



United States Department of the Interior

BUREAU OF MINES WM DOCKET CONTROL CENTER

SPOKANE RESEARCH CENTER
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SPOKANE, WASHINGTON 99207

86 JUL 25 A11:04

July 14, 1986

Mr. Banad Jagannath, Project Manager
Engineering Branch
Division of Waste Management, NMSS
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Jagannath:

As requested in your letter of April 25, 1986, Dr. M. Sokaski and Mr. T. Smelser have reviewed the Final Environmental Assessment report (FEA) for the BWIP site. The review was conducted in accordance with the standard Review Plan and the comment forms are attached. If you have any questions on the comments, please contact Michael Sokaski at 439-6880 (FTS).

Sincerely,

Ernest L. Corp
Research Supervisor
Mine Development Section

Enclosure

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PDR WMRES EUSDOIMI
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WM-RES
WM Record File
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WM Project 10,11,16
Docket No. _____
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Distribution:

Jagannath

(Return to WM, 623-SS)

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BWIP
DRAFT/ FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

BOM

(A) COMMENT No. 6

(B) Comment addressed in Vol. 2, Sections 6.3.3.2.3, 6.3.1.3.3 and Vol. 3, Section C.5.3.2.

(C) The thickness of the Cohasset flow was estimated from seven boreholes in the Draft EA, but eight boreholes were used for estimating the thickness in the Final EA. Presumably this new information is from the recently drilled borehole near the proposed exploratory shaft location. Therefore, some new information has been added. This new information has not changed DOE's conclusion that the Cohasset flow is sufficiently thick and laterally extensive for a waste repository.

(D) The role of the vesicular zone in the repository remains unclear. Some construction will presumably be in this zone as support requirements are discussed, but no reasons are given for construction in this zone. Also, an estimation of the extent of the construction is not given.

(E) The concern over the vesicular zone remains. A new concern has also developed. In Vol. 3, page 6.8-9, it is stated that the vesicular zone will be used as a marker bed to vertically locate developments at approximately the mid-height of the Cohasset flow. This statement is followed by, "This method of determining location within the flow...". This "method" is not clear. Usually a marker bed is visible in the advancing face, and as nearly all excavation should be in the dense interior, it is therefore not apparent how the vesicular zone, which is above the dense interior, can be used as a marker bed.

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DRAFT/ FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

BOM

(A) COMMENT No. 7, 6-65, 6-66

(B) Comment was addressed in Vol. 2, Section 6.3.3.2.6 and Vol. 3, Section C.4.3.5.

(C) No additional information is given. Conclusion is the same as in the Draft EA, i.e. shafts can be constructed with reasonably available technology.

(D) Comment was addressed with the qualification that there is "difficulty in extrapolating from small-diameter boreholes to large diameter shafts."

(E) Although no shaft has yet been drilled in the diameter, depth, and in basalt as proposed at the BWIP site, DOE's drilling experts claim that the shafts can be drilled according to their plans and with their equipment, but a larger drill pipe would seem to be advisable.

BWIP
DRAFT/FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986 BOM

(A) COMMENT No. 4-2

(B) Comment was addressed in Vol. 3, page C.4-99.

(C) More information is given on the grout seal with the conclusion that shafts will be effectively sealed.

(D) The sealing method and the sealing materials were described in greater detail, but no additional information was given on the porthole testing.

(E) The proposed shaft sealing program will use methods that have been successful in the petroleum industry for many years and recently in large diameter drilled shafts. One concern is the chemical grout seal; performance data is needed.

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DRAFT/FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

BOM

(A) COMMENT No. 6-35

(B) Comment was addressed in Vol. 2, Section 6.3.1.3.5 and Vol. 3, page C.5-205.

(C) Comment was only partially addressed. Discussion of long-term properties of sealing materials and monitoring procedures to verify long-term performance of seals is omitted.

(D) Questions regarding seal performance relating to the shafts have not been adequately answered. The selection of techniques and materials for sealing will depend on investigations during the characterization phase according to Vol. 2, page 6-135. In Vol. 3, page C.5-305 it is stated that more data is needed on sealing and seal materials, and this appears to be a reasonable conclusion.

BWIP
DRAFT/FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

BOM

(A) COMMENT No. 6-37

(B) Comment is partly addressed in Vol. 3, Sections C.5.3.1 and C.8.2.2.

(C) The comment regarding whether credit will or will not be taken for the isolation properties of the flow interior was not clarified. The second part of the comment regarding thermal-induced fracturing was addressed but with the same conclusion as in the Draft EA, i.e. thermal-induced fractures will not affect isolation.

(D) The specific issue of the effect of thermal-induced fractures on radionuclide travel paths was not specifically addressed. However, the extent of the thermal-induced fractures is expected to be small according to the DOE analysis and, therefore, not influence isolation.

(E) The computer codes used to estimate the size of the thermal-induced fracture zone require experimental verification, and this is not mentioned in the EA. Verification of computer codes is common practice and is an important final step in demonstrating their accuracy.

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July 9, 1986

BOM

(A) COMMENT No. 6-64

(B) Comment was addressed in Vol. 2, page 6-203 and Vol. 3, page C.8-10.

(C) No new information is given. Conclusions are the same as in the Draft EA.

(D) Comment was addressed as suggested.

(E) The long-term effects of the temperatures expected in the repository on ground supports remains an open question. Research on the temperature effects on ground supports is needed, e.g. creep and corrosion of rock bolts. The influence of temperature on both organic and inorganic grouts as well as their bond strengths is required. A comprehensive investigation on the effect of long-term high temperatures on ground supports is necessary. This information is essential before the long-term temperature effects on ground supports can be answered. The lack of this information is recognized and noted in the EA.

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DRAFT/FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

BOM

(A) COMMENT No. 6-68

(B) Comment is addressed in Vol. 2, Section 6.3.3.2.7 and Vol. 3, pages C8.9 and C8.10.

(C) No new information is given and conclusions are unmodified.

(D) Comment was not addressed as suggested. Reference to mines in the Coeur d'Alene District are omitted in the Final EA probably because the reference given by NRC refutes the claim that minimum maintenance would be required for the repository.

(E) Many of the conclusions concerning support requirements are based on the rock quality system of Barton and the rock mass rating system of Bieniawski. These methods are very sensitive to input parameters which are not well known at the repository level. Consequently, these estimated support requirements can be regarded as only rough approximations.

The amount of maintenance required for the support system cannot be definitely quantified at this time. It will require the excavation of suitable openings (drifts and rooms) away from the exploratory shafts to obtain the necessary information. As mentioned in the Final EA, more information on support maintenance can be obtained during site characterization.

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July 9, 1986

BOM

(A) COMMENT No. 6-69

(B) Comment was not addressed in the Final EA.

(E) The issue of joint surfaces and joint filling has not been resolved. Hydrothermal alteration of the basalt, presumably along joints and fractures, is expected to obstruct the flow of radionuclides from the repository (Vol. 2, pages 6-138, 6-139). However, basalt to basalt contact along joints and fractures is claimed to control shear strength (Vol. 2, page 6-227). It is not explained why the basalt contacts will not be adversely affected by the hydrothermal alteration and therefore degrade the strength of the rock.

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DRAFT/FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

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(A) COMMENT No. 6-71

(B) Comment was addressed in Vol. 3, page C.8-2.

(C) New information was presented which includes calculations indicating the steady state flow through boreholes penetrating the flow top will be small, i.e. a flow of about 10 gallons per minute for each borehole.

(D) Comment was addressed and justifications given for drilling into the flow top.

(E) If the estimated flow through boreholes that penetrate the flow top is accurate, no sudden releases of high pressure water are expected.

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DRAFT/FINAL ENVIRONMENTAL ASSESSMENT COMMENT

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July 9, 1986

BOM

(A) COMMENT No. 6-72

(B) Comment is addressed in Vol. 2, Section 6.3.3.2.9, page 6-239, and Vol. 3, pages C.8-2 and C.6-83.

(C) New information is given on the range of expected water inflows to drift and development headings.

(D) Comment was only partly addressed. No case histories were given to demonstrate that high water inflow rates can be handled. This is a minor point and several examples could be given, e.g. the Escalante Mine, Utah, is pumping about 22,000 gallons per minute.

(E) Predicting water inflow at the repository level cannot be done with great accuracy at this time. Drifting away from the shafts during the site characterization phase and noting water inflow is probably the best way to resolve this question.

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July 9, 1986

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(A) COMMENT No. Additional comments.

The reference by van Holstein and Matheson cited in Vol. 3, page C.5-185 is not listed in References for Chapter C.5.

Figure 6-10 in Vol. 2, page 6-222 is drawn improperly; the correct version follows:

