



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

N00164.AR.000344  
NSWC CRANE  
5090.3a

June 17, 1998

REPLY TO THE ATTENTION OF:

DW-8J

Ms. Chris Freeman  
Environmental Protection Department  
Bldg. 3260  
Naval Surface Warfare Center  
300 Highway 361  
Crane, Indiana 47522

RE: Appendix G Toxicity Testing NOD  
Bioremediation Facility  
Naval Surface Warfare Center  
Crane, IN

Dear Ms. Freeman:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the draft Appendix G Toxicity and Leaching Procedures, dated May 13, 1998. Attached are our comments concerning the plan. The plan should clearly explain step by step the sampling and analytical procedures, while being site-specific to the Navy's project. Please submit a revised plan addressing our comments, within 30 days of the date of this letter. If you have any questions regarding this matter, please contact me at (312) 886-6146.

Sincerely,

A handwritten signature in black ink, appearing to read "Carol Witt-Smith".

Carol Witt-Smith  
Corrective Action Expert  
WMB, IL/IN/MI Section

cc: Bill Gates, SOUTHDIV  
Dave Beall, MK  
Tom Linson, IDEM  
Al Debus, WMB  
Mario Mangino, WMB  
Dan Mazur, WMB  
Peg Donnelly, LAB

Comments on Appendix G, Bioremediation Facility  
Naval Surface Warfare Center  
Crane, IN

A. General Comments

1. The Plan needs to be specific to the Navy's project. The SOPs have generic language with options and it is not clear what specifically will be required for the Navy's project.
2. The Objectives should be labeled and written clearly with the goals defined.
3. References to other portions of the approved Work Plan or the Quality Assurance Project Plan (QAPP) must be precise. In several areas references are made to sections that don't exist in the Appendix.
4. Are all the sections of a QAPP represented or referenced to?

B. Specific Comments

1. Page G-3, Section 1.0 Introduction
  - a. The second paragraph refers to Appendix G for sampling descriptions but they are not described within that appendix.
  - b. The Introduction should tie the Appendix to the main text of the approved Work Plan.
2. Page G-4, Section 2.0 Test Methods
  - a. Note that the preservation is only for the finished compost. There needs to be an explanation on how the soil will be prepared to bring the temperature up to a temperature comfortable for the test species used for certain test methods.
  - b. Explain in the introduction or a piece on how the whole sampling ties in, how one compost pile will be constructed for a control.
  - c. Explain that the pile used for testing will be representative for the Solid Waste Management Unit (SWMU) and the worst-case scenario.
  - d. There should be included a justification why only 5 samples from a full-

scale pile shall be representative of the potential volume of soil per SWMU. If it is not a sufficient amount, then more samples should be taken either in that pile or from a second pile. Remember, the limited sampling needs to have a clear objective of representativeness.

3. Page G-5, Section 3.0 Remedial Goals

- a. Is this section meant to be just goals or goals and objectives?
- b. Tabelizing this information would make it clearer for the reviewer.
- c. "Objectives" are different than "Action Levels."
- d. What are the goals for compliance? Pass/Fail, toxic effects, etc.
- e. How will levels be determined for the Worm and Microtox tests? What is it based on? How many live or die? The concentration of contaminants in the worm?
- f. What exactly is the control windrow? Describe it. Doesn't the control also provide a basis for determining if the amendment ratios are also toxic or leachable?
- g. Exactly how will the control and sample data be compared? Statistics, direct comparison? Explain, include the details, and formulas.
- h. Define significant mortality.
- i. Include the objectives of the pathogen test, don't just reference the regulation.
- j. Table 1-4C is not included.
- k. The TCLP levels should be included in the goal table.
- l. Leachate concentrations should be compared to a goal table. Include and explain its use.

4. Section 4.0, Quality Control Procedures

- a. Define the control compost windrow. Size, how it is comparable, where it is located, how long it was treated, was it treated the same as the full-scale test pile, handling, etc.
- b. Explain where the worms are supplied from.

- c. Identify borrow locations for each SWMU.
  - d. What happens if background levels are toxic? Will only one control be made, or one per SWMU testing?
  - e. QC decontamination is referred to Appendix G, which this is, and is not included. Do you mean another appendix?
  - f. Section 4.6 of this QAPP in Appendix G is not included.
  - g. This plan should act like an independant amendment to the approved QAPP and Work Plan.
  - h. Be consistant with terms, control versus artificial soil.
  - i. Define LC-50.
  - j. What is the reference toxicant?
  - k. How is the sensitivity evaluated? By an SOP?
  - l. What are the Quality controls for the ph meter and any other field parameter equipment, etc. This should be in the QAPP.
  - m. The computer program or its statistical references must be checked to make sure the Agency's agree with their use.
  - n. Explain how calculations will be made.
5. SOP/SED/201, Earthworm Test
- a. What are the external sources for the worms. Worm age?
  - b. What are the test conditions the worms must be acclimated to?
  - c. Is the Artificial soil the compost, the control, or both?
  - d. Are the samples individually homogenized, or grouped, or what?
  - e. What is the *mechanical manipulation*?
  - f. The pass/fail procedure needs to be defined for this project.
  - g. SOP/GEN/303 referenced is not included.

- h. In Sections F and G, explain "when appropriate" and "by appropriate means."
  - I. Are both acute and bioaccumulation effects addressed?
  - j. Define artificial soil in Section I.
  - k. What is the exact volume of compost to be tested?
  - l. What is the reference toxicant test.
  - m. What does "or as specified in the workplan" mean in Section O. Be specific to this site.
  - n. Include the computer program analysis.
  - o. How do you establish pass or fail? Compared to what?
6. Southwest's SOP appears much more detailed than the other labs.
7. Microtox - It should be clarified what the sampling frequency really is. I am having a difficult time deciding whether the five samples will be taken during the final day interval, or whether the five samples will be taken per SWMU, at different periods in the life of the pile, including the final day interval. (Perhaps the answer to this is alluded to somewhere, but it could be clarified.)
8. Table G-1: Is a 4 degree C temperature sufficient for a 3 to 14 day holding time. Also, I am having a difficult time comprehending why the samples for the pathogen test would have to be chilled. After all, won't this kill the pathogens, producing a low bias in the final results?
9. Section 4.1, QC Procedures: Will the field duplicate be taken once per sampling interval? While it seems sensible to collect a field duplicate, analysis of field blanks and rinse water samples may not apply. Why would it be advantageous to run toxicity tests on these QC sample types? (A field blank is just reagent grade water, and by definition would not be expected to kill microorganisms. Ditto for the rinse blank, but the analysis of these blanks for targeted speciated compounds would indicate whether any contaminant transfer has occurred. Wouldn't that be sufficient?) So isn't this overkill? What is the rationale for these QA sample types?
10. Section 4.2: Target parameters for earthworm study analysis were not indicated.

11. Section 4.2, p. G-6, last three lines: What is meant by the range of test concentrations? What is the relationship between "EC-50" and "LC-50", and in fact what do these terms stand for? (Does "EC" stand for "exposure concentration"?) Define all terms.
12. Page G-7: What is an "R value"? If this is a statistical term, then it should be defined mathematically.
13. SOP/PRP/004: Is this SOP intended to be used for the microtox or the earthworm test?
14. Page A-2, Section 2.1: Should the term "compost" be substituted for the word, "sediment"? Won't the toxicity effects of compost be anticipated to be higher than in the case of sediment? Are these tests designed with that possibility in mind? Won't the measurement systems be "torqued" by the really high concentrations of microorganisms?
15. SOP/SED/201, page A-5, Section III.B: For this study, how will concentrations of specific contaminants be determined as part of exposure concentrations? The specific constituents that will be quantified for use in the earthworm test should be stated. Which compost sampling intervals will be represented in the form of earthworm data?
16. Page A-6, Sections C: Will data be averaged? is there an %RPD acceptance criterion for the set of replicates representing each dilution series?
17. Page A-6, Section D "Collection of Organisms for testing": Will worms which have been subjected to previous exposures in other testing be used for the Crane study?
18. Page A-7, section K; How will the number of live worms added to buckets be recorded?
19. Page A-7, Section N: What is the rationale for performing this step? Also, does this mean that this step will be performed for each test dilution/compost concentration?
20. Page A-7, Section P: Referring to the last sentence, does this permit recycling of old test worms?
21. Page A-8, section Q: The pH of each test mix of compost should be measured at the beginning and end of the test, (including all replicates).

22. Page A-8, Section R: There are two typographical errors here. Also, how will "analysis" be performed and for which constituents? Shouldn't an assay of earthworms also be analyzed before the test begins as a control blank?
23. Page A-9" This page is intended for the Picatiny Arsenal only. Therefore, it should be deleted.
24. SOP No. TOX-1001, Page A-13, middle of page: Where is Step 1.7, referred to in the middle paragraph on page?
25. Page A-15: The first sentence in the third paragraph is poorly phrased. Can it be clarified?
26. Page A-15: Referring to Roman numeral V, ("Chemical analysis"), what will be measured and how? Details are needed.
27. Page A-15, Roman Numeral VI: In the last paragraph, does the term "B0" refer to "zero time", or the 5 minute measurement described in a previous section.
28. Page A-16, top of page; What is meant by "IT"? Is this the 15 minute measurement? If so, then it should be so stated.
29. Page A-16: The equation for "blank ratio" should be indicated. Is it B0/BT?
30. Page A-16: What does "EC-50" stand for? Show the calculation.
31. There are terms in the pathogen testing SOP which could stand definition, such as "PBS", "MPN", and "MF".
32. For all variations on the pathogen test, how many milliliters of evolved gas would define the "production of gas" on which a positive result for pathogen would be founded? The "detectable" amount? What is detectable?
33. Note that the TCLP SOP is for non-volatile constituents. Will there also be a need to analyze the treated compost for TCLP parameters that are VOCs?
34. It is unclear which analytical methods will be utilized in the analysis of TC parameters. Since in certain cases there are alternatives, it should be more fully defined which methods will be utilized.
35. Does SOP SWL-IN-700 dated 5/6/98 entirely supercede SWL-IN-700, dated 12/2/97? I think this may be the case because the TCLP procedure is entirely incorporated in both SOPs. But if this is the case, then why has the earlier version been submitted? Can we delete the earlier version?

36. It is unclear what the rationale for use of the SPLP happens to be. It just seems to be a proposed procedure, but what will the results be used for? Are SPLP results factored into the Decision Tree" for this project?