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Mr. Richard H. Campbell
UMTRAP Project Office
US Department of Energy
Albuquerque Operations Office
Post Office Box 5400
Albuquerque, NM 87115

Dear Mr. Campbell:

My staff has reviewed the Preliminary Draft Environmental Impact Statement (PDEIS) dated August, 1982 for remedial actions at the former Vitro Chemical Company millsite in Salt Lake City. The content of this PDEIS addresses all the items which were identified in our letter of January 27, 1982 based on our review of the December, 1981 PDEIS. Enclosed are our comments related to this revised PDEIS. The majority of these comments pertain to lesser concerns such as inconsistencies and requests for clarifications. Those items and issues of more major concern are generically identified in the General Comment section of the enclosed comments. In order to discuss and resolve these concerns, we would welcome an opportunity to meet with you in the near future to plan for mutually agreeable revisions to the present PDEIS.

Sincerely,

Original Signed By

Ross A. Scarano, Chief
Low Level Waste Licensing Branch
Division of Waste Management

Enclosure:
Vitro PDEIS Comments

cc: Robert W. Ramsey, Jr., DOE-HQ
w/enclosure

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NRC Comments on August, 1982 PDEIS For
Salt Lake City (Vitro Site) UMTRAP Remedial Action

I. General Comments

1. The generic deficiency of greatest importance is the insufficient information about the hydrogeological conditions at the Vitro site. Specific comments which address this subject are #3, 19, 22-24, and 47-48.
2. In general cost estimates appear to be too high. Specific comments which address this subject are #7, 53, and 60.
3. The overall tone of the PDEIS downplays the health effects for each alternative. A more objective presentation of health effects is needed, even though the eventual health effects prediction for any one alternative may be very low. Specific comments which address this subject are #9, 29, 31, 34, and 35.
4. Other major comments are highlighted below in tabular form:

<u>Comment</u>	<u>Specific Comment</u>
Choice of 69-acre site	10
Need for controlled access	14, 16
Vegetation at South Clive	15
Appropriateness of Section 3.3	17
Expansion of CVWRF	18
Need for additional flood analyses	38
Need for a liner at South Clive	43
Appropriateness of liner discussion in Section 5.19	45
Reference to NRC Criteria	46
Discussion of Alternative 2 suboptions	19, 50
Availability of suitable soil for cover	52

II. Specific Comments

1. pg. 1-8 (Table 1-2): The indicated volume of contaminated material to be excavated under Alternative 2 (980,000 yds³) is somewhat misleading if, as indicated throughout for purposes of evaluation, Alternative 2 is assumed to involve a liner. If a liner is placed, all tailings at the Vitro site will have to be excavated even if some are redeposited in the same location.
2. pg. 1-10: It is stated here that disposal at the South Clive site ". . . would be in trenches lined with clay and cut deep enough to supply onsite material for the needed 6 feet of material." This appears to be inconsistent with the 7 ft. cover thickness derived from Figure A-27 as that amount needed to meet the proposed EPA radon flux of 2 pCi/m²/sec.
3. pg. 1-1: The description of the major environmental impacts of Alternative 1, no action, are limited to radiological considerations and the continued interference with the Central Valley Water Reclamation Facility Board's expansion plans. As discussed in more detail in comment #23 below, the conclusion that no groundwater protection measures may be needed at the Vitro site is dependent on the assumption that the upward gradient in the lower aquifer will be maintained. The absence of any mention of potential groundwater impacts under the no action alternative implies that this assumption is given; however, information presented in the report does not provide the basis for this assumption.
4. pg. 1-16 (Table 1-3): Why is there no external dose shown for the workforce under Alternatives 2 and 3?
5. pg. 1-16 (Table 1-3): It is not at all clear why more long term jobs are attributed to Alternative 3 than to Alternative 2.
6. pg. 1-17 (Table 1-3): In comparing the impacts of alternatives, it is not clear why the energy used by commercial transporters is not included. The additional transportation involved in Alternative 3 would use considerably more energy than Alternative 2, however, based on Table 1-3, the impacts would appear to be comparable. Quantification of the incremental

impact does not appear to be a difficult task and would make the comparison of total impacts more meaningful.

7. pgs. 1-19 and 3-34: Although it is recognized that in order to simplify the analysis in several aspects it is assumed that Alternative 2 involves installation of a clay liner, the statement clearly does not reach a determination as to what would be the most appropriate groundwater protection suboption under Alternative 2. Therefore, it is recommended that total costs for Alternative 2 be presented as a range corresponding to the suboptions.
8. pg. 2-1: What portion of the Vitro site is fenced at present? The discussion here in the Introduction seems to imply that the entire site is fenced while the discussion on pg 1-11 seems to imply that only the sewage facility is fenced.
9. pg. 2-3: NRC staff objects to the tone of the discussion characterizing the health effect predictions. It is not at all appropriate to indicate that the risks are "overstate[d]." Regardless of whether or not the measurements made by Shearer and Sill were able to detect radon at a distance from the pile, it is a generally accepted fact that radon still exists -- it doesn't disappear.
10. pg. 3-10 to 3-11: It is stated that under Alternative 2 all tailings and contaminated material would be stabilized on a 69-acre portion of the Vitro site consisting of 63.6 acres of the designated site and a 5.4 acre strip adjacent to the property. Some explanation of how it was determined that 69 acres was the appropriate size for the pile for the stabilization in place alternative is necessary. Further, an explanation of why the 5.4 acre industrial tract has been identified as a portion of the needed 69 acre area (requiring the demolition and removal of structures) would be appropriate. (Also pg. 3-35)
11. pg. 3-11: It is not entirely clear what is meant by the statement that the impacts of option b (Alternative 2) "will bound the impacts of the other two seepage control options." It is assumed that the impacts referred to here are primarily those related to remedial action costs and schedules. In any case, however, this statement needs to be clarified.

12. pg. 3-13: Why does the cross section drawing of the stabilization with liner option show a smaller surface area than the other two options (2150 ft. vs. 2200 ft)? Also, given a three foot liner underlain by a three foot gravel base for this option, why does the pile height only differ by 5 ft.?
13. pg. 3-14: What is the basis for assuming that a three foot base layer of granular material will be needed to provide stability for liner placement? Some consideration ought to be given to draining the wet areas, use of sumps, or use of a thinner gravel base.
14. pg. 3-18: Although controlling access to the Vitro site if it is stabilized in place may likely be the most reasonable course of action, the language that it would "necessarily remain under controlled access" is considered too strong.
15. pg. 3-25: The discussion here of final stabilization of the South Clive site indicates that "the cover itself will be stabilized by the placement of vegetation . . ." This is inconsistent with the conclusion reached on pgs. 1-10 and 1-15 that "in Alternative 3 revegetation is not practical . . ." Given the extremely low precipitation in the South Clive area, the likelihood of being able to establish self-sustaining vegetation is unlikely.
16. pg. 3-29: Similar to the comment in item 15, the statement that access to the South Clive site would be restricted is considered too strong.
17. pg. 3-33: It is recommended that the title of section 3.3 indicate that this section is intended to be a comparison of the major environmental impacts associated with the alternatives. The need for this section is questionable.
18. pg. 3-35: The significance of the impacts related to interference with the CVWRF Board's expansion plans might be better understood if some information were presented which would lend a perspective to the need and public benefits associated with such an expansion.
19. pg. 3-36: As discussed in more detail below, it is not clear whether mitigation measures to protect groundwater are

necessary to meet the EPA proposed standards. Given this candid discussion, however, it would be appropriate to indicate at what points, and on the basis of what criteria, one of the suboptions of Alternative 2 would be selected as the preferred course of action if Alternative 2 is chosen.

20. pg. 4-7 to 4-8: In addition to the information presented regarding precipitation, data related to evaporation rates in the affected areas needs to be included.
21. pg. 4-34: The statement that water quality samples have been taken along the transportation corridor in order to develop background data "prior to transportation of the tailings" is inappropriate in that the tone implies that the tailings will be moved. This is inconsistent with the position that the statement presents no preferred option.
22. pg. 4-35: As noted in the general comment, more geohydrological detail needs to be presented to explain what is meant by the phrase "partially confined groundwater system." The interrelationship between the shallow and lower aquifer needs to be addressed in detail. Further, in order to make predictions regarding potential future groundwater impacts, it is essential to understand the current extent of contamination. How far have the contaminants spread under existing conditions.
23. pg. 4-36: It is stated that at least one of the wells on the Vitro site (which pump tests show could yield greater than 1100 gpm) is being considered for redevelopment as part of the public water supply by the City of South Salt Lake. Given that the upward gradient of this lower aquifer is the factor relied upon to prevent vertical seepage, what would be the effect of this aquifer being drawn down? How much draw down could occur before the gradient would be reversed? What is the likelihood of such reversal occurring and what would be the impacts on the lower aquifer?
24. pg. 4-36: In view of the fact that more than 120 domestic wells exist within 0.5 mile of the Vitro site, what analysis has been done to verify that no communication exists from the shallow to the lower aquifer?

25. pg. 4-37 and Appendix D: The baseline water quality data for the South Clive site indicates that no significant distinction can be made between the shallow and deep wells. Are these the same aquifer?
26. pg. 4-38: It is stated that the closest known wells to the South Clive site are located approximately 3 miles northwest and 3.4 miles east. What is the present use of these wells?
27. pg. 4-59: It appears there is a typo in the 1st paragraph. It is our understanding that the industrial tract along 3300 South Street is currently under consideration, not construction.
28. pg. 4-60: It is stated that the lands in the vicinity of the South Clive site are rarely used partially because of muddy conditions. This statement as well as the moisture percentages noted in the boring logs are surprising in view of the extremely low average annual precipitation. Are these conditions a result of evapotranspiration? If not, what is responsible for such conditions?
29. pg. 5-1: The food ingestion pathway is eliminated from consideration because there is no significant agricultural land use near either of the sites. Explain why this conclusion is reached despite a 16% agriculture land use within a half mile radius of the site (see Sec. 4.9.1, p. 4-57).
30. pg. 5-4: Item 4, "Radionuclide concentration data," in the list following the first paragraph is not a MILDOS program input parameter.
31. pg. 5-5: Risk factors of 20 and 120 deaths per million man-rems are used for lung cancer deaths due to radon daughter inhalation and cancer deaths due to gamma exposure, respectively. These should be more positively identified. (Three references are quoted, but it is not clear if the risk factors are from one or more of the references.) Also, in view of the uncertainties involved in deriving risk factors it should be made clear that these factors are not to be construed as authoritative predictors of actual health effects. Whatever risk factors are ultimately used, it should be mentioned that there is a wide range of values used by the scientific community.

32. pg. 5-6 and 5-7: It is stated that direct external exposure of the whole body is an important secondary pathway for remedial workers, yet there is no worker dose commitment or excess lung cancer deaths due to whole body exposures in Tables 5-1 and 5-2. Please explain.
33. pg. 5-6: Explain the origin of the estimates for excess deaths due to remedial action.
34. pg. 5-9: Estimates of accident probability and health effects from an accident appear to be speculative. Some consideration should be given to health impact from increased exposure times due to delays in project work at the sites.
35. Sec. 5.1 (overall): Although particulate resuspension is addressed in the section, the ultimate health impact from this source is not documented because of the assumption that it is not a pathway of concern. Resuspension is a significant contributor to total ambient concentrations and its health effects should be calculated.
36. pg. 5-16: The sequence of the various material layers for the final reclamation cover for onsite stabilization is inconsistent with the sequence presented on page A-59. It is assumed that the sequence presented in Appendix A is what is actually intended.
37. pg. 5-16: It is stated that the presence of the coarse granular layer will protect the stabilized pile indefinitely against normal wind and water erosion. What is meant by the term "coarse granular layer?"
38. pg. 5-16: It is noted that the Vitro site is also subject to the long term effects of flooding. The information presented is probably adequate for purposes of the EIS, however, in view of the much greater flood potential of the Vitro site (as compared with the South Clive site), it will be necessary to review detailed flood analyses of all ditches, streams, etc. at a later date.
39. pg. 5-22: It is stated that under the Alternative of no action, contamination of the groundwater will continue for a long period of time, thus constituents near the site will continue to exceed the EPA proposed guidelines for

stabilization of inactive uranium mill tailings disposal sites. Isn't this inconsistent with the conclusion reached on pg. 5-24 that almost no seepage control is needed to meet the EPA proposed standard?

40. pg. 5-24: Based on the stated permeabilities and the total length of slurry wall, the seepage control estimates stated here appear to be in error.
41. pg. 5-24: The seepage model in Appendix A and the conclusions regarding the need for seepage control only address the movement of Radium-226. Will any of the other constituents controlled by the proposed EPA standard move more quickly?
42. pg. 5-25: It is stated here that the groundwater table will be 10-15 feet below the bottom of the trenches. This is inconsistent with the reference on pg. A-84 to excavation of the trenches to within 5 feet of the groundwater level.
43. pgs. 5-25 and A-80: In view of the fact that the seepage analysis for South Clive indicates that almost no seepage control is necessary to restrict contaminant migration to meet the proposed EPA standard and the fact that the water quality data in Appendix D make it highly questionable whether the affected aquifer is even covered by the EPA standard definition of underground source of drinking water, why is the 2 foot clay liner assumed? What is the benefit derived from retarding the migration of tailings fluid out of the trenches?
44. pg. 5-56: It is stated that workers will be unavoidably exposed to above-standard levels of radiation during the 3-year term of the remedial actions. It is assumed that what is meant here is above background. If this is not what is meant, please identify the standard to which this refers.
45. pg. 5-60: Discussion of a clay liner is not needed in consideration of mitigation measures during remedial action (Section 5.19).
46. pg. A-13: The sentence indicating that "certain of the rules and criteria that apply to licensing of active uranium mills will be used by NRC staff in deciding whether they concur with the uranium mill tailings remedial action (UMTRA) and in

deciding whether to license an UMTRA disposal site should be deleted. As indicated in previous NRC comments on the December 1981 PDEIS, the NRC evaluation of an application for an UMTRA disposal site will be geared only to assuring that the results of remedial action performed by the DOE meet applicable EPA 40 CFR 192 disposal standards as they are finally promulgated.

47. pg. A-19 to A-20: Again, several very brief statements are made regarding existing groundwater conditions (e.g. that the deeper system is partially confined, that there is an upward component of flow from the deeper to the shallow system, that recharge to the shallow groundwater system is from upward migration of water from the underlying aquifer and from precipitation.) The interrelationships between these aquifers and the existing groundwater situation in general needs to be characterized in significantly greater detail in order to allow for the necessary evaluations regarding potential impacts and thus the suitability of the Vitro site for tailings stabilization.
48. pg. A-29: It is indicated that groundwater quality monitoring at the Vitro site" will continue at least until January 1983. Consequently, a determination of the need to isolate the stabilized tailings and contaminated material from ground water has not been made." It is not apparent how additional water quality data will permit a determination regarding the need to employ groundwater protection measures. It appears that what is needed in order to make this determination is more detail in terms of geohydrological site characterization.
49. pg. A-34: It appears that there is an inconsistency in the permeability values attributed to the slurry wall. Table A-4 estimates the hydraulic conductivity of the slurry wall to be 0.0001 or 1×10^{-4} while the seepage estimated on pg. A-32 uses a permeability value of 2.8×10^{-4} .
50. pg. A-40: It is stated that in general "the perimeter slurry wall design is more applicable to the conditions at the Vitro site than is the impermeable liner design." This statement is considered prematurely judgemental in view of the fact that no information is presented supporting the assumption that the upward hydraulic gradient of the deeper aquifer will be

maintained. If it is assumed that the slurry wall design is more applicable it should be given equal treatment in evaluating the suboptions under Alternative 2.

51. pg. A-41: What moisture content of the tailings was assumed in the calculation of the cover thickness required to meet the proposed EPA standard for radon flux? Our calculations, assuming a 9% residual tailings moisture content, show that in addition to 2 feet of soil type 4, four feet of soil type 1 would be required.
52. pg. A-41: It is stated that the cover materials will consist of soils imported from nearby borrow sources. The moisture contents for the soil types considered appear rather high. Has it been verified that soils having such characteristics are, in fact, locally available?
53. pgs. A-64 to A-67: Although it is recognized that the cost estimates for remedial actions at this stage are still based on relatively conceptual plans, NRC considers the total DOE estimates may be high by about 35%. Our independent checks with various sources (including local private contractors, State Highway Department personnel, etc.) indicate that the following may represent more typical costs for these types of operations:
- | | |
|--|--|
| movement of contaminated material
within stabilization area
(including \$.50/yd ³ for environmental
and health requirements) | \$2.25/yd ³
vs.
\$3.25/yd |
| restoration grading
(imported material) | \$4.00/yd ³ vs.
\$7.50 yd ³ |
| cover stabilization area | \$4.00/yd ³ vs.
\$7.50/yd ³ |
54. pgs. A-65 to A-67 (Tables A-13 to A-15): The quantity of contaminated material within the stabilization area which needs to be moved is given as 124,000 yds³. On page A-50 it is stated that 74,000 yds³ of tailings and contaminated soil around the perimeter of the stabilization area will have to be moved under this alternative. Therefore, it is assumed that

the other 50,000 yds³ of material results from the demolition and cleanup of the industrial tract along 900 West. For purposes of clarification it would be helpful to break these activities out and calculate their costs separately.

55. pgs. A-65 to A-67 (Tables A-13 to A-15): The quantity of onsite tailings and contaminated material which would need to be moved to the stabilization area should be consistently stated throughout. In this table it is given as 1,000,000 yds³ while on Table A-8 it is given as 980,000 yds³. Although this would only have a minor effect on the total cost estimate, it is somewhat confusing.
56. pgs. A-65 to A-67 (Tables A-13 to A-15): Again, although the impact on the total cost estimates may be minor (\$375,000) it would be considered more appropriate to credit the resale value for the conveyor units associated with Alternative 2 since credit is given for the resale value of such equipment under Alternative 3.
57. pg. A-67 (Table A-15): It is noted in footnote C that the slurry wall would be 25 ft. deep. This is inconsistent with the discussion on pg. A-31 which describes the wall as 20 ft. deep.
58. pg. A-83 (Figure A-27): As in comment 51 above, what residual tailings moisture content was assumed in calculating the cover thickness for the South Clive disposal option? Our calculations, assuming 9% tailings moisture, indicate that 7.5 ft. of cover would be required. In any case, however, the calculated value for what would be required is greater than the thickness used in the remedial action design described on pg. A-104.
59. pg. A-87 and Figure A-28: It is indicated in both the text and the drawings that the trench sideslopes under Alternative 3 would be 1 horizontal to 1 vertical. This is inconsistent with the description on pgs. A-84, A-101 and other references throughout the text.
60. pgs. A-107 to A-110: In general, comments above regarding Alternative 2 cost estimates apply to the Alternative 3 cost estimates presented here.

61. pg. F-3: Reference to page G-7 of Appendix G, NUREG-0706 for derivation of the resuspension source term should be page G-10. What assumptions and input parameter values were used for deriving the $4.1E-7$ g/m²-sec natural suspension rate? Is this the vertical flux value? Did the local meteorology enter into this estimate? If so, please provide a copy of the local joint frequency wind distribution.
62. pg. F-11: There should be an explanation of how 25 pCi/l of radon six feet above the tailings and 15 percent equilibrium between radon and its daughter products were determined.