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NAS CECIL FIELD, FL
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U S NAVY RESPONSES TO U S EPA REGION IV COMMENTS ON DEVELOPMENT OF
ECOLOGICALLY-BASED REMEDIATION GOALS FOR LEAD IN SOIL AT OPERABLE UNIT 5
(OU 5) SITE 15 NAS CECIL FIELD FL

9/5/2000

NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION

RESPONSES TO EPA COMMENTS OF 5 SEP 2000

GENERAL COMMENTS

COMMENT 1: The introductory paragraph states that soil remediation goals must be determined to eliminate or minimize risk. This is effectively predicting a management decision when only one of the nine criteria to be considered is known. Assessment of risk and management of risk are different responsibilities and the ERA should not assume the task of deciding to eliminate risk, the law cites risk reduction not risk elimination. The calculation of preliminary remedial goals (PRG) for soil at site 15 does not ensure that management will make a decision to clean to the site-specific PRGs. The calculation of site-specific PRGs will allow a more accurate characterization of risk and provide management with a tool for evaluating their options. Towards this calculation, invertebrate tissue and soil lead concentrations will be measured and ingestion doses calculated for avian and mammalian receptors. By adding standard toxicity values for these species (TRVs) and setting the hazard quotient equal to 1, soil values will be calculated that pose acceptable risk to the receptors.

RESPONSE: The introductory paragraph has been revised as requested.

COMMENT 2: The first component needing definition is the Conceptual Site Model (CSM). This model should establish complete exposure pathways to be evaluated in the risk assessment. The document as written separates out sources of contamination and migration pathways under "conceptual understanding" from the CSM paragraph which doesn't get mentioned until the conclusion of the document. There needs to be one discussion of the CSM, it should be early on in the document, and it should focus on the complete pathways rather than the exposure routes that are not complete or not being considered. This will eliminate the need in several places explaining why you are not doing something.

RESPONSE: The text describing the Conceptual Site Model has been revised as requested (Section 2).

COMMENT 3: In the risk question section, the only question asked is where did the lead come from. The risk question being asked - what is the source of lead - is not an appropriate risk question (this is a risk assessment not a source assessment). The source is known - lead and skeet - as stated on page one of the document. What is unknown is whether ingestion of site contaminants (Pb) causes or has the potential to cause adverse effects to avian and mammalian receptors. Once the appropriate question is asked, appropriate assessment endpoints can be clarified.

RESPONSE: The text describing the risk question has been revised as requested (Section 3.1.2).

Comment 4: The document has no appropriate Assessment Endpoints (AE). Protection of groups of receptors is not specific enough as "protection" can be defined myriad ways. An example of a more specific AE would be: providing for sufficient rates of growth and reproduction to sustain residential and migratory avian population typical in pine flatwoods habitat. A similar AE can be written for mammalian populations typical in pine flatwoods habitat. More time is spent in the document defending why certain receptors are not included than developing those that the risk assessment will be based on. AEs are an opportunity to communicate to the public the good works we are doing and should be detailed enough to convey the importance of the environmental components to someone unfamiliar with the site.

RESPONSE: The text describing the assessment endpoints has been revised as requested (Sections 3.1.1 and 3.2.1).

COMMENT 5: Measurement Endpoints are "a measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint" (EPA, 1997). They are incorrectly defined in the document as surrogates and doses of lead. The ME's for this risk assessment are tissue residues and soil concentration values. These numbers will be put into a food web model for avian and mammalian receptors and ingestion doses for these receptors will be calculated that can be compared to TRV's.

RESPONSE: The text describing the measurement endpoints has been revised as requested (Sections 3.1.3 and 3.2.3).

SPECIFIC COMMENTS

COMMENT 1. Risk should be singular, not plural in the first sentence.

RESPONSE: The sentence will be revised as requested in the final version of the document (Section 1.0, first sentence).

COMMENT 2: The foundation for PRGs is an appropriate ERA. Central to the ERA is the CSM but I wouldn't say that the CSM is the foundation for PRGs.

RESPONSE: The text has been revised as requested (Section 1.0).

COMMENT 3. The last sentence in the introduction leaves out the risk questions which will be addressed in the document along with the CSM, AE's, and ME's.

RESPONSE: The text has been revised as requested (Section 1.0, second paragraph).

COMMENT 4: There needs to be more explanation of what habitats are at the site. The assumption appears to be that everyone understands what "various shrubs", "planted pine flatwoods", "floodplain forest" and various species of birds, mammals, amphibians and reptiles" are. This is incorrect. I would suggest a little more depth in your description, not a lot but at least enough for someone not intimately involved in the site to have a better idea of what you are describing.

RESPONSE: The text has been revised as requested (Section 2.1).

COMMENT 5: PRGs are not calculated to eliminate risk. You can not eliminate risk without completely eliminating exposure. We are trying to determine acceptable risk. Calculation of PRGs does not ensure that management will clean to that level. See above discussion.

RESPONSE: The text has been revised as requested (Section 1.0).

COMMENT 6: Good discussion of PAH issues. However, you need a specific risk question for the PAH in clay pigeons. What will "screen" out the PAHs? How will the PAHs in the pigeons be compared to the soil concentration? Fingerprinting? (Note: pigeons are 32% petroleum pitch by weight? Mass? Volume?) Need a rational up front.

RESPONSE: The approach for evaluating PAHs has been revised. Determining PAH concentrations in clay pigeons is no longer proposed (Sections 2.4.2, 3.2, and 4.3).

COMMENT 7: The effects list needs to include hematologic, gastrointestinal, respiratory, and immune system effects to be a complete list of the effects of chronic lead toxicity. Fetotoxic and teratogenic effects do not need to be listed separately unless there are fetal effects other than teratogenicity. Reproductive effects could be listed as both fetal and maternal.

RESPONSE: The text has been revised as requested (Section 2.4.1, first paragraph).

COMMENT 8: Soil to invertebrates to animals that prey on invertebrates:
The argument that soil invertebrates are not present is a conceptual model issue. The significant numbers issue could well be argued based on information given that the lead is killing them and that is why there are no soil invertebrates. This could be explained in the habitat discussion, i.e., that there is limited soil organic carbon in this habitat and the soil invertebrates are generally sparse. This route would then not be discussed as a pathway in the conceptual model.

RESPONSE: The conceptual model has been revised; the pathway in question is now proposed for evaluation (Section 2.4.1).

COMMENT 9: The same paragraph states that earthworms are not present (scarce), then re-states this finding another way (not naturally present) a few sentences later. After stating the same finding twice and having us all convinced earthworms are not present, you propose conducting a more detailed survey to be certain. If earthworms are not present, then move on to the next topic. This problem resurfaces on page 6 where the entire page is spent discussing earthworms which aren't present, and literature values which may not be present. It is suggested that you eliminate the lengthy discussions of possibilities and tell us what you do plan to do to calculate lead concentrations in duff instead of belaboring what you probably won't do.

RESPONSE: The conceptual model has been revised; the comment is no longer applicable (Section 2.4.1).

COMMENT 10: Soil to vegetation to duff: More discussion of what exists in the habitat. What is preying on the invertebrates? General receptors beyond birds and mammals.

RESPONSE: The text has been revised as requested. Specific receptors that prey on invertebrates are identified (Section 2.4.1, third paragraph).

COMMENT 11: Soil to vegetation to herbivorous animals:

This paragraph as written is not defensible. Less risk does not guarantee acceptable risk. Invertebrate-eating mammals having higher exposure than herbivorous mammals does not mean risk to herbivorous mammals is negligible. Again, too much time is spent on the AE's not being covered in the assessment and not enough time is spent developing those ecological entities the assessment has chosen to value. This is the time to show off what we are protecting rather than defend what we're not. Why pathway is not complete or insignificant should be in the conceptual site model.

Issue: Less lead accumulation in plants than invertebrates, OK. Therefore invertebrate eating mammals and birds will be more exposed than herbivorous mammals and birds. The unwritten assumption is that invertebrate eating mammals and birds have the same feeding rates as herbivores. Not OK. Herbivores eat substantially more, increasing the potential mass of lead ingestion. They may be more exposed based on a mass loading (mg Pb) but still have a lower dose (mg/kg/day). Need a better explanation.

RESPONSE: The text has been revised as requested (Section 2.4.1, final paragraph).

COMMENT 12: Soil to Animals: Include this in your ingestion model.

RESPONSE: The text has been revised as requested (Section 2.4.1).

COMMENT 13: Assessment Endpoints are "An explicit expression of the environmental value that is to be protected" (EPA 1977) The assessment endpoint is an opportunity to explain why anyone would care about the invertebrates and the birds and mammals that feed on them. This section gives more information relevant to the conceptual model and why particular exposure pathways are important and other pathways may not be as important.

RESPONSE: The text has been revised as requested (Sections 3.1.1 and 3.2.1).

COMMENT 14: Define what you mean by protection. If you can not define this term I would suggest not using it.

RESPONSE: The term "protection" has been deleted and the assessment endpoints have been revised (Sections 3.1.1 and 3.2.1).

COMMENT 15: Exposure to lead in soil at site 15 is considered to be primarily chronic, rather than acute. Why? Lead shot is known to be acutely toxic to many birds.

RESPONSE: The text has been revised to explain that pelletized lead shot is largely absent from the site (Sections 2.4.1, second paragraph)

COMMENT 16: The second paragraph is vague and misleading, "...different receptors preferentially inhabit particular habitat types, AE's can be general enough to ensure all habitat types are evaluated...". The point of the sentence is not clear, nor would it classify as a "discussion" as described in the following sentence. The third paragraph is similarly troubled: "Exposure to lead is primarily chronic, rather than acute". I think what is trying to be said is that toxicologic effects due to lead exposure that are being tested in this risk assessment are chronic which would imply that acute effects are not toxic.

RESPONSE: The text has been revised as requested (Section 2.4.1).

COMMENT 17: Plants are not included as AEs but then a long discussion follows of how they were already assessed. If the information is there, it should be included, and acknowledged. Write an AE for plants.

RESPONSE: The text has been revised as requested (Section 3.1.1).

COMMENT 18: Measurement Endpoints are "A measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint" EPA 1997, not surrogates as stated in the document, nor are they doses of lead. MEs are not surrogates for AEs. See previous comments.

RESPONSE: The text describing the measurement endpoints has been revised as requested (Sections 3.1.3 and 3.2.3).

COMMENT 19: The development of soil remediation goals. This is a numerical depiction of your site conceptual model. I suggest that it be placed there.

RESPONSE: The numerical depiction of the conceptual site model (Equation # 1) has been moved as requested (Section 2.4.1).

COMMENT 20: If the receptors are assumed to be on-site, feeding on the impacted area, the area use factor (FI) should be one. If they are feeding off-site, background lead levels in the off-site area need to be figured into the equation. There needs to be a discussion of this calculation so that it is defensible and understood by anyone reading the document. I suggest that you negotiate some background level, I doubt zero will be acceptable when the regulators figure it out.

RESPONSE: Representative receptors have been selected that are assumed to be feeding on-site; thus, the area use factor is 1.0 (Section 4.1, paragraph 6).

COMMENT 21: You suggest that you may use literature values, or you may collect invertebrates, or you will derive it from toxicity tests. Which is plan A and which is the alternative? Propose one plan. Also, provide information on what literature values will be used or provide the actual numbers.

RESPONSE: The text has been revised as requested. The average concentration of lead in soil dwelling invertebrates collected from Site 15 will be used to represent C_{prey} in the food chain equation (Section 3.1.3.1, first two paragraphs).

COMMENT 22: You have spent significant time convincing the reader that earthworms are not present. Now you back off and start talking about what you will do if you find earthworms. Step 1 would be rewrite the sections of the conceptual model that say earthworms are not present.

RESPONSE: The conceptual model and approach have been revised as requested. The presence or absence of earthworms at the site is no longer an issue, since the invertebrate-sampling will focus on all soil invertebrates available in the soil-duff interface (Sections 2.4.1 and 3.1.3.1).

COMMENT 23: Propose the collection of duff invertebrates. If it doesn't work have a backup plan i.e., literature values.

RESPONSE: The text has been revised as requested. See responses to Comments 21 and 22.

COMMENT 24: Surrogate species and receptors should not be used interchangeably. I would agree that receptor species could be better selected after the survey is complete, however the AEs will not change and should be specified at this point. The term surrogate can be used for choosing TRVs for related species if the chosen receptor does not have calculated lab values.

RESPONSE: The text has been revised as requested. The term "surrogate" is no longer used to describe the species that have been selected as representative receptors (Section 4.1, first three paragraphs).