March 29, 2002

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

SUBJECT: AMENDMENT 48, LICENSE SUA–648, UMETCO MINERALS CORPORATION, GAS HILLS URANIUM MILL SITE, ALTERNATE CONCENTRATION LIMITS (TAC NO. L51785)

Dear Mr. Sealy:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed 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. The ACL application was submitted by letters dated May 11 and May 18, 2001, as modified July 30, and December 3, 2001, and March 4, 2002. The staff has determined that your request to revise License Conditions (LC) 10B, 35, and 59, to authorize use of ACL at the Umetco Gas Hills, Wyoming, uranium mill site, is acceptable.

The staff determined that Umetco has demonstrated that the milling-related hazardous constituents in ground water will not pose a substantial present or potential hazard to human health or the environment as long as the ACL are not exceeded at the Point of Compliance wells. Also, the proposed limits are as low as reasonably achievable, after considering practicable corrective action alternatives. To support the modeling results, Umetco proposed an acceptable long-term ground water monitoring program (application, Appendix M) that would adequately monitor future contaminate plume migration and assure that the ACL will be protective of human health and the environment. Therefore, Umetco's proposal is acceptable and is in accordance with 10 CFR Part 40 Appendix A Criterion 5B(5)(c). The staff's technical evaluation is provided in Enclosure 1.

Based on the conclusions of this review, the Umetco license has been modified to change wording in LC 10B, 35, and 59, as requested February 11, 2002, and as discussed March 4, 2002. The amended license is provided as Enclosure 2.

The NRC staff evaluated the potential impact of implementation of the proposed ACL and prepared an Environmental Assessment (EA). A copy of the final EA was sent to you on March 24, 2002. The EA indicates that the staff concluded that there would be no significant environmental impact from the requested licensing action. A notice to this effect has been published in the Federal Register and the notice includes an opportunity for a hearing.

If you have any questions regarding this letter or the enclosures, please contact the NRC Project Manager for your facility, Ms. Elaine Brummett, at (301) 415-6606 or she can also be reached by e-mail at esb@nrc.gov.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter 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

Enclosures: 1. Technical Evaluation Report
2. SUA-648, Amendment 48

cc: M. Moxley, WDEQ, LQD
A. Kleinrath, DOE GJ

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DATE	3/21/02		3/26/02		3/26/02		3/29/02	

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TECHNICAL EVALUATION REPORT
ALTERNATIVE CONCENTRATION LIMITS APPLICATION
UMETCO MINERALS CORPORATION
EAST GAS HILLS, WYOMING

DATE: March 20, 2002

FACILITY: Umetco - East Gas Hills, Wyoming

TECHNICAL REVIEWERS: William von Till and John Bradbury

PROJECT MANAGER: Elaine Brummett

SUMMARY AND CONCLUSIONS:

Umetco Minerals Corporation (Umetco) submitted, by letter dated February 18, 1999, an application for alternate concentration limits (ACL) for ground water standards in License Condition 35 for its former uranium mill site in the East Gas Hills region of Wyoming. The staff reviewed this submittal and requested additional information on April 17, 2000. Umetco submitted, by letters dated May 11 and May 18, 2001, a revised application for ACL that was modified by submittals dated July 3 and December 3, 2001, and March 4, 2002. Based on the final ACL application, Umetco has demonstrated that the hazardous constituents in ground water will not pose a substantial present or potential hazard to human health or the environment as long as the ACL are not exceeded, and that the proposed limits are as low as reasonably achievable (ALARA), after considering practicable corrective action alternatives. Umetco demonstrated this through ground water flow and geochemical modeling to simulate ground water contamination migration from the point of compliance (POC) to the point of exposure (POE) over the 1000-year compliance period. Umetco proposed an acceptable long-term ground water monitoring program (application, Appendix M) that would adequately monitor future plume migration and assure that the ACL will be protective of human health and the environment. The staff finds Umetco's proposal to be acceptable and in accordance with 10 CFR Part 40 Appendix A Criterion 5B(5)(c) and the Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act (NUREG-1620, NRC, 2000). License Conditions 10B, 35, and 59 should be revised as requested in the letter of February 11, 2002, and as discussed with the licensee on March 4, 2002, to authorize use of the ACL and to remove the requirement for the current ground water corrective action program.

DESCRIPTION OF AMENDMENT REQUEST:

The Umetco East Gas Hills site contains two reclaimed disposal areas; the Above Ground Tailings Impoundment (Impoundment) and the A-9 Repository. The license establishes a separate ground water protection standard for each area. The ground water protection standard for the Impoundment is established at POC wells MW1 and MW21A; located north and west of the Impoundment. The ground water protection standard for the A-9 Repository is established at POC wells GW7 and GW8; located southwest of the repository (see Plan View at end of this document). These wells are used to monitor water quality in the upper aquifer.

The ACL application requests that site-specific concentration limits for hazardous constituents in ground water be granted for the Umetco site. These ACL will replace the ground water

protection standards in License Condition 35, to be met at the POC wells. By letter dated February 11, 2002, Umetco requested that a measured value not be required for gross alpha because the major alpha contributors have proposed ACL. This issue is discussed later. The proposed ACL are as follows.

Western Flow Regime (Impoundment):

	Current standard	Proposed ACL
arsenic	0.05 mg/l	1.80 mg/l
beryllium	0.05 mg/l	1.64 mg/l
gross alpha	46.0 pCi/l	Not a measured value
lead-210	5.0 pCi/l	35.4 pCi/l
nickel	0.06 mg/l	13.0 mg/l
radium-226 and 228	31.5 pCi/l	250.0 pCi/l
selenium	0.01 mg/l	0.161 mg/l
thorium-230	6.6 pCi/l	57.4 pCi/l
uranium	0.13 mg/l	11.9 mg/l

Southwestern Flow Regime (A-9 Repository):

	Current standard	Proposed ACL
arsenic	0.05 mg/l	1.36 mg/l
beryllium	0.01 mg/l	1.70 mg/l
gross alpha	17.8 pCi/l	Not a measured value
lead-210	4.6 pCi/l	46.7 pCi/l
nickel	0.04 mg/l	9.34 mg/l
radium-226 and 228	24.9 pCi/l	353.0 pCi/l
selenium	0.01 mg/l	0.53 mg/l
thorium-230	4.8 pCi/l	44.8 pCi/l
uranium	0.29 mg/l	34.1 mg/l

Umetco is also proposing that the POE be established for the site at the proposed long-term care boundary. This boundary encompasses all the land that will be transferred to the U.S. Department of Energy (DOE) for perpetual care of the disposal sites. The western side of the boundary would be located about 1.4 km (0.8 miles) west of the Impoundment and the southern side of the boundary would be located about 0.8 km (0.5 miles) south of the A-9 Repository (see the Plan View at the end of this document). Within the boundary, land currently owned by Umetco or federal land managed by the U.S. Bureau of Land Management (BLM) would be transferred to DOE.

License Condition 35 B requires Umetco to conduct corrective actions to remediate hazardous constituents from the milling process in ground water. Umetco proposes to stop corrective actions if the ACL are approved. The ACL application indicates that the hazardous constituents will not pose a substantial present or potential hazard to human health or the environment as long as the ACL are not exceeded and that the proposed limits are ALARA, after considering practicable corrective action alternatives.

BACKGROUND:

Uranium milling was conducted at the Umetco site from 1960 to 1984 and the mill has been decommissioned. From 1960 until 1979 uranium mill tailings were placed in the Impoundment and from 1979 to 1984 tailings were placed in the A-9 Repository. The Impoundment has been structurally stabilized and an engineered cover placed over it. The A-9 Repository has been covered with an interim compacted clay cover while the final cover is completed over the next 2 years. The Impoundment was constructed without a bottom liner, while the A-9 Repository, constructed in a former open-pit mine, has a bottom liner (3 feet of compacted clay), but no side liner. Consequently, water and tailings solution from both disposal areas migrated into the underlying ground water.

Uranium was mined from open pits in the Wind River Formation ground water up-gradient, cross-gradient, within, and down-gradient of the Umetco facility. These mines were developed by several different companies and involve approximately 684 acres. They have impacted the ground water quality as surface and ground water has flowed through the open pit mines, mine spoils, and backfilled reclaimed pits.

The mill site is locate within the Canyon Creek drainage, a sub-basin of the Wind River Surface Water Basin. With the exception of manmade impoundments for evaporation ponds, there are no perennial surface water bodies in the vicinity of the Umetco site. Consequently, any surface water drainage from the site is into ephemeral streams.

Current and Projected Land and Water Uses

The site is located in a sparsely populated area. The principal land use surrounding the site is uranium mining with some land used for livestock grazing and hunting on a seasonal basis. Most of the land within 8 km (5 miles) of the Umetco site is public domain under BLM jurisdiction. Only a small percentage of the land is privately owned. The nearest residence is located 8 km (5 miles) northeast and up-gradient from the site and is only inhabited on a seasonal basis. The nearest down-gradient residence is approximately 33 km (20 miles) from the Umetco site.

A water rights search showed that most of the water rights are for ground water quality monitoring purposes, with the remaining uses classified as miscellaneous, industrial, stock watering, and irrigation. All stock and irrigation uses correspond to surface water sources and not to ground water wells. With the exception of three springs located west of the Umetco site (e.g. Medicine Spring, Lincoln Spring, and Iron Spring) no municipal, domestic, irrigation, or stock uses of ground water in the area were identified. Water from these springs are used for stock watering and wildlife.

Widespread ground water contamination from mining and milling has resulted in a ground water quality that is not compatible with either domestic or agricultural ground water uses. Umetco's comparison of ambient levels of constituents with Wyoming Department of Environmental Quality (WDEQ) ground water quality standards indicated that background levels are compatible with a Class III (livestock) designation.

Power Resources Inc. plans to build an in situ leach facility to extract uranium from the upper aquifer south of the A-9 Repository. Since the sparse population in the Gas Hills area is

expected to remain stable, the most likely future use of the ground water in this area is mining and livestock and wildlife watering.

Hydrogeology

The Umetco site is located in the Wind River Basin of Central Wyoming. The Wind River Basin is a large sediment filled, northwest-trending structural depression that was formed as a result of Late Cretaceous and Early Cenozoic tectonic activity. The Wind River Formation was formed from the deposition of alluvial fans, stream channels, flood plains, lakes, and swamps; and is comprised of alternating and discontinuous layers of sandstone, siltstone, claystone, and conglomerate. Thickness ranges from a few feet near the basal margin to several thousand feet in the northern part of the basin. Beneath the site, the Wind River Formation is approximately 91.4 m (300 feet) thick.

Uranium occurs naturally in the Wind River Formation as roll-front deposits at the interface between oxidized and reduced rock. This deposit occurs in the Gas Hills in a section approximately 8 km (5 miles) wide by 32 km (20 miles) long in three north-trending belts.

Ground water, for the purposes of compliance by Umetco, occurs in two flow regimes of the Wind River (upper) aquifer. The shallowest ground water beneath the A-9 Repository, is defined as the Southwest Flow Regime (SWFR) and includes the upper portion of the Wind River Formation. This regime is characterized by more oxidizing conditions. The Western Flow Regime (WFR) is characterized by deeper, more reducing conditions. A mudstone unit separates the two flow regimes. In the vicinity of the site, ground water is constrained by pre-Wind River deposits made up of granite, gneiss, and schist. East of the site, ground water pinches out against these deposits. Regional ground water flow is toward the northwest, with a western component north of the site. Ground water flows toward the Pathfinder Lucky Mc Uranium Mill site (Source Materials License SUA-672) which is located 8 km (5 miles) from the Umetco site.

Natural widespread ambient contamination and mill-related impacts are limited to the uppermost occurrence of ground water where oxidizing conditions predominate. As mentioned earlier, uranium was mined from open pits in the Wind River Formation up-gradient, cross-gradient, within, and down-gradient of the site. Geochemical processes related to mining and reclamation have affected ground water quality because oxygenated surface water has percolated through open-pit mines, mine spoils, and backfill materials dissolving previously reduced minerals such as uranium and radium.

Historic Corrective Actions

Umetco's ground water corrective action activities have been on-going since 1983. Ground water remediation originally involved extracting ground water in the vicinity of the Impoundment and the A-9 Repository and evaporating the water extracted in evaporation ponds. Beginning in 1990, extracted ground water was treated using ion exchange and reverse osmosis technology. The clean water produced by this approach was re-injected into the ground water, while the dirty water was evaporated in evaporation ponds. However, in 1996, this form of treatment was found to be ineffective and was discontinued. The ground water corrective action presently consists of extraction and evaporation. Approximately 257 million gallons of ground water were recovered and treated at the Umetco site from 1983 though June 2001, at a cost of approximately 13.8 million dollars.

A capture zone analysis performed by the licensee of the corrective action plan for the A-9 Repository showed that all the ground water migrating beneath the A-9 Repository is captured by the extraction wells. However, this analysis also showed that ground water from outside the Umetco site, specifically from previously mined areas, is also captured. In spite of the ground water corrective actions for the A-9 Repository, the uranium concentration has increased with time. This increase is believed to have resulted from the oxidation of uranium ore bodies and previously mined areas near the A-9 Repository.

Regulatory Framework

Ground water protection programs for Title II uranium mill and tailings sites per 10 CFR Part 40, Appendix A, Criterion 5, must include the following four elements:

- A list of site-specific hazardous constituents per criterion 5B(2);
- Ground water concentration limits (or standards) for these constituents;
- A compliance location where the concentration limits must be met; and
- A time period during which compliance is required.

Criterion 5B(5) requires that the concentration limits for individual constituents must not exceed:

1) The Commission-approved background concentration of a constituent in the ground water;

2) The respective value given in Table 5C of Appendix A, if the constituent is listed in that table, and if the background level of the constituent is below the value listed (which correspond to EPA's maximum concentration limits (MCLs) for drinking water); or

3) An ACL established by the Commission.

Criterion 5B(6) states that ACL can be established on a site-specific basis, provided it is demonstrated that:

1) The constituents will not pose a substantial present or potential hazard to human health or the environment, as long as the ACL are not exceeded; and

2) The ACL are as low as is reasonably achievable (ALARA), after considering practicable corrective actions.

Factors used in evaluating the ACL application, as outlined in criterion 5B(6), can be found in the Appendix of this report

TECHNICAL EVALUATION:

Umetco justified the ACL by the use of ground water modeling to demonstrate that the present and future concentrations of hazardous constituents will not present a potential hazard to human health or the environment as long as the ACL are not exceeded, and by demonstrating that the ground water corrective actions will no longer provide an incremental benefit.

Flow and Transport Modeling

Three-dimensional analysis of ground water flow and advective transport in the Wind River aquifer was performed using MODFLOW (McDonald and Habaugh, 1988), a finite difference ground water flow model, and MODPATH (Pollock, 1989 and 1994), a particle tracking model, both developed by the U.S. Geologic Survey. Umetco simulated the flow of hazardous constituents from the POC to the POE over a 1000 years. In addition, the ground water flow model MODFLOW and solute transport model MT3D were used to evaluate the fate and transport of sulfate and chloride between the POC and POE. For the MODFLOW run, one hundred simulations were performed using the stochastic model. After calibration, twenty of the best fit simulations were carried further. The MINTEQ database (Allison et. al., 1991) was used to analyze the uranium species and phases. Thermodynamic data for thorium were imported from the EQ3/6 database (Wolery, 1992) and radium data were taken from Langmuir and Riese (1985). The use of a flow and transport code that simulates sorption processes including surface complexation and ion exchange is technically defensible.

Geochemical Modeling

The computer code PHREEQC (Parkhurst, 1995) was used by Umetco and NRC staff to simulate a geochemical model that incorporates surface complexation, ion exchange, precipitation-dissolution, and speciation in simulating flow and transport at the Umetco mill site. Arsenic, beryllium, nickel, chloride, selenium, lead-210, radium-226 + 228, sulfate, thorium-230, and natural uranium were addressed in the model.

The conceptual model used to demonstrate that the ACL are acceptable includes the following features:

1. Flow and transport from the POC to the POE is one-dimensional.

2. Tailings-contaminated water is diluted with uncontaminated water whose composition is that of an upstream well (e.g., MW27 for the WFR and LA2 for the SWFR). Reduction in source term concentrations via dilution over time for WFR is shown in Table 2 below. Reduction in source term concentrations via dilution over time for SWFR is shown in Table 3.

Table 2

Western Flow Regime Source Terms					
Time (yrs)	0 to 17	18 to 25	26 to 70	71 to 135	136 to 1000
percent Reduction	0	33	50	75	90

Table 3

Southwestern Flow Regime Source Terms					
Time (yrs)	0 to 6	7 to 9	10 to 16	17 to 35	36 to 1000
percent Reduction	0	33	50	75	90

3. The flow path of the WFR extends 1402 m (4,600 feet) from the edge of the Impoundment through the POC well MW21A and monitoring well MW28 to the POE. The model is composed of 46 cells arranged in a row. Each cell represents 30.5 m (100 feet) of flow path and contains 0.2 percent hydrous iron oxide and an ion exchange assemblage with a cation exchange capacity of 10 cmol/Kg. Chemical equilibria among dissolved species and sorption sites are instantaneous.

3. No solid phases are allowed to equilibrate with the initial (before transport) ground waters assigned to the cells. Precipitation during the transport simulation is allowed if solutions become saturated with respect to the phases, calcite, gypsum, uraninite, coffinite, ferroselite ($FeSe_2$), radium sulfate, nickel selenide and anglesite ($PbSO_4$).

4. Initial ground water compositions in the cells along the WFR flow path are consistent with January 2001 sampling of wells MW21A (cells 1 through 15) and MW28 (cells 16 through 46).

5. The flow path of the SWFR extends 1646 m (5,400 feet) from the toe of the A-9 Repository through the POC well G8 to well MW74. The model is composed of 54 cells, each 30.5 m (100 feet) long. Assumptions concerning solid phase equilibria and sorption processes are the same as for the WFR.

6. Initial ground water compositions in the cells along the SWFR flow path are consistent with January 2001 sampling of wells GW8 (cells 1 through 5) and MW74 (cells 6 through 54).

7. Solute dispersivity of 50 m is included in modeling both flow regimes.

8. Two flow rates are modeled for the WFR, 0.167 ft/d and 0.33 ft/d, corresponding to 644 and 1242 shifts, respectively, in the model representing 1000 years of transport time. Ground water leaving the POC takes 75 and 38 years, respectively, to reach the POE.
9. Two flow rates are modeled for the SWFR, 0.167 ft/d and 0.28 ft/d, corresponding to 648 and 1026 shifts, respectively, for 1000 years of transport. In this case the ground water leaving the POC takes 88 and 53 years, respectively, to reach the POE.

10. Ambient ground water compositions are consistent with waters that have not been impacted by milling operations. Included, however, are ground water compositions that have been impacted by mining and those associated with uranium ore bodies.

Results of Simulations

The PHREEQC code was used to simulate the transport of the contaminants from the POC to the POE for both flow regimes. For the sorption processes, PHREEQC takes the initial composition of water in the cells and calculates the composition of the solid with which it would be in equilibrium. These calculated solid compositions, along with the initial ground water composition, define the flow system prior to transport. This process results in significant masses of sorbed constituents, including those for which ACL have been requested, all along the flow path.

Except for beryllium, the modeling indicates that the peak concentrations for all the constituents simultaneously reach the POE shortly after the passage of one pore volume. The evidence of simultaneous fast breakthroughs suggests the peak of the contaminants is due to flushing of the rock by a relatively high concentration eluant competing for sorption sites. Sulfate is a likely candidate. The contaminant concentration (peak height) is related to the concentration of the sulfate. The duration of the elevated contaminant concentration (width of the peaks) is related to the duration of the sulfate pulse. The source term of the WFR is diluted to 1/10 of its initial concentration in 136 years, whereas that of the SWFR reaches 1/10 of its initial concentration in only 36 years. Consequently, the peak for WFR is wider than for SWFR.

The model determines the concentration of sorbed constituents along the flow path to be, in some cases, a million times greater than that in the associated ground water. This determination uses site-specific ground water. The values of parameters used to characterize the solids were not measured onsite but are comparable to those chosen for another site described in a peer-reviewed journal article (Zhu et al., 2002). Consequently, the model and parameters chosen are considered to provide reasonable technical support that the requested ACL concentrations at the POC would be protective. The model assumes a source term whose concentration decreases to 90 percent of its initial value over 136 and 36 years for the WFR and the SWFR, respectively. This assumption is more conservative than that included in the study by Zhu and Burden, 2001, where the incoming fluid has the chemistry of tailings pore water for the first 5 years and of uncontaminated upgradient ground water thereafter.

The method of determining a tailings solution source term using a statistical analysis of ground-water compositions from various wells at different times yields conservative concentrations of the licensed constituents. However, it also results in a composite ground water that is charge imbalanced (-39 percent). Real ground water whose analyzed composition were charge imbalanced by greater than 10 percent would be considered suspect. However, it was found that this imbalance does not impact the results of simulations in this case. The composite source terms had excess anions. Simulations were performed in which the imbalance was retained and compared to simulations where the solutions were charge balanced with the addition of a noncompeting cation. The results of the simulations were the same.

Results of the modeling indicate that concentrations of each ACL constituent along the flow path after 1000 years remain within the range of background at the proposed POE.

Gross Alpha

The geochemical model used the ACL of all the licensed constituents, except gross alpha, as constraints of the source. In a letter dated February 11, 2002, the licensee proposed that the gross alpha requirement be eliminated because: 1) gross alpha is an inexpensive measure of basically Ra-226, Th-230, and Pb-210, which are also licensed constituents for Umetco, 2)

gross alpha values have large uncertainty/errors, and 3) estimation of gross alpha is not amenable to modeling using PHREEQC. It is clear from the data that the subtraction of uranium from the measured gross alpha value (to meet Appendix A, Criterion 5C) from samples high in uranium, creates large errors in the final gross alpha value. The measured gross alpha value is not meaningful for this site because of the high concentrations of uranium and total dissolve solids in many wells in the Gas Hills region. The staff determined that the measurement of gross alpha duplicates the measurement of Ra-226 + Ra-228, Th-230, and Pb-210 because these radionuclides comprise the major contributors to gross alpha, as defined by Appendix A, criterion 5C. The licensee has demonstrated that radium, thorium and lead do not migrate from the POC to the POE in 1000 years and, therefore, the gross alpha level at the POE would pose no risk to the public or the environment.

The ACL for uranium, radium, Th-230, and Pb-210, would provide adequate protection from radiological hazards and better reflect the potential impact from alpha emitters than does the measured gross alpha. After discussions with the licensee, the recommended wording of the new License Condition 35E will indicate that the gross alpha ACL is not a measured number but is based on the sum of its major contributors and that the gross alpha ACL is considered to be met if the Th-230, Ra-226+Ra-228, and Pb-210 measured values at the POC are all below their ACL.

Sulfate

The PHREEQC model calculates significant sorbed masses of licensed constituents consistent with the licensee's proposal that regional ground water is affected by ore deposits and mining. The results of the model suggest attention should be paid to non-licensed constituents, such as sulfate, that can mobilize contaminants resulting in peak concentrations reaching the POE simultaneously within the regulatory period. Modeling results for sulfate indicate that concentrations will not exceed the WDEQ Class III sulfate quality standard at the POE or at the springs. The estimated maximum concentration for sulfate at the POE will occur in approximately 80 years and at a concentration of 1,715 mg/l. The cumulative concentration with the addition of background will be under the WDEQ Class III sulfate standard of 3,000 mg/l. The maximum sulfate concentration at Iron Spring, based on the model, will occur between 250 and 300 years and be at 94 mg/l. The cumulative sulfate concentration at Iron Spring will not exceed Class III quality. For sulfate modeling, the licensee used previous seepage modeling to simulate the source and confine the source vertically to 15 m (50 feet) which represents real conditions.

Alternative Corrective Actions

An evaluation of alternate corrective actions was made. Ground water pump and treat using evaporation ponds and ion exchange/reverse osmosis, ground water pumping and re-injection and evaporation ponds, and ground water pumping and re-injection and ion exchange/reverse osmosis were analyzed as potential alternatives. These alternatives were rejected because further ground water pumping would not result in an incremental benefit. Millions of dollars would be spent to continue the corrective action program and would result in decreasing water quality for the SWFR due to pulling in mine-contaminated water. Further, hydraulic control of the contamination is not warranted since the licensee has demonstrated that concentrations at the POE will not pose a risk to human health, safety, or the environment. The site will be

transferred to DOE for long-term care and DOE will restrict ground water use thereby reducing the potential for a ground water ingestion risk scenario.

Plans for an in-situ leach facility well unit within the Umetco site's long-term care boundary has been submitted for NRC review under a separate license. The proposed facility would inject lixiviant into the ground water within the mine unit and then extract ground water high in uranium and process the uranium. This pumping of ground water for industrial purposes would not increase any risk of exposure from the contamination left by Umetco. In fact, industrial pumping for an in-situ leach operation and the restoration that would be required could actually help reduce concentrations left from the Umetco operations.

Long-Term Monitoring

To reduce the uncertainty of the modeling predictions and to protect human health and the environment outside of the long-term care boundary, a post-remediation ground water monitoring system will be implemented. This monitoring should remain in place far into the future, after termination of the Umetco license, in order to be effective and protective. DOE would perform such monitoring under an NRC general license as part of the Long-Term Surveillance Plan. The details of the monitoring and corrective action programs are presented in Appendix M and the monitoring locations are illustrated in Figure M.1 of the application (March 4, 2002). In addition to monitoring the ACL constituents, chloride and sulfate will also be monitored to provide early indication of plume movement. The staff finds this program acceptable and concludes that the extended monitoring program assures that the ground water contaminant plume will be adequately monitored so that human health and the environment will be protected.

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ENVIRONMENTAL REVIEW:

During its review of the amendment request, the NRC staff performed an environmental assessment (EA) as required under 10 CFR 51.21, for this licensing action. The requested activity does not meet any of the criteria in Part 51.20 requiring an environmental impact statement.

The draft EA was provided to interested agencies and organizations on February 5, 2002. Comments received were addressed in the final EA that was approved on March 24, 2002. The notice of a finding of no significant impact was published in the Federal Register on March 29, 2002.

PROPOSED LICENSE CONDITIONS:

Based on the letter of February 11, 2002, and discussions with Umetco staff on February 27, 2002, the following changes should be made to License Conditions 10B, 35, and 59.

License Condition 10B – EDIT

Provide by a current organizational chart and details of the authority and responsibility of each level of management, noting any changes. This submittal will be included with the ground water monitoring review, due each September 30th.

License Condition 35 – REPLACE

The Alternate Concentration Limits (ACL) for ground water contained in Umetco's application dated May 11 and May 18, 2001, as revised by submittals of July 30, 2001, December 3, 2001, and March 4, 2002, have been approved for this site. The licensee shall implement a ground water compliance monitoring program that includes the following:

A. Conduct monitoring as described in the Ground Water Monitoring Plan (Appendix M) in the March 4, 2002, submittal. The validation of ACL exceedance will be in accordance with Section 4 of Appendix M. The licensee shall submit this monitoring data to the NRC by September 30th of each year.

B. Comply with the following ACL in the western flow regime at Point of Compliance (POC) wells MW1 and MW21A:
arsenic = 1.8 mg/l, beryllium = 1.64 mg/l, lead-210 = 35.4 pCi/l, nickel = 13.0 mg/l, combined radium-226 and 228 = 250 pCi/l, selenium = 0.161 mg/l, thorium-230 = 57.4 pCi/l, and uranium-natural = 11.9 mg/l.

C. Comply with the following ACL in the southwestern flow regime at POC wells GW7 and GW8:
arsenic = 1.36 mg/l, beryllium = 1.70 mg/l, lead-210 = 46.7 pCi/l, nickel = 9.34 mg/l, combined radium-226 and 228 = 353 pCi/l, selenium = 0.53 mg/l, thorium-230 = 44.8 pCi/l, and uranium-natural = 34.1 mg/l.

D. (Unchanged)

E. The ACL for gross alpha for both flow regimes is based on the sum of its major contributors and not on a measured number. The ACL for gross alpha is considered to be met if the major contributing radionuclides (Th-230, Ra-226 + Ra-228, Pb-210) are all below their ACL.

License Condition 59 – EDIT

59. The licensee shall complete site reclamation in accordance with the approved reclamation plan ~~and ground water corrective action plan~~, as authorized by License Condition Nos. ~~35,~~ 54 and 58 in accordance with the following schedules:

A. (unchanged)

B. (1) (unchanged)

(2) ~~Projected completion of ground water corrective actions to meet performance objectives specified in the ground water corrective action plan – December 31, 2001.~~ Deleted by Amendment No. 48.

APPENDIX
FACTORS TO CONSIDER FOR ACL

1) Potential adverse effects on ground water quality

   i) The physical and chemical characteristics of constituents in the residual radioactive material at the site, including their potential for migration.

   ii) The hydrogeological characteristics of the site and surrounding land.

   iii) The quantity of ground water and the direction of ground water flow.

   iv) The proximity and withdrawal rates of ground water users.

   v) The current and future uses of ground water in the region surrounding the site.

   vi) The existing quality of ground water, including other sources of contamination and their cumulative impacts on the ground water quality.

   vii) The potential for health risks caused by human exposure to constituents.

   viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to constituents.

   ix) The persistence and permanence of the potential adverse effects.

2) Potential adverse effects on hydraulically-connected surface water quality considering:

   i) The volume and physical and chemical characteristics of the residual radioactive material at the site.

   ii) The hydrogeological characteristics of the site and the surrounding land.

   iii) The quantity of ground water and the direction of ground water flow.

   iv) The patterns of rainfall in the region.

   v) The proximity to the site to surface waters.

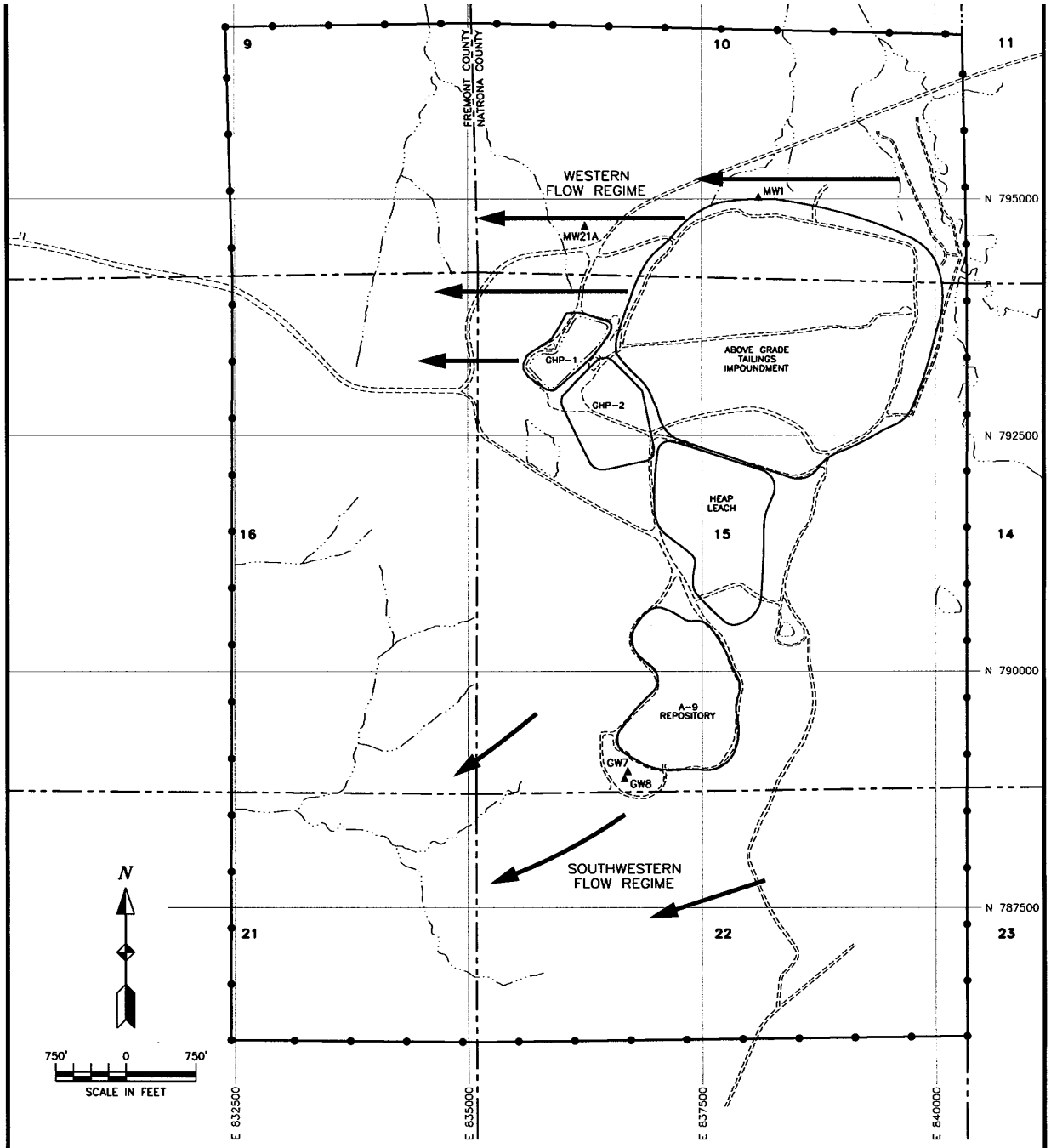
   vi) The current and future uses of surface waters in the region surrounding the site and any water quality standards established for those surface waters.

   vii) The existing quality of surface water, including other sources of contamination and their cumulative effect on surface water quality.

   viii) The potential for health risks caused by human exposure to constituents.

   ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to constituents.

   x) The persistence and permanence of the potential adverse effects.



LEGEND:

- PROPOSED LONG TERM CARE BOUNDARY
- GW8 ▲ – POINT OF COMPLIANCE MONITOR WELLS
- GROUNDWATER FLOW DIRECTION
- SECTION LINE
- 15 – SECTION DESIGNATION
- N 787500 – UMETCO SITE 2500' GRID SYSTEM
- UNPAVED ROAD
- SURFACE WATER

UMETCO MINERALS CORPORATION

PLAN VIEW

GAS HILLS SITE

APRIL 2001

EXHIBIT A

FIGEX-A2.DWG

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and the applicable parts of Title 10, Code of Federal Regulations, Chapter I, Parts 19, 20, 30, 31, 32, 33, 34, 35, 36, 39, 40, 51, 70, and 71, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Umetco Minerals Corporation	3. License Number SUA-648 Amendment No. 48
2. P.O. Box 1029 Grand Junction, Colorado 81502	4. Expiration Date Until terminated 5. Docket No. 40-0299 Reference No.

6. Byproduct Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum amount that Licensee May Possess at Any One Time Under This License
Natural Uranium	Any	Unlimited

9. Authorized place of use: The licensee's uranium milling and heap leach facilities located in Natrona County, Wyoming.

10. The licensee shall:

A. Issue a Radiation Work Permit (RWP) for non-routine work which may, by the determination of the Radiation Safety Officer, result in significant exposure to radioactive materials. The RWP shall at a minimum describe the scope of work to be performed, any precautions necessary to reduce exposure, and the necessary supplemental monitoring and sampling.

B. Provide by a current organizational chart and details of the authority and responsibility of each level of management, noting any changes. This submittal will be included in the groundwater monitoring review, due each September 30th.

C. Perform a weekly documented visual inspection of the evaporation storage ponds and solution transfer system from the A-9 impoundment. A visual inspection can be postponed during periods of adverse weather conditions. These periods of adverse weather conditions will be documented on the weekly inspection form.

D. Conduct training for site personnel, contractors, and visitors in accordance with the requirements of 10 CFR 19.12 "Instruction to Workers" on the following frequencies.

1. Site personnel shall receive radiation and safety training initially and radiation/safety refresher training on an annual basis.

2. Visitors are required to register at the office and are not permitted inside the facility restricted area without visitor training unless escorted by trained personnel.

3. Contractors having work assignments inside the restricted area are given radiation and safety training prior to performing their duties.

E. Control access to the site restricted area through the use of physical barriers and use of site personnel during scheduled work hours.

[Applicable Amendments: 22, 40, 48]

11. DELETED by Amendment No. 22.

12. DELETED by Amendment No. 22.

13. The licensee is hereby exempted from the requirements of 10 CFR 20.1902(e) for areas within the site, provided that all entrances to the site are conspicuously posted in accordance with Section 20.1902(e) and with the words, "Any area within this site may contain radioactive material."

[Applicable Amendment: 35]

14. The RSO shall meet the minimum qualifications specified in Section 2.4.1 of Regulatory Guide 8.31 dated May 1983.

15. Written procedures shall be established for non-operational activities to include environmental monitoring and instrument calibrations. An up-to-date copy of each written procedure shall be kept in the area to which it applies.

All written procedures shall be maintained on site and shall be reviewed and approved in writing by the RSO before implementation, and whenever a change in procedure is proposed, to ensure that proper radiation protection principles are being applied. In addition, the RSO shall perform a documented review of existing procedures at least annually.

[Applicable Amendments: 22, 40]

16. The licensee shall conduct an annual ALARA audit. A copy of the annual ALARA audit report shall be retained at the site and shall be available for NRC review.

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In addition, the licensee shall review the environmental monitoring program annually and provide a report that summarizes environmental monitoring conducted at the site and include the dose assessment for individual members of the public. A copy of the annual environmental monitoring audit report shall be available at the site for NRC review.

[Applicable Amendments: 22, 35, 40]

17. DELETED by Amendment No. 40.

18. DELETED by Amendment No. 22.

19. DELETED by Amendment No. 35.

20. Calibration of equipment utilized for radiation surveys shall be performed annually. Air sampling equipment shall be calibrated at least quarterly or prior to use if utilized less frequently than on a quarterly basis.

    [Applicable Amendment: 40]

21. DELETED by Amendment No. 40.

22. Release of equipment or packages from the restricted area shall be in accordance with, “Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct Materials,” dated April 1993.

    [Applicable Amendments: 22, 40]

23. Mill tailings other than samples for research shall not be transferred from the site without specific prior approval of the NRC in the form of a license amendment. The licensee shall maintain a permanent record of all transfers made under the provisions of this condition.

24. DELETED by Amendment No. 22.

25. The licensee is hereby authorized to possess byproduct material in the form of uranium waste tailings generated by the licensee’s former uranium recovery operations previously authorized under license SUA-648.

    [Applicable Amendment: 43]

26. DELETED by Amendment No. 22.

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27. The results of sampling, analyses, surveys and monitoring, the results of calibration of equipment, reports on audits and inspections, and all meetings and training courses required by this license and any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in NRC regulations, all such documentation shall be maintained for a period of at least 5 years.

28. The licensee shall immediately notify the NRC by telephone and facsimile transmission upon discovery in the tailings, heap leach or evaporation pond areas of any failure of structures or earthworks that results in a release of radioactive material and/or any unusual conditions which, if not corrected, could lead to such a failure. This requirement is in addition to the requirements of 10 CFR Part 20.

    [Applicable Amendments: 22, 31]

29. DELETED by Amendment No. 22.

30. The licensee shall decommission the Umetco Gas Hills Uranium Mill in accordance with its submittals dated May 2 and June 18, 1990, as modified for soil cleanup by submittals dated September 15 and November 17, 2000. The decommissioning shall include disposal, in the A-9 pit, of all structures (e.g. maintenance shop building, and water tower), debris, and other wastes within or originating from the restricted area. Notwithstanding any statements to the contrary above, the licensee shall:

    A. DELETED by Amendment No. 24.

    B. DELETED by Amendment No. 44.

    C. All mill debris shall be disposed of in accordance with the January 10, 1991, submittal. Additionally, all debris shall be placed in a manner that avoids nesting and minimizes voids. Fill material must be placed in and around each lift of debris in sufficient volume to form a coherent mass.

       All debris not specifically addressed in the May 2, 1990, submittal shall have a maximum dimension of 30 feet and a maximum volume of 30 cubic feet. Debris not meeting these requirements shall be reduced in size. Empty drums, tanks, or other objects with hollow volumes greater than 5 cubic feet shall be reduced in volume by at least 70 percent.

    [Applicable Amendments: 14, 16, 17, 22, 24, 31, 32, 44]

31. Before engaging in any activity not previously evaluated by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not assessed or that is greater than assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval from the NRC in the form of a license amendment.

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32. The licensee shall conduct an annual survey of land use (private residences, grazing areas, private and public potable water and agricultural wells, and non-residential structures and uses) in the area within five (5) miles (8 km) of any portion of the restricted area boundary and submit a report of this survey to the NRC. This report shall indicate any differences in land use from that described in the last report.

    [Applicable Amendment: 32]

33. In order to ensure that no disturbance of cultural resources occurs in the future, the licensee shall have an archeological and historical artifact survey of areas of its property, not previously surveyed, performed prior to their disturbance, including borrow areas to be used for reclamation cover. These surveys must be submitted to the NRC and no such disturbance shall occur until the licensee has received authorization from the NRC to proceed.

    In addition, all work in the immediate vicinity of any buried cultural deposits unearthed during the disturbance shall cease until approval to proceed has been granted by the NRC.

    [Applicable Amendment: 40]

34. Air particulate sampling stations will be taken at: Tower 1 - Downwind; Tower 4 - Site Background; Tower 6 - Nearest Residence.

    A. Air particulate samplers will be operated during the site construction season or when the potential for airborne radioactivity concentrations due to site activities, as determined by the RSO, would be expected to exceed 10 percent of the effluent concentrations as listed in 10 CFR 20, Appendix B, Table 2. Filters will be changed out at a maximum of every two weeks with filters composited and analyzed at a frequency to ensure results will meet LLD requirements, but not to exceed quarterly during continuous air particulate sampler operations.

    During site operational periods, air particulate samplers will be operated continuously. Filters will be analyzed for the following radionuclides: U-natural, Thorium-230, Radium-226, and Lead-210.

    B. Radon-222 monitoring will be performed at the air particulate monitoring locations. Radon-222 sampling devices will be exchanged at least semiannually.

    C. Environmental gamma monitoring will be performed at the air particulate monitoring locations and certified gamma monitoring devices will be exchanged quarterly.

    D. The licensee shall follow the lower limits of detection contained in Regulatory Guide 4.14, Section 5, and License Condition 35D, for the analysis of samples collected in conjunction with the environmental program.

    [Applicable Amendments: 8, 22, 40, 43, 45]

35. The Alternate Concentration Limits (ACL) for ground water contained in Umetco's application dated May 11 and May 18, 2001, as revised by submittals of July 30, 2001, December 3, 2001, and March 4, 2002, have been approved for this site. The licensee shall implement a ground water compliance monitoring program that includes the following.

    A. Conduct monitoring as described in the Ground Water Monitoring Plan (Appendix M) in the March 4, 2002, submittal. The validation of ACL exceedance will be in accordance with Section 4 of Appendix M. The licensee shall submit this monitoring data to the NRC by September 30th of each year.

    B. Comply with the following ACL in the western flow regime at Point of Compliance (POC) wells MW1 and MW21A: arsenic = 1.8 mg/l, beryllium = 1.64 mg/l, lead-210 = 35.4 pCi/l, nickel = 13.0 mg/l, combined radium-226 and 228 = 250 pCi/l, selenium = 0.161 mg/l, thorium-230 = 57.4 pCi/l, and uranium-natural = 11.9 mg/l.

    C. Comply with the following ACL in the southwestern flow regime at POC wells GW7 and GW8: arsenic = 1.36 mg/l, beryllium = 1.70 mg/l, lead-210 = 46.7 pCi/l, nickel = 9.34 mg/l, combined radium-226 and 228 = 353 pCi/l, selenium = 0.53 mg/l, thorium-230 = 44.8 pCi/l, and uranium-natural = 34.1 mg/l.

    D. The licensee shall use, at a minimum, the following lower limits of detection for water quality analysis in mg/l, unless otherwise noted: arsenic = 0.01, beryllium = 0.01, nickel = 0.01, selenium = 0.005, total dissolved solids = 10, sulfate = 1.0, chloride = 1.0, iron = 0.1, pH = 0.1 (standard units), natural uranium = 0.0015, combined radium-226 and 228 = 1.0 pCi/l, thorium-230 = 1.0 pCi/l, lead-210 = 1.0 pCi/l, and gross alpha = 5.0 pCi/l.

    E. The ACL for gross alpha for both flow regimes is based on the sum of its major contributors and not on a measured number. The ACL for gross alpha is considered to be met if the major contributing radionuclides (Th-230, Ra-226 + Ra-228, Pb-210) are all below their ACL.

    [Applicable Amendments: 6, 8, 11, 15, 21, 31, 32, 34, 40, 41, 43, 48]

36. In accordance with the submittal dated September 23, 1998, the licensee shall minimize, to the extent practicable, ponding of water on the A-9 repository. This shall be accomplished by best management practices. Precipitation runoff diverted around the A-9, and from the A-9 impoundment shall be accumulated in the C-18 pit and subsequently pumped to the GHP No. 2 lined evaporation pond.

    [Applicable Amendments: 22, 40]

37. DELETED by Amendment No. 22.

38. DELETED by Amendment No. 40.

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39. The results of all effluent and environmental monitoring required by this license shall be sent annually to the NRC.

    [Applicable Amendment: 43]

40. DELETED by Amendment No. 35.

41. DELETED by Amendment No. 22.

42. DELETED by Amendment No. 35.

43. DELETED by Amendment No. 40.

44. DELETED by Amendment No. 1.

45. DELETED by Amendment No. 40.

46. DELETED by Amendment No. 1.

47. DELETED by Amendment No. 1.

48. DELETED by Amendment No. 35.

49. The licensee shall maintain at least five (5) feet of freeboard between the embankment crest of any evaporation pond and the maximum operating level of the ponded liquid.

    [Applicable Amendment: 35]

50. DELETED by Amendment No. 35.

51. DELETED by Amendment No. 35.

52. DELETED by Amendment No. 31.

53. DELETED by Amendment No. 22.

54. The final reclamation of the inactive above-grade tailings impoundment (includes experimental heap leach site) shall be in accordance with the December 18, 1980, Reclamation Plan and the April 19, 1979, and May 13, 1982, letters; except as superceded by the Design for Enhancement of the Previously Approved Reclamation Plan for the Above-Grade Inactive Tailings Design Report of October 6 and October 28, 1997, as modified by submittals dated May 22, June 26, July 20, July 28, September 8, September 15, and November 23, 1998, as well as April 9 and June 7, 1999 and December 20, 2000.

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The following modifications shall be required in lieu of statements made in the above referenced 1980-82 documents:

A. The alternate reclamation plan that provides for 10H:1V embankment slopes as presented in Section 4.1 of the D'Appolonia report shall be required.

B. The entire reclaimed tailings and heap leach areas shall be covered with a minimum of 10 feet of cover material which meets the following requirements:

1) A clay cap of a minimum of 1 foot thickness.

2) A suitable filter material of a minimum 1 foot thickness to be placed directly over the clay cap. The licensee shall document and submit to the NRC the soils testing data for the filter materials which demonstrates a permeability differential of at least two orders of magnitude greater than the clay cap materials.

3) A minimum of 7.5 feet of additional overburden and spoils materials. The licensee may use a thickness of 6.5 feet over areas specified to be covered by cobble rock riprap.

4) A minimum of 0.5 feet of topsoil.

5) A minimum of 1.5 feet of cobble rock riprap on slopes greater than 10H:1V over reclaimed areas. The rock riprap shall have the following gradation as a minimum.

% Passing by Weight	Rock Size (inches)
100	8 - 12
50	6 - 8
15	3 - 4

C. The licensee shall not rip the topsoil into the spoils materials as proposed in the reclamation plan.

D. Prior to completion of reclamation, the licensee shall assure that the water retention structure adjacent to the spoils area, lying east of the above ground impoundment, has been removed and drainage re-established.

E. DELETED by Amendment No. 45

F. Construction of the reclamation cover shall be as specified in the licensee's submittal dated June 16, 1983, with the following exceptions:

1) The clay cap material shall be compacted to at least 90 percent of its standard Proctor maximum density (ASTM D698) at a moisture content between optimum and two (2) percent higher. If a lower degree of compaction is desired, permeability tests on samples of the clay material compacted to the desired density shall be performed to document that the permeability would not exceed 1 foot/year and the results submitted to the NRC for review and approval prior to construction.

2) An Atterberg Limits and laboratory moisture-density test shall be performed on a composite sample from each clay borrow area to be used during a particular construction phase prior to initiation of work. In addition, four field density and four field moisture content tests shall be performed for each layer of clay placed. These tests shall be performed prior to placing cover material over the clay. The results of the field tests shall be correlated using the results of the laboratory tests.

3) The cover material shall be compacted to between 85 and 90 percent of its standard Proctor maximum density (ASTM D698). The soil cover shall be placed and compacted in two approximately equal lifts. Four field density tests shall be performed for each lift of soil cover material placed.

4) A report summarizing construction activities for each phase of reclamation work and containing the results of all quality assurance testing shall be submitted to the NRC within 60 days of completion of the activities.

5) Following completion of the interim stabilization cover, the licensee shall thereafter perform documented inspections of the cover. The licensee shall, within 30 days of these inspections, weather permitting, provide for the repair of any area that could result in ponding of surface water due to settlement or exposure of tailings due to erosion.

[Applicable Amendments: 4, 6, 7, 32, 38, 41, 44, 45]

55. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, reclamation of any tailings or waste disposal areas, ground water restoration as warranted and the long-term surveillance fee. With submittal of a revised reclamation/decommissioning plan, the licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the new plan exceed the amount covered in the existing financial surety. The surety shall then be revised to include that amount with the annual surety update.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criteria 9 and 10, shall be submitted to the NRC at least 3 months prior to the anniversary date, which is designated as September 13 of each year. If the NRC has not approved a proposed revision to the surety coverage 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the

existing surety arrangement for one year. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a 15 percent contingency fee, changes in engineering plans, activities performed and any other conditions affecting estimated costs for site closure. The licensee shall also provide the NRC with all surety related correspondence submitted to the State of Wyoming, a copy of the State's surety review and the final approved surety arrangement. The licensee shall also ensure that the surety, where authorized to be held by the State, expressly identifies the NRC portion of the surety and covers the decommissioning and decontamination of the mill and mill site, reclamation of the tailings and waste disposal areas, ground water restoration, as warranted, and the transfer of the long-term surveillance fee to the U.S. General Treasury. The basis for the cost estimate is the NRC- approved reclamation/decommissioning plan or NRC-approved revisions to the plan. The minimum considerations used by the NRC in the review of decommissioning and reclamation estimates are shown in the attachment to SUA-648 entitled, "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates." Licensee submittals of reclamation/decommissioning plans and annual updates should follow this guidance.

Umetco Gas Hills' currently approved surety instrument, a surety bond held by the State of Wyoming, shall be continuously maintained in an amount no less than $21,418,428 (NRC portion) for the purpose of complying with 10 CFR 40, Appendix A, Criteria 9 and 10, until a replacement is authorized by both the State and NRC.

[Applicable Amendments: 1, 2, 13, 19, 20, 26, 27, 28, 33, 36, 39, 44, 46]

56. Prior to termination of this license, the licensee shall provide for transfer of title to byproduct material and land, including any interests therein (other than land owned by the United States or the State of Wyoming) that is used for the disposal of such byproduct material or is essential to ensure the long-term stability of such disposal site to the United States or State of Wyoming, at the State's option.

57. The NRC will not terminate the license until final reclamation has been completed and meets all applicable NRC regulations.

58. Wastes which may be disposed of in the A-9 pit may be from onsite sources (e.g. evaporation pond materials), licensed in situ leach facilities, and up to 10,000 cubic yards per year of other byproduct material provided that NRC approves the waste characteristics and disposal procedures for this other material. The maximum dimension of scrap material disposed shall be limited to 10 feet. Materials shall be placed to prevent nesting that could create large voids.

    Waste and fill disposed in the upper 12 feet of the A-9 repository shall be mapped as to the location, placement density, and radium activity. The potential impact of this material on the required radon cover shall be evaluated in a report (final radon flux estimate) submitted for NRC review and approval at least 3 months prior to initiation of the clay radon cover placement.

For the A-9 cover, the top 2 feet of frost protection soil will contain an average Ra-226 that does not exceed the NRC-approved Ra-226 value based on data for surface soil surrounding the site. Reclamation of the A-9 repository, C-18 pit, and of the north and south evaporation ponds, and the site grading shall be in accordance with the "Design for Enhancement of the Previously Approved Reclamation Plan for the A-9 Repository" in the licensee's submittal dated October 27, 1998, as modified by submittals dated December 10, 1998, and March 29, 1999.

[Applicable Amendment: 42]

59. The licensee shall complete site reclamation in accordance with the approved reclamation plan, as authorized by License Condition Nos. 54, and 58, in accordance with the following schedules.

A. To ensure timely compliance with target completion dates established in the Memorandum of Understanding with the Environmental Protection Agency (56 FR 55432, October 25, 1991), the licensee shall complete reclamation to control radon emissions as expeditiously as practicable, considering technological feasibility, in accordance with the following schedule:

(1) Remaining contaminated material retrieval and placement in the A-9 impoundment - December 31, 2002.

(2) Placement of the interim cover to decrease the potential for tailings dispersal and erosion:

For the Inactive Impoundment - complete
For the A-9 Impoundment - complete
For the Heap Leach Impoundment - complete

(3) Placement of final radon barrier designed and constructed to limit radon emissions to an average flux of no more than 20 pCi/m^2/s above background:

For the Inactive Impoundment - complete
For the A-9 Impoundment - December 31, 2003
For the Heap Leach Impoundment - complete

B. Reclamation, to ensure required longevity of the covered tailings and ground-water protection, shall be completed as expeditiously as is reasonably achievable, in accordance with the following target dates for completion:

(1) Placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 CFR Part 40:

For the Inactive Impoundment - December 31, 2002
For the A-9 Impoundment - December 31, 2004
For the Heap Leach Impoundment - complete

(2) Deleted by Amendment No. 48

C. Any license amendment request to revise the completion dates specified in Section A must demonstrate that compliance was not technologically feasible (including inclement weather, litigation which compels delay to reclamation, or other factors beyond the control of the licensee).

D. Any license amendment request to change the target dates in Section B above must address added risk to the public health and safety and the environment, with due consideration to the economic costs involved and other factors justifying the request such as delays caused by inclement weather, regulatory delays, litigation, and other factors beyond the control of the licensee.

[Applicable Amendments: 29, 30, 31, 37, 38, 40, 43, 47, 48]

60. Notification to NRC under 10 CFR 20.2202, 10 CFR 40.60, and specific license conditions should be made as follows:

Required written notice to NRC under this license should be given to: Chief, Fuel Cycle Licensing Branch, Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Mail stop T-8-A-33, or by express delivery to 11545 Rockville Pike, Rockville, Maryland 20852.

[Applicable Amendments: 32, 45]

61. The final reclamation of the heap leach impoundment shall be in accordance with the reclamation plan submitted September 25, 1996, as supplemented or revised by submittals dated June 6, August 19, and October 15, 1997, and January 15, and February 11 and 13, 1998, and December 20, 2000.

[Applicable Amendments: 38, 44]

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62. The licensee is authorized to receive and dispose in the A-9 Repository, the non-11e.(2) byproduct material from the IMC site as described in submittals dated May 11 and July 12, 2001.

[Applicable Amendment: 46]

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Dated: March 29, 2002

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

UNITED STATES NUCLEAR REGULATORY COMMISSION