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January 14, 1985
WGC - R531

of

Mr. Benjamin Rice, Project Manager
Geotechnical Branch
Division of Waste Management
Office of Nuclear Material Safety & Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Deaf Smith County Site, Texas DEA Review Comments

Dear Mr. Rice:

The enclosed comments are the result of Weston Geophysical's review of the above referenced DEA. Our comments are presented in the format described in "Standard Review Plan for Draft Environmental Assessments", dated December 12, 1984.

As directed by you and your fellow staff members, we have concentrated our comments on significant aspects of the DEA documents which impact guideline criteria.

Should you have any questions or require clarification regarding this submittal, please contact us.

Very truly yours,

WESTON GEOPHYSICAL CORPORATION

[Signature]
John P. Imse

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DEA

DEAF SMITH COUNTY SITE, TEXAS

REVIEW COMMENTS

PREPARED BY

WESTON GEOPHYSICAL CORPORATION

FOR

THE UNITED STATES NUCLEAR REGULATORY COMMISSION

MAJOR COMMENT #1

DEA: DEAF SMITH

Subject: Structure and Tectonics

Comment: Presentation of structural setting, particularly existence of faults, for the site vicinity is superficial. This is due to the unavailability of two key reports on interpreted seismic reflection data for the site area and the presentation of unit elevation maps. Because the seismic reflection reports are unavailable, faults in the site region cannot be reviewed for extent, style of faulting and occurrence. Use of unit elevation maps, noting that faults are not shown, rather than more accepted structure contour maps does not provide a clear picture of the structural setting. Structural development through time is not depicted and effects on depositional patterns can not be assessed.

The discussion of site area structure is very descriptive but not interpretive. Based on structure contour maps in [Dutton, et.al., 1982] the Deaf Smith site is located over an uplifted basement region where pre-Pennsylvanian rocks have been removed through erosion and/or nondeposition. Basement uplifts bounding the basin are typically fault controlled [Section 3.2.5], yet this possibility is not applied to the site location other than the statement, "undetected faulting could exist" [p. 3-52]. Based on Figure 3-24 which depicts elevation of the Precambrian basement and structure contour maps in Dutton, et.al. [1982], basement faulting could extend through the site area.

MAJOR COMMENT #2

DEA: DEAF SMITH

Subject: Hydrogeology

Comment: Calculations of travel times to the accessible environment are based on Darcian flow conditions. No calculations are presented where assumed flow is controlled by fracturing which could result in travel times "one, or more, orders of magnitude greater" [p. 6-81] than those presented. One order of

MAJOR COMMENT #2 Continued

DEA: DEAF SMITH

magnitude change for travel time to accessible environment could possibly produce a time of 5700 years [see Comment 6-1], just over half the minimum required interval. Fracture flow is not dealt with rigorously in this study and may be the most significant control on satisfying the guidelines. In addition, zones of fracture flow may also provide loci for interior zones of dissolution within the salt units.

The effect of interbeds on vertical flow through the unit is also not addressed. If the interbeds can act as barriers to vertical flow and can concentrate flow along the interbeds, the time to the accessible environment may be further diminished.

DETAILED COMMENT #3-1

DEA: DEAF SMITH

Section: 3.2, Geologic Conditions, p. 3-4, para. 3

Comment: Figure 3-3 is referenced but not included. This reviewer has used Figure 3-3 from the Swisher County DEA.

DETAILED COMMENT #3-2

DEA: DEAF SMITH

Section: 3.2.1 Regional Geology, p. 3-4, para. 5

Comment: Figure 3-4 is referenced but not included. This reviewer has used Figure 3-4 from the Swisher County DEA.

DETAILED COMMENT #3-3

DEA: DEAF SMITH

Section: 3.2.5.1 Faulting, p. 3-52, para. 4 and 5

Comment: Discussion of basement faulting in the site area references two seismic reflection reports which are not available for review, Budnik^k_^ [1984] and Long [1983].

DETAILED COMMENT #6-1

DEA: DEAF SMITH

Section: 6.3.1.1.1 Statement of Qualifying Condition, p. 6-82, para. 1

Comment: Calculations for travel time to the accessible environment, use a distance of 10 kilometers for horizontal flow. In Section 6.2.1.1.1 the authors state that although a 10 kilometer radius is the allowed maximum, a much smaller area, 5,600 hectares, will be controlled. Based on Figures 4-4 the eastern limit of the repository is nearly coincident with the eastern limit of the surface operations area which in turn is at the eastern edge of the controlled area. Therefore, the accessible environment at Deaf Smith is much less than 10 kilometers and may be less than 1 kilometer. Travel time to the accessible environment may be only the vertical travel time to the Wolfcamp of approximately 57,000 years. If the authors feel that the smaller area is supported, the supporting evidence should be presented. See also Major Comment 2.

DETAILED COMMENT #6-2

DEA: DEAF SMITH

Section: 6.3.1.1.2 Analysis of Favorable Conditions, p. 6-82, para. 3

Comment: See Comment 6-1.

DETAILED COMMENT #6-3

DEA: DEAF SMITH

Section: 6.3.1.1.5 Conclusion for Qualifying Condition, p. 6-85, para. 10

Comment: Distance to the accessible environment is described as "conservatively estimated to be 10 kilometers". First, this is not conservative because that is the maximum allowable distance, therefore it is the most liberal estimate. Second, as discussed in Comment 6-1, the accessible environment may be less than 1 kilometer. Where does the number 769,000 years come from?