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NAS CECIL FIELD, FL
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LETTER REGARDING FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
REVIEW OF SITE-SPECIFIC SOIL CLEANUP TARGET LEVELS FOR SITE 15 WITH
TRANSMITTAL OF UNIVERSITY OF FLORIDA COMMENTS NAS CECIL FIELD FL
6/16/2003
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

June 16, 2003

Commanding Officer
Attn: Mr. Mark Davidson, Code ES33
SOUTHNAVFACENGCOM
Post Office Box 190010
North Charleston, SC 29419-9010

RE: Site 15 Determination of Site-Specific SCTLs, Naval Air
Station Cecil Field, Florida.

Dear Mr. Davidson:

The Department has completed its review of the report titled Site 15 Determination of Site-Specific SCTLs, Naval Air Station Cecil Field, received by the Department on January 21, 2003, prepared and submitted by Tetra Tech NUS, Inc. Various discussions have ensued since the submittal of this document. You may recall that a decision was previously made between the Navy, EPA and FDEP that the soil cleanup target levels for this site would be based upon a "Restricted II" exposure scenario. This recreational exposure scenario was first developed in Woodward-Clyde Consultants' January 1995 Final Report: Cattle Dip Vat Assessment Program, A Summary Report, prepared for the Florida Department of Environmental Protection. The "Restricted II" recreational exposure scenario was originally developed by the Department to calculate risks posed by remote cattle dip vat sites. The Department has since modified the "Restricted II" recreational exposure assumptions from those contained in the Woodward-Clyde report.

The Department's contracted risk assessors with the University of Florida's Center for Environmental & Human Toxicology have looked at the document and have been involved in responding to the various proposals that have been suggested since the submittal of the document. In their February 21, 2003 letter, they initially took issue with Tetra Tech's modification of the body weight exposure assumption from the "Restricted II" scenario, increasing it from 35 kg to 70 kg so as to reflect an adult recreational user of the site. They argued that since there are not expected to be any institutional or engineering controls that would prevent access by adolescents and children, that the 70 kg body weight assumption would not be especially

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protective in cases of exposure of children and adolescents to the site. Using the 35 kg body weight assumption, they calculated "Restricted II" site-specific SCTLs for benzo(a)pyrene equivalents (BAPEq) of 2.25 mg/kg, assuming adolescents would frequent the site, and 1.5 mg/kg, assuming small children would frequent the site. The Department at that time made a risk management decision based upon our knowledge of the characteristics of Site 15. It is felt that adolescents were by far more likely to visit the site than small children and that small children were highly unlikely to visit the site unsupervised by an adult. Upon that basis, the Department has accepted a site-specific SCTL of 2.25 mg/kg for BAPEq.

In response to the Department's risk assessors' February 21, 2003 letter, Tetra Tech challenged the use of the 35 kg body weight assumption and has proposed alternately to use 58 kg as a reasonable body weight assumption. This body weight was calculate based upon the assumption that recreational exposure would begin at around age 6. Based upon this assumption, Tetra Tech recalculated a new SCTL for BAPEq. In response, the Department accepted this rationale, but because the Department's risk assessors sensed an interest in re-evaluating the applicability of the "Restricted II" exposure assumptions, they pointed out in a May 5, 2003 letter that the incidental soil ingestion assumption of 50 mg/day is not particularly conservative and its appropriateness is questionable. They proposed using the 100 mg/day soil ingestion assumption that is in the table for the "Restricted II" scenario in recalculating a new SCTL for BAPEq for this site.

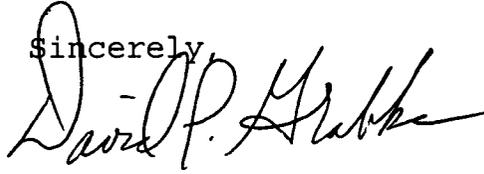
In response to the Department's risk assessors' May 5, 2003 letter, Tetra Tech requested the scientific basis for using the 100 mg/day incidental soil ingestion rate number. While our risk assessors could not respond with a specific scientific basis for the higher ingestion rate number, in a June 4, 2003 letter they explain their rationale in proposing this number.

In conclusion, I propose that Navy either accept the proposed site-specific SCTL of 2.25 mg/kg for BAPEq or have Tetra Tech (or other Navy risk assessor) recalculate the SCTL using the 58 kg body weight assumption and 100 mg/day incidental soil ingestion rate assumption. I believe the Department could accept the recalculated number.

I have attached the Department risk assessors' letter to this letter for your reference. If you have any concerns regarding this letter, please contact me at (850) 245-8997.

Mr. Mark Davidson
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Sincerely,



David P. Grabka, P.G.
Remedial Project Manager

CC: Satish Kastury, FDEPA
Debbie Vaughn-Wright, USEP, Atlanta
John Flowe, City of Jacksonville
Jeff Meyers, SOUTHNAVFACENGCOM
Mark Speranza, TtNUS, Pittsburgh
Mike Halil, CH2M Hill Constructors, Atlanta
Mike Fitzsimmons, FDEP, Northeast District

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February 21, 2003

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
Room 471A, Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, FL 32399

Dear Ms. Mora-Applegate:

At your request, we have reviewed the Site 15 Determination of Site Specific SCTLs for NAS Cecil Field, Jacksonville, Florida. This document proposes cleanup goals for lead and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in soil at the 85-acre Site 15. Cleanup goals for lead have been developed with the objective of eliminating significant exposures to mammalian and avian receptors, as well as to children and adults visiting the site. For cPAHs, the goal is to reduce exposure to bring cancer risks below the goal of 1.0E-06.

Based on our review, we have the following comments:

1. The document explains that cPAH concentrations should be assessed as total benzo(a)pyrene equivalents (BaPEq) rather than developing SCTLs for individual cPAHs. We agree with this approach — it is consistent with current FDEP procedures for addressing cPAH contamination in soils.
2. The proposed SCTL for carcinogenic PAHs (4.5 mg/kg) is based on the FDEP "Restricted II" scenario. This scenario was originally developed by FDEP to calculate risks posed by remote cattle dip vat sites. Some of the exposure assumptions have been modified for Site 15 — most notably, body weight. The body weight assumption was increased from 35 kg to 70 kg so as to reflect an adult recreational user. This begs the question why only adults are expected to visit Site 15, since no institutional/engineering controls are planned that would prevent access by adolescents and children. Presumably, at least some adults using the site for recreational purposes (e.g., hiking, biking, trail riding) will bring their children. Also, adolescents have sufficient mobility that they could visit the site by themselves. Since children and adolescents receive greater doses

of contaminants from soils than adults on a per unit body weight basis, a cleanup goal for cPAHs based strictly on adult exposure is not necessarily protective in the case of exposure of children and adolescents. One approach to address this would be to use the original body weight assumption from the Restricted II scenario, 35 kg, which includes exposure while an adolescent. This would reduce the cPAH SCTL to 2.25 mg/kg. This would cover the most likely age group, other than adults, that might visit the site on a regular basis. Alternatively, if the possibility of repeated visits by small children is considered, a lower SCTL would be needed. One could be derived simply by modifying the FDEP aggregate resident scenario to limit the exposure frequency to 50 days and the exposure duration to 20 years. This would result in a cPAH SCTL of about 1.5 mg/kg.¹

3. This SCTL is intended to be the acceptable upper limit for the average (or more precisely, the 95%UCL of the mean) concentration over an exposure unit. Currently, the entire 85-acre site is assumed to constitute a single exposure unit. In reality, contact with this large site is unlikely to be random, but instead more frequent near roads, trails, and access points. In part to address uncertainty about true randomness of contact within an exposure unit, FDEP requires that the highest post-remediation concentrations not exceed three times the SCTL. This means that the not-to-exceed concentration for cPAHs would be 13.5 mg/kg if the SCTL proposed in the document is used, and 6.75 mg/kg if an SCTL is used that doesn't limit exposure to adults (see comment 2, above). Both of these concentrations are substantially below the estimated pick-up level for cPAHs needed to achieve an SCTL of 4.5 mg/kg presented in the report. Also, with respect to non-random exposure, it would be helpful to remove structures at the site which might attract visitors (especially children) to areas with elevated cPAH concentrations, such as the burn areas.

4. Two SCTLs for lead are presented for protection of human health. One is based on acute exposure for a small child. We participated in the development of this acute lead SCTL of 6,500 mg/kg, and agree that its use is appropriate for this site. Because it is based on acute exposure, it is used as a not-to-exceed value. A second SCTL, 3,281 mg/kg, was developed for chronic exposure using the same assumptions as for cPAHs. As with cPAHs, it is not clear why the assessment of chronic exposure doesn't include older children or adolescents. In the case of lead, however, the question is probably moot. If the prediction of post-remediation concentrations in the report is accurate, cleanup of the site to satisfy the acute lead SCTL will leave a site-wide average lead concentration of 577 mg/kg. This concentration is only about 50% higher than the residential lead SCTL, and consequently should be protective for chronic lead exposure for children and adolescents at this undeveloped site.

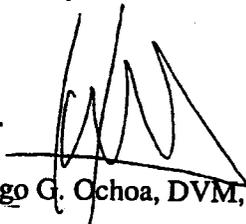
¹ This is an approximate value based on changing only exposure duration and exposure frequency. Technically, all of the age-weighted inputs for the aggregate resident scenario (e.g. soil ingestion, body weight, etc.) should be re-derived for an age interval of 1 to 21 years instead of 1 to 31 years.

5. We are in agreement with the remedial goals selected for lead based on protection of mammalian and avian species (1,149 mg/kg site-wide average for avian species; 2,512 mg/kg average over 2-acre parcels for mammalian species; Table 5). We also agree that cleaning the site to lead and cPAH levels protective of human health will also result in concentrations safe for ecological receptors.

6. Regarding the section on determining the extent of remediation, we have received the concentration data for both B[a]PEq and lead in a spreadsheet format. We note that a single location is represented by several samples, and that some sample values are averages, presumably of discrete samples. It is not clear which samples are being included in the iterative processes used to determine the extent of remediation. For example, for B[a]PEq, the spreadsheet contains 515 observations that decrease to 472 if we exclude average values, whereas 430 of these are surface samples (starting at 0 depth). However, the number of distinct locations is only 325. The calculation sheet included in the pdf document states that 385 samples are considered. We are unable to sort this out, and consequently unable to check the calculation of projected post-remediation concentrations. It would be very helpful to have a clearer articulation of the concentrations assigned to specific sampling locations and their basis.

We hope these comments are helpful. Please do not hesitate to contact us if you need further assistance regarding the evaluation of this site.

Sincerely,



Hugo G. Ochoa, DVM, Ph.D.



Stephen M. Roberts, Ph.D.



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May 5, 2003

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
Room 471A, Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, FL 32399

Dear Ms. Mora-Applegate:

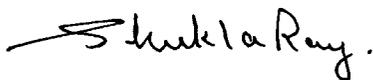
Tetra Tech has proposed basing the Soil Cleanup Target Level for benzo(a)pyrene (BaP) at Site 15 on a body weight of 58 kg. You may recall it has been decided that SCTLs for chronic exposure at this site will be developed using a recreational scenario, with the assumptions taken from the FDEP "Restricted II" scenario. The body weight assumption associated with this scenario is 35 kg. A 20-year exposure duration was chosen as a site-specific assumption for this site, and Tetra Tech maintains that the most accurate average body weight for a 20-year period that begins as an older child (i.e., from age 6 to 26) is 58 kg. This value was calculated from data on body weights over this interval found in the EPA *Exposure Factors Handbook*.

Since BaP is a carcinogen, the dose used to estimate risks is derived from the full exposure period — in this case, 20 years. If there is agreement that recreational exposure at this site in fact begins at age 6, then 58 kg would be a reasonable body weight assumption. If chronic exposure is assumed to begin at an earlier age, then a lesser value (perhaps closer to 35 kg) would be more appropriate. [Note: A body weight assumption of 35 kg would also be appropriate for chronic exposure to a non-carcinogen beginning at age 6. However, this is not an issue at this particular site, since the only chemical of concern other than BaP is lead. The cleanup levels for lead are driven by acute toxicity and ecological concerns.]

Since there seems to be interest in re-evaluation of the applicability of Restricted II exposure assumptions for this site, we would like to point out that the incidental soil ingestion assumption of 50 mg is not particularly conservative. This is a value typically used in adult exposure scenarios in which there is little direct contact with soil. Since the exposure scenario for Site 15 includes an adolescent at play or otherwise engaged in recreation, the appropriateness of a 50 mg/day soil ingestion rate is questionable. There is no explicit guidance from EPA

regarding the incidental soil ingestion rate to be used for an adolescent recreator, or an adolescent trespasser, which would presumably have similar soil contact. However, in our experience, a soil ingestion rate of 100 mg/day is most commonly used in risk assessments for an adolescent trespasser or recreator. In view of this, we recommend that the re-examination of exposure assumptions for this site by FDEP and the U.S. EPA include incidental soil ingestion.

Sincerely,



Shukla Roy, Ph.D.



Stephen M. Roberts, Ph.D

cc: David Grabka, FDEP



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June 4, 2003

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Dear Ms. Mora-Applegate:

Tetra Tech has proposed basing the Soil Cleanup Target Level (SCTL) for benzo(a)pyrene (BaP) at Site 15 on a body weight of 58 kg. You may recall it has been decided that SCTLs for chronic exposure at this site will be developed using a recreational scenario, with the assumptions taken from the FDEP "Restricted II" scenario. The body weight assumption associated with this scenario is 35 kg and the exposure duration is 20 years. Tetra Tech maintains that the most accurate average body weight for a 20-year period that begins as an older child (i.e., from age 6 to 26) is 58 kg. They derived this value from data on body weights for ages 6 through 26 found in the EPA *Exposure Factors Handbook*.

Since BaP is a carcinogen, the dose used to estimate risks is derived from the full exposure period — in this case, 20 years. If there is agreement that recreational exposure at this site in fact begins at age 6, then 58 kg would be a reasonable body weight assumption. If chronic exposure is assumed to begin at an earlier age, then a lesser value (perhaps closer to 35 kg) would be more appropriate.

Since there seems to be interest in re-evaluation of the applicability of exposure assumptions selected for this site, I would like to point out that the incidental soil ingestion assumption of 50 mg/day used by Tetra Tech to calculate a BaP SCTL is not particularly conservative. This value is typically used in adult commercial/industrial exposure scenarios in which there is little direct contact with soil. When there is direct contact with soil outdoors, such with an adult resident, a higher soil ingestion value of 100 mg/kg is used. A 100 mg/day assumption is not just relevant for residential settings. For example, U.S. EPA Region 9 has recently changed their default incidental ingestion assumption for adult occupational exposure from 50 mg/day to 100 mg/day when outdoor soil exposure is involved. The common risk assessment scenario that is probably most like the adolescent recreator, which is the basis for the BaP SCTLs at Site 15, is the adolescent trespasser. Both involve receptors in the same age range, with presumably the same opportunities for outdoor direct soil contact. Although there is no explicit guidance from the U.S. EPA regarding a default soil ingestion value for the adolescent trespasser,

the most typical value used, in my experience, is 100 mg/day. Use of a lesser value such as 50 mg/day at Site 15 would require some compelling justification, in my opinion. Unless there is a reason why the adolescent recreators at this particular site will have almost no direct soil contact, a soil ingestion rate assumption of 100 mg/kg would be much more defensible in creating site-specific SCTLs.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen M. Roberts". The signature is stylized with a large, sweeping initial "S" and a long horizontal stroke extending to the right.

Stephen M. Roberts. Ph.D.