

August8, 2001

MEMORANDUM TO: Melvyn Leach, Chief
Fuel Cycle Licensing Branch,
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

FROM: Michael C. Layton, Senior Hydrogeologist */RA/*
Uranium Recovery Section
Fuel Cycle Licensing Branch,
Division of Fuel Cycle Safety
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Office of Nuclear Material Safety
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SUBJECT: SITE VISIT TO THE QUIVIRA URANIUM MILL, AMBROSIA LAKE,
NEW MEXICO

Attached for your information is a summary of my observations from the July 24, 2001, site visit to the Quivira uranium mill near Ambrosia Lake, New Mexico. This visit was conducted for familiarization of the site and to support the review of the alternate concentration limits applications for the bedrock and alluvial ground-water systems.

CONTACT: Michael C. Layton, NMSS/FCSS/FCLB
(301) 415-6676

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SITE VISIT TO THE QUIVIRA URANIUM MILL
AMBROSIA LAKE, NEW MEXICO
JULY 24, 2001

On July 24, 2001, Michael Layton of the Uranium Recovery Section, Fuel Cycle Licensing Branch, visited the Quivira uranium mill for the purpose of familiarization with the site. This site visit was made to support the review of the alternate concentration limit (ACL) application for the bedrock and alluvial ground-water systems. This site visit was announced as an open meeting. No members of the public or representatives from the State of New Mexico attended this site visit.

BACKGROUND

Rio Algom Mining submitted an application for ACLs for the bedrock ground-water system at the Quivira uranium mill by letter dated February 15, 2000. Rio Algom also submitted an ACL application for the alluvial ground-water system at the Quivira mill by letter dated June 11, 2001. Both ground-water systems have been impacted by milling-related ground-water contamination and are currently under a ground-water corrective action program.

SITE VISIT

I arrived at the site and was greeted by Mr. Marvin Freeman and Mr. Peter Luthiger of Rio Algom and was escorted to a conference room where I met Mr. Terry Fletcher, General Manager of the mill; Mr. Russell Jones and Mr. Bill Ganus of Kerr-McGee Corporation; and Mr. Dan Erskine of Maxim Technologies, the contractor who developed the alluvial ACL application. After introductions, Mr. Luthiger provided a detailed overview of the past and present operations at the mill site, and the current ground-water corrective action program. He then turned the floor over to Mr. Ganus, who provided a detailed overview of the hydrogeology of the site, along with a synopsis of the amount and type of ground-water information that has been collected over the years. Mr. Erskine also provided an overview of the recent work that has been performed to characterize and model the alluvial ground-water system for the ACL application. Mr. Erskine pointed out that previous seepage from the nearby reclaimed Uranium Mill Tailings Radiation Control Act - Title I Ambrosia Lake tailings pile was also impacting shallow groundwater in the area. Mr. Jones had previously worked at the mill and represented Kerr-McGee's interest in the reclamation and cleanup activities. Kerr-McGee is the former owner-operator of the mill.

Mr. Luthiger then provided a guided site tour of the ongoing work to reclaim the tailings impoundments and the ground-water corrective action system. At one stop, we examined the Tres Hermanos A and B sandstones (contained within the Mancos shale)

that were exposed in a borrow pit excavation (Photo 1). These units are part of the bedrock ground-water system beneath the site, and are included in the ACL application for the bedrock system. The exposures exhibited the very fine-grained nature of the Tres Hermanos sandstones. The site visit continued with several stops illustrating the diversions that Quivira made to the Arroyo Puerto surface drainage and exposures of the alluvial materials north east of the mill site. Photo 2 shows the fine-grained nature of the alluvial material where surficial soils have been removed near a mine vent. The alluvium is addressed in the second ACL application submitted by the licensee. The interceptor trenches, situated on the east side of the main tailings impoundments were also examined. Mr. Luthiger explained that water from the underground mine workings in section 30, to the north of the mill, is pumped to the surface, processed through the ion exchange units at the mill to remove uranium, then discharged into the Arroyo Puerto. The discharged water infiltrates into the alluvium and maintains a hydraulic head that flushes contaminated ground water into the interceptor trench situated west of the arroyo. The water captured in the interceptor trench is then pumped into existing evaporation impoundment number 9, located near the interceptor trench. Photos 3 and 4 show the interceptor trench. Photo 4 also shows the fine-grained nature of the alluvium exposed in the trench wall.

While on the site tour, Mr. Freeman and Mr. Luthiger explained that water from many underground mines in the area had been discharged into the Arroyo Puerto, during mining operations in the 1960's, 1970's, and 1980's. Currently, only mine water from the section 30 pumping is being discharged. In addition, Mr. Freeman pointed out several abandoned spoil piles and mines from previous mining activities. Runoff from these locations also drain into the Arroyo Puerto.

The site visit concluded with a close out discussion in the conference room and a tentative review schedule for the ACL applications. No commitments or agreements were made during this site visit.

Photo 1: Tres Hermanos
Sandstone



Photo 2:
Alluvial
Material near
Mine Vent



Photo 3: Interceptor Trench
Looking North



Photo 4:
Interceptor
Trench Looking South

