



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
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REPLY TO THE ATTENTION OF:

May 23, 2000

DW-8J

Mr. Tom Brent  
Naval Surface Warfare Center  
EPD, Code 095 B-3260  
300 Highway 361  
Crane, IN 47522-5001

Re: U.S. EPA Comments on Draft Work  
Plan for Risk Assessment at SWMUs  
4, 5, 9, & 10.

Dear Mr. Brent:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the Draft Work Plan for Risk Assessment at SWMUs 4, 5, 9, & 10 Revision 0 dated October 1999. This document included the Field Sampling Plan (FSP), Health and Safety Plan (HASP), and Quality Assurance Project Plan (QAPP).

Comments on the Work Plan, FSP, HASP, and QAPP are provided as an attachment to this letter. The comments were assembled from several independent reviewers, including Allen Debus, U.S. EPA Quality Assurance Chemist; Mario Mangino, U.S. EPA Human Health Risk Assessor; Dan Mazur, U.S. EPA Ecological Risk Assessor; and myself. Please revise the document to address these comments.

If you have any questions regarding this matter, please contact me at (312) 886-7890.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter Ramanauskas".

Peter Ramanauskas  
Environmental Engineer  
WMB, Corrective Action Section

Enclosure

Filename: RA SWMU45910 Comments.wpd

cc: Core Team Members: Bill Gates, SOUTHDIV (w/ encls)  
Doug Griffin, IDEM (w/ encls)

Project Team Members: Allen Debus, U.S. EPA (w/ encls)  
Mario Mangino, U.S. EPA (w/ encls)  
Dan Mazur, U.S. EPA (w/ encls)

**COMMENTS ON THE WORK PLAN FOR RISK ASSESSMENT AT  
SWMUs 4, 5, 9, & 10 - REVISION 0 - DATED OCTOBER 1999  
NAVAL SURFACE WARFARE CENTER  
CRANE, INDIANA**

**Work Plan**

*Comment 1:*

In the Acronyms section on Page 9, the definition of OMOE is incomplete. On page 10, in the definition of RQAC, there is a typo.

*Comment 2:*

Section 4.1.4, Potential Receptors, lists Adolescent Trespassers as a potential receptor under the current and future land use scenario. Why are adult trespassers (e.g., hunters, adult civilians or family of military personnel) not included as potential receptors for the risk assessment? Similarly, why are adolescent recreational users not included? For construction workers, why aren't the surface water and sediment exposures considered to be factors? For the ecological receptors, provide an explanation of why the subsurface and air pathways are not considered pertinent for terrestrial receptors. Make all required changes to this section as well as the individual SWMUs (Sections 5, 6, 7, & 8) and Risk Assessment Methodology (Section 10.0).

*Comment 3:*

Table 4-1 shows that the occupational worker is a potential receptor for SWMU 9 in the current scenario but not in the future scenario, while the narrative in Section 4.1.4 states that there are no current receptors at SWMU 9, but they will be considered in the future scenario. Please resolve these discrepancies. Also, correct the table to reflect that occupational and maintenance workers are considered as future potential receptors for SWMU 10 as noted in Section 8.5.1. Similarly for SWMU 9, correct the Table to show that future maintenance workers are considered as receptors as noted in Section 4.1.4.

*Comment 4:*

In Section 4.2.5., page 4-14, decision rule #2, change the elimination of the SWMU from further consideration to an examination of the need for a CMS. Decision rule #3, recommend that a CMS be initiated, not just a risk management plan. Figure 4-1 should reflect these changes. Also, on Figure 4-1, there need to be changes to the decision point where Current Chemical Concentration > SL. If this condition results in a "No" determination, the chemical may be removed as a COPC and the next chemical considered; however, a risk analysis should be performed on all chemicals eliminated as COPCs to determine if there is any unacceptable cumulative risk. If this condition results in a "Yes" determination, the chemical is identified as a COPC and the next chemical is considered. Provide separate screening decision rule flowcharts for the different media considered (i.e., soils, sediment, groundwater, surface water).

*Comment 5:*

Section 4.2.7. states that explosives are the only parameters of interest at SWMU 10. However, Section 8.4.2. and Table 8-9 identify inorganics as chemicals of interest. Additionally, Section 8.4.1. discusses the presence of SVOCs at Area H soils. Because these chemicals have been positively detected at above risk-based concentrations, they should be considered in the risk assessment of the SWMU. Also, VOCs should be included for SWMU 10 (see also Work Plan Comment 22).

*Comment 6:*

In the last paragraph of Section 4.2.7., clarify that the additional sampling is also being performed to further delineate the extent of contamination at the units.

*Comment 7:*

Table 5-1 states that the depth to the water table as determined from the General Basewide Investigations (1981 - 1987) varied from 5 to 15 feet bgs. However, the second full sentence on page 5-6 states that depth to the water table varied from 3 feet bgs near Culpepper Branch Creek to approximately 10 feet bgs near the western edge of McComish Gorge. Please resolve this discrepancy.

*Comment 8:*

In Section 5.5.1, the maintenance worker is not assumed to be exposed to surface water and sediment. In Section 4.1.4., groundwater is included in this list. Correct this discrepancy.

*Comment 9:*

Please correct the references to the Field Sampling Plan sections in the Sample Collection Technique columns of Tables 5-5, 6-5, 7-5, and 8-5.

*Comment 10:*

In Section 5.5.2, please explain the rationale for not sampling groundwater wells 4-1-92 and 04C01 as noted in Table 5-5.

*Comment 11:*

In Section 5.5.2, Surface/Subsurface Soils (Borings), the last sentence of that subsection states that further work is needed to define the southern boundary of the site. The western boundary is apparently unknown as well (see Table 5-5 Surface Water/Sediment sample 04SW/SD04 - Location at wetland/marsh within *suspected* site boundary). Does this mean the estimated SWMU boundary on the figures is not inclusive of the newer (geophysical) data? If so, update the boundaries on the figures. The sampling plan presented in this work plan should have

additional sampling for boundary delineation included so we have collected enough information to confidently delineate the SWMU boundaries before performing the risk assessment. What is the risk boundary/border for Risk Assessment as was determined for SWMU #1, Mustard Gas Burial Ground (e.g., 20 additional feet)? The work plan currently states that the data collected during this field investigation will be used to assess the potential risks for human and ecological receptors.

*Comment 12:*

In Section 6.2, first sentence, insert Gate prior to No. 4.

*Comment 13:*

In Section 6.3, third paragraph, second sentence, identify the first round upgradient and downgradient wells by well numbers.

*Comment 14:*

Section 6.2 states that the northern boundary of the SWMU is undetermined. How will this boundary be set for this study? The sampling plan presented in this work plan should have additional sampling for boundary delineation included so we have collected enough information to confidently delineate the SWMU boundaries before performing the risk assessment (see also Work Plan Comment 12). Include description of additional investigative work to be performed. What will be the risk boundary/border for the risk assessment as was determined for MGBG for this and the other 3 SWMUs (e.g., 20 additional feet outside the SWMU boundary)?

*Comment 15:*

Table 6-5 and Section 6.5.2. state that well 05-01 will be used along with new monitoring well 05T01 to evaluate groundwater quality immediately upgradient of the site. Are these wells intended to be used to set background groundwater concentrations for SWMU 5? Note that it is inappropriate to use well 05-01 for this purpose as it has been shown to contain contaminants above human health and ecological levels. Please identify which samples will be used to determine background levels for this study and provide appropriate supporting rationale for all four SWMUs.

*Comment 16:*

There seems to be some uncertainty as to the direction of groundwater flow at SWMU 5. How will this be further investigated and clarified in this study?

*Comment 17:*

Footnote 9 in Table 6-5 states that surface water may not be available at all sample locations due to intermittent flow. Sediment samples should still be taken at these locations.

*Comment 18:*

There is a typo in the first sentence of Section 7.0 (i.e., Conttol).

*Comment 19:*

Section 8.2 states that surface drainage from Rockeye flows west to an unnamed tributary of Furst Creek while Table 8-1 states that drainage to the west goes to Lake Greenwood. Also, the last sentence of Section 10.1.2.1. states that none of the surface water bodies (i.e., streams, creeks, tributaries, etc.) at the sites affect Lake Greenwood. Please correct the discrepancies in these locations and throughout the Work Plan, FSP, and QAPP.

*Comment 20:*

In the Table 8-1 conclusions section for the RFI Phase II Soils study, please correct the third sentence from the bottom.

*Comment 21:*

On page 8-16 of Table 8-3, the range of detections for 1,1,1 - Trichloroethane is reported at 0.011 mg/kg. This level does not exceed any regulatory levels presented in the table. Please correct the table to reflect the reason for reporting this constituent as exceeding regulatory levels.

*Comment 22:*

Please correct the last sentence of Section 8.4.1 and explain the rationale for eliminating Appendix IX Pesticides/Herbicides, VOCs, etc. from consideration for Rockeye. Since it was historical practice to treat areas along roadways with a mixture of herbicides and waste fuel oils, it would seem reasonable to include these as parameters of interest as was done for the other three SWMUs. The rationale presented in Section 8.4.1. for eliminating VOCs from consideration at SWMU 10 because of historical Basewide management practices directly contradicts the rationale presented for the other three SWMUs (i.e., even though the chemicals may not be site-related constituents, they have been conservatively identified as detected chemicals of interest). Reflect any changes made to the work plan in the FSP and elsewhere throughout the document as needed.

*Comment 23:*

On page 8-65, the proposed study of ecological receptors considers ingestion of contaminated prey items as a pathway for terrestrial and aquatic receptors. Explain why this pathway is not included in the ecological receptors studies at the other three SWMUs. Also clarify that the air pathway will be considered for maintenance workers as indicated in Figure 8-9.

*Comment 24:*

Include further contaminant extent/boundary delineation as a primary objective of the sampling and analysis field investigations for those SWMUs at which extent of contamination is not fully known (i.e., McComish, Old Burn Pit).

*Comment 25:*

Table 8-9 states that soil field samples will be monitored with HNu readings while the text in Section 8.5.2. states that a PID will be utilized. Please correct this discrepancy. For the laboratory target constituents, include those chemical categories listed in Table 1-2 of the QAPP (i.e., metals, cyanide, TSS, hardness, etc.). Why is there an "NA" listed under Limit of Detection for both the field samples and the CEC, pH, and COC laboratory samples? This is inconsistent with the same sections in previous tables in the work plan.

*Comment 26:*

Table 8-9 states that surface water/sediment sample 10SW/SD08 is located east of the site outside the site boundaries in a tributary while in Figure 8-10, this sample appears north of the site. Please correct this discrepancy.

*Comment 27:*

Referring to Section 9.1.2, it is stated that sample nomenclature is established in Section 2.12.2. of the Field Sampling Plan (FSP). This reference is incorrect. Furthermore, the Table of Contents for the FSP does not accurately reflect the actual contents of the plan.

*Comment 28:*

There is a typo in the first sentence of Section 10.0.

*Comment 29:*

Referring to Section 11.0, page 11-1, first paragraph, no discussion on risk management or development of risk goals were provided. Text provided below is recommended for a new second paragraph. Also, please modify Figure 11-1, Summary of Ecological Risk Assessment Process, on page 11-3 after the rectangle labeled "Chemicals Identified as COPCs" insert rectangle labeled "Establish Risk Management Goals."

*The risk assessor and risk manager will work together in the problem formulation phase to develop theories about possible relationships between undesirable ecological effects and observable stressors. The key role of the risk manager will be to identify the goals of the risk assessment and ensure the risk assessment provides decision making information relevant to those goals. To that end, the risk manager will describe why the risk assessment is needed, what decisions it will support, and what information is required of*

*the risk assessor. The risk assessor will interpret the goals identified by the risk manager into ecological values that can be evaluated in the risk assessment. The risk assessor will ensure that science is effectively used to address ecological concerns.*

*Comment 30:*

On page 11-3, Figure 11-1, the word “identify” is misspelled in the rectangle labeled “Identify Toxicity Values” (see fourth polygon up from the bottom on left). Check entire document for spelling errors.

*Comment 31:*

On page 11-6, Section 11.1.2, first paragraph, second sentence, the verb tense is incorrect. Replace with the verb “were”. Check entire document for grammatical errors.

*Comment 32:*

On page 11-6, Section 11.1.2., third paragraph, last two sentences, the assumptions of contaminant transport, no exposure, actual soil zones utilized by ecological receptors are not described prior to making this conclusion that exposure to contaminated subsoils is unlikely. This needs to be revised by stating which ecological receptors will be used for the assessment endpoints and identify their expected soil exposure in terms of maximum soil depth. Explain if this maximum soil depth will exclude subsoil zones within the contaminated site.

*Comment 33:*

On page 11-8, Section 11.1.4, list of assessment endpoints, the selection of mortality for all the assessment endpoints is not acceptable and needs to be revised. In general, an assessment endpoint is related to the expected ecological use of the site. If the site has the potential or provides both habitat for reproduction and a food supply, the endpoint would be reproductive success and growth of [name of ecological receptor] not mortality. Review discussion on Defining Assessment Endpoints in Section 3.3.2 in the Guidelines for Ecological Risk Assessment, U.S. EPA 1998 (EPA/630/R-95/002F).

*Comment 34:*

On page 11-8, Section 11.1.5, to be consistent with Comment 33 above, replace the phrase “...increase in mortality” with “...decrease in survival.” Likewise, revise the text on page 11-20, Section 11.4.1, endpoints that address robin mortality.

*Comment 35:*

On page 11-9, Section 11.1.6, first paragraph, to be consistent with Comment 33 above, replace the term “mortality” with “survival” in the measure of effect statement.

*Comment 36:*

On page 11-11, Section 11.2.1, subsection on Surface Water and Sediment, add the following item #3:

*Organic contaminants in sediment that exceed the additive sediment guideline unit for narcotics will be retained as COPCs even if they are lower than the individual EDQLs.*

A document on the development and application of this additive sediment guideline unit for narcotics will be provided by Dan Mazur of EPA, Region 5.

*Comment 37:*

On page 11-11, Section 11.2.1, subsection on Surface Soil for..., modify item #2 as follows:

*Inorganic contaminants that exceed EDQLs and the site specific background concentrations will not be retained as COPCs.*

Add the following item #3:

*The inorganic contaminants that exceed EDQLs, but do not exceed background concentrations (i.e., unaffected by site operations) will be retained for discussion in the risk characterization section.*

*Comment 38:*

On page 11-11, Section 11.2.1, last paragraph, replace the term “weight-of-evidence” with “lines of evidence.” Review discussion on Lines of Evidence in Section 5.2.1 in the Guidelines for Ecological Risk Assessment, U.S. EPA 1998 (EPA/630/R-95/002F).

*Comment 39:*

On page 11-12, Section 11.2.2, defining terms in equation for exposure, in order to apply more realistic assumptions, the description for term “H” will be revised as follows: *percent of food intake from the contaminated area*. Review discussion on Describe Contact or Co-Occurrence in Section 5.2.1 (fourth paragraph and text box 4-10) in the Guidelines for Ecological Risk Assessment, U.S. EPA 1998 (EPA/630/R-95/002F).

*Comment 40:*

On page 11-13 through 11-14, Target Values - Soil Quality Standards, this section will be revised to use the Hazardous Concentration 95 (HC95), i.e., 95% protection, rather than the Hazardous Concentration 50 which does not provide protection for half of the species. This section will be revised based on either the 1997 WasteTECH Symposium report (revised text May 1997) by Frank Swartjes entitled "Assessment of Soil and Groundwater Quality in the Netherlands: Criteria and Remediation Priority or current revision. See related information at: <http://www.contaminatedland.co.uk/std-guid/dutch-1.htm>

*Comment 41:*

On page 11-14, first paragraph, both the Intervention and Target (HC50) values are intended to flag serious soil contamination and do not provide protection for many species as stated in Comment 40. The second to last sentence of this paragraph will be deleted and a replacement sentence can be added that discusses that the Negligible Risk level is assumed to be 1% of the Maximum Permissible Risk Level for ecosystems, which is defined as the HC95. The last sentence will be revised as follows: *The target value is calculated as 1% of HC95 and will be used to determine ecological effects.* The following equation:  $Criteria = (Intervention\ Value + Target\ Value)/2$ , will be deleted.

*Comment 42:*

On page 11-14, Canadian Soil Quality Guidelines, will be revised to incorporate revisions in the CCME 1999 document. See <http://www.ec.gc.ca/ceqg-rcqe/soil.htm>

*Comment 43:*

On page 11-16, Section 11.2.3.3, last paragraph, replace the term "weight-of-evidence" with "lines of evidence" as discussed in Comment 38. Repeat replacement of these same terms on page 11-18, last sentence of section 11.2.3.4.

*Comment 44:*

On page 11-17, Section 11.2.3.4, last paragraph, add the following sentence that reads, "The Region III BTAG screening levels will be used if no other data are available.":

*Additive sediment toxicity for narcotics will be evaluated using additive sediment guideline unit for narcotics.*

A document on the development and application of this additive sediment guideline unit for narcotics will be provided by Dan Mazur of EPA, Region 5.

*Comment 45:*

On page 11-19, Section 11.3, last paragraph, there is no discussion of how risk description, the narrative explanation and significance, will be addressed. The following paragraph will be inserted at the end of this section:

*The risk description is the technical narrative supporting the risk estimates. The risk description will provide a description of the risk estimates in terms of the extent, magnitude, and potential ecological significance. Specifically, the risk description portion of the risk characterization will describe the location and areal extent of existing contamination where the hazard quotient of 1 is exceeded for a chemical(s). This information will provide an area of the bounds of impact above the threshold for adverse effects. Other relevant information related to the risk estimate that will be provided in the ecological risk assessment includes the expected half-life (qualitative or quantitative) in the environment for those site-related contaminants which exceed the hazard quotient of 1 as well as a qualitative discussion of the uncertainties associated with the ecological risk assessment.*

*Comment 46:*

On page 11-21, Section 11.4.2, last paragraph, last sentence, the reference to “home range” will be replaced with “percent of food intake from the contaminated area.”

**Field Sampling Plan**

*Comment 1:*

Referring to Table 2-1, for VOCs entries, note that if sodium bisulfate can't be used, then the empty vial technique could be used, applying a 7 day holding time.

*Comment 2:*

On page 2-14, Section 2.4.2.1., how can a 0' to 1' soil depth be “representative” of a 0' to 2' soil depth? Should this section be rephrased? What is the rationale for this proposal?

*Comment 3:*

Note that the assumption expressed near the bottom of page 2-14, section 2.4.2.2. may not be valid.

*Comment 4:*

On page 2-24, Section 2.11.2., is it truly necessary to use isopropanol and nitric acid in the decontamination procedure? If possible, use of these reagents in decontamination steps should be omitted.

*Comment 5:*

In Section 3.1, page 3-1, referring to the second bullet, it should be clarified specifically how a “release” to an “off-SWMU” surface water body and sediment deposit is defined. Ground water should also be included. This should be reflected in the objectives for the remaining 3 SWMUs in the FSP, QAPP, and Work Plan as well.

*Comment 6:*

Referring to Table 3-2, page 3-4, will an extra set of soil, sediment, and aqueous VOCs samples be taken for Method 8015B (independently of Method 8260)?

*Comment 7:*

The rationale for surface soil depth sample collection appearing on page 3-5, Section 3.1.1., should be clarified. See the first bullet on page 3-5 as well as all analogous sections appearing in the context of the other 3 SWMUs under investigation through this plan. In particular, which DQOs (i.e., decision rules) do the proposed sampling depths correspond to, with respect to organic vs. inorganic contaminants?

*Comment 8:*

Referring to Table 3-4, and other analogous tables in the workplan, in the case of metals, the rationale for not taking both filtered and unfiltered groundwater samples should be explained. Note that both filtered and unfiltered surface waters samples will be taken.

*Comment 9:*

Table 3-15, page 3-31, shows 6 surface water samples to be collected while Section 3.3.4 states that 5 surface water/sediment samples will be collected. Please correct this discrepancy.

*Comment 10:*

Referring to Table 3-17, it appears from reading other portions of Section 3.4 that 20 soil samples will be taken for metals and explosives, not 24.

*Comment 11:*

Table 3-20, page 3-41, shows 6 surface water samples to be collected for explosives while Section 3.3.3. states that 12 surface water/sediment samples will be collected. Please correct this discrepancy.

*Comment 12:*

In SOP - CTO10, *SOP for Sample Preservation, Packaging, and Shipping*, the addresses of the two respective laboratories which will be receiving shipments of samples should be stated here, and in an appropriate QAPP section.

**Health And Safety Plan**

*Comment 1:*

Provide an updated page 1-3 when the “TBD/TBA” issues are resolved.

*Comment 2:*

Figure 2-2, Hospital Route Map, is missing.

**Quality Assurance Project Plan**

*Comment 1:*

Referring to Tables 1-1, 3-1, and 3-2, should other explosive “breakdown” products identified for other project phases be added to this target list? Do these lists apply to all 4 SWMUs? If not, then the list of parameters should be itemized by SWMU.

*Comment 2:*

If the data is to be used for risk assessment purposes, then data should be collected for hexavalent chromium. Note that there are many reporting limit “exceedances” for the intended matrices. If the project is approved, how will these discrepancies bear on risk assessment evaluation? Will the data for soil metals perhaps also be compared to levels in background locations once that database is compiled? If background levels exceed low risk founded levels, how will such data be assessed?

*Comment 3:*

Referring to footnote #11 in Table 1-1, when will the “TBD” issues be resolved for the soil matrix?

*Comment 4:*

Pentachlorophenol is included in the SVOC list in Table 1-1, when a better analysis would result from adding it to the Method 8151A target list.

*Comment 5:*

In Section 1.2.7., and in other analogous places in the QAPP, the Indiana Bat is referred to as a bird, when it is really a mammal. Also, the peregrine falcon is no longer on the Endangered Species list. Please correct.

*Comment 6:*

The list of specific objectives described on page 1-20, section 1.4.4. has omitted the purpose of determining the detection of releases in surface water and sediment, which is inconsistent with what has been stated in the Field Sampling Plan (See also FSP Comment 5.) Also, here it is mentioned that an ecological risk assessment will be performed, which isn't stated in the FSP. What is the purpose of collecting chemical environmental data for surface water and soil matrices? In this regard, also see Section 1.4.2. of the QAPP and all analogous sections. Is the purpose of comparing surface water and sediment data to values stated in Table 1-1 to do some sort of screening risk assessment, or instead, to detect releases?

*Comment 7:*

The sentence at the top of page 1-23 implies that groundwater values might be compared to ecological data quality levels simply because an EDQL could be the lowest and most conservative value. However, such values would not apply to groundwater. Are there cases where EDQLs are being inappropriately applied to matrices?

*Comment 8:*

In Section 1.4.3., how do soil metals background concentrations factor in to the final project assessment?

*Comment 9:*

Referring to page 7-2, 3<sup>rd</sup> paragraph from the top, note that the soil samples should be frozen within 2 days of collection.

*Comment 10:*

In Section 9.1.2., last paragraph, 5<sup>th</sup> line from the end, change the word "determine" to "confirm". A determination can still be made.

*Comment 11:*

In Section 9.2.2., page 9-4, last paragraph, can it be clarified why the "Z" qualifier will not be used in lieu of the "JN" flag?

*Comment 12:*

In Section 9.3.2., page 9-5, whose task is it to perform independent validation for both field and laboratory generated data? This should be stated correctly and consistently with information presented in the Project Management & Responsibility Section.

*Comment 13:*

Referring to Section 10.1.1.3., page 10-2, the February 1997 field audit checklist should be immediately updated to incorporate procedures to be used for collection of soil VOCs.

*Comment 14:*

Lauck's Method 8015B lab SOP (LTL-8019), should be revised to reflect a low level procedure that can be accommodated with the Method 5035 sampling technique. This procedure will not produce accurate data for soils. Also, it is an earlier version than the one EPA approved previously (Revision 3 - 12/9/1998). It is unclear why the earlier version was submitted in support of this QAPP. Similarly, the LTL-8151 SOP contained in Volume 3 is an earlier version than was previously approved (Revision 2 - 12/7/98). Also, please submit the following missing SOPs: LTL-7012 (Revision 1 - 8/21/98) and LTL-7015 (Revision 0 - 1/18/99).