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U S NAVY RESPONSES TO REGULATORY COMMENTS ON DRAFT REMEDIAL INVESTIGATION FOR SITE 46 NAS PENSACOLA FL
2/22/2007
NAVFAC SOUTHERN

Responses to Florida Department of Environmental Protection Comments dated February 22, 2007 on the Draft Remedial Investigation Report for Site 46 (Former Building 72), Naval Air Station Pensacola, Florida

Comment 1 (Page 4-45, Section 4.4, Surface Water and Sediments, 1st paragraph, 1st sentence) - The following sentence states, "Surface water and sediment samples were not collected for the site characterization investigation at Site 46 because no surface water bodies are present at the site." In the next sentence Pensacola Bay is referred to and Pensacola Bay is a marine surface water body and it is located downgradient from the site on the Southern boundary. Please clarify.

Response - Pensacola Bay is adjacent to the southern edge of Site 46, the boundary between the sites was established at the concrete seawall. This part of Pensacola Bay was previously investigated as Installation Restoration (IR) Site 2 because past waste disposal practices in this area of the base included disposal of untreated waste streams directly into the bay from industrial facilities, including the operations at Site 46.

An extensive surface water, sediment, and biological analytical program was conducted for Site 2 during the RI and focused feasibility study (FS). The proposed plan (July, 2005) and the final record of decision (signed September 2005) recommended no action (NA) based on the results of this investigation. The text of the Site 46 RI report will be edited to clarify the spatial relationship between the two sites and the NA status of Site 2.

Comment 2 (Chapters 6 and 7) - The Department supports and concurs with the attached comments on Chapter 6 "Human Health Risk Assessment" and Chapter 7 "Screening Level Ecological and Risk Assessment" which were reviewed by the University of Florida.

Response - Please see attached responses for the University of Florida review comments.

Comment 3 (Page 8-3, Section 8.3, Groundwater Assessment, 2nd paragraph) - This paragraph discusses groundwater analytical results for pesticides, PCBs and TRPH and says lab analyses for those analytes had results that were below the laboratory detection limits. Please explain whether the "laboratory detection limits" cited are method detection limits (MDLs) or Practical Quantitation Limits (PQLs). Also, it should be stated whether those "laboratory detection limits" are below the applicable groundwater cleanup target levels (GCTLs) or below the concentrations listed in Table C, in the guidance document entitled, "Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits". If the "laboratory detection limit" for a particular analyte exceeds the GCTL for that analyte, and the PQL in the guidance document for that analyte, it may be required to have groundwater reanalyzed by a different EPA Method or by another laboratory in order to get data verifying the absence of that analyte.

Response - The text will be modified to clearly indicate that the "laboratory detection limits" for these analytes were less than the GCTLs or the target PQLs listed in Table C.

Comment 4 (Page 8-4, Figure 8-2, Extent of Impact to Site Groundwater Site 46) - What does the shading in this figure indicate? Please clarify and make the necessary changes to the figure.

Response - The figure will be edited to clearly denote the meaning of the shading. The area was shaded in the summary figure to indicate the estimated areal extent of the CVOC plume in groundwater.

Comment 5 (Section 8.3, Groundwater Assessment) - Contaminants of Concern (COC) detected in the groundwater and their impact on the Pensacola Bay surface water body are discussed in this section. The COCs that exceed Marine Surface Water Cleanup Target Levels (MWSWCTLs) are listed below:

- Vinyl Chloride
- Bis(2-Ethylhexyl)phthalate
- Naphthalene
- Beryllium
- Nickel

The COCs listed above have been detected in concentrations that exceed MWSWCTL in sentry monitoring wells located adjacent to the Pensacola Bay. This contamination is a violation per Chapter 62-780, F.A.C. The Department recommends the following to determine if groundwater is contaminating Pensacola Bay:

- Install additional sentry monitoring wells closer to Pensacola Bay to determine if the groundwater contamination is affecting Pensacola Bay or
- conduct a Trident probe study to determine the same thing.

Response - Bis(2-ethylhexyl)phthalate was detected at a concentration greater than the GCTL in one groundwater sample, the field duplicate collected at PEN-46-14 (Section 4.3.1.2 of the RI report). The reported concentration in 46GW1401D was 64 ug/L, greater than the GCTL of 6 ug/L. The bis(2-ethylhexyl)phthalate concentration for the corresponding groundwater sample (46GW1401) was less than 7 ug/L. PEN-46-14 was resampled in May 2006 and the bis(2-ethylhexyl)phthalate result from that sampling event was less than 5.1 ug/L. The result of the May 2006 re-sampling has been added to Table 4-9. Although the detection limit in the May 2006 sample, 5.1 ug/L, was greater than the MWSWCTL of 2.2 ug/L, the target PQL for bis(2-ethylhexyl)phthalate in groundwater is 10 ug/L.

Beryllium concentrations in groundwater samples collected for the Site 46 RI ranged from less than 0.05 μg/L to 0.74 μg/L. Although beryllium concentrations in two groundwater samples were greater than the MWSWCTL of 0.13 μg/L, all were less than the NAS Pensacola reference concentration of 1.1 μg/L (Table 4-10).

Nickel concentrations in groundwater samples collected for the Site 46 RI ranged from 0.87 ug/L to 17.8 ug/L. Although the nickel concentration in one groundwater sample (46GW1401 collected from PEN-46-14) was greater than the MWSWCTL of 8.3 ug/L, all were less than the NAS Pensacola reference concentration of 40 ug/L (Table 4-10).

Vinyl chloride and naphthalene were detected in one or more of the wells close to Pensacola Bay at concentrations greater than MWSWCTLs. Installation of sentinel wells closer to the Bay was not feasible due to reconstruction along the sea wall following Hurricane Ivan. Additional sampling in Pensacola Bay (trident probe) is not considered necessary because the area of Pensacola Bay adjacent to Site 46 was investigated as IR Site 2. Please see response to comment 1 regarding IR Site 2. Site 2 has been approved for NFA, because the impact of releases from Site 46 and the adjacent industrial areas, including Site 38, appear to be minimal.

Comment 6 (Section 8.8 “Conclusions”) - In this section, the proposed remedy for this site is Monitored Natural Attenuation. The Department will consider this option after the issues explained in the previous comments have been addressed. In addition, an explanation on how the inorganic groundwater contamination naturally attenuates needs to be included when discussing this remedy.

Response - Site 38, located to the immediate east of Site 46, has been investigated and the final ROD was issued in 2005, which selected LUCs and MNA as the remedy for Site 38 groundwater contamination. Similar contaminants, including CVOCs and metals, were found at Site 38 and Site 46. Evaluation of the site conditions led to the selection of MNA as the remedial option for Site 38 groundwater contamination. Because of the proximity and similarity of the two sites, MNA is considered as an appropriate remedial option for groundwater at Site 46. A full evaluation of remedial options will conducted during the Feasibility Study for Site 46.

Responses to University of Florida Comments
dated September 25, 2007
on the
Draft Remedial Investigation Report for Site 46 (Former Building 72),
Naval Air Station Pensacola, Florida

Comment 1. - Bromodichloromethane and chlorodibromomethane were detected in groundwater samples (PEN-46-01 and PEN-46-14) at concentrations greater than their GCTLs. They are subsequently dropped as COPCs for groundwater without explanation. Bromodichloromethane and chlorodibromomethane should remain as COPCs.

Response - Bromodichloromethane and chlorodibromomethane were identified as COPCs for groundwater and were quantitatively evaluated in the risk assessment as shown in Table 6-5, 6-14, and page 6-67. Both chemical compounds were evaluated in the risk assessment.

Comment 2. –The report describes surface soil as soil from zero to six inches below land surface (bls) and subsurface soil as greater than six inches bls. Chapter 62-780 FAC defines surface soil as soil located from zero to two feet bls and subsurface soil as soil greater than two feet bls.

Response - The Navy concurs. The definitions of surface and subsurface soil specified by Chapter 62-780 will be added to the text. Please note that use of the Chapter 62-780 definitions will not change the results and conclusions of the risk assessment because risks were evaluated using maximum concentrations in surface and subsurface soil, as shown in Tables 6-6 through 6-13. Therefore, it will not be necessary to revise these tables.

Comment 3. –Page 6-6 of the report states that screening levels for sodium are not available in the FDEP CTL tables. This is incorrect for groundwater. Sodium has a GCTL of 160,000 ug/L (a secondary standard) (Chapter 62-777, FAC) and should be identified as a COPC for groundwater.

Response – The Navy concurs. Sodium and its CTL (160,000 ug/L) will be added to Table 6-14.

Comment 4. –We recommend adding the incidental ingestion of groundwater to the construction worker scenario due to the likely exposure to shallow groundwater during construction activities.

Response - Although possible, exposure to groundwater by a construction worker would be regarded as negligible relative to direct exposure to soil. The text will be modified to reflect that this exposure pathway is possible, but its contribution to overall risk would be insignificant.

The following revisions will be made to the text in Section 6.3.1, page 6-20:

- Construction/Excavation Worker – A plausible on-site receptor under future land use if major construction activities were to occur. This receptor could be exposed to surface and subsurface soils by incidental ingestion, dermal contact, and inhalation (i.e., airborne particulates/vapors). The construction worker is assumed to be exposed to soil for 250 days per year (USEPA, 2002b) assuming a Reasonable Maximum Exposure (RME) scenario. Although possible, direct exposure to groundwater by a construction worker is not quantitatively evaluated in the risk assessment. This scenario is considered to be unlikely and risks from exposure to groundwater (via incidental ingestion of small amounts of water) are regarded as negligible relative to direct exposure to soil. In addition, evaluation of exposure of construction workers to groundwater is not specified or recommended in Rule 62-777 FAC.

Comment 5. –An exposure frequency of 30 d/y for the site maintenance worker (based on professional judgment) seems low given the Pensacola area climate. Some documentation from NAS Pensacola regarding the expected frequency of groundskeeping and maintenance events for this part of the base will be important in helping to justify this exposure assumption.

Response - The EF of 30 days/year is recognized as professional judgment for evaluating risk at the site. A EF of 30 days/year for the maintenance worker has been used in human health risk assessments performed at various Navy facilities in Florida for at least 10 years (e.g., Naval Training Center, Orlando (June 1999) and NAS Whiting Field (January 1998) for reasonable maximum exposure (RME) scenarios. This exposure frequency has also been used in previous risk assessments at NAS Pensacola, (e.g., Site 43). It should be recognized that this provides a point of reference to the industrial worker who is assumed to have an EF of 250 days/year and for whom risks have also been calculated.

Comment 6. –Adult and adolescent recreational users and trespassers were assumed to be exposed to on-site soil for 45 d/y based on professional judgment. Although 45 d/y may be an appropriate exposure frequency for a trespasser, it is low for recreational users. We recommend using an exposure of 200 d/y for the recreational scenario. This value has been used by the FDEP for recreational scenarios at other sites.

Response - As stated, the exposure frequency for recreational users and trespassers is based on professional judgment. The 45 days per year is based on an estimate for swimming frequency in the southeast; this estimate is stated in EPA Region 4 guidance (Supplemental Guidance to RAGS: Human Health Risk Assessment Bulletins, EPA Region 4). Although the recreational user or trespasser at this site is not equivalent to a swimmer, it helps to predict the frequency that one may trespass or recreate, which may be similar to going to a lake or pond to swim. The Navy believes that the swimming frequency of 45 days per year was sufficiently conservative with regards to evaluating a reasonably maximum exposed individual. We believe that it is unlikely that a recreational user or trespasser would be at the site for an average of 4 days per week. Increasing the exposure frequency to 200 days per year renders these receptors essentially equivalent to an industrial worker. It is unlikely that the Navy would tolerate trespassers on the property with a frequency of 200 days per year.

In addition, a recreational EF of 45 days/year has been used in human health risk assessments performed at other Navy facilities in Florida (e.g., Naval Training Center, Orlando (June 1999) and NAS Whiting Field (January 1998) for reasonable maximum exposure (RME) scenarios. This exposure frequency has also been used in previous risk assessments at NAS Pensacola, (e.g., Site 43).

Comment 7. –The IEUBK Model for lead was used to assess exposure to lead in children from groundwater. The average groundwater lead concentration was used as the exposure point concentration in the model. Receptors are usually exposed to groundwater from only one well. Averaging contaminant concentrations across wells would not accurately represent potential exposure scenarios. The exposure point concentration for lead in groundwater should be the maximum detected concentration.

Response - Average lead concentrations were used for the IEUBK Model evaluation because current USEPA guidance indicates that average lead concentrations should be used for both the IEUBK (http://www.epa.gov/superfund/lead/ieubkfaq.htm#mean) and ALM (http://www.epa.gov/superfund/lead/almfaq.htm#equation) models. Please note that if the maximum lead concentration in groundwater (23.7 ug/L) were used in the IEUBK Model, the results would still be acceptable. The predicted geometric mean child blood lead level would be 3.7 ug/dL and the probability of exceeding the USEPA goal of 10 ug/dL would be 1.8 per cent. This estimate is less than USEPA's goal of limiting exposure to lead so that no more than 5 percent of the exposed children have an estimated blood-lead level greater than the established level of concern (i.e., 10 ug/dL).

Comment 8. –It is assumed that the grounds maintenance worker will spend at least part of the day outdoors. Therefore, we recommend using the US EPA default outdoor worker soil ingestion rate of 100 mg/d for this scenario (US EPA, 2002).

Response - The Navy disagrees with increasing the soil ingestion rate from 50 to mg/kg to 100 mg/kg. The soil ingestion rate is consistent with FDEP's exposure assumption for an industrial worker, which forms the basis for the derivation of the industrial SCTLs.

Comment 9. –Future adult recreational users/trespassers under the same conditions as the adolescents (95^{th} percentile value for soccer players in moist conditions) have a skin adherence factor of 0.08 mg/cm^2 (US EPA, 2004). We recommend changing the adult skin adherence factor to reflect the same conditions as the adolescent.

Response - Changing the skin adherence factor from 0.07 mg/cm^2 to 0.08 mg/cm^2 will pose a negligible change to the overall risk, and would have no significant impact on any risk management decisions. The adherence factor of 0.07 mg/cm^2 is taken from Exhibit 3-5 in EPA's Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) (EPA, July 2004). It is consistent with residential exposure conditions. The value of 0.08 mg/cm^2 is the 95^{th} percentile adherence factor for an adult soccer player in moist conditions. This value is also presented in the referenced guidance (EPA, July 2004).

Comment 10. –The list of COPCs in surface soil is incomplete. Phenol (Table 6-9), aluminum (Table 4-4), lead (Table 4-4), and methylene chloride (Table 4-6) exceed their SCTLs for leachability to groundwater.

Response – The Navy concurs with regard to aluminum, lead, and phenol. These analytes will be added to the list of COPCs for leachability to groundwater in Section 6.6.3.1. Methylene chloride was not positively detected in any surface soil samples (see Response to Comment 2).

<u>Comparison of Chemicals in Surface Soil with Leachability SCTLs</u>

Table 6-9 presents comparisons of maximum detected concentrations in surface soil with Florida criteria based on leachability to groundwater. As shown in the table, the following constituents had maximum concentrations which exceeded the leachability criteria:

- Acetone
- Chloromethane
- PCE
- TCE
- Phenol
- Aluminum
- Lead

Comment 11. –The list of COPCs in subsurface soil is incomplete. Methylene chloride (Table 6-13) and lead (Table 4-4) remain of concern for leachability to groundwater.

Response – The Navy concurs. These constituents will be added to the list of COPCs for leachability to groundwater in Section 6.6.3.2, as indicated below.

- Chloromethane
- Cis-1,2-DCE
- Chloroform
- Methylene Chloride
- PCE
- TCE
- Lead

The addition of methylene chloride and lead to the above table does not affect the conclusions of the risk assessment as the exceedances were correctly indicated in Table 6-13.

Comment 12. –The list of COPCs for groundwater is incomplete. Arsenic (Table 6-14) and sodium (Table 4-8) exceed their GCTLs.

Response – The Navy concurs. These constituents will be added to the list of COPCs for groundwater in Section 6.6.3.3. The list of COCs on page 6-67 will be revised as follows:

FLORIDA GROUNDWATER EVALUATION

Potential COCs for Groundwater
Bromodichloromethane
Chlorodibromomethane
TCE
Vinyl chloride
Bis(2-ethylhexyl)phthalate
Naphthalene
Aluminum
Arsenic
Barium
Cadmium
Chromium
Iron
Lead
Manganese
Sodium
Vanadium

The addition of these constituents to this table does not affect the results and conclusions of the risk assessment because arsenic was specified as a COC in both the USEPA (Table 6-5) and Florida (Table 6-14) risk assessments. The addition of sodium should not affect the conclusions because the elevated levels of sodium in groundwater (maximum = 2,020,000 ug/L) indicate that the water is likely not potable.

Comment 13. –Page 6-60 states that the 95% UCL is "..a representation of the upper limit that potential receptors would be exposed to over the entire exposure period". The 95% UCL is an upper limit on the mean concentration receptors would be exposed to, not the upper limit of the exposure concentration.

Response – The Navy concurs. The text and definition of the 95% UCL on page 6-60 will be revised as specified in the comment:

Exposure Point Concentrations

EPCs for soil were calculated using the Florida UCL Calculator (Version 1.0). Uncertainty is associated with the use of the 95 percent UCL on the mean concentration as the EPC. As a result of using the 95 percent UCL, the estimations of potential risk for the RME scenario were most likely overstated because this is ~~**a representation of**~~ the upper limit **on the mean concentration** that potential receptors would be exposed to over the entire exposure period. In some cases, the maximum concentration was used as the EPC. Use of the maximum concentration as the EPC tends to overestimate potential risks because receptors are assumed to be exposed continuously to the maximum concentration for the entire exposure period. Uncertainty was also introduced when the nondetects results were assigned a value of one-half the nondetect quantitation limit in the calculation of the EPC. This may either overstate or understate the risks to potential receptors.

Comment 14. –Section 8.0 Summary and Conclusions is incomplete:

a. Based on Table 4-6, chloromethane, methylene chloride, PCE, and cis-1,2 dichloroethene were detected above their SCTLs for leachability to groundwater. These chemicals should be added as COPCs.
b. Based on Table 4-7, chlorodibromomethane and bromodichloromethane were detected in wells above their GCTLs. In Table 4-8, sodium was detected above its GCTL. These constituents should be added as COPCs for groundwater.

Response – The Navy concurs. Section 8.0 is a summary of the previous sections of the report. These constituents were identified as COPCs in Sections 6.6.3.1, 6.6.3.2, and 6.6.3.3 and were included in both the USEPA and FDEP risk assessments. Sodium will be added as a COPC for groundwater as per the response to Comment 12. The report will be updated to include summary discussion of all the COPCs found at the site.

Comment 15. –In Table 4-5 the SCTL for TRPH leachability to groundwater should be 340 mg/kg.

Response – The Navy concurs. The SCTL for TRPH leachability to groundwater will be changed from 340,000 mg/kg to 340 mg/kg in Table 4-5.

Comment 16. – In Table 6-8 the simple apportionment for the recreational scenario was performed incorrectly. TCE, Aroclor-1260, and arsenic are carcinogens and had a maximum concentration greater than $1/10^{th}$ their non-apportioned SCTLs. Therefore, the SCTLs for these chemicals would be divided by

three and the SCTL for TCE would be 40,000 ug/kg. The TCE exposure point concentration of 38,000 ug/kg is below the correctly apportioned SCTL for direct contact.

Response – The Navy concurs. TCE, Aroclor-1260, and arsenic will be apportioned as specified in the comment. The table will be revised to show that the exposure point concentration for TCE exceeds the simple apportioned SCTL.

Comment 17. –Comments concerning Table 7-1:

Comment 17a. – The minimum detected PCE concentration was compared to the US EPA Region 4 soil screening values. The maximum concentration should be used for comparison and PCE should remain a COPEC.

Response – The Navy concurs. The maximum concentration will be used and PCE will be added as an initial COPC. Table 7-1 will be modified to reflect the change. The following modifications to the text were made to address this change:

Section 7.5.1 – The text was changed from "In surface soil, four VOCs (1,2-dichlorobenzene, 1,4-dichlorobenzene, chloromethane, and TCE) were retained as COPCs because their maximum concentrations exceeded screening values (Table 7-1)." to "In surface soil, **five** VOCs (1,2-dichlorobenzene, 1,4-dichlorobenzene, chloromethane, **PCE**, and TCE) were retained as COPCs because their maximum concentrations exceeded screening values (Table 7-1)."

Section 7.6.1.1 – The following text was added, "PCE was detected in 2 of 15 soil samples at or above its ESV (0.1 mg/kg). Sample location 46SB3401 had the highest concentration of 0.1 mg/kg while sample 46SB3101 had the lowest reported detected concentration of 0.006 mg/kg. The detected PCE concentrations were compared to the following toxicity guidelines to further evaluate risks to plants and invertebrates.

- Canadian Soil Quality Guideline (SQG): 3.8 mg/kg agricultural use (CCME, 1999a)
- Dutch Target Value 0.002 mg/kg, Intervention Value 4 mg/kg (MVROM, 2000)

The Canadian SQG of 3.8 mg/kg for PCE is the 25^{th} percentile of effects and no effects data distribution for plants and invertebrates (CCME, 1999a). The maximum detected concentration of PCE at Site 46 is well below the Canadian Soil Quality Guideline for agricultural use, and for residential parkland use (3.8 mg/kg). Both of the detected concentrations exceed the Dutch Target Value. The intermediate value, as describe previously, for PCE is 2.001 mg/kg. Both detected concentrations are well below this benchmark. Therefore, because the detected concentrations are below these benchmarks, risk to plants and soil invertebrates from TCE are expected to be minimal."

Comment 17b. – An ecological soil screening level was developed for total PAHs in June 2007. This new value (1.1 mg/kg) is based on protection of mammals exposed to high molecular weight PAHs and is very similar to the US EPA Region 4 screening value of 1 mg/kg.

Response - Comment noted. However, this Report was submitted for review in March 2007, prior to the Ecological Soil Screening Level document for PAHs becoming available in June 2007. Future documents will include the new screening level. Because the Region IV screening value (1.0 mg/kg) is more conservative than the Eco-SSL value (1.1 mg/kg), no changes to the document will be made to address this comment.

Comment 17c. – An ecological soil screening level was derived for manganese (220 mg/kg for the protection of plants) in April 2007. This value should be added to the Table. The conclusion that manganese is not a COPEC at this site remains valid.

Response - Comment noted. However, this Report was submitted for review in March 2007, prior to the Ecological Soil Screening Level document for manganese becoming available in April 2007. Future documents will include the new screening level. Because the Region IV screening value (100 mg/kg) is more conservative than the Eco-SSL value (220 mg/kg), no changes to the document will be made to address this comment.

Comment 17d. – The Canadian Soil Quality Guidelines (2006) recommends using a soil screening value of 0.1 mg/kg for benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene for the protection of the environment and human health. This value is the same as the US EPA Region 4 surface soil screening value for benzo(a)pyrene. Based on site concentrations, these constituents can be excluded as COPECs.

Response – The Navy concurs. The text was modified using the Canadian Soil Quality Guideline of 0.1 mg/kg in the Step 3A refinement for benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene). Consequently, these individual PAHs will be eliminated as COPCs for plants and invertebrates. The following modification to the text will be made to address this change:

Section 7.6.1.2 – The following text was added, "The Canadian SQG recommends individual soil screening values of 0.1 mg/kg for benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) for the protection of the environment and human health. The maximum detected concentrations of these PAHs are all below the Canadian SQG screening benchmarks (see Table 7-1). Therefore, risks to plants and soil invertebrates from. benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are expected to be negligible."

Comment 18. – In Section 4.3.2.4 the word "cadmium" should be changed to "chromium" for all occurrences.

Response – The Navy concurs. The text will be revised as indicated.