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OPERABLE UNIT 1 DRAFT FINAL FEASIBILITY STUDY REPORT/PROPOSED PLAN - ENVIRONMENTAL ASSESSMENT

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RESPONSES

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AUG 18 1994

DOE-2082-94

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U. S. Environmental Protection Agency
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77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

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

Dear Mr. Saric and Mr. Schneider:

OPERABLE UNIT 1 DRAFT FINAL FEASIBILITY STUDY REPORT/PROPOSED PLAN - ENVIRONMENTAL ASSESSMENT

This letter transmits document change pages for the Fernald Environmental Management Project (FEMP) Operable Unit 1 (OU1) Draft Final Feasibility Study/Proposed Plan (FS) Report which was delivered to your offices on July 1, 1994.

The enclosed document change pages were prepared in accordance to the July 7, 1994, discussion between our OU1 teams, and reflect the resolutions reached between Department of Energy (DOE) and United States Environmental Protection Agency (USEPA) during that meeting. These change pages are submitted for your review and approval, in support of the ongoing EPA review of the FS.

Please contact Dave Lojek at (513) 648-3127 should you have any questions or require further clarification regarding the OU1 Draft Final FS.

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Lojek

Enclosure: As Stated

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2 Page #: 2-20 Line #: 14-18 Code: M
Original Comment #: 79 (1)

Comment: This is an incorrect statement. In general, PRGs are not incremental above background concentrations; this process is only applicable for radionuclides. It is incorrect to calculate risks, PRGs, PRLs, or any management value for organic/inorganic contaminants using this methodology. All calculations for chemical contaminants are incorrect and must be recalculated. Tables 2-5, 2-6, 2-7, 2-7, 2-8, 2-13 and any other tables in which incremental risks or PRGs above background are presented must be revised.

For radionuclides, I have continuously commented that the most appropriate method of calculating risk is to subtract natural background levels and calculate the risk for the residual. This will avoid problems with the risk management values for the radionuclides as well.

Response: Partially Agree. DOE agrees that PRGs should not be developed such that they represent an incremental risk above that posed by background. In fact, the PRGs presented in Tables 2-5, 2-6, 2-7, and 2-8 were not calculated as being incremental above background. DOE recognizes that the text referenced in the comment, (partially on line 14 of page 2-20) implies that they were. This text is incorrect and will be revised per the action statement below. DOE also recognizes that Tables 2-5, 2-6, 2-7, and 2-8 state that the PRGs presented therein are incremental above background as organic background levels are assumed to be zero. That statement is incorrect and will also be revised per the action statement below. Further, DOE agrees that at the FEMP it would not be relevant to develop a PRL for organics that is incremental above background as organic background levels are assumed to be zero. Again, establishment of the PRLs for organics in the Operable Unit 1 did not use such a methodology.

At this time, however, DOE does not agree in principal that it is inappropriate to establish inorganic PRLs as representing an incremental risk above that posed by background. Although there is no specific reference to "background" in RAGS Part B it is clear from RAGS Part A and from the Guidance for Conducting Remedial Investigation/Feasibility Studies that background concentrations of chemicals is to be considered. There are two types of background considered (anthropogenic and natural). The concept put forward in all of the applicable guidance documents that DOE is aware of is that contamination is produced by activities at a site that result in uncontrolled release and distribution of hazardous substances. The definition of contaminant clearly means concentrations of hazardous materials in media and areas where they are not expected. The indication presented in RAGS Part A is that the level of background risk is not specifically addressed as a part of the guidance for evaluating the need for remedial action.

To consider that a particular cleanup level must be background when the 10^{-6}, 10^{-5}, or 10^{-4} PRG is less than background is in effect saying the excess risk range is actually 0.0.

For a site to be required to "clean" to background is not supported by the NCP. The NCP states that the cleanup levels are set to limit the excess cancer risk. The term excess implies greater than some threshold value which is nominally background. Additionally, there are several other factors to be considered as part of the process of establishing final remedial levels. These are, as identified in the NCP, factors related to technical limitations, uncertainty, and other pertinent information. Each of these additional factors can be made to take into account background (anthropogenic or natural) concentrations.

DOE believes, and EPA has agreed, that it is appropriate to establish PRLs for radionuclides that represent an incremental risk above that posed by naturally occurring background concentrations. DOE does not understand, nor is it aware of any written guidance which clarifies why there would be a distinction between the approach taken for radionuclides versus that taken for inorganics. From a chemical standpoint there is no apparent difference between radionuclides and inorganic metals. The only difference is that radionuclides present an additional exposure pathway, which is direct exposure. Once inside the body, there is a difference in how damage occurs and potential cancer-causing mechanisms, but there is no apparent technical basis for being able to have incremental above-background levels for radionuclides and none for naturally occurring inorganic metals.

While disagreeing in principle with the EPA on this matter, DOE believes that the substantive impact of this issue on the development of PRLs for Operable Unit 1 inorganic contaminants is inconsequential. There may be an issue for only one metal, which is beryllium, where the background value was reported as 0.6 milligrams/kilogram (mg/kg) and the calculated PRG was 0.025 mg/kg which would result in a final incremental risk PRL of 0.63. The issue is moot since there is no ability, on a technical level, to discriminate between 0.6 mg/kg and 0.63 mg/kg. Since these two levels are essentially indistinguishable, DOE will set the PRL for beryllium at the background level. A footnote will be added to the table that clarifies establishment of this level. The text will be reviewed and language which indicates that inorganic PRLs will be established as incremental above background will be removed in favor of language that states background concentrations are a factor to be considered in the establishment of such PRLs.

Action: ***Page 2-11, line 10. Revise Step 10 to read:*** "[***For radionuclides***] subtract this calculated or ARAR level from the background level previously determined for each COC. The difference between them will be the level required by remedial action. [***For other contaminants, if the calculated or ARAR level exceeds the 95th percentile of the background level, then the calculated or ARAR level, as appropriate, will be the level required by remedial action.***]

Page 2-20, Table 2-5, Page 2-23, Table 2-6, and Page 2-26, Table 2-7. The tables were revised by removing the label "Incremental Above Background Concentration" and replacing with the title "Risk-Based Concentrations."

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Page 2-32, Table 2-8. The following was deleted in the first heading: "..., Background Above."

Page 2-41, line 10. The text was modified as follows: "PRLs are established considering the PRG concentrations and background concentrations."

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Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2 Page #: 2-21 Line #: 22 Code: M
Original Comment #: 80 (2)

Comment: It is not clear what is meant by "infrequently detected" as it is used here. What is the basis for applying this criterion? Has it been used with the approval of the U.S. EPA RPM/toxicologist as suggested in RAGS? I have commented on the potential misuse of this criterion before.

Response: Comment Acknowledged. The term "infrequently detected" simply means that after comparison of the PRGs, which are calculated without regard to site concentrations, the development process for the PRL does take into account the detection frequency of a contaminant in a particular media and evaluates the frequency in light of cleanup considerations. Once a contaminant is identified as a COC in the baseline risk assessment, that constituent is evaluated for determining whether a PRL (modified PRG) needs to be established. [***For Oberable Unit 1, COCs were developed using the analytical results from the waste pit contents. There were instances where COCs (based on waste pit contents analytical results) were not detected in other media, such as surface soil. In such a case it would be appropriate to consider eliminating the need to establish an action level for that COC in the medium of interest. The text will be revised to more clearly reflect the above explanation.***] ~~The detection frequency is only one such consideration. If it is determined that the remedial action will address, for example, all of the surface soil and a particular constituent was infrequently detected in the surface soil then the development of a PRL may not be required since assumption is that the media which contained the constituent of concern will be addressed by removing the "hot spots".~~

~~The term infrequently detected is also considered in terms of the technical limitations related to detection in a specific media. In a number of cases, beryllium being just one example, there is no technical ability to both detect and distinguish between the site related concentrations and background. In cases such as these the number of times a particular constituent is detected in the characterization phase and in background can be used to determine whether a PRL is to be developed (PRGs are developed for all COCs and the preferred remedial alternative is designed to address all COCs). The NCP indicates in 40[CFR[300.430 (e) (2) (A), that there are 5 factors to be considered in development of the final cleanup concentrations; these are 1) ARARs, 2) risk range, 3) technical limitations, 4) uncertainty, and 5) other pertinent information. The term Infrequently detected is simply a means to take into account the factors identified in the NCP.~~

Action: ***Page 2-11, line 24. Revise the sentence to read: "...of detection of the COCs in a particular medium will also..."***

Page 2-11, line 26-27. Revise the sentence to read: "...observed concentrations or was not detected in a particular medium, consideration may be..."

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Page 2-11, line 28. Add the following text: "[Relative to Operable Unit 1, the COCs were established considering analytical data collected from the waste pit contents. If a contaminant was established as a COC based on waste pit contents analytical results but was not detected in a separate medium, such as surface soil, then consideration may be given to eliminating the need to propose a remediation level for that particular COC in the medium of interest."]

Page 2-46, line 26. Revise the sentence to read: "...it was not detected in a particular medium, consideration..."

Page 2-46, line 27. Delete existing text and replace with: "[Relative to Operable Unit 1, the COCs were established considering analytical data collected from the waste pit contents. If a contaminant was established as a COC based on waste pit contents analytical results but was not detected in a separate medium, such as surface soil, then consideration may be given to eliminating the need to propose a remediation level for that particular COC in the medium of interest.]

~~Page 2-46, line 27. The following text was added: "The NCP indicates in 40 CFR 300.430 (e) (2) (A), that there are 5 factors to be considered in development of the final cleanup concentrations; these are 1) ARARs, 2) risk range, 3) technical limitations, 4) uncertainty, and 5) other pertinent information. The term infrequently detected is simply a means to take into account the factors identified in the NCP."~~

Step 8 For all receptors, revise the PRGs based on HIs to include all COCs. This requires determination of the relative source contribution from each COC to the total HI of 1.0 for chemical toxicants. The target HQ may be less than or greater than 0.2, depending upon the number of COCs.

Step 9 Pertinent ARARs are identified for the individual COCs for that medium. Present both values, the ARARs level and the calculated risk value. Compare risk-based and ARAR PRGs. If the ARAR concentration level for that COC is less than the risk-based level, the ARAR level should be adopted as the remedial goal.

79 Step 10 [***For radionuclides***] subtract this calculated or ARAR level from the background level previously determined for each COC. The difference between them will be the level required by remedial action. [***For other contaminants, if the calculated or ARAR level exceeds the 95th percentile of the background level, then the calculated or ARAR level, as appropriate, will be the level required by remedial action.***]

Step 11 In the event the proposed remediation level from the first two steps is less than the 95th percentile of the background data for that medium, the proposed action level will be considered indistinguishable from background level. That is, concentrations that are at or below background concentrations would be considered acceptable as a conclusion for any remedial action.

Step 12 The proposed remediation level is compared to the 95th percentile of the observed concentrations for that particular medium, which includes the maximum detected values as reported in the data summary of the RI. The
80 frequency of detection of the COCs [***in a particular medium***] will also be considered in this evaluation. If the proposed remediation level is greater than the maximum observed concentrations or [~~it is infrequently~~ ***was not***] detected [***in a particular medium***], consideration may be given to eliminating the need to propose remediation levels for those COCs. [***Relative to Operable Unit 1, the COCs were established considering analytical data collected from the waste pit contents. If a contaminant was established as a COC based on waste pit contents analytical results but was not detected in a separate medium, such as surface soil, then consideration may be given to eliminating the need to propose a remediation level for that particular COC in the medium of interest.***]

2.2.2.1 Risk-Based PRG Development

Potential health effects resulting from exposures to radioactive and chemical contaminants are divided into two categories: carcinogenic and noncarcinogenic. For carcinogens, EPA has identified, in the NCP, a target range for incremental risks of 10^{-6} to 10^{-4}, or 1 in 1,000,000 to 1 in 10,000, to limit the possibility that an individual will develop cancer due to exposures to residual contaminants at an

NPL site (40 Code of Federal Regulations [CFR] 300). As part of cleanup at sites named to the National Priorities List (NPL), EPA strives to manage possible incremental cancer risks within the target range, which is generally 10^{-6} to 10^{-4}.

For noncarcinogens, EPA guidance provides protection to individuals from health effects other than cancer by proposing that potential intakes or dermal exposures to a toxic chemical are maintained below the reference dose. The ratio of actual or potential dose to the reference dose, referred to as the HQ, is maintained at less than one to provide protection. Exposures to more than one contaminant can result in multiple HQs. The sum of these HQs equals the HI, which must also be maintained at less than one to provide protection.

Beyond the MCLGs, the Safe Drinking Water act establishes secondary MCLs in 40 CFR § 143. Secondary MCLs are also contained in Ohio regulations, OAC 3745-82-02. Secondary MCLs are nonenforceable goals for drinking water established for contaminants whose presence in excessive quantities may discourage the use of a public water supply due to poor qualities such as taste, color, odor, and corrosivity. The secondary MCLs are a TBC in evaluating potential remedial actions.

A summary of the MCLs, MCLGs, and secondary MCLs previously discussed is presented in Table 2-9.

2.2.2.6 Preliminary Remediation Goals for Pit Waste Materials

Two sources of potential groundwater contamination will remain after all Operable Unit 1 remedial activities have been completed. The first is the migration of contaminants from residual soils remaining in the pit area after the pit wastes have been removed. These soils are contaminated by prior percolation of pit contaminants. The second is the migration of contaminants from the stabilized pit materials in an on-property disposal cell if a remedial alternative involving on-property disposal is chosen.

The PRGs for the residual soils are the concentration of COCs in the soils which will result in the groundwater concentrations of the COCs at the fenceline being equal to or less than the PRGs for the off-property farmer using groundwater. Final decisions concerning future land use have not yet been made as additional input from the Fernald Citizens Advisory Task Force is required. In the absence of a final future land use decision, an assumption was made to facilitate completion of the Operable Unit 1 Feasibility Study. The approach taken within the Operable Unit 1 Feasibility Study is similar to that taken in the Operable Unit 4 Feasibility Study. Specifically, proposed remediation levels were developed for a future land use/exposure scenario involving an on-site expanded trespasser and an off-site residential farmer. These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study.

The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure

DOE protectiveness of human health and the environment. [*In limited instances, new information or technical limitations could make it appropriate to revise the current Operable Unit 1 proposed remediation levels upward. Examples include establishment of updated or revised risk assessment methodologies which could affect risk based action levels or technical limitations in numerically establishing a precise background concentration as an action level (where appropriate).*] The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. It

indicates which of the receptors are protected for an ILCR below 10^{-6}, if the PRL based on the expanded trespasser is achieved.

It is anticipated that to attain the referenced proposed remediation levels, a minimum of 15 centimeters (6 inches) of soils will be removed from contaminated portions of the Operable Unit 1 area. Deeper excavations may also be required to remove identified "hot spots." This is particularly true for the polycyclic aromatic compounds which were found in only one sample. Following excavation, the excavation areas will be backfilled with clean soils and seeded. The following steps were followed in developing PRLs for Operable Unit 1:

- Step 1. The soil concentration representing the PRG for the 10^{-6} risk level for the expanded trespasser from Table 2-6 was adopted as the proposed preliminary soil remediation level.
- Step 2. Pertinent ARARs were identified for the individual COC. If the ARAR concentration level for the COC was less than the value identified above, the ARAR level was adopted.
- Step 3. In the event the proposed soil remediation level from the first two steps was less than the 95th percentile of the background soil data set, the proposed soil action level was considered indistinguishable from background. That is, any soil concentrations at or below background concentrations would be considered acceptable as a conclusion for remedial actions.
- Step 4. The proposed soil remediation level was compared to the 95th percentile of the observed surface and subsurface soil concentrations, which includes the maximum detected values as reported in the RI Report for Operable Unit 1, including the data sets such as Characterization Investigation Study on-property gamma spectrometry analysis. The frequency of detection of the COCs in the soils was also considered in this evaluation. If the PRL was greater than the maximum observed concentrations or it was [*not* ~~infrequently~~] detected [*in a particular medium*], consideration was given to eliminating the need to propose remediation levels for those COCs. [***Relative to Operable Unit 1, the COCs were established considering analytical data collected from the waste pit contents. If a contaminant was established as a COC based on waste pit contents analytical results but was not detected in a separate medium, such as surface soil, then consideration may be given to eliminating the need to propose a remediation level for that particular COC in the medium of interest.***] ~~The NCP indicates in 40 CFR 300.430 (e) (2) (A), that there are 5 factors to be considered in development of the final cleanup concentrations; these are 1) ARARs, 2) risk range, 3) technical limitations, 4) uncertainty, and 5) other pertinent information. The term infrequently detected is simply a means to take into account the factors identified in the NCP.~~

The risk or HI to the expanded trespasser and the on-property resident farmer was then calculated for the PRLs to demonstrate effectiveness for the expanded trespasser and to demonstrate the relationship

to the on-property farmer. If the PRL was the SQL as in the case for aroclor-1254, the input concentration for the risk calculations was one half the SQL. In the case for the noncarcinogenic effects for uranium, the PRL was the PRG multiplied by 0.5 because other non-carcinogens were present.

2.2.4 Proposed Remediation Levels for Subsurface Soils

Among the alternatives being considered for Operable Unit 1 is removal of the contents of the pits, the existing liners, and a portion of the contaminated till or the sand and gravel material as appropriate. However, there is inadequate data at the current time (due to potential for direct contamination conduit from the pits to the Greater Miami Aquifer) to determine how much (i.e. how deep) of the till or sand and gravel must be removed to prevent further contamination of the Great Miami Aquifer.

Section 2.2.2.6 presented the development of subsurface soil PRGs. These PRGs were based on being protective for the groundwater user at the FEMP fence line (off-site farmer). This assumption is consistent with the development of the surface soil PRLs presented in Section 2.2.3, where it is assumed that no land development will occur. Final decisions concerning future land use have not yet been made as additional input from the Fernald Citizens Advisory Task Force is required. In the absence of a final future land use decision, an assumption was made to facilitate completion of the Operable Unit 1 Feasibility Study. The approach taken within the Operable Unit 1 Feasibility Study is similar to that taken in the Operable Unit 4 Feasibility Study. Specifically, proposed remediation levels were developed for a future land use/exposure scenario involving an on-site expanded trespasser and an off-site residential farmer. These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study.

The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. [*In limited instances, new information or technical limitations could make it appropriate to revise the current Operable Unit 1 proposed remediation levels upward. Examples include establishment of updated or revised risk assessment methodologies which could affect risk based action levels or technical limitations in numerically establishing a precise background concentration as an action level (where appropriate).*] The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. It is emphasized that the PRGs and proposed remediation levels presented herein are interim, based on an assumed future land use, and may require modification depending on the final approved future land use scenario. In particular, the groundwater

monitoring program would be designed to help ensure that releases from the waste management unit did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. These PRGs were compared against the existing waste concentrations to determine if the PRGs were less than the existing waste concentration. The remedial levels must be developed to determine how much or how deep the material needs to be removed to protect the future users of the Great Miami Aquifer. The assumption here is that if the

Proposed remediation levels are presented in Table 5-2 (for surface soils) and Table 5-3 (for subsurface soils beneath the pits). Note that the levels in Tables 5-2 and 5-3 are interim. Additional input from the Fernald Citizens Advisory Task Force and the public is essential before making final recommendations on land use from a site-wide perspective. The Operable Unit 1 proposed remediation levels will be re-examined by the Operable Unit 5 Feasibility Study Report and Record of Decision, based upon available Operable Unit 5 Feasibility Study conclusions, recommendations from the Fernald Citizens Advisory Task Force, and further public comment. Specifically, the risk assessment for the Operable Unit 5 Feasibility Study will include additional trespassing as well as recreational exposure scenarios, which are to be fully developed on a site-wide basis within the Operable Unit 5 Remedial Investigation/Feasibility Study. A full array of trespassing and recreational scenarios from no trespassing through full recreational use of the site will be developed. If found to be necessary, the Operable Unit 5 Record of Decision will modify the Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment; the
DOE remediation levels will not be adjusted upward. [***In limited instances, new information or technical limitations could make it appropriate to revise the current Operable Unit 1 proposed remediation levels upward. Examples include establishment of updated or revised risk assessment methodologies which could affect risk based action levels or technical limitations in numerically establishing a precise background concentration as an action level (where appropriate).***]

Each action alternative would meet the chemical-specific ARARs associated with potential releases to
50, 52 groundwater, air, and surface water. Most notable of the chemical-specific ARARs are MCLs, with compliance measured at the waste unit boundary (disposal cell and/or restored pit area). All action alternatives would comply with the pertinent location-specific ARARs associated with potential releases to groundwater, air, and surface water. An exception to this statement is discussed in Section 5.1.2 of this Proposed Plan regarding the state siting criteria for sanitary waste landfills. Included among the location-specific ARARs would be those associated with discharge of dredged and excavated material into waters of the United States (33 CFR 323), the protection of wetlands (40 CFR 258.12, 40 CFR 6.302, 10 CFR 1022), floodplains (40 CFR 257.3-1, 40 CFR 264.18, 40 CFR 6.302, 10 CFR 1022), and endangered species (50 CFR 17 and 402) during the on-property treatment and disposal of materials.

All action alternatives would also comply with action-specific ARARs. For Alternatives 4A and 4B, the above-grade disposal cell would incorporate design requirements for the disposal of uranium mill