

WFO.30761

Total # of pages in document includes
2 pages of preface material and
4 pages of text

ARB 12/21/95

Record of FEP Screening Work

FEP ID # NS-11

**Subsidence Associated with Mining Inside or Outside
of the Controlled Area**

The following package contains:

- Screening Argument for the above FEP (s)
 - Technical Review Form (follows this cover page)
 - 1 Completed Comment Forms for NS-11 (at back of document)
(If no comments received fill in N/A)
 - Response to Comments (follows Technical Review Form)
- In total N/A pages of response(s) to comments are included in this records package.

This document represents implementation of:

- Technical comments presented during WIPP Project Management Review Sessions held September 8, 28,29 and open managerial review session.

Signed:

D.R. Anderson D. R. Anderson
(6749 Department Management Approval) Signature

Dated 12/8/95

Lead Staff
(6747)
Division Number

Shada A. Bertram
Signature

Dated 12/12/95

SWCF-A: 1.1.6.3:PA:QA:TSK: NS-11

ARS
12/21/95

Information Only

FEP Title: Subsidence Associated with Mining Inside or Outside the Controlled Area
FEP ID: NS-11

Reviewer Instructions
Check "Yes" for each item reviewed and found acceptable.
Check "No" for each item reviewed and found not acceptable.

1. Are the calculations applicable, correct, and adequate?
YES NO NA (for reasoned argument FEP's)
Comments (attach pages as needed)

2. Are the screening arguments derived from the calculations or arguments applicable, correct, and adequate?
YES NO
Comments (attach pages as needed)

3. Is the record package documenting the screening effort, complete? Use Criteria found in Appendix D of the FEP Plan Version 5.1.
YES NO
Comments (attach pages as needed)

Does the record packages contain sufficient information for an independent person with equivalent technical background to understand the work, evaluate the technical quality of the work, continue unfinished work, and/or reproduce the work and its primary results.

YES NO
Comments (attach pages as needed)

Report your assessment along with deficiencies if any and, if appropriate, make recommendations for addressing the deficiencies (attach pages as needed).

Signature of technical reviewer(s) and lead staff member indicates that the package reviewed was complete, accurate, and acceptable.

Technical Reviewer(s) (attach pages as needed)

Name (Print) Melvin G. Marietta Signature M. G. Marietta Date 11/13/95

Name (Print) Signature Date

Lead Staff

Name (Print) Sharla G. Bertram Signature Sharla G. Bertram Date 11/15/95

Management Concurrence

Name (Print) Margaret Chu Signature [Signature] Date 11/15/95

SCWF-A:1.1.6.3:PA: ^{9A} NS-11 (FEP ID) 0

MB
12/21/95

Information Only

Summary Memo of Record
NS-11 SUBSIDENCE ASSOCIATED WITH MINING INSIDE
OR OUTSIDE THE CONTROLLED AREA

Sharla G. Bertram
Department 6747

Screening Decision

Based upon regulatory interpretation it is recommended that future mining inside or outside the controlled area be eliminated from further consideration.

Screening Issue

Subsidence over future potash mines could modify groundwater flow in strata overlying the Salado Formation

Approach (as performed, not planned)

Based upon regulatory interpretation this FEP is eliminated from the Performance Assessment analyses.

Results and discussion

Not applicable.

Basis for recommended screening decision

The EPA has provided detailed guidance on the types of intrusions that should be considered in assessing repository performance for 10,000 years. The Agency stated the following:

The most speculative potential disruptions of a mined geologic repository are those associated with inadvertent human intrusion. Some types of intrusion would have virtually no effect on a repository's containment of waste. On the other hand, it is possible to conceive of intrusions (involving widespread societal loss of knowledge regarding radioactive wastes) that could result in major disruptions that no reasonable repository selection or design precautions could alleviate. **The Agency**

believes that the most productive consideration of inadvertent intrusion concerns those realistic possibilities that may be usefully mitigated by repository design, site selection, or use of passive controls (although passive institutional controls should not be assumed to completely rule out the possibility of intrusion). Therefore, inadvertent and intermittent intrusion by exploratory drilling for resources (other than any provided by the disposal system itself) can be the most severe intrusion scenario assumed by the implementing agencies. Furthermore, the implementing agencies can assume that passive institutional controls or the intruders' own exploratory procedures are adequate for the intruders to soon detect, or be warned of, the incompatibility of the area with their activities (40 CFR Part 191 Appendix C). (emphasis added)

The Agency intended that implementing agencies not deviate from the fundamental approach to Part 191. The EPA believed that it was important that implementing agencies understand the assumptions used by the EPA in developing the rule so that these implementing agencies could implement the standards in a manner consistent with what the EPA had intended. In fact the EPA stated that "it is important that the assumptions used by the implementing agencies are compatible with those used by EPA in developing this rule. Otherwise, implementation of the disposal standards may have effects quite different than those anticipated by EPA." (50 FR 38074, September 19 1985)

Of the assumptions made by the EPA it is key to point out that the Agency **did not** consider mining influences in their derivation of the release limits. In fact, the EPA specifically provided the example of "drilling a mining borehole" in their explanation of the environmental pathway models used to develop the standards (EPA, 1982). As a result, it would be a significant departure from the EPA's intent to begin assessing mining influences upon repository performance.

Mining may be specifically excluded from within the controlled area on the additional basis that the controlled area is a sacrifice zone from which there will be no commercial exploitation. In support of this argument the EPA has stated:

The release limits apply to radionuclides that are projected to move into the "accessible environment" during the first 10,000 years after disposal. The accessible environment includes all of the atmosphere, land surface, surface waters, and oceans. However, it does not include the lithosphere (and the ground water within it) that is below the "controlled area" surrounding a disposal system. The standards are formulated this way because the properties of the geologic media around a mined repository are expected to provide much of the disposal system's capability to isolate these wastes over these long time periods. Thus, a certain area of the natural environment is envisioned to be dedicated to keeping these dangerous materials away from future generations and may not be suitable for certain other uses. In the final rule, this "controlled area" is not to exceed 100 square kilometers and is not to extend more than five kilometers in any direction from the original emplacement of the wastes in the disposal system. The implementing agencies may choose a smaller area whenever appropriate. (50 FR 38071 September 19, 1985)

Mining within the controlled may therefore be excluded on these additional basis

It is also evident from the EPA's guidance on borehole intrusions that the Agency only intended for

an implementing agency to consider human influences that involved intrusion into the repository (i.e., excavated area). In the guidance addressing the frequency and severity of inadvertent human intrusion the EPA states that it "assumes that the likelihood of such inadvertent and intermittent drilling need not be taken to be greater than 30 boreholes per square kilometer of **repository area** per 10,000 years for geologic repositories in proximity to sedimentary rock formations"(emphasis added) (40 CFR Part 191 Appendix C). Their specific use of the term "repository area" lends further credence to the argument that the Agency intended that intrusions into the repository (i.e., excavated area) be the only type of human influence considered. As a result, mining influences are outside of what the EPA intended an implementing agency to consider.

References

U.S. Environmental Protection Agency (EPA). 1982. *Environmental Pathway Models for Estimating Population Health Effects from Disposal of High-Level Radioactive Waste in Geologic Repositories. Draft Report.* J.M. Smith, T.W. Fowler, and A.S. Goldin. EPA-520/5-80-002. Washington, DC: U.S. Environmental Protection Agency, Office of Radiation Programs.

U.S. Environmental Protection Agency (EPA). 1985. "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes; Final Rule," *Federal Register*. Vol. 50, no. 182, 38066-38089. (*Federal Register* dated September 19, 1985 (50 FR 38066), Environmental Protection Agency, Office of Radiation and Air, Washington, DC.)

U.S. Environmental Protection Agency (EPA). 1993. "40 CFR Part 191 Environmental Radiation Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Waste," *Federal Register*. Vol. 58, no. 242, 66398-66416. (*Federal Register* dated December 20, 1993, (58 FR 66398), Environmental Protection Agency, Office of Radiation and Indoor Air, Washington DC.)