

March 24, 2002

Mr. Curtis O. Sealy, General Manager  
Umetco Minerals Corporation  
P.O. Box 1029  
Grand Junction, CO 81502

SUBJECT: ENVIRONMENTAL ASSESSMENT OF THE APPLICATION OF ALTERNATE  
CONCENTRATION LIMITS TO GROUND WATER AT THE UMETCO MINERALS  
CORPORATION, GAS HILLS URANIUM MILL SITE (TAC NO. L51785)

Dear Mr. Sealy:

The U.S. Nuclear Regulatory Commission (NRC) staff is completing its review of your request to approve the proposed alternate concentration limits (ACL) for ground water, and thus terminate the currently required ground water corrective action program, at the Umetco Minerals Corporation's (Umetco) Gas Hills site. During this review, the staff evaluated the potential environmental impact of implementation of the proposed ACL and prepared an Environmental Assessment (EA). The draft EA was distributed to interested agencies and stakeholders on February 6, 2002. Comments were received from two agencies and addressed in the final EA.

The final EA indicates that the staff concluded that there would be no significant environmental impact from the requested licensing action. A notice to this effect will be submitted for publication in the Federal Register and the notice includes an opportunity for a hearing. A copy of the final EA is enclosed.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and the EA will be available electronically from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Melvyn N. Leach, Chief  
Fuel Cycle Licensing Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Docket No: 40-0299  
SUA-648

Enclosure: Environmental Assessment

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ENVIRONMENTAL ASSESSMENT  
FOR  
UMETCO MINERALS CORPORATION'S URANIUM MILL SITE  
EAST GAS HILLS, WYOMING

IN CONSIDERATION OF AN AMENDMENT TO  
SOURCE MATERIAL LICENSE SUA-648 FOR  
ALTERNATE CONCENTRATION LIMITS  
FOR GROUND WATER

PREPARED BY

THE U.S. NUCLEAR REGULATORY COMMISSION  
DIVISION OF FUEL CYCLE SAFETY AND SAFEGUARDS  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

March 2002

ENVIRONMENTAL ASSESSMENT FOR  
ALTERNATE CONCENTRATION LIMITS FOR GROUND WATER AT  
UMETCO MINERALS CORPORATION'S URANIUM MILL SITE  
EAST GAS HILLS, WYOMING

## 1.0 INTRODUCTION

### 1.1 Background

The Umetco Minerals Corporation's (Umetco) uranium mill site is located in western Natrona and eastern Fremont Counties, in the East Gas Hills area of central Wyoming. The Umetco site is licensed by the U.S. Nuclear Regulatory Commission (NRC) under Materials License SUA-648 to possess byproduct material in the form of uranium tailings and other wastes generated by past milling operations. The mill operated from 1960 to 1984 and has been dismantled and disposed. Current site activities include completion of reclamation of the last of three disposal areas and continuation of the ground water corrective action program (CAP).

A ground water CAP was necessary because contamination from milling waste had leached from two disposal cells, the Above-Grade Tailings Impoundment (AGTI) and the A-9 Repository (a former uranium mine pit). The constituents of main concern are radionuclides and heavy metals. Ground water extraction (pumping to evaporation ponds) to prevent spread of the contamination plume began in 1983 and a formal CAP was established at the Gas Hills site in 1990.

Key components of the current CAP include ground water monitoring, minimizing infiltration from source areas, and ground water pumping and treatment by evaporation in lined ponds. The resulting contaminated residue will be removed to a disposal cell. The ground water CAP objective is to reduce nine hazardous constituents to the concentration limits specified in the ground water protection standards (GWPS) listed in License Condition 35 B. This condition requires samples from two point of compliance (POC) wells, for each of the two portions of the upper aquifer (Upper and Lower Wind River). Currently, approximately 50 ground water monitor wells are sampled semi-annually and the sample analyzed for 20 constituents.

The four POC wells are specific locations in the uppermost aquifer where the GWPS must be met. The two POC wells for the Upper Wind River aquifer are located at the down-gradient edge of the A-9 Repository. The ground water in this area flows to the southwest. The two POC wells for the Lower Wind River aquifer are at the down-gradient edge of the AGTI and ground water flow is to the west.

### 1.2 License Amendment Request

Umetco contends that it is technically impracticable and economically infeasible to remediate ground water to the levels required by License Condition 35 B. Umetco submitted an application for alternate concentration limits (ACL) for the nine ground water constituents by letter dated February 18, 1999, and requested a license amendment to allow Umetco to abandon the current ground water CAP. Such alternate limits that present no significant hazard may be considered under NRC regulations (10 CFR Part 40, Appendix A, Criterion 5B(6)) for concentrations of hazardous constituents at the POC (Criterion 5B(5)). In response to the NRC request for additional information of April 17, 2000, a revised ACL application was submitted

May 11 and May 18, 2001, with proposed wording for the revised License Condition 35. Additional information and page changes for the application were provided July 30 and December 3, 2001, and March 4, 2002. Under the proposed action, ACL would apply to the four POC wells instead of the GWPS.

### 1.3 Review Scope

In accordance with 10 CFR Part 51, this Environmental Assessment (EA) serves to: (1) present information and analysis for determining whether to issue a Finding of No Significant Impact (FONSI) or to prepare an Environmental Impact Statement (EIS); (2) fulfill the NRC's compliance with the National Environmental Policy Act when no EIS is necessary; and (3) facilitate preparation of an EIS when one is necessary. Should the NRC issue a finding of no significant impact, no EIS would be prepared.

## 2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

According to Part 40, Appendix A, Criterion 5D, the licensee must continue corrective action measures to the extent necessary to achieve and maintain compliance with the GWPS. However, the GWPS listed in the license were derived using limited sampling results of only two background (up-gradient) locations. This original background data did not take into account the spatial and temporal variability of background water quality and are not representative of the site's background water quality. Thus, achieving the GWPS is not possible.

Some corrective action associated with ground water quality has been accomplished by surface reclamation activities. Specifically, milling processes and discharge of tailings ceased in 1984, the tailings disposal areas have been covered to reduce infiltration (water percolating through tailings), and open-pit mines have been reclaimed on and near the site. These efforts have reduced the sources for ground water contamination, but future reduction of contamination entering the aquifer by source control will be small because surface reclamation is nearly complete.

As of June 2001, 257 million gallons of water have been collected for treatment under the CAP. During 2001, approximately 6 million gallons of water will be evaporated that could otherwise be left in the aquifer for extraction downgradient for industrial uses. Continuing to remove water from this aquifer only pulls mine contaminated water into the southwestern upper portion of the aquifer and results in insignificant improvement in the lower portion at a large cost.

Umetco provided additional background water quality data that appear to be representative of site area conditions and these revised values provide a baseline for comparing to mill-related impacts. The revised background values form the basis for the ACL. Umetco stated that the proposed ACL are protective of human health and the environment and are as low as is reasonably achievable.

The ACL at the POC wells will be reduced by natural attenuation to background levels at the point of exposure (POE) which is defined as the area at or outside of the long-term care boundary where the public or environment might be exposed to impacted ground water. The POE location was chosen by Umetco to be the long-term care boundary. The long-term care boundary is the border of the land to be deeded to the U.S. Department of Energy (DOE) for perpetual surveillance and maintenance of the disposal cells (see the figure at the end of this report). The DOE accepted the Umetco proposed boundary by letter of February 16, 1999,

pending approval of the ACL application and resolution of property and title issues or other issues that may arise.

### 3.0 THE PROPOSED ACTION

The proposed action consists of the following:

- 1) Terminate the current ground water CAP and replace the GWPS with ACL.
- 2) Perform annual monitoring at the POC locations for the constituents for which GWPS have been established in the license and for which ACL would apply (arsenic, beryllium, nickel, selenium, natural uranium, radium-226+228, thorium-230, and lead-210, as well as gross alpha).
- 3) Abandon the monitoring well network, with the exception of the POC wells and nine wells for continued monitoring (see Section 7), and decommission the ground water treatment system in accordance with applicable regulations.
- 4) Follow the long-term ground water monitoring plan until license termination and recommend that DOE, as long-term custodian of the site, monitor the same wells. This monitoring of the ground water contamination plume over time and distance would assure protection of human health and the environment.
- 5) Establish the POE as the long-term care boundary.

On February 11, 2002, Umetco requested that gross alpha be deleted as a required measured value. The justification for the request is the fact that the major contributors to gross alpha are and will be regulated and monitored. Also, the reported gross alpha value (with radon and uranium subtracted, per Part 40, Appendix A, Criterion 5C) is inaccurate due to the conversion from mg to pCi of the high uranium values. The NRC staff determined that the gross alpha ACL did not have to be a measured value but could rely on the major alpha radionuclides; Ra-226 + Ra-228, Th-230, and Pb-210 (representing radon daughters); meeting their respective ACL. The technical review that is in progress will determine whether or not the application of ACL as proposed, is adequate to meet the applicable 10 CFR Part 40, Appendix A criteria.

If the NRC approves the ACL application, the ground water CAP will be terminated. Source Material License SUA-648 will be terminated when surface reclamation is completed and the long-term care area, encompassing 1,920 acres, will be transferred to the DOE for custody and surveillance. Restrictions on use of shallow ground water (Wind River aquifer) will be imposed by the institutional control of the land within the long-term care boundary, by the DOE, in perpetuity.

The legal description of this area to be transferred to the DOE (within the proposed long-term care boundary) is as follows:

All of Section 15, the north half of Section 22, the northeast quarter of Section 21, the east half of Section 16, the southeast quarter of Section 9, and the south half of Section 10, Township 33 North, Range 89 West, 6<sup>th</sup> Principal Meridian.

## 4.0 ALTERNATIVES TO THE PROPOSED ACTION

### No-Action Alternative (Current CAP)

The current CAP consists of conventional pump and evaporation treatment. Specifically, ground water is extracted from areas downgradient of the AGTI and the A-9 Repository and transferred to a lined evaporation pond. As indicated in the ACL application, 11 wells are presently used for extracting ground water. Ground water monitoring results indicate that applicable standards are not being met at the POC locations. Since the ground water CAP objectives are unlikely to be met, cost projection under the no-action alternative is based upon conducting the CAP for the next decade. Review of annual costs since the formal CAP was established indicates an average of \$1,300,000 expended per year. Umetco calculated that under the current CAP for the past 10 years, the potential dose averted at the four POC wells cost from 0.8 to 87 million dollars per person-rem. Umetco indicated that this is substantially higher than the \$20,000 per person-rem considered prohibitively expensive by the NRC (NUREG-1727, Appendix D, Section 4).

Projecting over the next ten years and assuming an inflation rate of 3 percent, total costs for the no-action alternative are estimated at \$15,400,000. Although CAP operation over the next decade would not result in improved ground water quality, the 10-year time frame has been estimated for alternative comparison.

The impact associated with the no-action alternative is that there may be marginal improvement in ground water quality of the aquifer downgradient of the AGTI and possible further degradation of ground water quality in areas of the aquifer downgradient of the A-9 Repository. Also, a large amount of ground water will be wasted by evaporation.

### Effective CAP

Umetco used the calculated annual effective averted dose for each POC well to estimate the benefit of a collective averted dose (\$2,000/person-rem acceptable to NRC (NUREG-1727, Appendix D, Section 1.1)) for a theoretical 100 percent effective CAP, if someone were to drink the water, as part of the "as low as reasonable achievable" (ALARA) analysis. The result was a cost of \$2,515,400. However, the current CAP can never be 100 percent effective because of the surrounding natural uranium mineralization contributing radionuclides and heavy metals to the aquifer, and DOE would not allow a drinking water well to be installed on the land deeded to that agency.

### Pump and Treat Options

Umetco examined four options combining ground water extraction with increased evaporation, ion-exchange/reverse osmosis (IX/RO), re-injection and evaporation, and re-injection with IX/RO. Estimated costs for each of these alternatives were developed and compared to the benefits that could be derived. The lowest cost option was 32 million dollars. Umetco indicated that corrective action alternatives would require between 80 and 200 years of extraction and treatment at costs of up to 100 million dollars. These treatment options would not improve water quality from its current class of use because of widespread ambient contamination from mining activities and natural uranium mineralization. This contamination is usually indistinguishable from milling impacts created by the Umetco facility because the sulfate associated with milling is also found in acidic mine drainage.

## Other Options

The licensee considered techniques such as french drains, passive barriers, and interceptor trenches. Since the aquifers of concern are at 100 to 200 feet in depth, such methods are impracticable. Electrodialysis was eliminated due to cost and throughput considerations. Selective cleanup by pumping from “hot spots” would mobilize contamination from natural mineralization in the area of the A-9 Repository and there are no “hot spots” associated with the AGTI. Umetco concluded that the only practicable corrective action is the institutional controls associated with the long-term care boundary and the proposed ACL.

## 5.0 POTENTIALLY AFFECTED ENVIRONMENT

### 5.1 Location and Land Use

The Umetco site is in central Wyoming, in western Natrona and eastern Fremont Counties. The licensed facility comprises 546 acres in the East Gas Hills region and is located approximately 80 km (50 miles) southeast of Riverton, Wyoming.

The ecology of the region has not materially changed from that presented in the Final Environmental Statement (FES) for the mill operation (NRC, 1980), as confirmed by reports of annual inspection by the Wyoming Department of Environmental Quality (WDEQ) and the U. S. Bureau of Land Management (BLM). According to the FES, the Supplement to the Environmental Report (Umetco, 1995), and the current annual land use report, the nearest residence (inhabited on a seasonal basis only) is located approximately 8 km (5 miles) northeast of the site. Within a 80-km (50-mile) radius, the 1990 population was 4,407.

Within 8 km (5 miles) of the site, approximately 78 percent of the land is under the BLM jurisdiction. Within 48 km (30 miles) of the Umetco facility, there are three other uranium mill sites and many former uranium mining sites. The Gas Hills region of Wyoming has also been explored for oil and gas. These uses are the same reviewed by the NRC staff and documented in its original FES for the East Gas Hills Uranium Project except for an in situ leach (ISL) facility planned for the property south of the Umetco site (see Section 5.3).

The climate is semi-arid (average annual precipitation is 23 cm (9 inches)) with wide seasonal variation of temperatures. The vegetation is sparse, consisting mainly of sagebrush and native grasses. Soils in the Gas Hills area are classified as generally unsuitable for cultivation (USDA 1973 *in* NRC 1980a). Consequently, agriculture is not a viable land use, however, livestock and wildlife use the area around the Umetco site.

### 5.2 Hydrogeology

The Umetco Gas Hills site is within the Wind River Basin of central Wyoming and is situated on the Wind River Formation. The Wind River Formation is characterized as a sequence of alternating discontinuous layers of sandstone, siltstone, claystone, and conglomerate. The uppermost occurrence of ground water beneath the site is within the Wind River aquifer. This aquifer has poor ambient quality and limited production capacity.

Two flow regimes, or hydrostratigraphic units, are present at the Gas Hills site. The Southwestern Flow Regime includes the upper portion of the Wind River Formation and is present beneath the A-9 Repository. This flow regime is characterized as a shallow unconfined system with a southwesterly flow direction and a saturated thickness of typically less than

6 m (20 feet). This shallow unit generally occurs within 30.5 to 46 m (100 to 150 feet) of the ground surface. The Southwestern Flow Regime is absent beneath the AGTI and west of the site. The Southwestern Flow Regime, where present, is separated from the Western Flow Regime by a mudstone unit. The mudstone is an aquitard that acts as a confining unit between the two flow regimes.

The Western Flow Regime includes the lower portion of the Wind River Formation beneath the mudstone unit. The Western Flow Regime is characterized as a deeper, more reducing system than the Southwestern Flow Regime, but is still part of the shallow aquifer. Unconfined conditions exist in the Western Flow Regime to the north where the Southwestern Flow Regime is absent. In the deep, more reducing portions of the aquifer, ground water is not impacted (ACL application, Section 2). For this reason, aquifers beneath the Wind River aquifer were not considered for this EA.

### 5.3 Water Resource Uses

#### Current Uses

There are no perennial surface water sources and ground water use in the vicinity of the site is limited. No residential ground water use occurs within a 8-km (5-mile) radius of the site and no current irrigation use has been identified downgradient of the site as discussed below. The nearest downgradient year-round residence is approximately 32 km (20 miles) from the site. The water rights search by Umetco (Wyoming State Engineer's Office, 2000) yielded 178 distinct water uses, the majority of which (59 percent) are permitted for monitoring purposes, within 5 km (3 miles) of the site. The remaining uses are classified as miscellaneous (14 percent), industrial (13 percent), stock watering (12 percent), and irrigation (3 percent).

Of particular relevance to this assessment is the fact that all irrigation and stock water uses correspond to surface water sources, not ground water via wells. The five irrigation uses are located upgradient to the north/northeast of the Gas Hills site. Livestock and wildlife do use the Rattlesnake springs/ditches located east (upgradient) of the site and several springs located west of the site (e.g., Iron Spring, see figure at end of this EA) that are derived from the Wind River aquifer. As discussed below and in Appendix D of the application, these springs have not been impacted by site activities, nor are any site related water quality impacts expected in the future.

The WDEQ Water Quality Division classification of ground water compared to ambient quality is provided in Table 2.12 of the application. The Wyoming classification is first done by use of the water on a well by well basis and secondly, on constituent concentration. Umetco stated that comparison of ambient levels of constituents with WDEQ ground water quality standards could yield a Class IV (industrial) designation, based on concentration. However, based on use, the springs west of the site that are fed by ground water, should represent Class III (livestock watering).

#### Future Ground Water Uses

The sparse population that characterizes the Gas Hills area is expected to remain stable. This prediction is based on 1997 census projections as well as other factors, including the harsh climate, lack of arable land, and the lack of a foreseeable economic base. Therefore, ground water uses in the area (within 5 miles) of the Umetco site are not expected to change in the future, but to remain for mining and livestock and wildlife watering.

As Umetco indicated, 1,920 acres of land should be transferred to the DOE in perpetuity. As part of the DOE long-term surveillance and maintenance requirements, water supply wells could not be installed within this land transfer area. However, there is an application for an ISL mine permit with the Land Quality Division of the WDEQ and for a license application with the NRC, for an area located partially within the long-term care boundary, due south of the Umetco facility. The ground water to be affected by the proposed operations, which includes all ore zones presently known and identified within the mine permit boundary, will be classified by WDEQ Water Quality Division according to its regulations. The DOE has indicated that the ISL operation appears compatible with its requirements for long-term surveillance and maintenance and the NRC could approve such use of the subsurface estates for the southern portion of the land transferred to DOE.

## 6.0 POTENTIAL ENVIRONMENTAL IMPACTS

### 6.1 Cultural Resources

The cultural and historical (archaeological) resources data for the site were recently updated (Umetco, February 1998 and April 1999). No potential or identified resource area would be impacted by the approval of the requested ACL.

### 6.2 Biota

The potential impact to threatened and endangered species on or near the site has been addressed by Umetco (April 1, 1998 and April 14, 1999) for surface disturbances associated with reclamation and decommissioning. There would be little or no impact to plants or animals under the currently proposed action. Based on the physical setting of the Gas Hills site, the only exposure pathway for wildlife receptors near the POE would be ingestion of water from a stock watering tank supplied by a well and/or ingestion of irrigated forage. Even though such ground water use is very unlikely, Umetco examined the potential impact.

The proposed ACL and the modeled POE hazardous constituent concentrations were compared to benchmarks developed for limiting exposure to wildlife. The benchmarks for radionuclides are based on a limiting dose of 100 mrad per day (Higley 1995). The benchmarks for inorganic constituents are based on No Observed Adverse Effect Levels derived for DOE's Oak Ridge facility site (Sample 1996). As Umetco demonstrated, the modeled concentrations at the proposed POE are below both the wildlife benchmark values and the WDEQ ground water Class III (livestock watering) standards for these licensed constituents.

The modeled constituent concentrations at the proposed POE are within the range of background (ambient) levels for each constituent, demonstrating that no adverse impacts to crops or plants are anticipated.

### 6.3 Water Quality

#### Surface Water

West Canyon Creek is an intermittent stream west and south of the Umetco site while East Canyon Creek is east and north and ephemeral in this area (see figure at end of this report). With the exception of two evaporation ponds, there are no perennial surface water bodies in the area of the East Gas Hills mining district.

As mentioned in Section 5.3, a hydraulic connection exists between ground water and springs located 2 miles west of the site (e.g., Medicine Spring, Lincoln Spring, and Iron Spring). However, historical results of biannual surface water samples collected from these springs indicate no impacts related to the Gas Hills site. In fact, water quality in some of the springs, in particular Iron Spring, is influenced by acidic conditions associated with naturally-occurring uranium mineralization (pH value of 3.9 in 1954 before mining began). Based on ground water fate and transport modeling conducted by Umetco and approved by the NRC, these springs are not expected to be affected by the site derived ground water contamination.

## Ground Water

There are numerous reclaimed and unreclaimed mine pits and overburden piles in the area (it is possible that 75 to 100 mine pits have been developed since uranium was first discovered in the 1950s in the Gas Hills District). Umetco also has several mine pits on the site to reclaim according to State regulations and the C-18 Pit to fill and regrade according to NRC regulations. This mining activity over 50 years has affected the ground water by increasing the level of many of the same constituents that were increased by milling and tailings disposal. Particularly, mining has resulted in the degradation of ground water quality in areas upgradient of the Umetco site. Other mining impacts have been documented in ground water monitoring data downgradient of the Rim Pit approximately 1,524 m (5,000 feet) west of the site.

Elevated levels of sulfate and total dissolved solids as well as hazardous constituents occur naturally in areas clearly not impacted by milling operations. Evidence of poor ambient water quality has been identified at springs in the area and exploratory borings drilled by mining companies have identified ground water impacted by mineralization. Based on results of the Umetco geochemical and transport models for a 1000-year time period, water quality at seeps and springs is not, and will not be, impacted by mill-related constituents. Long-term ground water monitoring has been proposed by Umetco to track the future movements of the ground water plume to assure that no significant environmental impacts will occur.

As implied in Section 5.3, it is very unlikely that wells will be installed in the Wind River aquifer near the POE because of the existing poor quality and limited quantity of water. Also, Umetco owns the land west of the POE in the area of the Western Flow Regime and BLM land encompasses the Southwestern Flow Regime beyond the POE. Conservative modeling indicates that there will be a temporary increase in some ACL constituents and several non-hazardous chemical constituents, such as sulfate, in the ground water at the POE. Long-term monitoring will be performed and corrective action can be taken, if necessary to protect ground water quality.

Based on ground water fate and transport modeling conducted by Umetco, mill related ground water contamination is not expected to degrade ground water use. This is due to the attenuation (absorption and precipitation) of chemical constituents in the ground water plume as the plume migrates through the aquifer over time and distance. Geochemical processes account for the majority of the reduction in chemical concentrations. The concentration of each licensed constituent has been calculated to be within the range of background at the POE for 1000 years. Although modeling indicates that the residual western plume should reach the POE in approximately 30 years and the southwestern plume in 40 years, dilution and continued absorption of the constituents will further reduce the contamination beyond the POE. In addition, DOE may obtain the mineral and water rights within the long-term care boundary from the State, to increase its control of the site.

#### 6.4 Health and Safety

The ACL application contains an exposure assessment. Based on the geochemical modeling results, combined with the evaluation of ambient ground water quality, Umetco stated that the modeled hazardous constituent concentrations at the POE, for 1000 years, are not distinguishable from ambient conditions when the concentrations at the POC wells are at or below the proposed ACL.

Because mill-related sources at the Gas Hills facility will pose no incremental risks to human health or the environment, a quantitative analysis of potential exposures and human health and environmental hazards is not required. Potential exposure pathways were discussed in Table 2.13 of the application and were determined by Umetco to be unlikely pathways or to result in insignificant exposure. The potential for environmental exposures in the vicinity of the Gas Hills site is expected to be limited due to the lack of permanent surface water bodies, the poor soil quality precluding use of ground water for irrigation purposes, and the other factors discussed in the preceding sections. The NRC staff considered this information in evaluating the significance of potential environmental impacts.

#### 6.5 Other Potential Effects

The environmental effects of the closing and sealing of monitoring and extraction wells has been addressed previously with the reclamation plan. The following potential effects were considered as part of this assessment. Because the proposed action is associated only with ground water conditions, it was determined that there would be no effect to the following resources: visual resources, vegetation and soils, ambient air quality, and transportation.

The BLM Casper, Wyoming Office was concerned about the impact on existing grazing leases because 1320 acres administered by the BLM are proposed to be transferred to DOE when the Umetco license is terminated. Based on an August 28, 2001, conference call of the involved agencies, it appears that cattle or sheep grazing would be compatible with the long-term surveillance plan that DOE will develop for the site. The BLM also has the option to issue a 2-year segregation notice that the leases will be withdrawn.

#### 6.6 Potential Cumulative Impacts

A proposed action may have limited effects when considered individually and significant effects when considered cumulatively in space or time. The staff cumulative effects analysis considered the incremental direct and indirect impacts of the project in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. The cumulative effects review included activities both on and off the site.

Because site reclamation activities are sometimes hindered by the physical features of the ground water monitoring network (for example, monitoring wells located in areas of construction or reclamation), the proposed action will facilitate site remediation. Another positive effect will be ceasing withdrawal of shallow ground water, allowing more water for uses down-gradient. In addition, the requested activity would terminate the ground water corrective action program and thus allow Umetco to stop pumping water into the evaporation pond. This would allow plugging of most of the wells, reclamation of the ponds, and removal of the pumps. Therefore, there would be decreased radiation exposure, vehicle traffic, and electricity use at the site.

The WDEQ expressed concerns about the preliminary ACL application to the NRC and Umetco in correspondence of April 2000. One concern was the impact on the proposed ISL operation discussed in Section 5.2. Umetco responded that the proposed action will not impact the effectiveness of the Long-Term Care Area since the only restriction will be that shallow ground water may not be used for domestic or agricultural purposes (see Appendix K of the application). Also, there is a fault between the Umetco site and the proposed ISL mine unit that would deflect ground water movement from the tailings area away from the proposed ISL operation. Thus, the ISL operation should not impact, or be impacted by, conditions at the Umetco Gas Hills site. In any case, the NRC staff will assess environmental impacts before licensing the ISL facility and the State will perform a separate evaluation. Therefore, no significant cumulative impacts were identified by staff.

## 7.0 MONITORING

### Ground Water Monitoring Prior to License Termination

The proposed long-term monitoring plan (ACL application, Appendix M, March 4, 2002) indicates monitoring to be done until the site is transferred to the DOE in 2005, to ensure that levels of the nine licensed constituents remain at or below the proposed ACL. Umetco proposed ground water monitoring locations for both the Western and Southwestern Flow Regimes (see the last page of this document). The following criteria, based in part on NRC guidance, were established for selection of monitor well locations.

- Within the plume and in “hot spot” locations
- Proximal to extraction wells
- Downgradient edge of the plume
- Downgradient of site impacts
- Discharge point for ground water (springs)

The four POC wells (MW1, MW21A, GW7 and GW8) will be sampled annually with analysis for the ACL constituents. If an ACL value is exceeded, additional sampling will be done within 3 months to determine if laboratory error or a transient increase had occurred. If the second sample demonstrates an exceedance, Umetco will be required to submit a corrective action plan.

In addition, two of the POC wells and wells MW164, MW70A, MW25, MW71B, MW28, MW77, PW4, MW72, MW82 and Iron Spring will be sampled semi-annually with analysis for sulfate, chloride and natural uranium. These wells were selected, based on the stated criteria, to reaffirm ground water flow and geochemical modeling presented in the ACL application. Values from four of these wells will be compared to target levels derived for the applicable time frame, to monitor plume movement. Results of monitoring will be provided in Umetco’s annual report as required by license SUA-648. For the Western Flow Regime, the six wells are aligned in the direction of ground water flow and present a transect from the edge of the AGTI to the nearest discharge point from ground water (Iron Spring). This transect is identical to the flowpath simulated in the modeling. For the Southwestern Flow Regime, the three wells are aligned with the natural (non-pumping) ground water flowpath from the edge of the A-9 Repository toward the proposed land transfer (long-term care) boundary. This transect is identical to the flowpath simulated in the modeling.

## Monitoring After Termination of the Umetco License

A ground water monitoring plan for the site will also be incorporated into the Long-Term Surveillance Plan (LTSP) to be prepared by the DOE with concurrence by NRC (see Section 40.28 of Chapter 10 in Code of Federal Regulations). Results of ground water monitoring prior to license termination will likely provide some insight to DOE in development of the plan. After termination of the Umetco license, ground water monitoring will be conducted by the DOE under a general NRC license to ensure that concentrations of constituents remain protective of human health and the environment.

### 8.0 CONCLUSIONS

The action that the NRC is considering is approval of an amendment request to revise the ground water compliance standards to ACL and amend source material license SUA-648 issued pursuant to 10 CFR Part 40. The alternatives available to the NRC are:

1. Approve the license amendment request as submitted; or
2. Amend the license with such additional conditions as are considered necessary or appropriate to protect public health and safety and the environment; or
3. Deny the request.

Based on its review, the NRC staff has concluded that the environmental impacts associated with the proposed action do not warrant denial of the license amendment. The NRC staff has concluded that there are no significant environmental impacts associated with the proposed action. Therefore, alternatives with equal or greater impacts need not be evaluated. Additionally, in the Technical Evaluation Report being prepared for this action, the staff has reviewed the licensee's proposed action with respect to the criteria for ground water restoration, specified in 10 CFR Part 40, Appendix A, and has no basis for denial of the proposed action. Therefore, the staff considers that Alternative 1 is the appropriate alternative for selection.

The NRC staff has determined that the proper action is to issue a FONSI in the Federal Register. The following statements support a FONSI and summarize the conclusions resulting from the EA.

1. Ground water fate and transport modeling, conducted by Umetco and approved by NRC, has determined that revising the ground water standards to ACL will cause no degradation to the use of ground water or surface water, as a result of mill related activities, outside the long-term care boundary.
2. An acceptable long-term ground water monitoring program will be implemented to adequately monitor the future movements of the ground water plume and assure that no significant environmental impacts will occur and that the ACL will not be exceeded.
3. Due to the reduction of ground water contamination as a result of mill related activities over time and distance, such that values should be within the range of background values at the long-term care boundary, no significant environmental impacts are expected to occur as a result of revising the existing ground water standards to ACL for the Umetco site.

## 9.0 CONSULTATIONS

Most of the information for this document was obtained from the licensee's ACL application. Correspondence and data for previous EAs for Umetco site activities related to decommissioning and reclamation have also been used. In completing this EA, the NRC staff held discussions or corresponded with representatives of the Wyoming State Historic Preservation Office, WDEQ, Wyoming Fish and Game Department, U.S. Fish and Wildlife Service, and the BLM (Wyoming offices), as indicated below.

Meeting in Casper, Wyoming with NRC, Umetco, BLM, WDEQ, Fremont County, and DOE staff; and Gas Hills industry representatives, June 19, 2001.

Telephone conversation with Roberta Hoy, Land Quality Division, Wyoming Department of Environmental Quality, on the status of her review of the revised ACL application and any concerns, July 30 and November 19, 2001.

Telephone conference with staff from BLM, WDEQ, DOE, Army Corp of Engineers, and NRC concerning NRC-licensee leased land to be deeded to DOE that is currently owned by others, August 28, 2001.

The draft EA was provided by electronic or surface mail on February 6 and 7, 2002, as follows;

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Letter from Roberta Hoy, Program Principal, Land Quality Division, Wyoming Department of Environmental Quality, dated March 8, 2002, provided comments on the draft EA. These were summarized and addressed as follows:

Comment - Section 2.0, last paragraph, says DOE ownership of the land will prevent exposure to the contaminated plume of ground water but this does not account for possible well installation near the long-term care boundary, water rights, and long-term responsibility.

Response - The paragraph was moved to Section 6.3 and revised to state that modeling indicates that the constituents will be within the range of background values at the POE. As indicated in the ACL application, Umetco bought Section 16 (west of the licensed site, in path of Western Flow Regime) several years ago and the eastern half will be deeded to the DOE as part of the long-term care area. Umetco could add deed restrictions to the western portion of the section to prevent well construction, if the State has a significant concern with the Western Flow Regime. While the State could not transfer the water and minerals rights with this land, the DOE can obtain these rights by condemnation. This approach has been discussed with the State. The land in the path of the Southwestern Flow Regime is controlled by BLM but this area does have mining claims with water use permitted by the State. As suggested, DOE can consider checking the water records once every 10 years. Under the NRC general license, DOE would be responsible to mitigate any problems that develop, including ground water contamination levels of concern at the POE.

Comment - Section 3.0, item 2, indicates that monitoring will be done for a limited set of parameters. This is not appropriate because none are the most mobile or of most concern to water users; estimates of their rate of movement rely, in part, on sulfate concentrations; and these parameters may not be of use to delineate impacts from the proposed ISL facility. Conductivity, pH, sulfate, chloride, and bicarbonate need to be monitored. In addition, water level measurements at each sampling event should be mentioned.

Response - Section 7 states that sulfate and chloride will be monitored in 11 wells (includes two

POC wells). Umetco's approved ground water sampling procedure E-10, states that pH, temperature, specific conductivity and the water level will be measured. DOE can consider bicarbonate monitoring in the LTSP.

Comment - Section 3.0, item 3, does not identify the monitoring well locations. Also, POE locations should be monitored.

Response - A figure has been added to the end of the EA indicating monitoring locations. Since one of the more mobile constituents, sulfate, is not expected to increase noticeably at the POE for many years (in Western Flow Regime, 300 mg/l at 10 years with peak at 78 years, in Southwestern Flow Regime, 100 mg/l at 40 years with peak at 100 years), and Umetco will terminate its license in 3 or 4 years, Umetco will not be required to have monitoring wells at the POE for approval of the ACL request. However, it is anticipated that before license termination, DOE will require Umetco to install wells near the POE along the paths of the plumes, for monitoring under the LTSP.

Comment - Section 3.0, item 4, states that the proposed action recommends that DOE monitor the same wells every 5 years. Based on LQD experience, wells should be checked at least every year. Also, the well sampling frequency should be clarified.

Response - Umetco's recommendations are not binding on NRC or DOE and this phrase has been deleted. It is anticipated that the LTSP will indicate annual monitoring of which ever wells are deemed necessary. Umetco's sampling frequency (based on submittal of March 4, 2002) has been clarified in Section 7.

Comment - Section 5.1, third paragraph, neglects the importance of livestock and wildlife for land use.

Response - The paragraph has been revised to mention livestock and wildlife.

Comment - Section 5.2, first paragraph, states that the aquifer is a "marginal resource." However, it is an important resource to wildlife and livestock and this use should be indicated.

Response - The phrase "marginal resource" has been deleted. Section 5.3 has been revised to mention use of the aquifer by wildlife and livestock via the springs.

Comment - Section 5.3, first paragraph, contains contradictory statements on current water uses.

Response - The paragraph has been revised to indicate that "... stock water uses correspond to surface water sources, not ground water via wells." It is explained in the next paragraph that the springs are surface water sources derived from the Wind River Aquifer.

Comment - Section 5.3, second paragraph, ground water classification is done by WDEQ Water Quality Division (WQD).

Response - We are aware of that, and Umetco referred to WQD's published water quality standards for comparison to the site's ambient quality. A sentence has been revised to indicate that, based on concentrations of several constituents the water **could** be Class IV, and based on water use, Class III.

Comment - Section 5.3, fourth paragraph, incorrectly states that in the proposed ISL permit area, the ground water will be classified Class V (uranium commercial) and it does not reflect the requirement to restore ground water after ISL operation.

Response - The sentence has been deleted.

Comment - Section 6.2, second paragraph, compares the WQD ground water standards to predicted concentrations of the ACL constituents instead of all parameters of concern. Also, the statement that modeled concentrations at the POE are “orders of magnitude” below the WQD standards is incorrect. The concern is that additional degradation not be allowed just because mining has impacted some of the ambient wells, even though natural movement of radium has resulted in elevated levels at various springs.

Response - The response to the Section 3.0, item 2, comment addresses other parameters modeled and to be monitored. The modeling done after the draft EA was prepared does indicate that the ACL constituents and sulfate will be within the range of background at the POE. The term “orders of magnitude” has been deleted. Concerning degradation of water quality, conservative modeling indicates that there may be a temporary increase in some constituents levels at the POE, but long-term monitoring will be performed and corrective action can be taken, if necessary to protect ground water quality.

Comment - Section 6.6, third paragraph, incorrectly states that the ISL operation is a “closed system.” The concern is that there not be any incursions of ground water of poorer quality that would impact mining efficiency and ground water restoration. Umetco has evaluated potential interactions from the tailings disposal areas and the proposed ISL in Appendix K of the application and this should be referenced in the EA. In relation to this possible interaction, the EA should mention the North Thunderbird Fault.

Response - The paragraph has been revised as suggested.

Electronic mail from Bob Specht, BLM Casper Office, on March 12, 2002, provided two comments on the draft EA that were addressed by the above.

Letter from Michael M. Long, Field Supervisor, Wyoming Office, U.S. Fish and Wildlife Service, dated February 25, 2002 (received March 19, 2002), requested data and expressed concern that future extraction of this contaminated ground water could impact surface water. The proposed ISL operation was also a concern. The NRC staff supplied the data via facsimile and explained that land ownership would prevent ground water extraction near the POE and farther out the constituents of concern would be at background levels. Also, a draft EA is being prepared for the proposed ISL operation and will be submitted to his agency for comment.

## 10.0 PREPARER

Elaine Brummett, Umetco Project Manager and Health Physicist in the Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, NRC.

## 11.0 REFERENCES

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Sample, B.E., et al., “Toxicology Benchmarks for Wildlife: 1996 Revisions,” ES/ER/Tm-86/R3, DOE Risk assessment Program, Health Science Division, Oak Ridge, TN. 1996.

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Umetco, Supplement to Applicant's Environmental Report, January 23, 1995.

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Umetco, Letter from T. Gieck, to J. Holonich, NRC, response to comment on potential environmental impacts to borrow areas, clean-up areas, and East Canyon Creek drainage, April 1, 1998.

Umetco, Letter from T. Gieck, to J. Holonich, NRC, response i.e., updating environmental assessment and information on borrow sites, April 21, 1998.

Umetco, Memorandum from T. Gieck, to E. Brummett, NRC, transmitting drawing showing boundaries of threatened and endangered species survey, January 5, 1999.

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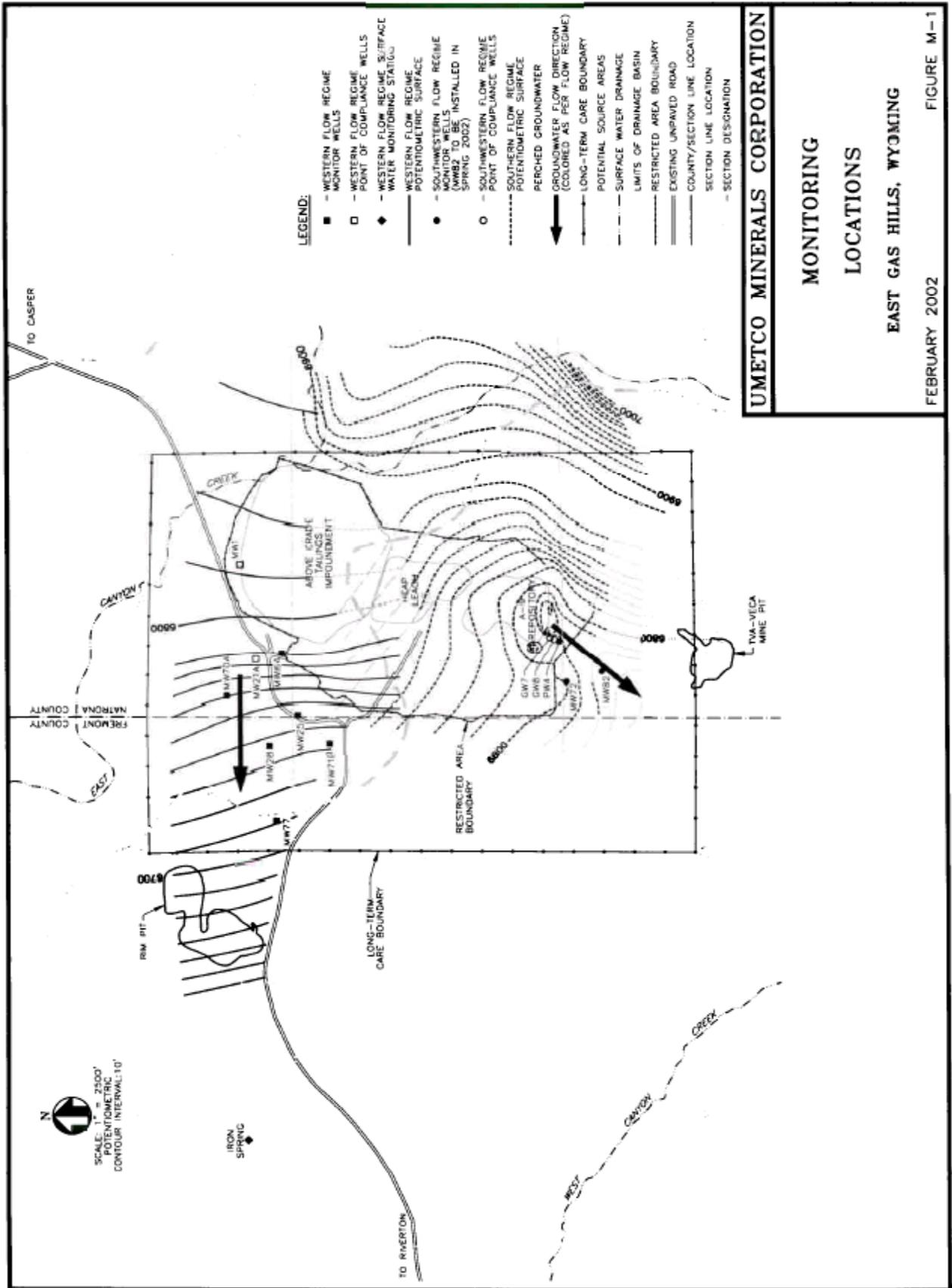
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FIGM-15 B & W.DWG