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LETTER REGARDING RESPONSE TO REVIEW COMMENTS DRAFT REMEDIAL INVESTIGATION REPORT FOR SITES 3, 4, 6, 30, 32 AND 33 NAS WHITING FIELD FL
4/9/1999
TETRA TECH

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99-E091

April 9, 1999

Mr. Jim Cason
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399

Subject: **Response to Review Comments - Draft Remedial Investigation Report for Sites 3, 4, 6, 30, 32, and 33**
Naval Air Station Whiting Field, Milton, Florida

Dear Mr. Cason:

On behalf of Southern Division, Naval Facilities Engineering Command, Tetra Tech, Inc. is pleased to submit two copies of the draft Response to Comments for the Remedial Investigation Report for Sites 3, 4, 6, 30, 32, and 33 at Naval Air Station Whiting Field, Milton, Florida. Copies of this letter are also being forwarded to members of the NAS Whiting Field Partnering Team.

If you have any questions, please give me a call at (423) 220-4727.

Sincerely yours,

Phillip Ottinger

Phillip Ottinger
Task Order Manager

Enclosure

PEO:smc

c: Craig Benedikt, EPA (electronic copy)
Linda Martin, SDIV (electronic copy)
Jim Holland, NAS Whiting Field (electronic copy)
Tom Conrad, BEI (electronic copy)
Terry Hanson, TtNUS (electronic copy)
Rao Angara, HLA (electronic copy)
Gerry Walker, TtNUS (electronic copy)
Amy Twitty, CH2M Hill (electronic copy)
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RESPONSE TO COMMENTS

FDEP Review Comments
Remedial Investigation Report for
Sites 3, 4, 6, 30, 32, & 33
September 1998

1. The title of the report should be " The Remedial Investigation Report for Surface and Subsurface Soil at..."

Response:

The title and text will be revised as suggested.

2. At the conclusion of each site investigation, recommendations regarding possible well placement should be included in a groundwater assessment or a statement as to why none are recommended should also be included.

Response:

Since evaluation of groundwater was not part of this remedial investigation, recommendations on the placement of additional wells are not appropriate. The text will be revised to note groundwater is currently being assessed in the base-wide groundwater investigation for Site 40 and well placement recommendations are included in the Work Plan for Site 40.

3. The map on page 1-2 shows essentially nothing and should be revised.

Response:

The map on page 1-2 will be deleted as suggested.

4. Similar to the Table 1-1, a table showing the number, supposed contents and disposition history of all ASTs and USTs at each site should be prepared. Additionally, please insure that accurate (to the degree possible) locations are shown on appropriate figures.

Response:

A new table listing the USTs and ASTs at each site will be added to Section 1. The locations of these tanks will be shown on the appropriate figures.

5. Was building 1478, the old transformer repair shop, and the surrounding area, evaluated?

Response:

Building 1478, the old transformer repair shop, and the surrounding area were investigated as part of the Site 5, Battery Acid Seepage Pit, investigation. Geraghty & Miller, Inc. investigated Site 5 located next to Building 1478, in June of 1985. After the Consent Order for Site 5 was closed (FDER letter dated 15 April, 1987), Site 5 went into no further action status. Four soil borings were installed around the site. In addition, at each of the boring locations, a 4-inch diameter monitoring well (WHF 5-2, WHF 5-3, WHF 5-4, and WHF 5-1) was installed to a total depth of 142 to 147 feet BLS.

6. **Refer to page 1-12: what is APU thinner? What was the nature (unpaved ditch, concrete pipe, etc.) of the storm sewer at the wash rack? What is (was) the nature of the cleaning solution (that was used at the rate of 4200gallons per year)?**

Response:

The earliest references to APU thinner are contained in the Initial Assessment Study (IAS) by Envirodyne Engineers, Inc. The IAS notes APU thinner was used for helicopter maintenance operations at the South Field. Base personnel identified APU as an acronym for "all-purpose Universal." The exact composition of the thinner is unknown. It was estimated 180 gallons per year (from 1980 -1984) were generated. This waste was drummed and sent off-site for disposal. The text will be revised to note APU thinner was used at South Field, not North Field.

Originally, the storm sewer system at the wash rack appears to have consisted of underground vitrified clay piping. In the early 1970s, the wash rack was connected to the sanitary sewer system using concrete pipe. Several other piping modifications appear to have been made over the years of operation of the wash rack, but specific piping details are not known.

The cleaning solution used at the rate of 4,200 gallons per year at North Field consisted of detergent/soap to wash aircraft. The exact composition of the cleaning solution is unknown.

7. **Refer to page 1-13: what was the disposition of the tank at Building 1454 (is it in the new table)?**

Response:

The tank was abandoned in place and filled with sand. The new table in Section 1 will include a description of this tank.

8. **Section 1.4, Regulatory Setting: a discussion of the appropriate Florida rules and regulations should be included, including a discussion of the leaching testing and data application that is required by Florida.**

Response:

A discussion of appropriate Florida regulations that have been utilized in preparing the RI Report will be added to Section 1.4.

9. **The Navy intends to evaluate groundwater at NAS Whiting Field as a separate endeavor; however, there is some question as to the practicality of doing this in light of the fact that the state of the art of investigation at IRP sites has developed along the lines of a continuing and consequent knowledge of site soil and ground water. I question the ability of the Navy to adequately conduct site assessments and soil assessments on a strictly separate basis, especially in cases where a ground water investigation may precede complete soil investigation. When the NAS Whiting Field Partnering Team was considering making the ground water a separate site, my thinking along those lines primarily concerned how we would deal with the remedial aspects of the ground water at NASWF and not necessarily with the assessment aspects of each site; now, I am questioning the wisdom of our actions. I am requesting that we revisit that decision at an early date and confirm that the decision was correct. If it is not the best way to pursue the investigations, we should be prepared to modify our actions accordingly.**

Response:

In all cases, except possibly Sites 38 and PSC 1485C the soil investigation will either precede or be performed concurrently with the groundwater investigation. If these or any future site investigations reveal soil contamination leaching to groundwater or other groundwater contaminants the ROD for groundwater Site 39 & 40 will be modified to reflect these changes. Since the groundwater plume is commingled in many areas, assessment of the groundwater as one site appears to be a practical alternative. The confusing part of the process appears to be capturing and making sure all of the groundwater and soil leaching issues identified in the individual site soil assessments are addressed in the Site 39 & 40, Basewide Groundwater Remedial Investigation. To ensure this, the groundwater and soil leaching issues identified in each of the individual soil RI Reports are currently being tabulated and included in the Work Plan for Site 40. This issue can be discussed at the 13-14 April Partnering Meeting.

10. **Section 5.1, Geologic Setting and at site-specific discussions: these various site-specific discussions concerning perched water tables and clay layers should also be consolidated as one section that pertains to the absence or presence of (a) perched zone(s). This is important in that such a zone(s) may be a continuing source of contamination to the ground water and deeper zones at particular site, which has great implications as to whether a site has been sufficiently evaluated after the usual surface/subsurface investigation(s). Maps and isopachs should also be presented for that (those) zone(s), if those data are available.**

Response:

The perched water table was not investigated as part of the Remedial Investigation of Sites 3, 4, 6, 30, 32, and 33. The general perched water table information, described in Section 5.1, was taken from Technical Memorandums 1 and 2. A detailed description of the perched water tables will be provided in the Site 39 & 40 Basewide Groundwater Remedial Investigation Report.

11. **Table 5-2, 5-6 and other similar tables for other sites should also consider leachability values as compared to the appropriate leachability values for soils in Chapter 62-785, F.A.C.**

Response:

The potential for soil contamination to leach to groundwater is currently being addressed under the Site 39 & 40, Basewide Groundwater Investigation. As part of this investigation, soil chemical concentrations at each site are being compared to the proposed Florida FAC 62-777 leachability screening values. For chemicals without screening values (inorganics) and at locations where the detected chemical concentrations exceed the published leachability screening values, soil samples will be collected and analyzed using the synthetic precipitation leaching procedure (SPLP) test to determine facility-specific leachability action levels in accordance with Florida guidance. A copy of the soil leachability screening table developed for the Site 39 & 40 Work Plan showing chemicals at Site 3, 4, 6, 30, 32, and 33 exceeding FAC 62-777 leachability screening criteria will be referenced in the text and included as an appendix.

12. **Section 5.2, Soil Assessment: please insure that the data from the investigation sufficiently characterizes the areal extent of any contaminants, to the degree that the data can be utilized to prepare IM or FS tasks for any necessary remedial action(s). Please be aware that insufficient contaminant delineation during the RI phase has necessitated additional delineation during remedial actions. If the present conditions of separate soil and ground water investigations continues, this becomes more important.**

Response:

The data from the soil assessment will be reviewed to insure sufficient characterization of the areal extent of any contaminants has occurred. Chemicals exceeding two times background and either USEPA Region III RBCs or Florida SCTLs will be bolded on the Section 5 figures to make it easier to identify the areas exceeding RBCs or SCTLs.

13. Section 5.2.1.1, Surface Soil: please present assurance that comparison of the soils at this and all other sites are compared to the background soil type, in this case, to the Troup Loamy Soil, and that graphic presentations of such data such as Figure 5-1 (and all similar figures) sufficiently characterize the areal extent of contamination, as previously mentioned in the comments on Section 5.2.

Response:

All of the sites were compared to the appropriate background soil type. Troup loamy soil is present at all sites except Site 6. Site 6 consists of Troup loamy soil and Dothan/Lucy/Bonifay soil. Background soil types, for surface soil comparison at each site are stated in the text and footnoted in the summary of surface soil analytical results tables for each site. Figure 5-1 and similar figures will be reviewed as stated in the response to Comment No. 12.

14. Please carefully consider the comment from page 2 of Dr. Roberts' letter regarding "a thick layer of concrete" serving to prevent a complete exposure pathway at certain sites. It is important that the Navy address this concern, as it is directly related to the problem of not only future exposure risks, but also in the future when the concrete may be removed or repaired, when it may contaminate the surface/subsurface soil and ground water by virtue of leaching from soil that was formerly covered by concrete. Has the Navy adequately addressed both the risk and the leaching scenario for any or all of the sites that are covered in the RI? If not, we need to discuss this and assure that it has been addressed properly.

Response:

For comparison and completeness purposes, Tetra Tech will calculate the risk of exposure to surface soils under hypothetical future use assuming the concrete layer is removed exposing the soil These calculations will be included in Appendix E of the RI Report The text will be revised to include the results of the hypothetical future use risk calculations and will note, a complete exposure pathway does not currently exist because of the thick layer of concrete.

The potential for leaching is being performed as part of the Site 39 & 40 remedial investigation; however, review of the leachability screening table, developed as part of the Site 39 & 40 Work Plan, indicates several chemicals exceed the Florida FAC 62-777 screening values in the areas presently covered by concrete.

Land use controls should be implemented to ensure the concrete or other similar materials remain in place at Sites 30, 32, and 33 to prevent exposure to surface soil and/or leaching. The use of land use controls will be evaluated in the Feasibility Study and, if agreed upon, will be documented in the Record of Decision.

RESPONSE TO COMMENTS

University of Florida Review Comments
Remedial Investigation Report for
Sites 3, 4, 6, 30, 32, & 33
September 1998

Human Health Risk Assessment

General Comments

Soils at this site were screened against Florida Soil Cleanup Target Levels (SCTLs) and Region III Risk-Based Concentrations (RBCs). However, the preference of FDEP is to screen all soil samples against values for leachability based on groundwater criteria, found in Table I of the Technical Report for Chapter 62-785, F.A.C. Screening against leachability numbers will have some impact on the selection of chemicals of potential concern (COPCs) for this site. For example, for subsurface soils at Site 4, chloromethane, ethylbenzene, toluene, total xylenes, 2-methylphenol, and n-nitroso-di-n-propylamine would be included as COPCs. As calculated at present and included in this report, risk/hazard estimates may change somewhat, therefore this RIR may be of limited use as a risk management tool.

Response:

The potential for soil contamination to leach to groundwater is currently being addressed under the Site 39 & 40, Basewide Groundwater Investigation. As part of this investigation, soil chemical concentrations at each site are being compared to the proposed Florida FAC 62-777 leachability screening values. For chemicals without screening values (inorganics) and at locations where the detected chemical concentrations exceed the published leachability screening values, soil samples will be collected and analyzed using the synthetic precipitation leaching procedure (SPLP) test to determine facility-specific leachability action levels in accordance with Florida guidance. A copy of the soil leachability screening table, develop for the Site 39 & 40 Work Plan, showing chemicals at Site 3, 4, 6, 30, 32, and 33 exceeding FAC 62-777 leachability screening criteria will be referenced in the text and included as an appendix.

It should also be noted that subsurface soil was screened against industrial/commercial SCTLs/RBCs. This further limits the usefulness of this RIR from a risk management standpoint. When calculating risk/hazard based on future residential use, the screening of subsurface soil against industrial/commercial values implies that site soils would not be disturbed if this area were to undergo residential construction.

Response:

Screening subsurface soil against industrial/commercial SCTLs/RBCs is in accordance with the risk assessment procedures outlined in the GIR and is consistent with the approach used for preparing the human health risk assessments at other NAS Whiting Field sites.

Specific Comments

Iron was inappropriately screened out of the COPC selection process based on its status as an essential nutrient. According to Region IV guidance, iron may not be eliminated for this reason. Chemicals which may be eliminated as essential

nutrients (if their concentrations are such that they do not pose a risk) are calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium.

Response:

The human health risk assessment will be revised so iron is not screened out of the COPC selection based on its status as an essential nutrient. However, it should be noted that the RfD currently available for iron is only a provisional value. There is high uncertainty attached to risk estimates developed based on the provisional RfD and the utility of such risk estimates is very limited.

It should be noted that, since this RIR was submitted in September 1998, an updated Region III RBC Table has been released. The RBC for chromium VI in soil has been revised, for residential exposure from 390 mg/kg to 230 mg/kg and for industrial/commercial exposure from 10,000 mg/kg to 6,100 mg/kg. The value of 230 mg/kg for residential contact is below the Florida residential SCTL for chromium VI (290mg/kg). This change should be reflected in tables as appropriate, and chromium VI should be included as a COPC where the screening values are exceeded.

Response:

The tables will be changed to reflect the latest EPA Region III RBCs dated 10/1/98. Chromium VI will be included as a COPC where the screening values are exceeded.

There are discrepancies between sampling reports as stated in Section 5 (Investigative Results) and Section 6 (Human Health Risk Assessment). For example, Tetra Tech states on page 5-30 that "twenty-four subsurface soil samples and five duplicates were collected at Site 4 in 1998 and analyzed for VOCs, SVOCs, Pesticides/PCBs, TPH, and metals." Table 5-8 (Summary of Subsurface Soil Analytical Results at Site 4) lists 52 analytes and also indicates that 24 samples were analyzed for this Site. However, Tetra Tech indicates on page 6-5 that one sample was collected at Site 4 from 2-15 feet below ground surface (bgs) and six samples were collected from 2-22 feet bgs, for a total of seven samples. Tables 6-4A and 6-4B (Occurrence, Distribution, and Selection of Chemicals of Concern for Site 4 Subsurface Soil) also indicate that seven samples were analyzed for Site 4, and Table 6-4B lists 44 analytes. Although it appears that the samples in Section 6 may be a subset of the samples in Section 5, it is unclear a) why there is a discrepancy in the number of samples and b) which section contains the corrects data. The same type of apparent discrepancy also exists for Site 3 subsurface soil, Site 6 subsurface soil, Site 30 surface soil, Site 32 subsurface soil, and Site 33 subsurface soil.

Response:

It is correct Section 6 contains a subset of the data in Section 5. Both sets of data are correct for their respective intended purposes. Section 5 contains analytical results and statistics, including analytical data for all soil samples collected. Section 6 only includes the analytical data utilized for the risk assessment pathways shown on Figure 6-1. The data utilized for the risk assessment generally includes the analytical data for the samples collected from the land surface to a depth of 15 feet (to 22 feet for Site 4). Surface soil samples (0 to 2 feet) collected under concrete or asphalt at Sites 30, 32, and 33 were not included in the risk assessment data set since the concrete or asphalt prevented direct exposure to the soil material. However, surface samples (0 to 2 feet) collected under concrete or asphalt at Sites 30, 32, and 33 will be included in the risk assessment data set for future resident. Please also see the response to FDEP Comment No. 14.

Regarding Sites 32 and 33, Tetra Tech states on page 6-22 that "a thick layer of concrete covers the surface soil at Site 32 [and Site 33]. Therefore, a complete exposure pathway does not exist." It should be made clear that a complete exposure pathway does not exist *at the present time*. Unless there is some mechanism to ensure that a thick layer of concrete overlies these sites *both now and in the future*, risk/hazard for future use should be predicted upon exposure to surface soils. Also regarding these sites, it is stated on page 6-52 that "if the concrete would be removed, clean fill would be used as the replacement." Is there some mechanism in place to ensure that this would be the case?

Response:

see the response to FDEP Comment No. 14

Risk/hazard from inhalation exposure was not calculated for any receptor because "inhalation exposures represent a relatively minor exposure relative to dermal and ingestion pathways (Table 6-11, Selection of Exposure Pathways)." Rather than disregard potential risk/hazard from inhalation exposure, Tetra Tech should include this exposure pathway in the calculations. For example, since chromium VI is a carcinogen only through the inhalation route, potential cancer risks from this COPC were not calculated. After inhalation risk/hazard from COPCs is determined, it can then be concluded whether the risk/hazard is negligible.

Response:

Tetra Tech has compared the maximum concentrations of chromium VI and the other chemicals driving the risk at each site with the USEPA generic Soil Screening Levels (SSLs) for the migration of contaminants from soil to air. All maximum concentrations of these chemicals are well below the respective SSLs, except where no SSLs were developed because no toxicity criteria are available for the inhalation exposure route [e.g., benzo(a)pyrene]. Because the SSLs were established at a cancer risk level of 1 x 10^{-6} and an HI equal to 1, concentrations less than the SSLs represent negligible risk (i.e., risk less than benchmarks). Tetra Tech will compare maximum concentrations of all other COPCs to the SSLs and will calculate inhalation risk for any COPCs with maximum concentrations exceeding the EPA SSTLs for migration of chemicals from soil to air.

There seems to be some confusion as to the derivation of dermal toxicity factors. In Section 6, Tables 6-23 and 6-24 (Non-Cancer Toxicity Data – Oral/Dermal and Cancer Toxicity Data – Oral/Dermal, respectively), Tetra Tech presents the oral toxicity values, oral to dermal adjustment factors (i.e., gastrointestinal absorption), and adjusted dermal toxicity values for COPCs. Region IV guidance states that when "appropriate data are available on oral absorption of a specific chemical, they should be used to make the administered/absorbed dose adjustment...in the absence of chemical-specific data, the Region IV OTS has adopted the following oral adsorption efficiencies...80% for volatile organic chemicals, 50% for semi-volatile organic chemicals, 20% for inorganic chemicals." For all the COPCs listed, data for gastrointestinal (GI) absorption are available from either the ATSDR Toxicant Profiles or the Hazardous Substances Data Bank (HSDB). The table below lists COPCs identified by Tetra Tech, the GI absorption used in this RIR to extrapolate dermal toxicity factors, and the chemical-specific absorption factors. Tetra Tech references Region IV supplemental guidance to RAGS as the source for its GI absorption factors; however, the guidance as quoted above is the only guidance specified by Region IV. It should be noted that correction of the GI absorption values will also change the dermal toxicity values used by Tetra Tech in the RIR.

COPC	GI Absorption Used by Tetra Tech	Literature GI Absorption	Reference
Aroclor - 1260	0.9	0.85	ATSDR
arsenic	0.41	0.95	ATSDR
aluminum	0.1	0.04	ATSDR
benzo(a)anthracene	0.31	0.5	ATSDR
benzo(a)pyrene	0.31	0.5	ATSDR
benzo(b)fluoranthene	0.31	0.5	ATSDR
benzo(k)fluoranthene	0.31	0.5	ATSDR
chrysene	0.31	0.5	ATSDR
dibenz(a,h)anthracene	0.31	0.5	ATSDR
indeno(1,2,3-cd)pyrene	0.31	0.5	ATSDR
dieldrin	0.5	1.0	HSDB
chromium VI	0.02	0.013	ATSDR
vanadium	0.01	0.03	ATSDR

Response:

Tetra Tech used GI Absorption Factors from a table provided by EPA Region IV (Dr. Ted Simon) dated June 1997. The table will be referenced in the text as the source of the GI Absorption Factors.

Receptor-specific exposure parameters (both reasonable maximum exposure [RME] and central tendency [CT] are presented in Appendix D-1. The exposure parameters for an older child trespasser are listed in Table D1-1. The surface area for this receptor is 1,013 cm^2-year/kg. The surface area should be derived assuming a child receptor has the hands, one-half the arms and one-half the legs available for dermal contact (i.e., wearing shorts and a short-sleeved shirt). As Tetra Tech has not specified the age of the older child trespasser, they should do so and derive an appropriate surface area. The construction worker scenario parameters (Table D1-6) are for RME only, and the exposure frequency and duration for these workers is 30 days/year for one year. Since the length of construction projects frequently seem to exceed one month, this value seems to be more indicative of CT than RME. A more conservative approach would be to assess the short-term construction worker (i.e., 30 days/year) and the longer-term construction worker (i.e., 60-90 days/year). Additionally, for non-carcinogens, if the exposure frequency is set to 30 days, then the averaging time should be 42 days (30 days plus weekends). Tetra Tech instead incorrectly used an averaging time of one year.

Response:

Page 6-32 of the report specifies the older child trespasser receptor was considered to be 7-16 years old. The 1,013 cm^2-year/kg is an appropriate and defensible age/body weighted surface area for the 95th percentile (RME) case. The derivation of the value was presented in the *Remedial Investigation and Feasibility Study, General Information Report, Naval Air Station Whiting Field, Milton, FL* (GIR) (ABB Environmental Services, Inc., January 1998). The GIR contains much of the risk assessment protocol historically used for Whiting Field. Protocol for the evaluation of the dermal contact with soil is presented starting on page C-5-3 of Appendix C-5. The protocol used a USEPA assumption, 25% of the total body surface area would be available for soil contact. Based on data presented in Table 6-8 of the USEPA *Exposure Factors Handbook* (August 1997), this is roughly in line with the recommendation to use the surface area of the hands, one-half the arms, and one-half the legs (for example, 27% for the 12- to 13-year-old child). The formula for dermally absorbed dose for a child includes the summation for each year of age from 7 through 16 of the surface area divided by the body weight:

$$DA_{child} = [(C_{soil} * AF * ABS * CF * EF)/AT] \Sigma_i (SA_i * ED_i/BW_i)$$

Where DA_{child} = dermally absorbed dose for a child [mg/kg-day]
C_{soil} = contaminant concentration in soil [mg/kg]
AF = adherence factor of soil to skin [mg/cm^2-event]
ABS = absorption fraction [dimensionless]
CF = units conversion factor [10^{-6} kg/mg]
EF = exposure frequency [events/year]
AT = averaging time [days] (=ED for noncarcinogens; 25,550 days for carcinogens)
SA_i = surface area exposed at age i [cm^2]
ED_i = exposure duration at age i [years] = 1 year
BWi = body weight at age i [kg]
i = age 7 through age 16

Summing the final column of this table for ages 7<8 through 16<17 provides the value for $\Sigma_i (SA_i * ED_i/BW_i)$ for the RME (95th percentile). The RME value is 115.9 + 113.6 + 108.8 + 107.6 + 104.7 + 100.8 + 94.0 + 88.2 + 88.5 + 90.8, or 1,013 cm^2-year/kg. Tetra Tech conservatively used the RME value for the CT exposure.

The 30-days/year exposure frequency is the duration specified for the construction worker scenario; in the GIR, Appendix C-2, Table C-2-4 (adult excavation worker). The GIR also specifies an exposure duration of one year. Although these are assumed values, they appear reasonable for the sites in question and are consistent with the exposure frequency and exposure duration used in previous RIs. In addition, even though the calculated excavation worker risk would change using the values suggested above, the risk at all sites is still acceptable (cancer risk less than 1 E-6 and HI less than 1.0).

Cancer risk calculations are shown in Appendix D-5. In several of the tables in this section, the cancer slope factors are incorrectly listed and appear to be oral reference doses instead. However, the cancer risks appear to have been calculated correctly. In all of the tables for adult/child residential receptors, the COPC-specific intake values are not listed.

Response:

The cancer slope factors in Appendix D-5 will be checked and revised as necessary. Tetra Tech will include adult/child residential receptor COPC-specific intake values in the appropriate tables.

Ecological Risk Assessment

Tetra Tech dismisses ecological receptors to most of the sites in this RIR on the basis of noise from adjacent taxiways and runways. However, there are well-documented populations of terrestrial wildlife in busy metropolitan airports, most notably (in Florida) rabbits and burrowing owls. It has also been demonstrated that industrialization and human activity do not preclude use of an area by potential ecological receptors. It is unclear, however, if a walk-through assessment of an populations of ecological receptors has been performed at this site. It is further stated on pages 7-3, 7-4, and 7-5 that "no rare, threatened, or endangered species are located on or near the site (Lancaster, 1998)." There is no

reference for Lancaster; however, there is a reference for Lassiter, which is perhaps what the authors intended to state.

Response:

Indeed, certain types of wildlife can adapt to urban environments, including extremely noisy areas on and near airports. However, these areas are also characterized by favorable habitat, such as wetlands or extensive old fields. As discussed in the ERA, the sites investigated in this RI are in a highly developed area characterized by buildings, concrete, and asphalt with only scattered ornamental trees and mowed turfgrass present. The periphery of the North Field area is characterized by better habitat in quality and quantity, but this area is outside the boundaries of the sites investigated in this ERA. It should also be noted, only certain types of wildlife can adapt to noisy, urban environments. These include some species of birds and small mammals. Yet, many of these species cannot always complete their entire life cycle (i.e., sensitive life stages) in such environments. A site visit by a TtNUS ecologist was conducted in Spring 1998 and only a modicum of wildlife was observed. Heavy human activity and loud flight operations were prevalent.

The reference stated in the comment should be (Lassiter, 1998) and will be changed accordingly.

Table 7-2 lists toxicity reference values for the selected endpoint ecological receptor species. These values were generally taken form the 1996 revision of *Toxicological Benchmarks for Wildlife*. Although the Benchmarks provides estimated *wildlife* toxicity values extrapolated from values measured in laboratory animal models (usually rats or mice), Tetra Tech uses the toxicity value (NOAEL and LOAEL) determined in the laboratory species. The Benchmarks does not extrapolate toxicity values for all representative ecological species chosen by Tetra Tech, but when this is the case, the extrapolated values should be used. For example, for aluminum, Tetra Tech uses the NOAEL and LOAEl determined in the mouse, when an extrapolated value is given for the red fox, which is an endpoint terrestrial ecological receptor chosen for the analysis. Additionally, it would be helpful if intermediate food chain modeling calculations were provided. Again using the risk to the red fox from exposure to aluminum, at Site 3 the hazard quotient based on a NOAEL is listed as 5.7E+02. In reproducing this calculation, using equations provided in the ERA and input values as shown in Tables 7-2 and 7-4, it appears that this value should be 1.2E+03 using a NOAEL for a laboratory mouse (1.93 mg/kg/day). When the extrapolated NOAEL for the red fox is used (0.551 mg/kg/day), the hazard quotient becomes 4.3E+03. Tetra Tech should therefore confirm calculations presented in this section, and further confirm that toxicity reference values are the most appropriate for the chosen endpoint ecological receptors.

Response:

In general, the extrapolated TRVs in Sample et al. (1996) were calculated using factors Region 4 EPA does not recommend or accept, such as metabolic scaling factors. Region 4 recommends only the use of a factor of 10 to extrapolate an NOAEL to an LOAEL from laboratory studies. As a result, the TRVs from the laboratory studies are consistently used in all cases in this ERA. The calculations for the foodchain modeling will be checked and revised, where necessary.