

**ENVIRONMENTAL ASSESSMENT
FOR UMETCO MINERALS CORPORATION, GAS HILLS RECLAMATION PROJECT,
ABOVE-GRADE TAILINGS IMPOUNDMENT AND A-9 REPOSITORY EROSION
PROTECTION ENHANCEMENT DESIGN REPORT**

**UMETCO Minerals Corporation
Gas Hills Uranium Reclamation Project,
Fremont and Natrona Counties, Wyoming**

**Source Materials License SUA-648
Docket No. 40-0299**

**Prepared By:
U.S. Nuclear Regulatory Commission
Office of Federal and State Materials and Environmental Management Programs
Division of Waste Management and Environmental Protection**

ENVIRONMENTAL ASSESSMENT
FOR UMETCO MINERALS CORPORATION, GAS HILLS RECLAMATION PROJECT,
ABOVE-GRADE TAILINGS IMPOUNDMENT AND A-9 REPOSITORY EROSION
PROTECTION ENHANCEMENT DESIGN REPORT

1.0 INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) staff is conducting a review of Umetco Minerals Corporation's (Umetco's) license amendment request for approval of enhancements to, and repair of, the erosion protection cover at Umetco's Gas Hills Reclamation Project in Natrona and Fremont Counties, Wyoming. The NRC staff's review of the proposed license amendment is documented in this Environmental Assessment (EA), which was prepared in accordance with NRC's regulations in Title 10 of the Code of Federal Regulations (CFR) Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," that implement the National Environmental Policy Act of 1969, as amended (NEPA); and is consistent with NRC staff guidance in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with Nuclear Material Safety and Safeguards Programs" (NRC, 2003). The purpose of this document is to assess the potential environmental impacts of the proposed license amendment.

The NRC is also conducting a technical and safety evaluation of Umetco's request. The results of the technical and safety evaluation will be documented in a separate Technical Evaluation Report (TER).

1.1 Background

Umetco's Gas Hills Reclamation Project is located in the East Gas Hills area of central Wyoming, approximately 50 miles (80 kilometers) southeast of Riverton, Wyoming and west of East Canyon Creek. The Umetco site is licensed by the NRC under Source Materials License SUA-648 to possess byproduct material in the form of uranium mill tailings waste, as well as other radioactive wastes generated by past uranium milling operations.

The mill operated from 1960 to 1979 and has been dismantled. The current Umetco site consists of three primary tailings disposal areas on the 1,920 acre parcel – the 170 acre Above-Grade Tailings Impoundment (AGTI), the 55 acre A-9 Repository (A-9), and the 60 acre Heap Leach Area. In addition, the Gas Hills Pond No. 2 area, adjacent to the Heap Leach Area, also contains waste from heap leach operations.

Umetco submitted a reclamation plan for the AGTI area of the site in 1980 [D' Appolonia 1980]. During the mid-1990s, the existing reclamation plan was reevaluated to address potential erosion of the cover design and additional contamination identified adjacent to the existing cover in the area. In addition, in view of NRC's position on the acceptance of previously approved reclamation plans and license termination requirements, Umetco re-examined the AGTI reclamation design and the completed work, and concluded that license termination would not be possible with the existing erosion protection design. Umetco submitted an enhanced reclamation plan for the AGTI area on October 6, 1997 [SMI 1997] that involved: (1) extending

the existing radon barrier to address the additional contamination; (2) regrading areas of the impoundment; (3) installing a 137.16-cm (54-inch) frost protection layer; and (4) installing riprap erosion protection. The NRC approved this enhanced plan in 1999 [NRC 1999a]. In 2000, Umetco requested approval for modification of the erosion protection design to prevent potential disturbance of cultural resources discovered during reclamation activities [Umetco 2000]. The enhanced design modification was approved by NRC in April 2001 [NRC 2001]. Umetco completed the work in this area in 2002.

The A-9 is a former open pit uranium mine that was used for tailings disposal. The original reclamation plan was previously approved by the NRC, but the cover was never constructed [NRC 1987]. Umetco submitted a revised reclamation plan in 1998 to implement modifications to the A-9 [SMI 1998]. The NRC approved the revised reclamation plan in 1999 [NRC 1999b]. This approval allowed for the North and South Evaporation Pond liners to be placed in the A-9 and for the slopes of the North and South Evaporation Ponds to be re-graded. The A-9 reclamation cover includes a 45.72-cm (18-inch) thick radon barrier, a 137.16-cm (54-inch) thick frost protection layer and an erosion protection layer. Umetco completed work in this area in 2006.

On June 29, 2007, Umetco submitted the Construction Completion Report documenting the completed construction activities at the site inclusive of the AGTI and A-9 reclamation covers [Umetco 2007]. The Construction Completion Report was subsequently approved by License Amendment 60, dated September 8, 2008 [NRC 2008].

Monitoring and inspection activities performed by Umetco on the AGTI and A-9 reclamation covers have identified isolated areas of concern associated with the erosion protection layer, namely sub-grade erosion causing isolated, shallow incisions of the underlying cover soils, resulting from what Umetco believes is a design error. This issue had been previously communicated to the NRC and observed by NRC staff in the field. While this issue has resulted in shallow incisions of the underlying cover soils in isolated locations, the incisions do not extend deeper than 12-18 inches. In addition, the frost protection layer is 54 inches thick on the cover and the radon barrier is located beneath the frost protection layer. Thus, it does not appear that there has been a release of tailings or degradation of the radon attenuation capacities of the completed reclamation covers. However, Umetco committed to evaluating the integrity of the radon barrier during the repair project.

On December 21, 2010, Umetco submitted an evaluation that identified what Umetco believed was the reason for the incisions, namely a deficiency in the design of the erosion protection system in the areas of the incisions, and requested approval of an enhanced design to correct this deficiency [Umetco 2010a]. Umetco provided additional information to support their request on May 10, 2011 [Umetco 2011a], June 8, 2011 [Umetco 2011b], July 13, 2011 [Umetco 2011c], and July 18, 2011 [Umetco 2011d]. The incisions were first identified by Umetco during routine field inspections. Subsequent field investigations and review of approved design documents by Umetco identified the cause of the sub-grade erosion as an error in the calculation of the interstitial velocity for determining if a filter or bedding layer is necessary in the erosion protection design. Umetco stated that they had completed a review of approved designs associated with all reclamation cover systems constructed at the site to ensure the design deficiency is confined to AGTI and A-9 and that other potential contributing factors are adequately addressed.

1.2 Proposed Action

Umetco proposes to correct the sub-grade erosion by placing a bedding layer under the AGTI and A-9 covers by one of two methods. The first would involve removing the Type C rock¹ cover, laying down a bedding layer and replacing the cover. The second method would involve laying the bedding layer on the Type C rock and using a mechanical vibrator to move the bedding layer under the Type C rock. Umetco also proposed installing multi-layer filters zones on the up and down stream sides of the Launch Rock structure (located on the northeast portion of the AGTI) to reduce erosion and repair erosion sink holes that have developed upstream of the Launch Rock structure. Umetco also proposed repairing the erosion control apron on the southeast corner of the AGTI by placing riprap around the apron channel.

1.3 Need for the Proposed Action

The proposed action is needed to correct erosion on limited portions of the AGTI and A-9 area, reduce and repair erosion on the Launch Rock structure and repair the erosion control apron on the southeast of the AGTI. These actions are necessary to repair the existing erosion protection system and prevent future erosion of the rock armour.

1.4 Review Scope/Regulatory Environment

The NRC staff evaluated the potential environmental impacts of the proposed erosion protection enhancement design. Most of the aspects of the proposed action, the affected environment, and the interaction between the two, were previously addressed in past NRC environmental reviews (ML080770144 and ML081160159) [US NRC 1999c and 1999d]. These reviews found that the proposed activities (i.e., the original cover placement and the subsequent covering with rock) did not result in significant impacts to the quality of the human environment. Therefore, the staff is focusing on new and significant information, including changes as a result of the proposed action, changes in the affected environment (including future changes expected to occur during the proposed license period), and the operating history, to determine whether there is new information that has not been previously evaluated.

The conclusions presented in this EA are based on all aspects of the proposed action and the affected environment including those that have been evaluated in previous environmental reviews. However, in order to limit redundancy and to focus this EA on issues that have not been previously evaluated, the NRC staff refers to past environmental review documents for more detailed descriptions of those aspects of analysis that remain unchanged.

2.0 SITE CHARACTERISTICS

The current Umetco site consists of three primary tailings disposal areas on the 1,920 acre parcel – the 170 acre AGTI, the 55 acre A-9, and the 60 acre Heap Leach Area. In addition, the

¹ The rock cover consists of 3 rock layers referred to as Type A, B, or C rock depending on the mean diameter (D_{50}) of the rock. Type A rock has a D_{50} of 0.5 inches, Type B rock has a D_{50} of 3 inches and Type C rock has a D_{50} of 6 inches. Type C rock is placed on the lowest portion of the tailings pile, Type B the middle and Type A on the top of the pile. The bedding layer would consist of 30% quarry fines and 70% rock with a D_{50} of less than 2 inches.

Gas Hills Pond No. 2 area, adjacent to the Heap Leach Area, also contains waste from heap leach operations.

Based on information presented in the Annual Report for the Umetco Gas Hill site dated September 30, 2010, mining, mine reclamation, mineral exploration (for oil and gas), recreational use and seasonal grazing are the primary land uses within the five-mile radius of the Gas Hills site [Umetco 2010b].

The East Gas Hills site is located in a sparsely populated area within Natrona and Fremont counties in central Wyoming. The majority of the land within five miles of the site is public domain under Bureau of Land Management jurisdiction. The nearest residence, the JE Ranch, is approximately five miles northeast of the site. It is occupied for one to two weeks per year. The nearest full-time residents are located approximately eight miles to the west-southwest at the Puddle Spring Ranch.

3.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

Umetco will perform the proposed activities either on the existing tailings pile or on areas that were disturbed during earlier closure activities and were previously evaluated by NRC. The footprint of the site will not be expanded as a result of the proposed actions. The NRC staff, therefore, does not expect the proposed action to impact land use, geology, soils, water resources, ecological resources, meteorology, climatology, air quality, endangered and threatened species, historic and cultural resources. The staff also does not expect significant environmental impacts to ecological resources, transportation, noise, visual resources, socioeconomic conditions or public and occupational health, as discussed below.

Ecological Resources and Historic and Cultural Resources

By letter dated March 29, 2011, the Wyoming State Historic Preservation Office (WYSHPO), Senior Archaeologist stated that the proposed activities are to be undertaken in an area of previous disturbance that has a low probability of containing historic properties [WYSHPO 2011]. By letter dated May 25, 2011, the U.S. Fish and Wildlife (USFWS) Field Supervisor stated that the project would not adversely affect any threatened or endangered species or migratory birds [USFWS 2011]. Therefore, the NRC staff has concluded that the impact to ecological resources and historic and cultural resources as result of the proposed action will be SMALL, and thus, will have no significant environmental impact. The WYSHPO Senior Archaeologist suggested that the NRC include a License Condition that if any cultural materials are discovered during construction, work in the area should halt and the NRC, the U.S. Department of the Interior, Bureau of Land Management, and WYSHPO be contacted and the materials be evaluated by an archaeologist or historian. The NRC will include this license condition in the license amendment approving the repairs.

Transportation

Transportation in and around the site will increase temporarily during the period of construction, approximately 4.5 months, due to trucks transporting the material from the Rattlesnake Quarry to the site [Umetco 2011]. The scope of the activity is not different from past construction activities (i.e., the placement of the original cover) in this and adjacent areas, which were

previously addressed in past NRC environmental reviews [US NRC 1999a and 199b]. Therefore, the NRC staff concludes the impact due to transportation will be SMALL and, thus, will have no significant environmental impact.

Noise

Noise impacts would be expected to be temporary and within the range of a typical construction site. In addition, the site is in a remote area and the activity will occur within a limited timeframe (approximately 4.5 months). Therefore, the NRC staff concludes the impact from noise will be SMALL and, thus, will have no significant environmental impact.

Visual/Scenic Resources

The visual/scenic resources will be affected temporary during placement of the material that will be used to repair the existing erosion protection system. However, the site is in a remote area and the activity will occur within a limited timeframe (approximately 4.5 months). In addition, the project area consists of existing impoundments and repositories and no additional land disturbance is expected. Therefore, the NRC concludes that the impact to visual and scenic resources will be SMALL and, thus, will have no significant environmental impact.

Socioeconomic Conditions

The NRC staff does not expect the proposed action to significantly impact the socioeconomic conditions in or near the East Gas Hills area of central Wyoming. Umetco stated that approximately 20-25 people will be working at the site for 10 hours per day, 5 days per week [Umetco 2011b]. These individuals will be hired from local communities and will reside in either Casper or Riverton. Results from the 2010 U.S. Census indicate that the population is approximately 55,000 for Casper and 10,000 for Riverton. Therefore, it is not expected that the anticipated temporary workforce will significantly increase the population of either community, and, thus the impacts will be SMALL and will have no significant environmental impact.

Public and Occupational Health

In its December 2010, request, Umetco discussed the various procedures that it will employ to ensure protection of workers, the public, and the environment from the radioactive mill tailings. Umetco committed to conduct work at the site in accordance with Umetco's existing radioactive materials license and Radiation Monitoring Program, which include: surveys for unrestricted release, heavy equipment surveys and pre-entry surveys. These surveys are taken to control the spread of radioactive materials off-site and keep personal exposure to radioactive materials as low as reasonably achievable (ALARA). NRC staff reviewed the procedures and concluded that, if implemented, they will ensure that there will be little impact to worker safety and public health from the activity.

4.0 ALTERNATIVES TO THE PROPOSED ACTION (ENVIRONMENTAL IMPACTS)

The only alternative to the proposed action is the no-action alternative in which the NRC staff denies the proposed action request to repair the existing erosion protection system and prevent

future erosion of the cover. This alternative was not considered viable because it could result in the degradation of the cover and eventual release of radioactive mill tailings.

5.0 AGENCIES AND PERSONS CONSULTED

The NRC staff consulted with the WYSHPO and USFWS. By letter dated March 29, 2011, the WYSHPO stated that no historic properties would be affected by the proposed project. By letter dated May 25, 2011, USFWS stated that the project would not adversely affect any threatened or endangered species or migratory birds. The Wyoming Department of Environmental Quality (WYDEQ) was also provided a copy of this EA prior to finalization and was invited to provide comments. By email on July 19, 2011, WYDEQ indicated that they did not have any concerns with the draft EA [WYDEQ 2011].

6.0 CONCLUSION

The NRC staff concludes that Umetco's proposed actions to enhance the erosion protection design to correct the sub-grade erosion at its Gas Hill Reclamation Project will not significantly affect the quality of the human environment. Therefore, an environmental impact statement is not warranted for the proposed action. Pursuant to 10 CFR Part 51, the NRC staff has prepared this EA and determined that a Finding of No Significant Impact (FONSI) is appropriate for the proposed action to amend Umetco's license.

7.0 LIST OF PREPARERS

Zahira Cruz, Geotechnical Engineer, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs.

Dominick Orlando, Senior Project Manager, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs.

8.0 LIST OF REFERENCES

[D' Appolonia 1980] D' Appolonia Consulting Engineers, Inc., Reclamation Plan: Inactive Tailings Areas and Heap Leach Site: East Gas Hills Uranium Mill, Wyoming, December 18, 1980.

[SMI 1997] Shepherd Miller, Inc. (SMI), Design for Enhancement of the Previously Approved Reclamation Plan for the Above-Grade Inactive Railings Impoundment, October 6, 1997.

[NRC 1999a] U.S. Nuclear Regulatory Commission, Technical Evaluation Report Umetco Design for Enhancement of the Previously Approved Reclamation Plan for the Above-Grade Inactive Tailings Impoundment, June 21, 1999 (ADAMS Accession No. ML080770146).

[Umetco 2000] Umetco Minerals Corporation, Proposal for Erosion Protection Modification for the Above-Grade Tailings Impoundment and Heap Leach, Gas Hills Wyoming, December 20, 2000 (ML003782075).

[NRC 2001] U.S. Nuclear Regulatory Commission, License Amendment 44, Revised Soil Decommissioning and erosion protection plans and surety update for License SUA-648, Umetco Mineral Corporation, Gas Hills Uranium Mill Site, April 5, 2001 (ML010870207).

[NRC 1987] U.S. Nuclear Regulatory Commission, License Amendment 58, Source Material License SUA-648, Docket 40-0299, Umetco Gas Hills, Wyoming Site, October 7, 1987 (ML112230025).

[SMI 1998] Shepherd Miller, Inc. (SMI), Design for Enhancement of the Previously Approved Reclamation Plan for the A-9 Repository, October 27, 1998. (ADAMS Legacy Library ML9811020141).

[NRC 1999b] U.S. Nuclear Regulatory Commission, Technical Evaluation Report Umetco Enhanced A-9 Reclamation Plan, November 16, 1999 (ML080740169).

[Umetco 2007] Umetco Minerals Corporation, Final Construction Completion Report Gas Hills, Wyoming Site, June 29, 2007 (ML072210275).

[NRC 2008] U.S. Nuclear Regulatory Commission, License Amendment 60, Construction Completion Report, Completion of Reclamation, Source Material License SUA-648, Docket 40-0299, Umetco Gas Hills, Wyoming Site, September 8, 2008 (ML081780626).

[Umetco 2010a] Umetco Minerals Corporation, Above Grade Tailings Impoundment and A-9 Repository Erosion Protection Enhancement Design Report, December 21, 2010 (ML103640265).

[Umetco 2011a] Umetco Minerals Corporation, Above Grade Tailings Impoundment and A-9 Repository Erosion Protection Enhancement Design Report, May 10, 2011 (ML11132A154).

[Umetco 2011b] Umetco Minerals Corporation, Above Grade Tailings Impoundment and A-9 Repository Erosion Protection Enhancement Design Report, June 8, 2011 (ML11160A0961).

[Umetco 2011c] Umetco Minerals Corporation, Above Grade Tailings Impoundment and A-9 Repository Erosion Protection Enhancement Design Report, July 13, 2011 (ML11196A143).

[Umetco 2011d] Umetco Minerals Corporation, Above Grade Tailings Impoundment and A-9 Repository Erosion Protection Enhancement Design Report, July 18, 2011 (ML11201A304).

[US NRC 1999c] U.S. Nuclear Regulatory Commission, Environmental Assessment regarding the Above-Grade Impoundment enhancement reclamation design for the Umetco Minerals Corporation East Gas Hills Uranium Mill Site in Wyoming, May 19, 1999 (ML080770144).

[US NRC 1999d] U.S. Nuclear Regulatory Commission, Environmental Assessment regarding the A-9 Repository enhancement reclamation design for the Umetco Minerals Corporation East Gas Hills Uranium Mill Site in Wyoming, November 17, 1999 (ML081160159).

[Umetco 2010b] Umetco Minerals Corporation, Nuclear Regulatory Commission Annual Report Umetco Minerals Corporation Gas Hills, Wyoming Site For the report period July 2009 through June 2010, September 30, 2010 (ML102770461).

[WYSHPO 2011] Wyoming State Historic Preservation Office, Letter from R. Currit to D. Orlando, March 29, 2011 (ML110950201)

[USFWS 2011] U.S. Fish and Wildlife Service, Letter from R. M. Sattelberg to D. Orlando, May 25, 2011 (ML111510242).

[WYDEQ 2011] email dated July 19, 2011 from M. Moxley to D. Orlando (ML112000365).