



Department of Energy

**Ohio Field Office
Fernald Area Office**

P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155



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SEP 21 1999

Mr. Thomas A. Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

DOE-1006-99

Dear Mr. Schneider:

**TRANSMITTAL OF RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY'S
COMMENTS ON THE SILOS 1 AND 2 FINAL PROOF OF PRINCIPLE TESTING REPORTS**

Enclosed are two (2) copies of the responses to the Ohio Environmental Protection Agency's (OEPA) comments on the Silos 1 and 2 Proof of Principle (POP) Final Testing Reports for your formal review and comment.

If you or your staff have any questions relative to the Final Reports, please contact Dave Yockman at (513) 648-3141.

Sincerely,

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Yockman

Enclosures

Mr. Tom Schneider

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cc w/enclosures:

G. Jablonowski, USEPA-V, SRF-5J
T. Schneider, OEPA-Dayton (three copies of enclosures)
F. Bell, ATSDR
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
F. Barker, Tetra Tech
AR Coordinator, FDF/78

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cc w/o enclosures:

N. Hallein, EM-42/CLOV
N. Akgunduz, OH/FEMP
J. Lorence, OH/FEMP
A. Murphy, OH/FEMP
D. Yockman, OH/FEMP
J. Saric, USEPA-V, SRF-5J
S. M. Beckman, FDF/52-4
D. Carr, FDF/52-2
T. D. Hagen, FDF/65-2
J. Harmon, FDF/90
R. Heck, FDF/2
S. Hinnefeld, FDF/31
D. A. Nixon, FDF/52-4
D. Paine, FDF/52-4
S. M. Peterman, FDF/52-4
J. L. Smets, FDF/52-4
T. J. Stone, FDF/52-4
T. Walsh, FDF/65-2
ECDC, FDF/52-7

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DOCUMENT REVIEW COMMENT SHEET

DOCUMENT NUMBER AND TITLE: Final OU4 POP Reports - Ohio EPA

Comments				
ITEM NO.	REVIEWER NAME	PAGE NO./ PARAGRAPH	COMMENT	COMMENT RESPONSE AND RESOLUTION
1	Ohio EPA		Ohio EPA is not aware of any 15 ton-per-day joule heated melter being used to treat radioactive waste. This should clearly be reflected in the implementability review within the feasibility study.	The degree to which the required capacity for <u>each</u> of the four technologies has been commercially demonstrated will be reflected in the implementability evaluation. The "implementability" criterion will consider among other factors the technical maturity of the technology, demonstrated commercial availability and the capacity of existing treatment facilities for each technology of interest. The evaluation will also consider the chemistry of the waste streams being processed as similar or dissimilar to the Silos 1 and 2 material. The detailed analyses will consider the size and applicability of the proposed equipment and system designs for all four technologies being evaluated.
2	Ohio EPA		Ohio EPA is aware that during the 72-hour Proof of Principle tests, not all equipment proposed for the full-scale facilities was demonstrated (i.e., the slurry dryer proposed by Vortec). The feasibility study must clearly weigh this factor in the implementability section.	The POP testing yielded data on the performance of all equipment and systems tested. The data indicated that most systems worked well, some needed to be improved, and a few needed to be totally redesigned to meet specified full-scale design criteria. For those components of the full-scale conceptual designs proposed by the POP contractor containing equipment and systems not demonstrated during the POP testing (e.g., the automated filter press proposed by IT), the FS will appropriately discuss the uncertainties associated with implementing these equipment items.
3	Ohio EPA		The drawbacks of any single vendor's proprietary equipment must be considered in the implementability section of the feasibility study.	The implementability criterion will consider the availability of services and material required to implement the technology, including the potential for obtaining competitive vendor bids for a given technology. The alternatives being evaluated in the FS are based upon the technologies, not the vendors or specific process designs utilized during the POP testing. The drawbacks of any specific vendor's process would be evaluated, outside of this FS, as part of the technical evaluation of vendor proposals, submitted in response to the Request for Proposal for remediation of Silos 1 and 2.

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4	Ohio EPA		The Proof of Principle results show the need for on-line spare parts. This information should be included when the detailed design is submitted for review.	A key requirement of the Basis for Design is the 70 percent overall availability factor. To achieve this at the conceptual design level, redundancy on key equipment (e.g., pumps, blowers) was used as a way to improve overall system availability. These redundant equipment items also serve as an approximation for the required on-line spare parts. Furthermore, to estimate spare parts over the lifetime of each technology, consumption of spare parts is also included in the lifecycle cost estimate.
5	Ohio EPA		When reviewing plans for the vitrification pilot plant, DOE expressed concern regarding the possibility of spontaneous combustion of the carbon beds. Carbon beds are again being proposed for radon control in vitrification of the silos material and none of the Proof of Principle reports addresses the possibility of this occurrence. These concerns should be addressed in the implementability and short-term effectiveness sections of the feasibility study.	FDF has investigated the possibility of spontaneous combustion of the carbon beds due to the presence of contaminants in the off-gas system of vitrification processes. FDF recognizes that the presence of NO _x species in the off-gas could theoretically lead to spontaneous combustion of the carbon bed under extremely remote circumstances. A laboratory investigation was conducted at the University of Cincinnati. They were unable to cause spontaneous combustion due to NO _x under any condition. However, a process control limit of 20 ppm for NO _x species was calculated for off-gas entering the carbon beds. This design criteria would limit the accumulation over time of NO _x species in the carbon beds to less than 1 wt% on the carbon which we believe eliminates any significant potential for spontaneous combustion. This requirement was communicated to all the POP vendors in the POP contract, so that adequate off-gas treatment (e.g., NO _x destructor) would be included in the design of the proposed full-scale treatment processes. This design criterion is discussed in Appendix G of the FS. The potential for spontaneous combustion of the carbon beds will not be a significant implementability issue for discussion in the FS and its mitigation by limiting NO _x , will be discussed in the short-term effectiveness section.
6	Ohio EPA		Low flow off gas can be treated with better efficiency than higher flows. DOE should examine the flow rates of each proposed technology in the implementability and short-term effectiveness sections of the feasibility study.	The efficiency of off-gas treatment is a function of the size of the treatment system versus the flow rate. The size of each system is based on the design flow rates and will be reflected in the FS Design.

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7	Ohio EPA		The feasibility study should present a comparison of expected radon releases to the proposed treatment systems and emissions after the treatment system within the short-term effectiveness section.	The release of radon to the environment is a significant concern to DOE-FEMP. If an alternative requires a significantly higher RCS capacity or generates significantly more radon from treated waste, etc., it will be incorporated into the FS designs. As part of the common basis of design for all four technologies, a design criterion was established requiring all releases from silo remediation activities (of which Silos 1 and 2 are only a part) shall add no more than 0.5 pCi/L radon concentration as measured at the fence line. All four proposed full-scale facility designs include off-gas treatment and radon control systems to ensure that their designs satisfy this radon emission requirement. Based on this approach, the expected radon emissions to the environment and exposure to the worker would be as low as reasonably achievable. The expected radon releases, based on the full-scale facility mass balances, will be addressed in the short-term effectiveness section.
8	Ohio EPA		Chem-Nuclear proposed macro-encapsulation as a rework method for off spec material. Ohio EPA disagrees with this method of reworking off spec material. Any rework must involve the regrinding and reprocessing of any off spec material.	DOE-FEMP agrees with OEPA, that the proposed macro-encapsulation system for reworking the off-spec material is not acceptable. The final alternative description for the CNS technology includes a mechanical rework station and material recycling system. As part of finalizing the design basis (Appendix G), conceptual design and alternative descriptions for each of the four alternatives evaluated in Section 3 of the FS, FDF reviewed each contractor's final report for consistency and completeness with consideration to balance of plant issues. FDF compared each contractor's proposed conceptual design with the draft FDF conceptual designs, which formed the alternative descriptions evaluated in this FS. In addition, FDF has considered the input provided by the agencies and other stakeholders in finalizing the alternative descriptions. Appendix M, Section M.3 contains a discussion for each technology which highlights and provides technical justification for those systems and design features where FDF was compelled to deviate from the contractors' proposed conceptual designs, such as the CNS macro-encapsulation system.

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9	Ohio EPA		Although DOE constrained the operation of the technologies to a three-year period, the feasibility study must evaluate the relative ability to recover the schedule for the various technologies. In addition, the feasibility study should present the total hours of operation anticipated to complete remediation of the silos contents for each technology.	In order to evaluate all four alternatives on an equal basis, DOE constrained the operation of the technologies to a three-year period. A key requirement of the Basis for Design is the 70 percent overall availability factor. The reduced availability factor (from 100 percent) incorporates random equipment/component failures, times to recover, and preventive maintenance programs into the operating basis. The reduced plant capacity, in turn, requires plant designers to oversize the facility in order to recover from failures and meet the three-year operating schedule. The FS will evaluate the relative ability of the four alternatives to accelerate the operations schedule and the total hours of operations will be discussed at that time. This will be reflected in the implementability, administrative feasibility discussion. Furthermore, the design capacity of any of the four alternatives can be increased to produce whatever total hours of operation is desired as long as it doesn't push the boundary of the technology or significantly increase capital cost. However, depending on the technology, an increase in capacity may result in a significant increase in capital costs.
10	Ohio EPA		After the selected technology is selected and the full scale plant built, Ohio EPA feels that it is of utmost importance to operate the facility using a non-radioactive surrogate to assure the ability of the technology to operate in a safe manner. This proof of process request should be included in the feasibility study as well as the Request for Proposal for the final vendor.	DOE recognizes the importance to operate the full-scale treatment facility using a non-radioactive surrogate to assure the ability of the technology to operate in a safe manner. The generic remedial action schedule developed for implementing the four alternatives includes an activity entitled, "Proof of Process" testing (Appendix G). The Proof of Process testing is planned to occur after the full-scale treatment facilities have been constructed, tested and the readiness assessment has been completed. Successful testing of a non-radioactive surrogate on a full-scale basis would be a prerequisite for initiating full-scale operations. The duration of this activity is based upon POP vendor input and modified by DOE-FEMP experience. Consideration has already been given for including this requirement in the Silos 1 and 2 Request for Proposal.

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