United States Department of the Interior

BUREAU OF MINES

SPOKANE RESEARCH CENTER
EAST 315 MONTGOMERY AVENUE
SPOKANE, WASHINGTON 99207

August 10, 1983

Mr. David Tiktinsky
U.S. Nuclear Regulatory Commission
High-Level Waste Technical
Development Branch
Division of Waste Management
Washington, DC 20555

Dear Mr. Tiktinsky:

On August 2nd, two other engineers and I from the Spokane Research Center visited the BWIP site to observe tests being conducted on a Watson Model 750 rotary drill. Arrangements for the visit were made with Don J. Moak, Manager of Drilling for Rockwell.

The drill is being tested in a 6-foot-diameter raise that connects tunnel No. 1 with the other two tunnels at the Near Surface Test Facility. The test simulates the proposed drilling from the exploratory shaft.

The drill (335 lbs) is a standard hydraulic model (H-750) with the chain feed carriage shortened from 10 feet to 53 inches. With the blowout preventer, the hydraulic drill steel clamp, and the motor, there is an effective feed stroke of 29-1/2 inches. They were using 2-foot sections of 1.89-inch-diameter pipe (AW) with a tapered API thread. The 20-HP drill was powered by a 40-HP electric/hydraulic power pack (weight of 1,000 lbs) which also operated a 3,000 psi water pump to control blowout. A brochure, photo, and machine drawing of the Watson drill are enclosed.

Horizontal holes were being drilled to a depth of 150 to 175 feet, the same depth anticipated in the exploratory shaft. The drilling is only to obtain core samples and not for overcoring associated with in situ stress measurement. Overcoring will be done with a larger drill such as a Diamec 260. Because of its size, this drill can only be used in shaft breakout areas. They anticipate drilling 3-inch holes out to 1,000 feet.

The Watson drill appeared far superior to any comparable exploration equipment of its size such as the Longyear CP 65. It had separate controls for water, drill string clamp actuation, drill rotation speed, and feed advance rate. Rotation speed and feed advance were controlled by a vernier value that permitted any desired value from zero to maximum. This provided the close control needed for drilling or overcoring in fractured ground. Also, the hydraulically-powered drill is much quieter than comparable air drills and has an 8,000 lb push/pull thrust for inserting and removing steel.

The Bureau of Mines is considering the purchase of a Watson drill to drill 6-inch-diameter in situ stress overcore holes out to about 60 feet. Even with the shorter drill steel (2 to 3 feet), drill time is much less than with a CP 65.

Rockwell is in the process of purchasing a larger drill for overcoring work. This will be tested in crosscut connection tunnels 2 and 3 at the NSTF.

During our visit, we also observed the Geodril rig for drilling the exploratory shaft. The schedule for startup is sometime between March and December of 1984. There is also a contingency plan to drill a 20-foot-diameter hole on-site to a depth of 800 feet. The purpose of this test is to determine if large-diameter drilling is feasible for sinking the repository production shafts.

Sincerely,

Ernest L. Corp

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Supv. Mining Engineer

Enclosure