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GEOLOGICAL SURVEY
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In Reply Refer To:
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April 6, 1983

Mr. Robert Morgan
Director
Nuclear Waste Policy Act Project Office
U.S. Department of Energy
Germantown, Maryland 20545

WM Record File	<i>10.6</i>
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Dear Mr. Morgan:

In a letter dated March 7, 1981, to the Director of the Division of Waste Isolation in the Department of Energy (DOE), from George DeBuchananne, Chief of the Office of Radiohydrology, U.S. Geological Survey (USGS), the predictability of geologic and hydrologic characteristics of bedded salt were compared to those of salt domes. Subsequently, this letter has been cited and questioned with increasing frequency. We are, therefore, becoming concerned that the letter might be interpreted or applied beyond the limited scope of its original purpose.

At the time the letter was prepared, the DOE had just announced plans for accelerating the schedule for identifying the first repository candidate sites and indicated that the length of time available for characterizing the candidate sites would become much more constrained. Our letter was prepared to advise DOE that in our opinion, that bedded salt deposits generally were simpler geologically, hence more predictable, and might therefore require less work and time (that is fewer drill holes, fewer seismic lines, etc.) to evaluate than domed salt sites.

This advice was based on the general state of knowledge at that time and was not aimed at any specific sites; the data available on various candidate areas or localities were far less than those available today. Thus, the basic argument was that, given a limited amount of data on both bedded salt areas and salt domes, less additional data would probably be needed to establish the potential suitability of a bedded salt site, depending on site-specific conditions. Because there were fewer apparent "unknowns" for a bedded salt than for a salt dome to achieve comparable levels of site evaluation, the letter stated that chances of success in evaluation of potential sites appeared greater for bedded salt sites than for salt domes. The letter then summarized and compared specific aspects of both types of salt settings that would have to be considered and explained why we believed there was a greater risk of a salt dome site failing to qualify than a bedded salt site, with the assumed time and resource constraints.

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Thus, the letter advised DOE on how to focus the site exploration program and should not be interpreted as suggesting that a specific repository site in bedded salt would necessarily be superior to one in a specific salt dome. Such a determination would require sufficient site specific data for both potential repository settings to compare their estimated performance and attendant uncertainties. Therefore, the generalities stated in that letter fade in significance as larger amounts of data are acquired concerning specific locations. The letter was generic in approach and was not aimed at any specific locations containing either type of salt. Obviously, no geohydrologic environment is "simple" or absolutely predictable, nor is any site categorically unqualified because its setting involves some complexities which are difficult to evaluate. The approaching decisions on nominating and recommending specific candidate sites should be based on site-specific information developed for the specific candidate sites, considering non-geologic as well as geologic criteria and the relevant uncertainties; therefore it would be inappropriate for those decisions to be based on or supported in any way on the contents of the 1981 letter. Unresolved geotechnical issues remain at all salt sites currently under study and none of us can determine with certainty that one site is more qualified than any other at this point in time.

Please contact me if you have further questions on the subject letter or other USGS comments regarding repositories in salt environments.

Sincerely yours,

John B. Robertson
Chief,
Office of Hazardous Waste Hydrology

Copy to: Jeff O. Neff

cc: J. Devine--MS106	State Geologists
J. Rollo--MS106	Texas
Chief Hydrologist--MS409	Louisiana
WRD general files--MS402	Mississippi
ACH/R&TC--MS414	Utah
Gene Roseboom--MS908	Phil Justus, NRC
George Dinwiddie--MS410	Al La Sala, Columbus, OH
Peter Stevens--MS410	Hub Miller, NRC ←
Jerry Mercer--Albuquerque, NM	Mike Bell, NRC
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OHWH files--MS4103:32	Program Director, ONWI
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