



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

DCS  
40-8721

MAY 02 1980

MEMORANDUM FOR: Ross A. Scarano, Chief  
Uranium Recovery Licensing Branch

FROM: J. E. Rothfleisch  
Uranium Recovery Licensing Branch

SUBJECT: INFORMATIONAL MEETING WITH ROCKY MOUNTAIN ENERGY  
COMPANY (RMEC) PERSONNEL

Purpose: To discuss means of verifying whether or not there is hydraulic connection between the Teapot Sandstone and the Parkman Sandstone at the Nine Mile Lake ISL Site.

Place & Date: NRC Offices at Silver Spring, Maryland; April 25, 1980.  
This meeting was requested by M. R. Neumann, RMEC in a telephone conversation with R. S. Kaufmann on March 25, 1980.

Attendees:

NRC - J. E. Rothfleisch, WMUR  
R. S. Kaufmann, WMUR

RMEC - M. R. Neumann, Field Environmental Coordinator  
K. W. Loest, Technical & Environmental Manager  
D. S. Gardner, Operations & Development Manager  
K. L. Shelburne, Hydrologist  
R. E. Iwanicki, Environmental Specialist

Discussion:

The meeting opened with a presentation and handout\* by Dave Gardner covering recent geological studies at Nine Mile Lake site which showed continuity in the top 230 feet of the Pumpkin Buttes Shale formation underlying the Teapot Sandstone proposed production zone. The area studied was within the proposed first year mining area. Ron Kaufmann recommended that, as mining progressed away from this first year area, additional holes be drilled and geophysical logs as well as permeability measurements be made on at least the Nine Mile Lake Facies and upper Pumpkin Buttes layers. Kaufmann indicated that a total of about six additional holes covering the site areas away from the middle of the ore body should be adequate to provide the desired information for the remainder of the site.

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Kevin Shelburne then reviewed the details of the pump test that had been conducted by RMEC previously to demonstrate that there was no hydraulic connection between the Teapot Sandstone ore zone and the Parkman Sandstone aquifer. For this test, the observation well had been completed in the Nine Mile Lake Facies layer about 110 feet from the pumped well which was completed in the ore sand. Observations during pumping for a period of about nine hours failed to produce any measurable drawdown in the observation well indicating that there was no significant communication between the two wells.

Based on the demonstrated continuity of the Pumpkin Buttes Shale formation coupled with the results of the extended pump test, it was concluded that there is no significant hydraulic connection between the Teapot Sandstone and the Parkman Sandstone aquifers in the central portion of the ore body and that no deep monitoring wells should be required at least during the first year of operation of the proposed commercial scale Nine Mile Lake in situ uranium recovery facility.



J. E. Rothfleisch  
Uranium Recovery Licensing Branch  
Division of Waste Management

cc: M. S. Kelly, ORNL  
M. R. Neumann, RMEC

\*RMEC Intercompany Memo from J. Moran to D. Gardner dated April 23, 1980  
(copy attached)

DATE: April 23, 1980

TO: D. Gardner

FROM: J. Moran *J.M.*

SUBJECT: Competency of the Pumpkin Buttes Aquaclude

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The ISL geological staff has completed the analysis of available data regarding the aquaclude beneath the Nine Mile Lake host sand. Two cross-sections have been constructed based on geophysical logs from exploration holes and oil and gas wells in the area. Cross-section A-A' runs north-south as shown on the plan view of the Nine Mile Lake area and is positioned down the center of the ore trend. Cross-section B-B' crosses the ore body perpendicularly and runs down-dip regionally until it approaches the Midway Anticline.

Both the Nine Mile Lake facies (the basal unit of the Teapot Sand) and the Pumpkin Buttes shale lie between our Teapot host sand and the nearest aquifer, the Parkman Sand. The Nine Mile Lake facies is a sandy shale averaging approximately 50 feet in thickness. Core samples taken from Holes BM-3 and BM-5 show the Nine Mile Lake facies to have a very low permeability value. The unit has an average vertical permeability of 5.0 millidarcies.

The Pumpkin Buttes Shale underlying the Nine Mile Lake facies is described in lithology logs for NM-1886 and NM-1906 as a medium brown to gray, massive shale made of abundant carbonaceous clay with common silt. The Pumpkin Buttes Shale is approximately 290 feet thick. Core from Well #143C indicated an average vertical permeability of 0.39 millidarcies. Core points for this hole were randomly chosen exactly 200 feet apart within the Pumpkin Buttes and show the consistency of this Shale.

A regional structural investigation was completed in 1978. No evidence of any type of faulting was discovered anywhere near the Nine Mile Lake land holdings.

D. Gardner  
April 23, 1980  
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In conclusion, all data indicate that the Pumpkin Buttes Shale is an excellent aquaclude. Due to the thickness of the Pumpkin Buttes, no exploration program was ever carried out penetrating the Shale. We feel that the installation of a monitor system would only introduce a plausible system of communication between the Parkman and Teapot Sands. The natural hydrological barrier of the Pumpkin Buttes Shale is best left untouched.

JM/ph  
Attachments

cc: R. Hynes  
K. Loest  
M. Neumann  
K. Shelbourne