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FINAL COMMENT/RESOLUTION SUMMARY OF U.S DEPARTMENT OF ENERGY COMMENTS ON FINAL TREATABILITY STUDIES PLAN

ROCKY FLATS PLANT

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado

ENVIRONMENTAL RESTORATION PROGRAM

April 1992

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ROCKY FLATS ENVIRONMENTAL RESTORATION PROGRAM
REVIEW/COMMENT RESOLUTION FORM

Document No. and Title: FINAL TREATABILITY STUDIES PLAN (AUGUST 26, 1991)

Reviewer Name(s): U.S. DEPARTMENT OF ENERGY Date: April 21, 1992

REVIEWER'S COMMENTS			RESPONSE
COMMENT NO.	PAGE NO.	COMMENTS	DISCUSSION
		GENERAL NOTES: 1. This document contains the responses to comments made in two separate, but very similar memorandums. The memorandum dated Aug., 1991 and the memorandum dated Sept., 1991 have nearly identical comments and differ by only seven comments. In an effort to reduce waste and simplify the response process, the documents have been combined into one. Those comments which are unique to an individual memorandum are marked appropriately. * Comment from Aug., 1991 memorandum only. Generated by the Decontamination and Decommissioning Branch, Division of Southwestern Area Programs, Office of Environmental Restoration. ** Comment from Sept., 1991 memorandum only. Generated by the Waste Management Division 2. Please note that where comments suggest amendments, changes, edits, additions, or deletions, the Final TSP dated Aug. 26, 1991 will not be re-opened for these types of changes.	
		GENERAL COMMENTS	
1		The testing of stabilization technologies should be examined more carefully because these technologies could generate large quantities of materials that would have to be disposed. Perhaps these technologies should only be tested with materials generated from physical separation, soil washing, magnetic separation, and transuranic (TRU) clean processes rather than untreated soils.	We agree that the testing of stabilization technologies should be examined in more detail and will attempt to include a more thorough investigation of these technologies in the Annual Report. We also agree that stabilization of materials extracted from treatments is much more efficient than stabilization of masses of untreated soils in large remedial actions and will attempt to address this in the technology specific test plans.
2.		The proposed pilot scale testing with oxidation of volatile organic compounds does not make sense because the 881 Hillside Treatment Facility will use this process. The data from the treatment plant operation will be far more valuable than limited testing. In addition, several other facilities are already using these technologies at full scale operation. Therefore, the reviewers do	The TSP attempted to address all appropriate technologies suitable for testing. We agree that the full scale plant operation will yield more data than a reduced scale pilot test. If the 881 Hillside program is complete before the Sitewide program, then the generated data will be incorporated in the TSP annual reports in lieu of an additional test.

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		not see any new information being generated from these pilot scale tests.	If the 881 overlooks any useful measurements the Sitewide program will include a test to supplement the data gaps.
*3.		Integration of all technologies being addressed by the Office of Technology Development (OTD), Environmental Restoration and Waste Management (EM-50) should be noted and their applicability evaluated. It may be that some of these will not be available in time to address the early Operable Units (OUs), but others may well be. Innovative technologies are not being actively pursued by Rocky Flats Plant (RFP). Interagency Agreement time constraints (e.g., completion of the treatability studies within 36 months of TSP approval by the United States Environmental Protection Agency (EPA) and the State) effectively limit selection and evaluation to only well-developed technologies in order to meet those constraints. The text should address this situation, anticipating possible concerns among the readers that RFP is not "forward looking" in technology evaluation and selection.	Technologies being developed by EM-50 will be considered in the TSP annual reports as information is provided by EM-50. EG&G Rocky Flats is in fact pursuing innovative technologies. Innovative technologies that were excluded from the TSP have not been permanently dropped from the program. Information on these technologies will be monitored in future annual reports and some of these technologies may be incorporated for studies as appropriate when more information is available.
*4.		In the presentation of the Operable Units (OUs), it is difficult for the reader to locate the units relative to the site since only a very brief discussion is presented. As an example, OU-1 is the 881 Hillside which is described as located in the southeast corner of RFP and consists of 11 hazardous substance sites. OU locations should be delineated in a figure similar to Figure 2-2.	The difficulty in locating the OUs relative to the site is understandable as each OU is not necessarily defined by a geographic area alone. An OU, by definition, can be defined by a combination of three elements; contaminant, matrix, and geographic location, hence some of the OUs overlap.
*5.		There should be a discussion of waste minimization efforts in Environmental Restoration activities at Rocky Flats.	There is currently no formal waste minimization program as part of the Environmental Restoration activities at Rocky Flats Plant. However, as the technology-specific test plans and Operable Unit-specific test

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			plans are developed, waste management and reduction will be considered in each one.
		SPECIFIC COMMENTS	
1.		Executive Summary: A table listing the technologies chosen for treatability studies will be helpful in this section.	See General Note #2. The technologies chosen for treatability studies will be listed in the Executive Summary of future annual reports.
2.		Page VIII is out of sequence.	See General Note #2. The page numbering error has been noted. Our copy does not show Page VIII out of sequence, but instead shows Page VIII appearing twice.
3.		Two copies of p. VI are present.	See General Note #2. The page numbering error has been noted. The published copy does not show two copies of Page VI. This may be the result of a binding error.
4.		Page 3-1, para, 2: Will the guidelines and any additional requirements developed in the TSP be used in the individual Corrective Measures Study/Feasibility Study (CMS/FS)?	Yes, guidelines developed in the August 26, 1991 Final TSP for Treatability Studies Work Plans will be applied to both the Sitewide Treatability Studies and Corrective Measures Studies.
5.		Page 3-1, para. 3: Will the TSP require sampling of the site for characterization beyond what is already being done? If so, how will this be coordinated with existing sampling plans?	The TSP program and annual reports evaluate candidate remedial technologies based on the currently available characterization data and will not generate sampling for characterization beyond what is already being done. However, if necessary, individual technology work plans will address coordination with existing sampling plans.
6.		Page 3-6, para. 1: If a technology is chosen for a study at a specific Operable Unit (OU) before the TSP is able to do the study, will it be eliminated from the TSP or will the TSP still evaluate the technology?	A technology used in an OU-specific study which provides results useful to the Sitewide program will not be re-tested in the TSP program if it is not necessary. The technology and its results will be reported in future annual reports.

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*7.		Section 3.2, p. 3-6, para. 1: It appears that participation in an integrated program may be less expensive. It would be helpful if the text elaborated on how the cost of participating in integrated programs compare with Rocky Flats evaluating the same technology.	Rocky Flats Plant is participating in both the SITE program on the Techtran (Filter Flow) Technology on OU4, and the Integrated Demonstration with Nevada Test Site on plutonium contaminated soil clean-up on OU2. We are planning to collaborate with the Nevada Test Site during Integrated Demonstration (ID) tests on plutonium contaminated soil. We plan to reduce overall expenses by using cost sharing during implementation of ID tests for evaluation of the TRU Clean technology.
8.		Section 3.2, p. 3-6: The text states that because of funding and outside control of external programs [Office of Technology Development (OTD) funded programs and Environmental Protection Agency (EPA) site demonstrations], Rocky Flats Plant (RFP) participation is questionable. Furthermore, the text states that "once participation is decided, it is the intent of DOE to coordinate with EPA and the Colorado Department of Health (CDH) before conducting any treatability testing including those conducted off site." These statements make the reviewer wonder how participation is to be "decided" and how active will the RFP participants be in cooperation with the external programs. It would seem that active efforts would be made to resolve the funding and outside control issues and then decisions should be made regarding participation. Considering that the site and the participants are "government" related, the citizenry could demand that more cooperation be implemented.	See Specific Response #7.
9.		Section 3.3, p. 3-8, para. 1: All results should be reported since it may not be possible to determine if they are significant until all technologies are evaluated.	This has been addressed in Section 3.3, p. 3-8, para. 1 of the Final TSP dated August 26, 1991. "The Treatability Studies Program includes the preparation of interim and annual reports. Interim reports will be prepared when individual bench or pilot scale studies are completed and will present all results or conclusions. This will facilitate the

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			provision of relevant information to individual OU programs as soon as possible."
10.		Section 4.1, pp. 4-1, to 4-6: Locating the Operable Units (OU) relative to the site is difficult because only a very brief discussion followed their presentation (for example, OU 1 is the 881 Hillside that is described as located in the southeast corner of RFP and consists of 11 hazardous substance sites.) This should be marked in a figure similar to Fig. 2-2. Table 4-1 (p. T-2) includes the reference title of U.S.DOE 1990a which includes the words "High Priority Sites." The different treatability studies should be phased to take into consideration any prioritization established.	See General Response #4. We agree with the comment and plan to prioritize the treatability studies.
11.		Section 5.2.4, p. 5-23: Reference is made in the text to Table 5-8 (p. T-118) summarizing the technologies selected for bench/laboratory tests and to Table 5-9 (p.T-119) summarizing those selected for pilot scale testing. Note that the technologies selected are all in advanced stages of development or commercialization. Technologies that passed preliminary screening but were not selected for treatability studies include many that are under development by OTD. Although innovative technologies are not being actively pursued by RFP, under the intra-agency agreement, the submission and completion of the treatability studies require well-developed technologies be selected and evaluated for the RFP.	See General Response #3.
12.		Section 5.1.2, p. 5-5, para. 2: A list of the "numerous technology data bases" would be helpful.	See General Note #2. We agree that a list of the "numerous technology databases" would be helpful and will attempt to include this in future annual reports.

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13.		Section 5.1.4, p. 5-8: "The technology was then assessed against other proven technologies and if it offered no significant advantages in terms of effectiveness, cost, O&M requirements, or reduction in adverse impacts, it was eliminated from consideration." This type of comparison seems difficult to do if the emerging technology has only been tested in the laboratory because many unforeseen problems can occur once the technology is implemented in the field.	Emerging technologies were assessed against proven technologies based on the best data available at the time of publication of the TSP. Although this comparison seems difficult to do in light of the uneven level of development, it was the best comparison available at that time. The innovative technologies have not been permanently dropped from consideration. As more information becomes available on emerging technologies we will try to reassess these comparisons and address any new findings in future annual reports.
14.		Page 5-20, "In-Situ Soil Flushing for Organics": The description refers to above ground soil flushing or washing, but above ground treatment is not discussed previously.	The meaning of this comment is not clear. The August 26, 1991 Final TSP description of "In-Situ Soil Flushing for Organics" (Page 5-19) does not refer to above ground soil flushing or washing.
15.		Page 5-22, "Thermal Desorption," para. 2, line 2: In the phrase "Another process is," the "is" should be "uses."	This has been addressed on page 5-22, "Thermal Desorption", para. 2, line 2 of the Final TSP, dated August 26, 1991.
16.		Section 6.6, p. 6-3, Data Management: The term "RFEDS" is not defined.	This has been addressed in Section 6.6, p. 6-4 of the Final TSP, dated August 26, 1991.
*17.		Page T-14, Table 5-2: The presence of volatile organics is noted in the description of the OUs, however, there are no volatile organics identified in the soils column of this table. Please clarify.	Table 5-2 lists only chemicals which were reported above ARARs in two or more operable units. Although 4.1 SUMMARY OF CONTAMINANTS - OPERABLE UNITS may mention that soils in a specific OU were subject to solvent or VOC spills, these data would not be reported on Table 5-2 unless detected VOC concentrations exceeded ARARs. As shown in Table 4-2, potential ARARs for VOCs from the EPA 1989 RFI Guidance Document in soils are relatively high, and no VOC compounds showed maximum concentrations which exceed potential ARARs for soils.
18.		Page T-25, Electron Beam, Adverse Impacts: Electron beam would need very high energies to produce new radionuclides. This should not be a problem at energies used for destruction of volatile organic compounds.	This is a valid comment that will be noted for use in future annual reports.

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19.		Page T-31, Plasma Arc, Adverse Impacts: The term "PIC" is not defined.	This has been addressed on page T-31, Plasma Arc, Adverse Impacts, of the Final TSP dated August 26, 1991.
20.		Page T-32, Supercritical Water Oxidation, Implementability: If this technology, effective in the parts per billion range, is not applicable to organic concentrations in the parts per million (ppm) range, why is it retained? This should be clarified as most groundwater and soil at Rocky Flats is contaminated at the ppm level.	It should be clarified that the implementability of Supercritical Water Oxidation is effective for concentrations of ppm and greater, not ppm and lesser as the comment suggests. Therefore the technology meets the selection criteria and is retained.
*21.		Page T-43, Trickling Filter, Applicability: It appears that the word "organics" is misspelled.	This has been addressed on page T-45 of the Final TSP, dated August 26, 1991.
22.		Pages T-82 and T-83: Soil washing is listed twice.	This has been addressed on page T-86 of the Final TSP dated August 26, 1991.
23.		Pages T-86 and T-93: Why is masonry cement not retained for the metal contaminant group but is retained for the radionuclides?	This is an error in the text which has been corrected in the Annual Report. In fact, masonry cement has been retained for both the metal contaminant group and the radionuclides.
24.		Page B-1.6, para. 1, line 3: The word "exchanged" should be "exchange."	This has been addressed on page B-1.8, para. 1 of the Final TSP dated August 26, 1991.
25.		Page B-1.6, para. 2, line 3: The word "Regrade" should be Regenerate."	This has been addressed on page B-1.8, para. 2 of the Final TSP dated August 26, 1991.
**26.		Page B-1.8, Appendix B: The references listing the magnetic separation technique did not include a report that may be of value to the RFP in pursuing this technology. The reference is Hoegler, J.M., and W.M. Bradshaw. "Magnetic Separation of Department of Energy Wastes" (ORNL/TM-11117---DOE/HWP-80) March 1989.	See General Note #2. This comment has been noted and we will locate the reference and include it in future annual reports.

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27.		Page B-1.12, para. 2, line 7: The term "radiocolloid" is not defined.	On page B-1.14, para. 2, line 7 of the August 26, 1991 Final TSP, the term "radiocolloid" is defined as the colloidal form (non-crystalline substance with very large molecules, which forms a viscous solution) of the radionuclide Americium.
28.		Page B-1.20, para. 2: If portland cement is being used at Rocky Flats, why is it being proposed for a treatability study?	Portland cement was formally proposed in the Final TSP dated August 26, 1991 because it is the scope of the TSP to evaluate all candidate remedial technologies whether in use at RFP or not. All relevant data and information about the current use of Portland cement at Rocky Flats will be gathered, analyzed, and possibly included in future annual reports.
29.		Page B-1.23, description line 1: The term "aquitated" is not defined.	On page B-1.27, line 1, of the August 26, 1991 Final TSP, the term "aquitated" is taken directly from the TRU Clean™ literature and is a process which uses a hydraulic gravitational separation process.
30.		Page B-2.3, para 1: The "number of air stripping units" should be replaced with "number of transfer units" because this is the proper terminology.	This has been addressed on page B-2.3, para. 1, Line 9 of the August 26, 1991 Final TSP. The phrase has been changed to "number of mass transfer units."
31.		Page B-2.3, last para., last line: The word "is" should be "are."	This has been addressed on the last line of page B-2.3 of the Final TSP dated August 26, 1991.
32.		Page B-2.22, last para.: The dates on the defense waste processing facility should be checked.	The dates will be checked. If these dates are used again in future annual reports they will be corrected.
33.		Page B-2.25, para. 1, line 7: "Pretreatment be acceptable" should be "Pretreatment to be acceptable."	This has been addressed on page B-2.26, para. 1, line 7 of the August 26, 1991 Final TSP. Phrase has been changed to "pretreatment to be acceptable".

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34.		Page B-2.36: Does the Low Temperature Thermal Treatment process simply volatilize organic compounds or does it also destroy them? This process is not clear from the "description" and "advantages and disadvantages."	On page B-2.37 of the August 26, 1991 Final TSP, Low Temperature Thermal desorption is a non-combustion process in which organic contaminants and water are volatilized and removed from contaminated soil. Depending on allowable volatilization rates into the atmosphere, an after-burner is often used to destroy/combust the volatilized vapor.
35.		Appendix C Title: The title should be changed to "bench or laboratory scale treatability studies statements of work" to reflect the contents.	This has been addressed in the Final TSP dated August 26, 1991.
36.		Page C-3, para. 3, first word: The word "it" should be "if."	This has been addressed in the Final TSP dated August 26, 1991.
37.		Page C-15, Ultrafiltration/microfiltration: How will this work be coordinated with the OU2 surface water seeps treatment studies scheduled for the interim measure?	A surface water microfiltration technique is scheduled to be tested for OU2. Results obtained from this test will be evaluated and considered in the schedule and design of ultrafiltration/microfiltration in the Sitewide program.
38.		Page C-16, para. 2: The second sentence is not clear.	See General Note #2. We agree with the comment.