor/lessee tenant arrangement. Most of the current land area within the present site boundary has been excluded from livestock grazing and other land use, except those areas that are not directly related to the ongoing groundwater restoration activities. As such, livestock grazing is not currently allowed in the immediate tailings pile areas, evaporation pond areas, or the office/maintenance shop locations. However, certain small areas in the southern and western portions of land within the site boundary are utilized for livestock grazing.

Several residential lots held by HMC in the surrounding subdivisions and in the general area of the reclamation site are idle and are essentially not in use, except in certain instances where fresh water injection and water collection are underway as part of the ongoing groundwater restoration program.

3.1.3 Off-Site Land Use – Pleasant Valley Estates, Murray Acres, Broadview Acres, Felice Acres and Valle Verde Residential Subdivisions

A large portion of land around the HMC-owned properties is used for grazing. The other major land use immediately proximal to the site consists of residential development located in the Pleasant Valley Estates, Murray Acres, Broadview Acres, Valle Verde, and Felice Acres residential subdivisions. Into the mid-1970s, monitoring wells showed no increase in the levels of radioactive materials, but did show elevated levels of selenium in the domestic water supply. As a result of the elevated selenium levels, HMC provided subdivision residents with potable water and eventually entered into an agreement with the EPA to extend the Village of Milan water system to the four residential subdivisions near the mill. The Village of Milan water supply extension was completed in the mid-1980s and HMC agreed to pay the basic water service charges for the residents of the Pleasant Valley Estates, Murray Acres, Broadview Acres, and

Felice Acres subdivisions for a period of 10 years. The Village of Milan water supply was extended out to the Valle Verde subdivision and immediately adjacent area at a later date. However, current information indicates that some residents in the area are using water wells for drinking water supplies.

An assessment of current land use in these residential subdivision areas was completed by Hydro-Engineering, LLC of Casper, Wyoming, in late 2005 and early 2006, to provide an annual review of the present uses, occupancy, and status for the various lots within these subdivisions (HMC, 2006b). A review of land use for HMC properties and the residential subdivision areas to the immediate south and west of the Grants Reclamation Project site indicates that present land uses in the area have not changed significantly over the past five years. Over the years, permanent residential homes, modular homes and mobile homes have been established in the subdivision areas, and immediate adjacent areas, as would typify a rural residential neighborhood. A number of lots remain vacant, or are utilized for horse barns, corrals, and/or equipment storage. In some cases, dwellings are present on several lots throughout the subdivisions, but are currently vacant or have been permanently abandoned.

Field review of the five subdivision areas, along with follow-up inquiries as required to confirm the status of water use at each property, indicates that, at present, all occupied residential sites in, or immediately adjacent to the Felice Acres, Broadview Acres, Murray Acres, and Pleasant Valley subdivisions are on metered water service with the Village of Milan. In the Valle Verde residential area and immediately adjacent to the subdivision, 12 residences were identified that are not on the Village of Milan water supply system and therefore are obtaining domestic-use water from private well supplies. One of these 12 is a residence on a private well supply about one-quarter mile west of the Valle Verde subdivision. Current information indicates that all other occupied residential lots in the Valle Verde area are on the Village of Milan water supply system (Bridges and Meyer, 2007).

3.2 Transportation

Interstate-40 and State Highway 605 are the principal highway access routes near the project area. Public highways or railroads do not cross the NRC-licensed area of the HMC property. County Road 63 bisects the proposed boundary expansion of Alternatives B and C to the north. Normal access to the HMC site is from the south via State Highway 605 then traveling west on County Road 63. The NRC-licensed area is fenced and posted by HMC. Currently, County Road 63 is not within the NRC-licensed site boundary.

3.3 Geology and Seismology

The HMC Site is located on the northeast flank of the Zuni Uplift, a tectonic feature, which is characterized by Precambrian crystalline basement rocks overlain by Permian and Triassic sedimentary rocks (D’Appolonia,1982). Major faults occur along the southwest flank of the Zuni Uplift, with only minor faults mapped in the region surrounding the site. Faults associated with the Zuni Uplift are generally northwest trending, steeply dipping reverse faults. However, the minor, steeply dipping normal and reverse faults in the vicinity of the site generally trend northeast. A number of geologic faults pass near the site; however, they are considered to be inactive since they do not displace nearby lava flows of Quaternary age (less than 1.8 million years) or express youthful geomorphic features indicative of active faults (Bridges and Meyer, 2007). None of the local faults are considered to be active (D’Appolonia, 1982).

Earthquakes, which have occurred within 60 miles (96 km) of the site, have typically been of low intensity (D'Appolonia, 1982). Based on an analysis conducted in 1981 of the number of earthquakes and their magnitudes, the maximum earthquake in the area is estimated to be a magnitude 4.9 (Richter Scale) during a 100-year period. By comparison, the largest historical earthquake recorded in the region is a magnitude 4.1 (Richter Scale) (D'Appolonia, 1982; Bridges and Meyer, 2007).

Slope gradients in the area generally range from zero to five percent in valleys and mesa tops, and from five-to-over 100 percent on the flanks of the mesas and on the nearby volcanic peaks. Where the gradient is steep in the northern San Mateo drainage, intersecting arroyos are commonly incised from 10 to 30 feet (three to nine meters). Where the gradient decreases, such as in the Site vicinity, incision is minimal and flow occurs in wide, shallow, poorly defined, or practically nonexistent channels.

The majority of the project area contains soils of the Sparank-San Mateo complex. Sparank and San Mateo soils are well drained and moderately alkaline. Sparank soils are comprised of clay loam overlying silty clay loam; San Mateo soils are loams. Both soils are conducive to agriculture (Bridges and Meyer, 2007; Byszewski, 2006).

In general, the nature of the flat valley exposes it to high winds and shifting aeolian sands. Documentation of mechanical disturbance of one meter of accumulated Aeolian sediments, and the presence of sand sage (deep sand indicator species) suggests the presence of deep Aeolian overburden in the area, especially areas that have not been subjected to mechanical disturbance (Byszewski, 2006).

3.4 Water Resources and Hydrology

The HMC Site is located east of the continental divide in the Rio Grande drainage system of west-central New Mexico. The surface water regime surrounding the HMC Site is influenced by the arid-to-semiarid climate of the region, the relatively medium-to-high permeability of the soils, and the exposed bedrocks of the watersheds. The HMC Site is in the San Mateo drainage. Down gradient from the site the Lobo Canyon drainage flows into the San Mateo drainage from the southeast, and the San Mateo drainage flows westward into the Rio San Jose drainage, which flows to the southeast. The San Mateo drainage basin above the site has a drainage area of approximately 291 square miles. Its shape is roughly circular and it contains a dendritic drainage pattern (D'Appolonia 1982). Maximum relief is 4,724 feet with elevations ranging from 6,576 feet above MSL at the outlet to 11,300 feet above MSL at Mount Taylor. North of the site, the San Mateo is an ephemeral arroyo and flows in direct response to precipitation or snow melt events. There is no distinct channel near the site. A very large precipitation event could result in flow from the San Mateo drainage entering the Rio San Jose drainage. The Rio San Jose is itself ephemeral and flows only in direct response to local rainstorms or snow melt. The Rio San Jose discharges to the Rio Puerco drainage, which is a tributary of the Rio Grande River. San Mateo Creek reaches from the northeast to the southwest through the HMC property. Other surface water bodies in the general vicinity of the HMC Site include several stock ponds, some small ephemeral ponds, and an undetermined number of springs on the flanks of Mount Taylor.

At and nearby the HMC site, the saturated drainages are the saturated alluviums or shallow water-bearing units. In the immediate vicinity of the site, the saturated thickness of the San Mateo alluvium varies from 10-to-60 feet (3-to-20 meters). The Chinle formation, comprised mainly of massive shale interspersed with some sandstone (approximately 800 feet thick), exists below the alluvium. The Chinle formation acts as an effective barrier between the aquifer bearing portion of the alluvium and the underlying San Andres formation, which is the principal water-bearing formation in the vicinity of the mill (Bridges and Meyer, 2007) and the primary groundwater source for the municipalities in the area. Milling activities at the site have resulted in impacts to the San Mateo alluvial aquifer and Chinle aquifers, which underlie the Grants Mill. A groundwater corrective action program has been implemented at the site since 1977. The corrective action includes the injection of fresh water from the San Andres aquifer into the alluvial aquifer near an HMC property boundary to form a hydraulic barrier to the seepage and reverse the local groundwater gradient so contaminated water can be retrieved by a series of collection wells located near the tailings impoundment. The captured water is treated currently through the RO plant or sent directly to synthetically-lined evaporation ponds. The corrective action program appears to be successful in mitigating the negative impacts of seepage from the tailings ponds (Bridges and Meyer, 2007).

Under the HMC groundwater restoration plan, water collected from the alluvial and Chinle aquifers underlying the site would continue to be collected where there are relatively low levels of selenium and uranium and be used for re-injection in the initial phase of restoration of some areas. Re-injection would occur in the alluvium where concentrations are greater than those of the injected water until such time as injection with San Andres fresh water or RO product water would better complete the restoration.

3.5 Ecology

3.5.1 Vegetation

Vegetation in the vicinity of the site consists primarily of desert grassland of the Colorado Plateau (NRC, 1993). The project area is semi-arid grassland characterized by shrubs and mixed grama-gelleta steppe grasses. A large area in west-central New Mexico is classified as Desert Grassland and is thought to be a new succession-disturbance desert grassland, characterized by galleta and blue grama grasses consisting of high shrub and forb densities, with low grass densities (Byszewski, 2006).

Common plants found include four-wing saltbrush, greasewood, sand sage, and broom snakeweed (*Gutierrezia Sarothrae*). Grasses include blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Achnatherum hymenoides*), and bunch grass species. Some narrowleaf yucca (*Yucca angustissima*) was also observed. Salt cedar (*Tamarix spp.*), an invasive species, is beginning to establish itself in isolated areas along the shallow San Mateo Creek.

Earthen stock tanks within the project area are supporting wetland plants such as Cattail (*Typha lantifolia*). The establishment of wet areas provides water and food for a variety of wildlife, including red-winged black birds and coyotes.

Most of the area located around the site was bladed in 1995 and re-seeded with shrubs, forbs, and grasses. Groundcover varies from 79 percent to 99 percent. No plant species currently listed as rare, endangered, or threatened by the U.S. Fish and Wildlife Service (USFWS) or the State of New Mexico, were observed within the project area (Byszewski, 2006).

3.5.2 Wildlife

Wildlife in the area is generally limited to small mammals and bird species. Characteristic species include mule deer, coyote, rattlesnakes, and many species of birds, small rodents, and lizards. During the Cultural Resource inventory survey in June 2006, cottontail rabbits and black tailed jackrabbits, ravens, rattlesnakes, horned lizards, blackbirds, and prairie dogs were observed (Byszewski, 2006).

3.5.3 Rare, Threatened and Endangered Species

The following Federal threatened and endangered species and species of concern are known to occur in Cibola County, New Mexico, according to the New Mexico Game and Fish (NMGF) (Bridges and Meyer, 2007; NMGF, 2007).

Table 1 Federal Rare, Threatened and Endangered Species

Common Name	Scientific Name	Status
Zuni Bluehead Sucker	***Catostomus discobolus yarrowi***	**Candidate**
Bald Eagle	**Haliaeetus leucocephalus**	**Threatened**
Northern Goshawk	***Accipiter gentilis***	**Species of Concern**
American Peregrine Falcon	***Falco peregrinus anatum***	**Species of Concern**
Mountain Plover	***Charadrius montanus***	**Species of Concern**
Yellow-billed Cuckoo	***Coccyzus americanus***	**Candidate**
Mexican Spotted Owl	***Strix occidentalis lucida***	**Threatened**
Burrowing Owl	***Athene cunicularia***	**Species of Concern**
Southwest Willow Flycatcher	***Empidonax trailii extimus***	**Endangered**
Cebolleta Pocket Gopher	***Thomomys bottae paguatae***	**Species of Concern**
Mtn Silverspot Butterfly	***Speyeria nokomis nitocris***	**Species of Concern**
Pecos sunflower	***Helianthus paradoxus***	**Threatened**
Zuni fleabane	***Erigeron rhizomatus***	**Threatened**
Acoma fleabane	***Erigeron acomanus***	**Species of Concern**
Cinder phacelia	***Phacelia serrata***	**Species of Concern**
Gypsum phacelia	***Phacelia sp. nov***	**Species of Concern**
Black Footed Ferret	***Mustela nigripes***	**Endangered**

The occurrence of endangered or threatened plant species is unlikely to occur within the project area due to the surface being significantly altered by mechanical disturbance that had occurred as part of HMC's windblown contamination clean-up project.

3.6 Meteorology, Climatology, and Air Quality

3.6.1 Meteorology and Climatology

Climatology and meteorology data are based on data summaries acquired from the National Climatology Data Center (NCDC) and the New Mexico Climate Center (NMCC) within the proximity of the project location and include National Weather Service data from the City of Grants (approximately 5.5 miles southeast of the project area (Bridges and Meyer, 2007).

Monthly average temperatures in Grants, New Mexico, range from the low thirties (degrees Fahrenheit) during the winter, to the low seventies in the summer. Maximum summer temperatures reach into the low nineties, while minimum winter temperatures fall in the low teens.

Precipitation received in the area averages approximately 12 inches per year with the maximum monthly totals received during the summer months accounting for nearly half of the annual total. Summer precipitation is usually associated with thunderstorms, which form with the arrival of warm, moist air from the Gulf of Mexico. Winter precipitation is derived mainly from storms from the Pacific Ocean, although the amounts received are much less than during summer months.

Relative humidity in the area averages near 60 percent with the highest monthly average in December and the lowest in May. Annual evaporation for the area, estimated using equations outlined by NRC (1993), is approximately 78-to-94 percent of the annual precipitation, or 9-to-11 inches per year.

HMC (2007d) reports the predominant wind direction is from the southwest. Average wind speed is estimated to be five miles per hour with a prevailing wind speed of five miles per hour. However, surface winds in the project area are reported by Bridges and Meyer (2007) as predominantly from the north-northwest. The Bridges and Meyer wind data is from the Grants/Milan airport. Wind direction at the local airport is thought to be influenced by local landforms that are absent at the site. Data showing the predominant wind direction from the southwest is reported from HMC's onsite weather station and is consistent with older weather information from the nearby Arco/Bluewater site. While the prevailing wind direction is from the southwest, the Arco/Bluewater data wind rose shows a very significant westerly and northwesterly component (Cox, 2007).

3.6.2 Air Quality

Air quality status of the project area is considered to be unclassifiable or in attainment with the National Ambient Air Quality Standards (NAAQS) for the regulated criteria air pollutants, including particulate matter less than 10 microns in diameter (PM-10), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Carbon Monoxide (CO) and Ozone. No known monitoring data for the HMC site area were found through a review of New Mexico ambient air monitoring data within the past five years (Bridges and Meyer, 2007). The nearest monitoring sites are located in Albuquerque.

Total suspended particulate matter (TSP) is an additional regulated air pollutant in New Mexico. TSP refers to small, solid particles or liquid droplets suspended in the air and having diameters of 25-to-45 microns. The major industrial point source of TSP is the coal-fired Coronado Generating Station, approximately 60 miles southwest of the project site.

Peabody Energy's Mustang project is a proposed 300-megawatt project to be located north of Grants, New Mexico, using coal from the existing Lee Ranch Mine operated by Peabody. An air quality permit application has already been filed and accepted as complete. Peabody recently received approval for a Department of Energy (DOE) grant (Bridges and Meyer, 2007). The permit application will likely be revised to reflect changes proposed in the grant application.

Local area TSP sources are wind-blown dust, vehicular traffic on unpaved roads, and wind-blown liquid droplets from the aeration activities in the HMC evaporation ponds Evaporation Pond #1 (EP1) and EP2.

3.7 Noise

The HMC Site is located approximately one-half to three-quarters of a mile from the nearest subdivision. The operational noises generated at the HMC site are related to reclamation activities. Reclamation activities include vehicle traffic, heavy equipment operation, pump operation, and monitoring well drilling activities.

3.8 Cultural Resources

Taschek Environmental Consulting personnel conducted an intensive (100-percent) cultural resource survey on approximately 350 acres in Sections 22 and 23 of Township 12 North, Range 10 West, for the proposed project. The field survey was conducted from June 5 to June 15, 2006. The New Mexico Cultural Resource Inventory System (NMCRIS) Project Activity Number for the survey is 100406.

Eleven new sites, one previously recorded site, and 53 isolated occurrences (IOs) were identified during the survey. Of the twelve documented archaeological sites, three sites are recommended eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion D for their information potential, based on the high probability of intact buried cultural deposits at these sites. An undetermined eligibility status is recommended for three sites pending a testing program that would determine the presence or absence of intact subsurface cultural deposits. The remaining six sites are recommended ineligible for inclusion in the NRHP due to their lack of integrity (Byszewski, 2006).

3.9 Visual Resources

Visual resources and recreational areas found within Cibola County include: San Mateo Mountains (including Mt. Taylor), Cibola National Forest, Acoma Village, San Estaban Del Ray Mission, El Malpais National Monument, El Morro National Monument, El Morro National Monument Inscription Rock Historical Marker, Old Fort Wingate-Zuni Wagon Road Historic Site, Pueblo Revolt Tricentennial Historical Marker, Petaca Plata Wilderness Study Area, Long Park, San Rafael Historical Marker, and Pueblo of Acoma Historical Marker.

Facility buildings and mill tailings impoundments associated with the HMC site are visible from State Highway NM 605 and surrounding residential areas to the south and west of the property boundary. The HMC site can be seen from the following residential areas: Pleasant Valley Estates, Murray Acres, Broadview Acres, Felice Acres, and Valle Verde Subdivisions.

3.10 Socioeconomic

3.10.1 Cibola County

Cibola County was created by a division of Valencia County in 1981 therefore, population data for the new county before 1981 are estimated. In 1970, the county's population was 20,125, rising to 30,109 in 1980 and falling to 23,794 in 1990. These population changes were mainly related to uranium mining activity in the area. In 2000 the Cibola County population was estimated to be 25,595. The county encompasses a land area of 4,539 square miles. Industries providing employment include: educational, health and social services (27.4 percent), Arts, entertainment, recreation, accommodation and food services (12.8 percent), public administration (12.3 percent), and retail trade (10.5 percent). Types of workers within Cibola County include, private wage or salary - 58 percent, government - 35 percent, self-employed, not incorporated 6 percent, and unpaid family work - 1 percent. Cibola County population, by ethnic background, includes: American Indian - 41.8 percent, Hispanic - 33.4 percent, White Non-Hispanic - 24.7 percent, Other race - 15.4 percent, two or more races - 3.2 percent, and African American - 1-percent. The total can be greater than 100-percent because some Hispanics could be counted as other races. A mix of rural and industrial activities has characterized the Cibola County economy with uranium mining as the biggest factor in both the "boom" cycles of the 1950s, 60s and 70s and the "bust" cycle of the 1980s. The location of federal and state prisons in the county has helped buffer some of the consequences of the economic downturn, and the County is currently on an economic upturn, as evidenced by the recent location of a major retail center and the construction of an inter-agency "gateway to the region" Visitor Center (Bridges and Meyer, 2007).

3.10.2 City of Grants

The City of Grants is the largest incorporated area near the proposed project site. The population of Grants, in November of 2005, was estimated at 15,232. Between 2000 and 2005, the population of Grants has increased 2.7 percent. The City of Grants encompasses approximately 13.7 square miles. The next nearest city is Rio Rancho, located approximately 80 miles east of the HMC site, with a population of 51,765. The City of Albuquerque is located approximately 85 miles east, with a population of 448,607 (Bridges and Meyer, 2007).

3.11 Public and Occupational Health

3.11.1 Air Particulate Monitoring

HMC continuously samples suspended particulates at six locations around the reclamation site (HMC, 2007b, HMC, 2007d). Three of the six locations are down wind from the reclamation activities. Two of the six locations are located close to the nearest residence, and the remaining location is located up wind from the reclamation site. The up wind location is used for background sampling. Energy Laboratories, Inc., analyzes the collected samples quarterly for Natural Uranium (Unat), Radium-226, and Thorium-230.

3.11.2 Radon Gas Monitoring

Radon gas is monitored on a continuous basis at eight locations, with one location located northwest of the site to record background levels (HMC, 2007b, HMC, 2007d). Semiannually HMC personnel place new track-etch passive radon monitors (PRMs) at the monitoring locations, and the exposed detectors are retrieved and returned to Landauer Corporation for analysis (HMC, 2007d).

3.11.3 Direct Radiation

Gamma exposure rates are continuously monitored through the use of optically stimulated luminescence (OSL) dosimeter badges at each of seven locations (HMC, 2007b, HMC, 2007d). One location northwest of the site is considered the background location for direct radiation. The OSLs are exchanged semiannually and analyzed by an approved independent laboratory (currently Landauer). The levels of direct environmental radiation are recorded for each of the seven locations (HMC, 2007d).

3.11.4 Surface Contamination

3.11.4.1 Personnel Skin and Clothing

The monitoring of personnel for alpha contamination is required as part of all radiation work permits using standard operating procedures. No releases of personnel or clothing above administrative limits were reported during the January - June 2007 period (HMC 2007d). Previous project Semi-Annual Environmental Monitoring Reports, filed with NRC pursuant to requirements of the project Radioactive Materials License, also document non-release of contaminated materials.

3.11.4.2 Survey of Equipment Prior to Release for Unrestricted Use

Equipment surveys are required for all equipment that is to be removed from contaminated areas as specified in radiation work permits. Standard operating procedures are used for these surveys. No releases of contaminated material above NRC release criteria were reported during the January - June 2007 period (HMC, 2007d). Previous project Semi-Annual

Environmental Monitoring Reports, filed with NRC pursuant to requirements of the project radioactive materials license, also document non-release of contaminated materials.

3.12 Waste Management

Upon completion of reclamation and groundwater cleanup activities, EP3 would be decommissioned and the area reclaimed to allow return of the land to present unrestricted use. At present, the proposed EP3 pond site area is utilized for livestock grazing.

All evaporation concentrates remaining within the EP3 pond liner at the end of the EP3 use period, would be removed and relocated to EP1 for incorporation with final reclamation of EP1 and the small tailings pile. The pond liner, piping, and other related infrastructure associated with EP3 would also be relocated to EP1, incorporated with other project demolition and decommissioning waste, and reclaimed with the small tailings pile that presently underlies EP1.

The area occupied by EP3, along with the access corridor, piping and utility corridors would be seeded and revegetated. The security fencing would be removed to allow agricultural grazing land use. Upon completion of the reclamation and decommissioning, the permitted license boundary associated with the EP3 pond location would be adjusted back to the present project site boundary.

4.0 Environmental Impacts, Mitigation Measures and Monitoring

4.1 Environmental Impacts

The environmental impacts associated with the possible locations for EP3 are discussed below.

4.1.1 Land Use

For Alternative A, the no action alternative, there would be no changes to the affected environment as described in Section 3. However, there are short-term positive impacts associated with the no action alternative because land use changes resulting from construction and operation of EP3 would be avoided. The short-term positive land use impacts are offset by the benefits associated with operation of EP3. Operation of EP3 is expected to shorten the reclamation time at the HMC site by 10 years, at which time the large tailings impoundment would receive its final cover, and the HMC site would be returned to its original land use.

For Alternatives B and C, land use would be changed in the area, as the existing mill boundary would need to be increased to accommodate new construction of an evaporation pond. Alternative B would require a license boundary expansion of 185 acres. Alternative C would require a license boundary expansion of 68 acres. Under Alternatives B and C, land that is currently used for cattle grazing would be used as an evaporation pond for groundwater remedial activities and therefore unavailable for cattle grazing. The EP3 area will be reclaimed and returned to the desert grassland land use that exists today after completion of remediation activities in 2017.

Approximately the top three feet of natural soil was removed or disturbed during the past removal of surface radioactive contamination over the entire Alternative C proposed licensed boundary location (Byszewski, 2006). Approximately the top three feet of natural soil was removed or disturbed during the past removal of surface radioactive contamination over approximately two thirds of the Alternative B proposed licensed boundary location. Only natural soil remains in the northern third of the Alternative B proposed boundary expansion location. However, the footprint of the proposed location of EP3 would disturb approximately 90 percent of the remaining natural soil area.

For Alternative D, land use would be little changed under this alternative. This location is within the existing licensed boundary that is currently an industrial site undergoing reclamation. This alternative site is immediately adjacent to EP1 and EP2.

Under Alternatives B and C, adverse environmental impacts to land use would be present in the short term, for approximately the next 10 years, until EP3 is reclaimed and the land is returned to its prior use. Under Alternative D, adverse environmental impacts would be minimal.

4.1.2 Transportation

For Alternative A, the no action alternative, there would be no changes to the current transportation system. However, there are short-term positive impacts associated with the no action alternative because transportation impacts resulting from construction and operation of EP3 would be avoided.

For Alternatives B and C, the site-licensed boundary would be expanded and be located across County Road 63. County Road 63 would not be within the licensed boundary, and access to County Road 63 would not be restricted. However, during construction of the evaporation pond at either location B or C, the road would have to be crossed occasionally by equipment or workers accessing the site. The road may also be disturbed by construction during the installation of pipes to carry reclamation water to the ponds for evaporation. Any construction may involve a temporary closure of the road. Any lane or road closure would need to be coordinated with Cibola County. During construction, the other County or State roads in the vicinity may be used by workers or equipment accessing the site. This would only be for the period of EP3 construction and reclamation. County Road 63 is very lightly traveled, so the impact would be very small.

For Alternative D, this location is within the existing licensed boundary. During construction, County or State roads in the vicinity may be used by workers or equipment accessing the site. This would only be for the period of construction.

Under Alternatives B, C and D, adverse environmental impacts to transportation would be small.

4.1.3 Geology and Soils

For Alternative A, the no action alternative, there would be no changes to the affected environment as described in Section 3. However, there are short-term positive impacts associated with the no action alternative because impacts to geology and soils resulting from construction and operation of EP3 would be avoided.

For Alternatives B, C, and D, soils would be disturbed during construction of EP3 and the associated roads and underground utilities leading to EP3. Disturbed soil would be more vulnerable to wind and water erosion. Soil disturbance would be greater for Alternative B, less for C, and even less for D. Alternative B is located furthest away from the groundwater remedial system and would require a longer access road and more distance to run utilities to reach the pond and, therefore, more soil disturbance. Alternative D is located closest to groundwater remedial system and would require the least amount of disturbance for the same reasons. Much of the area around the HMC site, including Alternatives C and D, has had several feet of soil removed when windblown tailings were identified and removed for placement in the large tailings impoundment. Windblown tailings over approximately 40 percent of Alternative B have been removed. More native soil would be disturbed under Alternative B than Alternative C or D. Under Alternatives C and D, very little native soil would be disturbed since the entire area had been previously disturbed when windblown tailings were removed. Disturbance of the native soil would have a short-term negative impact on the natural vegetation. However, after remediation is finished, the EP3 area would be restored.

EP3 would be constructed as at grade facilities, with cut and fill designed to be in rough balance. No significant quantities of soil would be imported or exported from the site. Soil impacts would be limited to the site.

Under all three alternatives, there would be minimal changes in geology, since construction would be limited to the near surface.

Under Alternatives B, C and D, adverse environmental impacts to geology and soils would be small.

4.1.4 Water Resources

For Alternative A, the no action alternative, there would be no changes to the current water resources. However, there are short-term positive impacts associated with the no action alternative because there would be no loss of precipitation infiltration or the possibility of additional groundwater and/or soil contamination that would result from construction of EP3. Since operation of EP3 would significantly speed up reclamation of the HMC site, the short-term positive impacts would be outweighed by the negative impacts associated with a longer reclamation period.

For Alternatives B, C, and D, the construction of each pond would cover approximately 33 acres. The pond would be designed to evaporate water and be double lined with a synthetic liner to prevent water infiltration. This would result in the loss of a minor amount of precipitation that would not be available for infiltration. Additionally, construction of the access road would likely lead to increased compaction and loss of the ability for precipitation to infiltrate. These losses are considered to be minor. Additional runoff from the pond area would be minor as a majority of the water would drain into the pond and eventually evaporate. Additional runoff from the access road would be minor.

The only surface water bodies in the vicinity of the site are several stock ponds and some small ephemeral ponds, which would not be affected by site activities or the proposed EP3 construction.

Construction of EP3 has positive impacts under all three alternatives. Operation of EP3 would allow HMC to pump 33% more contaminated groundwater which would increase the rate of groundwater remediation and ultimately speed up the reclamation of the entire site. In addition, the increase in groundwater pumping would allow HMC to more effectively control the contaminant plume at the site. These benefits outweigh the negative impact of increased water usage during operation of EP3. HMC is currently permitted to use the additional groundwater needed for operation of EP3, and would not be required to obtain additional permit(s) for increased water consumption for this action from the New Mexico Office of the State Engineer (OSE). The OSE is the permitting authority for groundwater consumption and groundwater diversions. HMC has been granted permit 1605 and B-28 to consume and divert approximately 1175 acre-feet of water per year and to temporarily divert 4500 acre-feet of water per year by the OSE (OSE, 2005). HMC's temporary diversion permit will expire on December 31, 2008, and HMC may be required to seek an extension of their temporary diversion at that time (OSE, 2002). The OSE determined the approval of the permit for consumption and diversion of water is not detrimental to the public welfare of the state (OSE, 2005).

There is a risk that the EP3 impoundment could fail, or the pond liner could fail, which could lead to contamination of San Mateo Creek. EP3 is engineered to withstand the maximum probable flood which should ensure failure of the EP3 is an unlikely event. The perimeter berm of EP3 is above grade and storm water runoff does not drain into the pond. EP3 has been designed to maintain enough freeboard above the probable maximum precipitation that overtopping of the berm by precipitation events should not occur. EP3 construction specifications have been approved by the State of New Mexico, Office of the State Engineer, Dam Safety Section, and reviewed by the NRC. The NRC review would be documented in a Technical Evaluation Report. Engineering controls and frequent inspections would be employed to ensure the pond does not fail or leak.

Under Alternatives B, C, and D, adverse environmental impacts to water resources would be moderate as additional groundwater may be used by HMC. Under Alternatives B, C, and D, beneficial environmental impacts to water resources would be moderate, since the site may be cleaned up at a faster rate.

4.1.5 Ecology

For Alternative A, the no action alternative, there would be no changes to the current ecology. However, there may be short-term positive impacts associated with the no action alternative because the loss of land for plants and animals resulting from construction and operation of EP3 would be avoided.

Birds and fowl may use EP3 after it is constructed. The NMGF noted that methods may have to be used to keep birds and fowl from using EP3 (NMGF letter in Section 6.0, Bridges and Meyer, 2007). While the methods discussed by NMGF were not prescriptive, they may need to be employed in the future if adverse effects to birds and fowl are observed. HMC currently operates two evaporation ponds, EP1 and EP2, and has stated that to its knowledge birds and fowl have not been impacted or adversely affected. EP1 began operating in 1990. EP2 began operating in 1994. Although migratory birds and waterfowl visit the ponds frequently (especially during migration seasons), no mortality has been observed in or around either pond. Site operation crews are onsite during the day, and pond operations are among their primary duties. Water chemistry varies over time as the crews move water around between ponds, operate different wells, and run or shut off the reverse osmosis plant. The absence of bird mortality in or around the ponds over the years indicates that the water in the evaporation ponds does not contain contaminants at levels acutely toxic to birds. This is based on many years of observation of EP1 and EP2 (Bridges and Meyer, 2007).

Construction of EP3 would result in the loss of some land available for plant and small animal life. The NMGF also noted that wildlife fencing may be appropriate for the pond. The NMGF discussed the potential for wildlife trapping hazards of the pond and suggested methods that may be used to minimize the risk of trapping. EP3 would be fenced to keep humans and wildlife away from the pond and frequent inspections would include wildlife observation to ensure impacts are minimized. NMGF also suggested that its trenching guidelines be used when installing pipe to minimize ground disturbance (Bridges and Meyer, 2007).

A list of endangered and threatened plant and animal species was obtained from both the USFWS, as well as the NMGF, that may be found in the project area. This list of species is published in the HMC ER and can be found online as published by the NMGF (NMGF, 2007). Species listed by the NMGF are the same as those listed by the USFWS for threatened and endangered species. None of these species is known to be at the site and HMC has determined that there is a lack of a suitable habitat for the 16 plant and animal species listed as threatened or endangered (Bridges and Meyer, 2007). A survey by biologist Louis Bridges, who has extensive experience with western threatened and endangered species evaluations, confirmed the lack of suitable habitat for plant and animal species listed (Bridges, 2007a, 2007b).

There are no anticipated effects on threatened or endangered species from the proposed action. The USFWS has indicated that where a determination of no effects is concluded, no further consultation is required (Hein, 2007).

For Alternatives B, C and D, environmental impacts would be similar for each pond location, and adverse environmental impacts to ecological resources would be small.

4.1.6 Meteorology, Climatology, and Air Quality

For Alternative A, the no action alternative, there would be no changes to the current air quality. However, there are short-term positive impacts associated with the no action alternative because additional dust, TSP, and evaporative odors resulting from construction and operation of EP3, respectively, would be avoided.

For Alternatives B, C, and D, there would be increased impacts to air quality during construction and reclamation of the pond which would be in the form of fugitive dust. HMC has proposed to use construction best management practices (BMPs) (see Section 4.2.1) to control fugitive dust and emissions from construction equipment (Bridges and Meyer, 2007). Increases in radon emissions from EP3 are expected to be minimal based on observations from current ponds EP1 and EP2 as shown in HMC's Semi-Annual Report (HMC, 2007d). There would be no expected changes in meteorology or climatology.

For Alternatives B and C, a boundary expansion would be required. Additional air monitoring for radioactive dust and material may be required in the expanded boundary area to ensure radiological impacts to adjacent properties do not occur.

Placement of EP3 at Alternative D, south of the mill tailings impoundment, would have the greatest potential to contribute to the evaporative odors in the residential areas to the south of the site that would be associated with the reclamation activities. Odors from EP1 and EP2 have been a source of concern of nearby residences in the past. Alternative B and C locations would lessen odors and concern of water spray leaving the licensed boundary.

Under Alternatives B, C, and D, adverse environmental impacts to air quality would be small.

4.1.7 Noise

For Alternative A, the no action alternative, there would be no changes to the levels of operational noises coming from the HMC facility.

The current HMC site is one-half to three-quarters of a mile from the nearest residential community. Operational noises are routinely generated from the HMC site, including heavy machinery. For Alternative D, construction of the pond would likely result in increased noise from heavy machinery during construction and reclamation activities, but would last only a few months while construction or reclamation activities occurred.

For Alternatives B and C, noise impacts would be limited, since these sites are approximately one-mile from the nearest residential community.

Under Alternatives B, C, and D, adverse environmental impacts from noise would be small.

4.1.8 Historical and Cultural Resources

For Alternative A, the no action alternative, there would be no additional impacts to the historical and cultural resources surrounding the HMC site. However, there are minor positive impacts associated with the no action alternative because the potential for impact to cultural sites resulting from construction and operation of EP3 at Alternative B and C locations, would be avoided.

A cultural resources inventory was performed by Taschek Environmental and was documented in a July 2006 report (Byszewski, 2006). The report identified six sites that should be avoided by construction activities. There are no historic structures, buildings, or museum collections within the HMC project area. No ethnographic and traditional cultural properties or landscapes have been formally identified within or adjacent to the project area.

Under Alternative B, there are two cultural sites that were identified in the cultural resources survey that should be avoided within the area proposed to be added to the site-licensed boundary. The two areas would not be impacted by the construction of the pond within the adjusted site boundary. The pond footprint is about one-third the size of the increased boundary for the pond. All areas that should be avoided would be avoided by using simple mitigation measures of putting a fence around the sensitive areas. In 1995, mechanical disturbance of up to three feet (one meter) of aeolian sediments exposed a number of new archaeological sites in the immediate area. The undisturbed portions of Alternative B contain older aeolian sediments that appear to be stabilized by increased vegetative cover. Given the high density of sites in the bladed portion of the survey area, and the lack of sites in the non-bladed portion, except for one, it is likely that aeolian deposits are covering intact subsurface archaeological remains in the undisturbed portions of the survey area (Byszewski, 2006).

For Alternative C, there are four cultural sites that were identified in the cultural resources survey that should be avoided within the area proposed to be added to the site-licensed boundary. The footprint of the pond would avoid these areas, but would be much closer than that of Alternative B.

Alternative D is located within the footprint of the existing facility and is heavily disturbed by prior construction and industrial activities at the site. There are no known cultural resources that may be impacted from this alternative.

For Alternatives B, C, and D, the New Mexico Historic Preservation Office included a discovery clause in the event bones or prehistoric or historic archeological materials are discovered. The discovery clause is contained in section 4.2, Mitigation Measures. The office also determined that, "This undertaking will not have an adverse effect on registered or eligible properties." (Meyer, 2007).

Under Alternatives B, C, and D, adverse environmental impacts to cultural resources would be small.

4.1.9 Visual and Scenic Resources

For Alternative A, the no action alternative, there would be no impacts to the current visual and scenic resources.

The construction of EP3 would require the movement of heavy machinery which may cause some additional dust to be observed at the site. The design of the pond for each of the alternatives is the same, with the pond berm having a maximum height above the natural ground surface of approximately 10 feet. This profile is much lower than that of existing features at the site such as the large tailings impoundment. The HMC site has not been determined to be a cultural landscape.

Under Alternatives B, C, and D, the impact to visual and scenic resources would be small.

4.1.10 Socioeconomic

For Alternative A, the no action alternative, there would be no changes to the current socioeconomics of the area. However, there are short-term negative impacts associated with the no action alternative because jobs for local residents resulting from construction of EP3 would not be available.

The construction of an additional evaporation pond may add a few short term jobs to the area for the contractor constructing the pond and the contractor decommissioning the pond at the end of its service life. The need for maintenance and inspection of the pond would likely add to job duties already performed by on-site personnel.

For Alternatives B, C, and D, socioeconomic impacts are expected to be small.

4.1.11 Public and Occupational Health

For Alternative A, the no action alternative, there would be no additional impacts to public or occupational health. However, there may be short-term positive impacts associated with the no action alternative because potential impacts to the public from dust due to construction of EP3 would be avoided.

HMC conducts an air quality monitoring program at the site for particulates, radon, and gamma radiation. Continuous particulate monitoring occurs at six locations, continuous radon monitoring occurs at eight locations, and continuous gamma radiation occurs at seven locations. Construction of EP3 would cause an increase of dust particles and fossil fuel emissions during the approximately two month construction period.

HMC currently operates two evaporation ponds at the site, EP1 and EP2. Both of these ponds use spray misters to aid in their evaporative capacity. HMC's air sampling at various locations around the licensed boundary has not identified potential problems with the operation of EP1 or EP2. The air sampling test results indicate that airborne contaminants are below regulatory levels. Increases in contaminants from EP3 would be minimal and not expected to be any different from those occurring from EP1 and EP2, and the total contaminants from all three ponds would be minimal, cumulatively.

Local residences have been concerned about odors and contaminants from the evaporation ponds and pond misters that are currently on the site. HMC currently has been attempting to control odors by using a combination of copper sulfate and citric acid to control algal growth in the ponds (Cox, 2007). Dying and decaying algae is thought to be the primary source of the nuisance odors, although the high total dissolved solid may also be a source of odors. The issue of odors and possible contamination from the evaporation ponds were studied in 2001. Air monitoring for additional constituents in 2001, found that contaminant levels were similar to levels found before misters were installed. Contaminant levels were below regulatory limits and no health threat existed (NMED, 2001).

No additional air monitoring would be required for Alternative D since Alternative D is located within the existing site boundary. No additional air monitoring would be required for Alternative C since Hi-Vol #2 sampling station is located directly to the east of the pond location.

An additional Hi-Vol air monitoring station would be required for construction of the pond at Alternative B. Hi-Vol #1 sampler is located to the east, southeast of Alternative B and HMC has confirmed the predominant and prevailing wind direction is from the southwest. There is a lack of sampling coverage for the Alternative B location to the northwest of proposed Alternative B pond location.

Under Alternatives B, C, and D, adverse environmental impacts to public and occupational health would be small.

4.1.12 Waste Management

For Alternative A, the no action alternative, there would be no additional waste generated. However, there may be short-term positive impacts associated with the no action alternative because there would be no EP3 evaporation concentrates, and no dust or noise from the removal of the pond liner at the end of decommissioning activities.

Under each Alternative B, C, or D, the ponds would be decommissioned when the corrective action plan is completed and approved. Decommissioning involves removing EP3 and returning the land to unrestricted use. All evaporation concentrates remaining within the evaporation pond liner, the pond liner, piping, and other related infrastructure would be removed and relocated to EP1, which would eventually be incorporated into the small tailings pile at final reclamation. Environmental impacts during decommissioning would include increased noise and dust from heavy earth moving machinery, removing the pond embankment and liner to the small tailings impoundment. These impacts would only be for a short period of time during EP3 removal.

Additional waste would also be generated from the operation of EP3. All evaporation concentrates remaining within the EP3 pond liner at the end of the EP3 use period, would be removed and relocated to EP1 for incorporation with final reclamation of EP1 and the small tailings pile. The pond liner, piping, and other related infrastructure associated with EP3 would also be relocated to EP1, incorporated with other project demolition and decommissioning waste, and reclaimed with the small tailings pile that presently underlies EP1. However, since the additional volume of waste from EP3 would be incorporated with other project demolition and decommissioning waste, the environmental impacts associated with the additional waste would be small.

Under Alternatives B, C, and D, adverse environmental impacts to decommissioning and management of waste would be small.

4.1.13 Comparison of Most Significant Impacts for Alternatives

The following table presents a comparison of the most significant impacts associated with construction and operation of EP3.

Impacts vs. Alternative

Impacts	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C	Alternative D
Licensed site boundary	No change	Expand site boundary by 185 acres	Expand site boundary by 68 acres	No change
Impacts from Construction of access corridor	No change	Construction of 50 ft x 1800 ft access corridor	Construction of 50 ft x 1800 ft access corridor	No change
HMC site land use	Livestock continue grazing on site via lessor/lessee arrangement	Livestock grazing in EP3 pond area discontinued	Livestock grazing in EP3 pond area discontinued	Livestock continue grazing on site via lessor/lessee arrangement
Off-site land use	Livestock grazing and residential	Livestock grazing and residential	Livestock grazing and residential	Livestock grazing and residential
Transportation	Public highways /roads do not cross NRC-licensed area	County Rd 63 bisects proposed boundary expansion	County Rd 63 bisects proposed boundary expansion	Public highways /roads do not cross NRC-licensed area
Air quality	No change	Additional air monitoring required to ensure air quality to adjacent properties	Additional air monitoring required to ensure air quality to adjacent properties	Potential for evaporative odors to adjacent properties

Impacts	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C	Alternative D
Noise	No change	Lesser potential for noise during construction of pond	Lesser potential for noise during construction of pond	Greater potential for noise to adjacent properties during construction of pond
Cultural resources	No change	Two cultural sites identified, but pond would not disturb these sites. It is likely that native soil is covering intact subsurface archeological remains	Four cultural sites identified, but pond would not disturb these sites.	No cultural sites present
Soil disturbance	No change	Natural soil remaining on 60 of 185 acres. Proposed EP3 site would disturb 90% of remaining natural soil.	No natural soil remaining	No natural soil remaining
Water resources	No change	Precipitation on 33 acres not available for infiltration Additional groundwater to be used in EP3	Precipitation on 33 acres not available for infiltration Additional groundwater to be used in EP3	Precipitation on 33 acres not available for infiltration Additional groundwater to be used in EP3
Ecology	No change	Potential impacts to migratory birds. May need mitigative measures	Potential impacts to migratory birds. May need mitigative measures	Potential impacts to migratory birds. May need mitigative measures

From the above table it can be seen that there are impacts associated with construction and operation of EP3. However, the environmental impacts associated with all of the alternatives are considered to be minor. Further, the benefit of a shortened remediation period outweighs these minor impacts. The impacts associated with construction and operation of EP3 at siting Alternatives B and C are approximately equal and greater than the impacts at Alternative D. However, construction of EP3 at the Alternative B location, rather than Alternative D location, would result in less construction noise and evaporative odors to the surrounding community. For these reasons, constructing EP3 at the proposed Alternative B location is acceptable.

4.2 Mitigation Measures

Mitigation measures that could reduce adverse impacts or enhance beneficial impacts have been proposed in the HMC ER (Bridges and Meyer, 2007). The mitigation measures identified in the ER and those identified by the NRC have been incorporated into this EA as discussed below.

4.2.1 Construction Best Managements Practices

HMC would use construction BMPs to reduce the associated adverse impacts of the construction of EP3.

BMPs and storm water control practices are to be inspected before and after storm events to ensure that each BMP or control is functioning properly. Project BMPs would be constructed such that sediment and other pollutants are contained within the project site.

Erosion and sediment control measures, such as silt fences, sediment traps, or straw bale dikes would be constructed around all areas with disturbed or exposed soil. A silt fence sediment barrier is required at a distance of 30 feet around the perimeter of all jurisdictional wetlands, in order to create an impact buffer zone. Erosion and sediment control measures would be designed and constructed in accordance with state and/or local specifications.

Construction equipment would be stored at the off-site staging areas at the end of each work period. Storm water runoff would be routed around equipment, vehicles, and materials storage areas. Diversion of concentrated runoff would be accomplished through shallow earthen swales or similar methods in accordance with state or local specifications.

Areas of the site would be designated for the delivery and removal of construction materials. Construction materials would not be stored beyond the site perimeter silt fence.

Construction materials, such as concrete, would be used in a manner that would not allow discharges into jurisdictional wetlands and drainage channels. Equipment used to make and pour concrete would be washed at an off-site location. Concrete fine material or aggregate would not be washed into the jurisdictional wetlands or other associated drainage channels. Concrete application equipment must be parked over drip pans or absorbent material at all times. The discharge or creation of potential discharge of any soil material, including concrete, cement, silts, clay, sand, or any other materials, to the Waters of the United States is prohibited.

Secondary containment areas would be utilized for chemicals, drums, or bagged materials. Should material spills occur, materials and/or contaminants would be cleaned from the project site and recycled or disposed to the satisfaction of NMED.

Waste dumpsters would be covered with plastic sheeting at the end of each workday and during storm events. All sheeting would be carefully secured to withstand weather conditions.

On-site personnel would be trained in spill prevention and countermeasure practices. Spill containment materials would be provided near all storage areas. HMC contractors would be responsible for familiarizing their personnel with the information contained in the Storm Water Pollution Prevention Plan.

Non-radiological and radiological wastes would be recycled or disposed of in compliance with federal, state, and local regulations.

Water would be sprayed on earth fill and disturbed ground surfaces as necessary to minimize wind-blown dust.

NMGF, in a letter dated August 7, 2006, to Kleinfelder Inc., suggested the use of trenching guidelines that should be used when installing pipe to minimize disturbance. These guidelines are to be transmitted by HMC to the contractor in the plan of work and used whenever possible.

All construction equipment and vehicles would be maintained and inspected regularly to prevent oil or fluid leaks, and use drip pans or other secondary containment measures as necessary beneath vehicles during storage.

Vehicles and equipment would be fueled and washed at an off-site location.

4.2.2 Cultural Resources

Cultural resources have been identified within the project area and documented in the Cultural Resources Inventory completed by TEC for HMC in June 2006 (Byszewski, 2006). The sites that were addressed from the TEC survey would be monitored to confirm that these sites are not being impacted. If these sites are avoided, little impact should occur to on-site cultural resources. Furthermore, if any additional cultural resources are uncovered during excavation activities, the New Mexico Historical Society would be notified immediately to evaluate and initiate appropriate mitigation measures.

The New Mexico Historic Preservation Division has requested that the following discovery clause be attached to the construction of EP3:

> DISCOVERY CLAUSE
>
> In the event that bones or prehistoric or historic archaeological materials are uncovered during construction or earth-disturbing activities, cease work immediately and protect the remains from further disturbance. If bones are found, immediately notify local law enforcement and the Office of the Medical Investigator pursuant to 18-6-11.2C (Cultural Properties Act NMSA 1978).
>
> In accordance with 18-6-11.2C and/or 36 CFR 800.13(b) (Protection of Historic Properties), notify the State Historic Preservation Officer (SHPO) or the State Archaeologist immediately.

In either case, the Agency and the SHPO, in consultation with an archaeologist who holds state unmarked human burial excavation and survey permits, would determine the necessary steps to evaluate significance, document, protect or remove the material or remains, in compliance with law. Call the SHPO or State Archaeologist at (505) 827-6320.

4.2.3 Wildlife

The proposed EP3 would be operated like EP1 and EP2 and would receive the same water quality. No measures to prevent birds from landing on EP3 are anticipated. EP3 would be inspected daily by on site personnel and would include observing wildlife in and around the pond. Mitigation measures would be implemented if it is determined that wildlife or migratory bird mortality is occurring. Mitigation measures would be similar to those suggested by the NMGF in an August 7, 2006, letter to Kleinfelder Inc. (Bridges and Meyer, 2007).

A fence would be constructed around evaporation pond 3 in order to prevent unwanted access. This security fence would also be part of a fencing system that would be used to deter wildlife from entering the ponds.

4.2.4 Threatened and Endangered Species

Based upon site observation and information collected from current scientific literature, no threatened or endangered species or their habitat is present within the project area (Bridges and Meyer, 2007; Bridges, 2007). Therefore, no effects on threatened or endangered species or their habitat are anticipated and no mitigation measures are required at this time in order to prevent impacts to threatened and endangered species. However, if threatened or endangered species are identified within the project area during on-site activities, the NMGF would be notified immediately to initiate and evaluate mitigation measures.

4.3 Monitoring

An archaeological monitoring plan has been developed to be used during EP3 construction (HMC, 2007c). If buried cultural deposits are encountered at any point during construction activities, work would be ceased immediately and the New Mexico SHPO would be contacted. During ground disturbing activities, monitoring for archaeological artifacts should be completed in the undisturbed portions of Alternative B. The Discovery Clause requested by the New Mexico State Historic Preservation Office in Section 4.2.2 of this EA will be included in the Archaeological Monitoring Plan.

A groundwater-monitoring program for EP3 at Alternatives B or C would be implemented. Baseline water quality would be established from samples collected prior to completion of EP3. Groundwater monitoring wells are currently located down gradient of the EP3 Alternate C location and additional monitoring wells would not be required.

Existing groundwater monitoring well DD is located to the west of the EP3 Alternative B location. A second groundwater well is proposed by HMC to be located near the middle of the southeast side of Alternative B EP3 location (HMC, 2007c). The additional well should adequately monitor the alluvial aquifer down gradient of the EP3 Alternative B location and should provide additional data, along with the EP3 liner leak detection system, that pond EP3 is functioning as designed. EP3 would be double lined and contain a leak detection system that would be monitored on a regular basis.

The collected samples would be analyzed for the parameters listed in HMC's current groundwater protection standards in their License SUA-1471, License Condition No. 35. The monitoring well(s) would provide the capability to help detect pond liner failure that could lead to the contamination of local groundwater.

Additional groundwater monitoring would not be required for Alternative D, since it is within the current site boundary.

HMC's monitoring and surveillance program for radioactive effluent releases has been designed to ensure the project compliance with 10 CFR 40, Part 20, U.S. NRC Standards for Protection Against Radiation and closely approximates programs as described in NRC's Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills (NRC, 1980; HMC, 2006). Some effluent monitoring activities differ from those presented in Regulatory Guide 4.14, as specified and required by HMC's Radioactive Material License (SUA-1471). An additional particulate, radon, and gamma radiation air monitoring station needs to be sited in the primary downwind direction of the Alternative B location. The licensee would need to evaluate the need for additional monitoring as required by 10 CFR Part 20 and Regulatory Guide 4.20 (NRC, 1996).

Land use survey reviews are completed on an annual basis to meet annual reporting requirements under NRC License SUA-1471. This would help in assuring that land use activities in the immediate area surrounding EP3 are regularly reviewed to determine that those uses do not present a new concern for EP3.

5.0 Agencies and Persons Consulted

5.1 National Historic Preservation Act Section 106 Consultations

HMC sent pre-consultation letters to the seven Native American Tribes identified by the State of New Mexico, Department of Cultural Affairs, Historic Preservation Office on July 6 and July 7, 2006 (HMC, 2006a). Comments received by HMC can be found in the HMC Environmental Report (HMC, 2007a).

NRC sent consultation letters May 11, 2007, to seven Native American Indian Tribes and the New Mexico Historic Preservation Office (NRC, 2007b). The Native American Tribes were identified by the State of New Mexico, Department of Cultural Affairs, Historic Preservation Division website as requiring consultation in Cibola County, New Mexico. A list of the letters and responses received is presented below in Table 2.

Table 2 Section 106 Consultation Letters

Addressee	Date of Response
Pueblo of Acoma	June 4, 2007 April 25, 2008
Hopi Tribe	September 10, 2007
Isleta Pueblo	August 17, 2007
Mescalero Apache Tribe	No response received
Navajo Nation	No response received
White Mt. Apache Tribe	No response received
Zuni Pueblo	No response received
NM Historic Preservation Office	June 8, 2007

Reponses by Native American Tribes and Pueblos primarily centered on the discovery of remains and cultural artifacts and that the State Historic Preservation Office should be notified and work stopped until the remains or site can be further assessed. The Hopi Tribe was also supporting comments made by the Pueblo of Acoma.

5.1.1 Consultations with the Pueblo of Acoma

The Pueblo of Acoma outlined several concerns in a letter to the NRC dated June 4, 2007 (Pueblo of Acoma, 2007). NRC and the New Mexico Office of the State Engineer (OSE) held a teleconference with the Pueblo of Acoma on October 22, 2007, and November 5, 2007 (NRC, 2007d). In addition, the Pueblo of Acoma submitted comments on the draft EA in a letter dated April 25, 2008. The Pueblo of Acoma's concerns as expressed in correspondence and in meetings with the NRC, and the NRC responses are summarized below:

Comment: The Pueblo of Acoma, a sovereign Indian Nation, is authorized to protect its traditional cultural properties and sacred sites affiliated with the Acoma Cultural Province, including the Rio San Jose Watershed. The Ojo del Gallo spring, has dried up due to new demands for water which include the construction of the Bluewater Dam in 1927 and groundwater mining from the alluvial and bedrock aquifers upstream from irrigation, municipal, and mining interest.

Response: Permitted water consumption and diversion in New Mexico is the responsibility of the OSE. HMC has OSE permitted consumption rights of approximately 1175 acre feet. HMC also has been granted a temporary diversion for 4500 acre-foot of water and this permit expires December 2008. If HMC applies for an extension of the temporary diversion, the public would have an opportunity to comment during this review. For each alternative, EP3 would not result in additional water usage above what is already permitted by the OSE. During the review of EP3, the OSE was consulted regarding water consumption issues raised by the Pueblo of Acoma, and the OSE has indicated that these views would be considered during future applications for water permits. The OSE is the appropriate regulatory authority to determine water consumption and diversions in the state.

Comment: Flows from Horace Springs have declined over the last decade and a half, impeding the use of Horace Springs for traditional cultural practices.

Response: As the Pueblo of Acoma discuss in their letter, the reduced water flows in Horace Springs may be a result of various reasons including construction of Bluewater Lake, agricultural uses, municipal uses, and mining uses. Changes in rainfall over time may also contribute to changes in water flow. As discussed above, permitted water consumption, diversion and the effects on water bodies in New Mexico is reviewed and approved by the OSE.

Comment: Water quality standards were enacted to protect all the waters of the Acoma, including groundwater, and that the bulk of the water supply for the Acoma population is obtained from wells drilled in the Dakota, Zuni, and Entrada Formations. Pueblo of Acoma water quality standards can be used as an Applicable or Relevant and Appropriate Requirement (ARAR) for purposes of cleanup actions under CERCLA, commonly known as Superfund. Acoma's criteria for radioactive materials may also be included as conditions in the Pueblo of Acoma's Clean Water Act Section 401 certifications or used as ARARs.

Response: The HMC groundwater corrective action is a very complex remediation and restoration effort with the goal of cleaning up groundwater to approved background groundwater protection standards that were approved by the NRC, EPA, and NMED. NRC is the lead agency in this process as HMC possesses an NRC Material License that specifies these cleanup standards. The current groundwater protection standards for the site are contained in HMC's License SUA-1471, Amendment No. 40, License Condition 35B. The regulatory basis for the groundwater protection standards is found in 10 CFR 40, Appendix A, Criterion 5B(5). NRC, EPA, and NMED cooperate in this remedial effort since the site is a listed EPA superfund site and HMC also possesses a groundwater discharge permit through NMED. The Pueblo of Acoma Water Quality Standards are applicable to all Pueblo waters, inclusive of all waters within the exterior boundaries of the Pueblo of Acoma, and water situated wholly or partly within or bordering upon the Pueblo (Pueblo of Acoma, 2005).

Comment: The issuance of permits for uranium and coal mining, processing and other water-intensive use permits upstream of Acoma threatens further degradation and impairment to Acoma's water and cultural resources within the Acoma Cultural Province.

Response: The proposed action would not result in a change in the amount of water that HMC is allowed to consume or divert for their on site corrective actions. The amount of water consumed or diverted has been assessed by the OSE and found to be not detrimental to the public welfare of the state.

Comment: The HMC corrective action plan proposes to expand the NRC-licensed site boundary and use of the region's valuable groundwater resources. HMC's plan is likely to have a significant effect on the air, land, and cultural significance of the area. Health impacts to area residents in the form of cancer, genetic and immune system disorders, represent and environmental justice issue that has yet to be addressed.

Response: The expansion of the NRC-licensed site would occur on property owned by HMC and land used primarily for grazing. As previously discussed, no additional groundwater permits from the OSE are required by HMC for EP3. There would be land disturbance required with the proposed action, but the site would be reclaimed after the pond is no longer necessary, estimated by HMC to be approximately 10 years. The site currently has continuous particulate monitoring at six locations, continuous radon monitoring at eight locations, and continuous gamma radiation at seven locations. A NRC inspection indicated that all air quality parameters are within regulatory limits for public health and safety. While past health affects of uranium mining and milling have remained a concern in the Grants Mineral District and in Native American communities, air monitoring, groundwater monitoring, and monitoring of the EP3 liner present reasonable assurance that public health and safety would be protected with respect to the EP3 proposed action.

Comment: Acoma noted that the Kleinfelder Environmental Report incorrectly stated that the Rio San Jose is ephemeral, when in fact the Rio San Jose is, or once was a perennial, river. The absence of the Pecos Sunflower along the Rio San Jose below the San Mateo Creek is troublesome because the report states that the sunflower will disappear if a site dries out.

Response: None.

Comment: Acoma was not notified of the survey conducted by Taschek Environmental Consulting last June, 2006.

Response: The cultural resources study was contracted by HMC to determine what cultural sites may exist at the site in preparation of the proposed EP3. The New Mexico Historic Preservation Office has reviewed the report and determined that no adverse effects would be expected. The Historic Preservation Office has requested that the Discovery Clause provide be part of the record and construction requirements for EP3. Tribes that have requested consultation in Cibola County were not contacted prior to initiation of the cultural survey. The State Historic Preservation Office has indicated that Tribal consultation is advisable for future proposed licensing actions before a cultural survey is conducted (personal communication, R. Proctor to R. Linton, October 9, 2007). The Pueblo of Acoma have included the HMC site within their Acoma Cultural Province boundaries, but have not indicated that historic properties exist within the area of the proposed action.

Comment: The Acoma Historic Preservation Office stated no preference for Alternative B other than to indicate there may be fewer cultural sites of which the office is aware which may be impacted.

Response: None.

Comment: The Pueblo of Acoma has requested a moratorium on future permits or permit renewals in the area due to the adverse effects on Acoma's senior water rights in the watershed. The Pueblo of Acoma also stated that Acoma's water quality standards apply to both surface and groundwater.

Response: The NRC does not have the regulatory authority to implement a moratorium on future licensing or license renewals in the area. Pueblo of Acoma may relay this request to other regulatory agencies.

Comment: Acoma requires consultation with all regulatory agencies regarding Alternatives B, C, and D in order to determine probable impacts to regional groundwater, the San Mateo Creek drainage area, and Horace Springs within the Acoma Cultural Province resulting from each of HMC's proposed alternatives.

Response: The NRC is required by 26 CFR Part 800 – Protection of Historic Properties, Subpart A, Section 800.2 (c) (2) (ii) to consult with any Tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. NRC has consulted with the Pueblo of Acoma with regard to possible affects on historic properties. NRC has had discussions with OSE, NMED, Pueblo of Acoma, and the State Historic Preservation Office regarding concerns related to water consumption and diversion and affects on surface bodies of cultural and historic significance to the Acoma.

Comment: The Pueblo of Acoma would like to request ongoing consultation with the Nuclear Regulatory Commission and the New Mexico Office of the State Engineer to discuss the whether the proposed action will adversely affect surface and groundwater water quality and quantity at the Pueblo of Acoma or its cultural resources.

Response: The NRC has consulted with the Pueblo of Acoma and has considered the offered comments. This environmental assessment has considered the affect of the proposed action on the environment. The NRC will continue to discuss future licensing actions will all interested stakeholders, including Tribal governments.

Comment: At page 9 the Assessment states that the Rio San Jose is an ephemeral stream. This is incorrect. While the movement of water goes below the surface at some points along the river, it is considered to be a perennial river in New Mexico. It is the largest freshwater surface water source in west central New Mexico.

Response: The EA references the HMC Uranium Mill License Renewal Application Environmental Report prepared by D'Appolonia, April 1982. This report provides drainage flow data indicating that the Rio San Jose flows only in direct response to local rainstorms or snow melt. The Handbook of Hydrology (Maidment, 1992) defines streamflow as:

(1) *perennial*, in a channel that never dries up; (2) *intermittent*, in a channel which at drier times of year may have some reaches with flowing water interspersed with other reaches in which the water flows below the surface; and (3) *ephemeral*, in a channel which flows only after rainfall.

Given the definitions above, it is not incorrect to characterize the Rio San Jose as ephemeral. The staff is not aware of any data which shows that the Rio San Jose is a perennial river.

Comment: At page 10 of the Assessment it states that the San Andres formation is the principle water-bearing formation in the vicinity of the mill. This is very much an understatement. It is the primary groundwater source for the municipalities in the area, and also served as a source of surface water through discharge at Ojo de Gallo Springs until last year. The Assessment also fails to mention that this key aquifer is the source for the "fresh water from an underlying aquifer" that is pumped to form the "hydraulic barrier to seepage" and "reverse the local groundwater gradient so contaminated water can be retrieved." The failure to acknowledge this important fact severely undermines the credibility of your assessment of the effect of this project on the most important groundwater source in the region.

Response: The staff agrees that additional information will enhance the description of the affected hydrological environment. As such, the staff has revised Section 3.4, paragraph two, to emphasize the importance of the San Andres aquifer as requested. Paragraph two now reads as follows:

At and nearby the HMC site, the saturated drainages are the saturated alluviums or shallow water-bearing units. In the immediate vicinity of the site, the saturated thickness of the San Mateo alluvium varies from 10-to-60 feet (3-to-20 meters). The Chinle formation, comprised mainly of massive shale interspersed with some sandstone (approximately 800 feet thick), exists below the alluvium. The Chinle formation acts as an effective barrier between the aquifer bearing portion of the alluvium and the underlying San Andres formation, which is the principal water-bearing formation in the vicinity of the mill (Bridges and Meyer, 2007) **and the primary groundwater source for municipalities in the area**. Milling activities at the site have resulted in impacts to the San Mateo alluvial aquifer and Chinle aquifers, which underlie the Grants Mill. A groundwater corrective action program has been implemented at the site since 1977. The corrective action includes the injection of fresh water from **the San Andres** aquifer into the alluvial aquifer near an HMC property boundary to form a hydraulic barrier to the seepage and reverse the local groundwater gradient so contaminated water can be retrieved by a series of collection wells located near the tailings impoundment. The captured water is treated currently through the RO plant or sent directly to synthetically-lined evaporation ponds. The corrective action program appears to be successful in mitigating the negative impacts of seepage from the tailings ponds (Bridges and Meyer, 2007).

Comment: At page 13, the statement of Visual Resources fails to mention the San Mateo Mountains, particularly Mount Taylor, the third tallest mountain in the state of New Mexico, or the Cibola National Forest, and it fails to mention Acoma Village, the oldest continuously inhabited village in the United States. It also fails to mention the existence of the Mount Taylor Traditional Cultural Property that is listed on the State of New Mexico Cultural Properties Register and the parallel designation of a Mount Taylor Traditional Cultural Property that has been determined to be eligible for the National Register of Historic Places. Certainly these locations, all closer to the Homestake Mining Company site than El Morro National Monument, are of equal or greater importance than the “Pueblo of Acoma Historical Marker” which is mentioned under visual and recreational areas.

Response: The staff has revised Section 3.9, Visual Resources, by adding the San Mateo Mountains (including Mt. Taylor), Cibola National Forest, Acoma Village and San Estaban Del Ray Mission to the list of visual resources and recreation areas in Cibola County.

It should be noted that construction and operation of EP3 will have an insignificant impact on the visual resources and recreational areas identified in the EA.

Comment: Water Quality concerns are not addressed in one cohesive section of the Environmental Assessment. Instead, Water Quality is discussed in terms of Fish and Wildlife and Water Resources, etc. In terms of fish and wildlife, the fact that birds who drink from the ponds do not die on site is used to support a finding of minimal impact. There is no analysis of whether there are higher levels of avian mortality in the general region. There has been no attempt to track the birds that consume the water to determine the extent of any effect.

The discussion of water quality in the water resources section is equally without merit. The Pueblo of Acoma water quality standards apply to waters downstream from the mine site.

Groundwater aquifers that Acoma Pueblo relies on extend beyond the Pueblo's lands and any additional contamination of groundwater can be very detrimental to the Pueblo, particularly where there is significant withdrawal from the aquifer so that there is less dilution of contaminants. The area in question is hydrologically complex. For example, although the stream bed may be dry at times, the only uncontaminated groundwater aquifer in the region comes in contact with the surface of the land in the general vicinity of the mine site. Any leakage from the holding ponds can contaminate this aquifer. The problem is compounded because the lack of water flowing in the stream bed of San Mateo Creek except during run-off events does not permit dilution of the contaminated water that ends up in the Creek. Finally, surface water that flows in the Rio San Jose through Acoma Pueblo today is largely supplied by Horace Springs which emits water from the ground into the streambed. The source for this water can be traced back to surface runoff and groundwater flows. The Springs are located just west of the boundary of the Pueblo's federally recognized Pueblo Grant. As such, the water coming out of the Springs would be subject to Acoma Pueblo Water Quality Standards almost immediately. These standards are at least as stringent, if not more stringent than the State water quality standards usually applicable to this type of water source. Any adequate analysis of effects on water quality should consider the more stringent of standards, not the minimum standards. The Assessment does not do this.

Response: Section 3.4 of the EA describes the water resources and hydrology "affected environment" at the HMC site. Section 4.1.4 describes the environmental impacts that EP3 construction and operation will have on the "affected environment." Therefore, given the format of an EA, it is not feasible to discuss all water quality issues in one section of the EA.

As stated in Section 4.1.4, paragraph 5, construction and operation of EP3 could affect water quality if the impoundment fails. This section describes the engineering controls employed to ensure that the impoundment does not leak. Since HMC has taken adequate controls to ensure that the liner will not leak, the staff has chosen not to discuss either the State's or Acoma's surface water quality standards. Other than the potential for groundwater contamination due to impoundment leakage, operation of EP3 will improve groundwater quality by reducing the spread of contamination and cleaning up the site at a faster rate.

The quality of the water in the evaporation pond is addressed in Section 4.1.5, Ecology, because the water in the pond may affect the ecology but will not come in contact with surface- or ground water. Therefore, the staff chooses not to discuss EP3 water quality in Section 4.1.4, Water Resources. The staff is not aware of any comprehensive studies done to evaluate whether there are higher levels of avian mortality in the general region due to operation of evaporation ponds, waste water ponds or waste treatment ponds. The U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office recommends on its website, http://www.fws.gov/southwest/es/NewMexico/SBC_NM_rec.cfm?pr=wf , that open structures that contain toxic conditions be constructed with an appropriate exclusion methodology. HMC has been operating evaporation ponds at the site since 1990 with no mortality observed. The staff believes that the operation of EP3 will have no increased affects on migratory birds or waterfowl. HMC has committed to employ exclusion methodology if adverse effects to birds and fowl are observed in the future.

Section 4.1.4 of the EA does indicate that operation of a third evaporation pond would result in an increase in groundwater pumping and therefore have a negative environmental impact. However, the staff believes that the negative impact of pumping more groundwater is outweighed by the positive impacts of controlling the groundwater plume at the site and decreasing the reclamation time for the entire site.

The staff agrees that the regional hydrology and the hydrology at the HMC site are complex, and the staff continues to work with HMC and NMED to refine its understanding of the hydrologic issues. The staff shares Acoma's concern regarding protecting water quality. Groundwater quality at the area is largely dependent upon controlling the contamination plume at the HMC site. The staff has reviewed the EP3 design and evaluated the engineering controls proposed to ensure that leakage from EP3 does not occur. The staff has determined that the environmental impacts associated with potential leakage from the pond is minimal compared to the benefit of controlling the contamination plume through operation of EP3.

Comment: The omissions discussed at paragraph 1 above, are magnified on page 18 in the discussion of water resources. The Assessment incorrectly states that HMC would not be required to obtain additional permit(s) for increased water consumption for this action from the New Mexico Office of the State Engineer (OSE). Acoma Pueblo will engage in government-to-government consultation with the Office of the State Engineer on April 30, 2008 to address the application of Homestake Mining Company to appropriate water from the San Andres aquifer to supply the proposed expansion. The approach taken by the Assessment, by treating the temporary diversion permit as expiring in 2008 leads to inaccurate assessment of the effect of this project on the groundwater resource.

Homestake's own documents establish significant declines in the area's groundwater aquifers, including the San Andres. Additional pumping of up to 4,500 acre-feet of water per year, an amount equivalent to a little less than one half of the annual water use of the largest city in the State of New Mexico, the City of Albuquerque (10,0045.72 AFY in 2004, U.S. Water News, www.uswaternews.com/archives.arcconserve/5albuwate1.html) will certainly contribute to the declining water table in the San Andres aquifer. While the Assessment does acknowledge that the withdrawal is greater than natural recharge to the basin, it does not acknowledge the great disparity. The area receives an average of less than 12 inches of precipitation or less. Even if one ignores the fact that all precipitation does not make it into an aquifer, the recharge to the aquifer from the 185 acre proposed expansion in Alternative B, without the expansion is no more than 185 acre-feet per year, leaving a deficit of 4,315 acre-feet to be mined from the aquifer. This simple calculation does not even take into account that if the proposed expansion takes place there will be even less infiltration of precipitation into the aquifer due to runoff and soil covering or compaction. The failure of the Assessment to adequately discuss this effect on the only uncontaminated groundwater aquifer in the region is unsatisfactory.

The Assessment takes the position that it need not discuss the effects of this expanded appropriation of groundwater because it is the responsibility of the New Mexico Office of the State Engineer to grant or deny an appropriation. This approach does not meet the responsibility of a federal agency under the National Environmental Policy Act to take a hard and independent look at the effects of an undertaking.

Response: The discussion of water resources in Section 4.1.4 of the EA is factually accurate. HMC is allowed to consume and divert water as specified in Permits 1605 and B-28. HMC's temporary diversion permit will expire on December 31, 2008. HMC is currently applying for permit renewal.

As noted in the comment above, the EA does recognize that increased water consumption for the operation of EP3 will have a negative impact on the San Andres aquifer. However, the negative impact is outweighed by the positive impact of controlling the contamination plume and speeding up reclamation efforts at the site. The staff believes that the EA does meet the requirements of the National Environmental Policy Act. The staff feels that the New Mexico OSE permitting requirements are stringent enough to ensure that direct impacts from groundwater consumption are minimal. However, the staff also takes an independent look at the indirect and cumulative impacts of pumping from the San Andres to support operation of EP3 to reach the conclusion that the overall impacts will not be significant. Based on what is currently known about the regional and local hydrology, the staff believes that the operation of EP3 is the most effective way to control the groundwater contaminant plume emanating from the HMC site.

Comment: The assessment at Page 16 states that the Alternative B is the only alternative that still has native soils in place on at least a part of the location, and that use of the site will destroy 90% of that remaining native soil cover. In the discussion of Historical and Cultural Resources, the Assessment states that adjacent areas that were bladed in 1995 and exposed "a number of new archaeological sites in the immediate area." It goes on to states that "it is likely that aeolian deposits are covering intact subsurface archaeological remains in the undisturbed portions of the survey area." Therefore, of all the alternatives, the one selected as the preferred alternative is the one with the greatest likelihood of disturbing previously undisturbed archaeological resources. At the same time there is one alternative that does not have any cultural sites located within its boundaries, and includes no native soil cover. That is Alternative D. So, there is one alternative where there could be a significant effect and one where there is none. At the same time, the Assessment concludes that under any alternative the adverse environmental impacts to these resources would be small. This conclusion is inconsistent with the information provided in the analysis.

Response: Section 4.1 of the EA evaluates the environmental impacts associated with construction and operation of EP3. The EA evaluates the impacts of EP3 on: (1) land use; (2) transportation; (3) geology and soils; (4) water resources; (5) ecology; (6) meteorology, climatology, and air quality; (7) noise; (8) historical and cultural resources; (9) visual and scenic resources; (10) socio economic; (11) public and occupational health; and (12) waste management. Although the proposed location for EP3 (Alternative B) may not be the "best" location with regard to the disturbance of native soil, Alternative B minimizes the noise and air quality impacts for the surrounding communities. In addition, the proposed EP3 site location does not have to be the "best" location, it simply has to be an acceptable location. Identification of the "best" location is subjective, and depends on which criteria one finds to be the most important. Section 4.2.2 of the EA describes the requirements on HMC to ensure that cultural resources are not impacted during construction of EP3 at the proposed location. Based on the requirements placed on HMC, the staff has determined that adverse environmental impacts to cultural resources at the Alternative B location would be small.

Comment: The Pueblo of Acoma submits that the Environmental Assessment prepared for this proposed federal action does not meet the minimal standards required by federal law to support a finding of no significant impact. The Assessment contains clear misstatements of fact and ignores known facts that do not support the selection of Alternative B. The Pueblo submits that if all known facts were considered, there would be a finding of significant effect, if for no other reason that this expansion is being used to attempt to justify increased groundwater mining on an annual basis equal to one half of what a city of 600,000 people requires, and that this is being taken from the only uncontaminated groundwater source in the region. Based on the facts stated in the Assessment, the preferred alternative for the Pueblo of Acoma is the one that disturbs the least area: alternative D.

Response: The staff disagrees with the Pueblo of Acoma's assertion that the EA does not meet the minimal standards required by federal law to support a finding of no significant impact. The EA is factually accurate as described in the responses above. The staff believes that the construction and operation of EP3 will enhance HMC's ability to perform groundwater remediation at the site.

HMC submitted an application to construct and operate a third evaporation pond on HMC property to the north of the large tailings impoundment at a location in Sections 22 and 23. The staff is required to evaluate HMC's application as submitted. NRC must either approve or disapprove the application, including the proposed location. In conducting its review, the staff is required to prepare an EA which includes an evaluation of possible alternative locations. Based on the information presented, the staff has determined that the environmental impacts associated with the construction an operation of EP3 at Alternative B are minimal and outweighed by the environmental benefits associated with remediation of the groundwater beneath the HMC site. It must be remembered that the purpose of the EA is not to determine which alternative is the best or has the least impacts, but to serve as a decision making tool to evaluate the environmental impacts of the proposed action and reasonable alternatives.

5.2 Endangered Species Act Section 7 Consultations

HMC and NRC consulted with the NMGF and the USFWS to determine which, if any, threatened and endangered may be found in Cibola County, New Mexico. Threatened and endangered species are not known to be located at the site. Mr. Louis Bridges, a biologist with NMGF, who has extensive experience in threatened and endangered species in western states, has verified that threatened and endangered species are not known at the site. Therefore, a determination of no effects to threatened and endangered species is reasonable for this proposed action.

The USFWS has indicated that consultations are not required when a Federal agency has made a determination of no effects on threatened and endangered species (Hein, 2007).

5.3 NMED and EPA Review of Draft EA

NRC provided the draft EA to NMED and EPA for review and comment. Comments from the two agencies were considered in the development of the final EA.

5.4 Public meetings and comments

NRC held public meetings in Milan and Grants, New Mexico, to discuss the proposed action. The first meeting was on April 24, 2007, at the HMC site and the second was held on September 18, 2007, at the Cibola County Center (NRC, 2007a, 2007c). Citizens and representatives of the Pueblo of Acoma attended both meetings.

Local residents have been concerned for many years about the timeliness of overall cleanup at the site and the availability of clean potable water. These concerns were raised again at both meetings. Pertaining to EP3, local residents were concerned that the pond may not be big enough to clean up the site in a timely manner. Also, local residents were concerned about odors and contaminants that may come form EP3 and were generally supportive of the location of EP3 to the north of the site versus adjacent to EP1 and EP2. However, local residents are skeptical that the proposed size of the evaporation pond is adequate to address the volume of contaminants at the site (Bluewater Valley Downstream Alliance, 2007).

6.0 Conclusion

The NRC staff has concluded that site boundary expansion and construction of EP3, as proposed in the license amendment application dated October 25, 2006, and January 30, 2007, complies with NRC regulations and will be protective of health, safety and the environment. The proposed action will be protective of groundwater resources, since EP3 will be double lined and monitored for leakage, and will enhance the groundwater reclamation currently ongoing at the site. EP3 will be decommissioned after it is no longer needed for groundwater reclamation purposes and the area will be returned to its current condition.

The NRC staff has prepared this EA in support of the proposed action to amend License SUA-1471 to allow the construction of EP3 at the proposed location and allow expansion of the site boundary as outlined in the license amendment application. On the basis of the EA, NRC has concluded that there are no significant environmental impacts and the license amendment does not warrant the preparation of an Environmental Impact Statement. Accordingly, it has been determined that a Finding of No Significant Impact is appropriate.

7.0 List of Preparers

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