

February 13, 1997

Mr. David B. Crouch
Director of Environment Quality
Sohio Western Mining Company
150 E. Social Hall Ave., Suite 400
Salt Lake City, Utah 84111

SUBJECT: REVIEW OF SEISMIC ANALYSIS FOR THE SOHIO L-BAR URANIUM RECOVERY SITE

Dear Mr. Crouch:

The U.S. Nuclear Regulatory Commission staff has completed its review of Sohio Western Mining Company's submittal dated September 13, 1996, which provided a review by Shepherd Miller, Inc. of the seismicity of the L-Bar site area. As a result of its review, the staff concludes that the seismic hazard for the L-Bar site, as represented by a magnitude 6.25 seismic event located 15 km from the site, is acceptable.

A copy of the staff's technical evaluation is enclosed. If you have any questions regarding this letter or the enclosure, please contact the NRC Project Manager, Ms. Charlotte Abrams, at (301) 415-5808.

Sincerely,

151
Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-8904
License SUA-1472

Enclosure: As stated

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TECHNICAL EVALUATION REPORT

DATE: January 27, 1997

DOCKET NO. 40-8904 LICENSE NO. SUA-1472

LICENSEE: Sohio Western Mining Company (SWMC)

FACILITY: L-Bar

PROJECT MANAGER: Charlotte Abrams

TECHNICAL REVIEWER: Stephen McDuffie

DESCRIPTION OF LICENSEE'S REQUEST AND CONCLUSIONS:

On September 13, 1996, SWMC submitted a technical analysis of the seismic hazard for the L-Bar site, located in the Laguna Uranium district of New Mexico, on the southern edge of the Mt. Taylor Volcanics, eastern Colorado Plateau tectonic province. The analysis, conducted by the licensee's consultant, Shepherd Miller Incorporated (SMI), proposes a PGA of 0.15 g for the design of the L-Bar tailings facility. SMI suggests an alternative to the mean-value plus 1-sigma method for determination of the PGA presented in the Standard Review Plan (SRP; NRC, 1993) for the review of Title I uranium mill tailings sites. In the proposed alternative, SMI considers the Mt. Taylor seismic zone, located 15 km from the site, to be capable of a M 6.25 earthquake, resulting in a PGA of 0.15 g.

Based on its review of the SMI analysis for the L-Bar site, the staff concludes that the seismic hazard represented by a magnitude 6.25 event located 15 km from the site is acceptable. However, using a favored attenuation model, the staff finds 0.18 g to be a more appropriate PGA value. This corresponds to a seismic coefficient of 0.12 g.

TECHNICAL EVALUATION:

The NRC staff evaluated the SMI analysis, using as guidance the SRP (NRC, 1993). SMI first identified any capable faults which could engender significant ground motion at the site. Floating earthquakes were also considered as part of the SMI analysis. At L-Bar, an appropriate floating earthquake is M 6.25, located 15 km from the site.

An unnamed fault, of unknown capability and 60 km in length, is located approximately 22 km southeast of the L-Bar site. SMI evaluated the PGA at the site from the unnamed fault and from the Mt. Taylor seismic zone, located 15 km from the site. SMI assumed the unnamed fault to be capable of a M 6.0-6.5 event, as offset of the entire 60 km length simultaneously is unlikely (Bernreuter and others, 1994).

The Mt. Taylor seismic zone of the Jemez lineament is not an identifiable tectonic structure capable of offset, but for the sake of conservatism, in the SMI analysis, the zone was assumed to be capable of a M 6.25 event. Using the attenuation relationship of Campbell (1981), SMI derived a mean PGA of 0.09 g at the site from a M 6.25 event on the fault located 22 km to the southeast. Given the site-to-source distance, such an event on the unnamed fault would cause a PGA at the site less than that from a M 6.25 in the Mt. Taylor seismic zone, located 15 km from the site. SMI derived a mean PGA of 0.15 g for a M 6.25 event in the Mt. Taylor zone seismic zone. This magnitude and distance are equivalent to those of a floating earthquake, so the floating earthquake need not be considered in this case.

The staff finds SMI's use of a mean PGA value is an acceptable alternative for uranium mill tailings facilities. Although the SRP suggests using 1-sigma values, staff also considers the use of the Campbell and Bozorgnia (1994) attenuation relationship to be acceptable. The updated model of Campbell and Bozorgnia (1994) provides slightly higher, and more conservative, PGA values than the models presently recommended in the SRP, such as, Campbell (1981) and Joyner and Boore (1981). Using Campbell and Bozorgnia (1994), the staff obtains a mean PGA value of 0.18 g for a M 6.25 event at 15 km. Therefore, the staff concludes that the PGA value of 0.18 g is acceptable for the seismic stability analysis for the L-Bar site.

REFERENCES:

- Bernreuter, D., McDermott, E., and Wagoner, J., 1994, Seismic hazard analysis of Title II reclamation plans: Lawrence Livermore National Laboratory, prepared for the U.S. Nuclear Regulatory Commission, 145 p.
- Campbell, K.W., 1981, Near-source attenuation of peak horizontal acceleration: Bulletin of the Seismological Society of America, vol. 71, p. 2039-2070.
- Campbell, K.W., and Bozorgnia, Y., 1994, Near source attenuation of peak horizontal acceleration from worldwide accelerograms recorded from 1975 to 1993: Fifth U.S. National Conference on Earthquake Engineering, Chicago, Illinois, July 10-14.
- Joyner, W.B., and Boore, D.M., 1981, Peak horizontal acceleration and velocity from strong motion records including records from the 1979 Imperial Valley, California, earthquake: Bulletin of the Seismological Society of America, vol. 71, p. 2011-2038.
- NRC, 1993, Final standard review plan for the review and remedial action of inactive mill tailings sites under Title I of the Uranium Mill Tailings Radiation Control Act, Revision 1: U.S. Nuclear Regulatory Commission, June 1993, 66 p.