TETRA TECH NUS, INC.
3360 Capital Circle N.E. ▪ Suite B ▪ Tallahassee, Florida 32308
(850) 385-9899 ▪ FAX (850) 385-9860 ▪ www.tetratech.com

July 11, 2006

Project Number 112G00390

Commander
Southeast
Naval Facilities Engineering Command
ATTN: Mr. Bill Hill,
Remedial Project Manager
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: Clean Contract No. N62467-04-D-0055
Contract Task Order No. 0030

Subject: Submittal of the Response to Comments for the Final Site 41 – Combined Wetlands - Remedial Investigation Report Naval Air Station Pensacola, Pensacola, Florida

Dear Mr. Hill:

Tetra Tech NUS, Inc. (TtNUS) is please to submit the Response to Comments for the Final Site 41 – Combined Wetlands, Remedial Investigation (RI) Report at the Naval Air Station (NAS) Pensacola, Pensacola, Florida. These Response to Comment documents address regulators comments on the Final RI report submitted by Ensafe, Inc. in August 2005. Ensafe, Inc has completed these Response to Comments submittals under subcontract to TtNUS.

It should be noted that revisions to the original Final RI Report and additional sampling of the wetlands will not be completed until approval of these Response to Comments, therefore an expedited review of these documents is requested.

As indicated below, copies of these Response to Comments have been forwarded to members of the NAS Pensacola Partnering Team as well as Tom Dillion. In addition, the Response to Comment documents are posted to the NAS Pensacola Installation Restoration (IR) portal.

If you have any questions regarding these documents or require further information, please contact me at (850) 385-9899.

Sincerely,

Gerald Walker

Gerald Walker, P.G.
Task Order Manager

GW/gw
Enclosures (1 copy)

c: Greg Fraley, USEPA
Tracie Bolamos, FDEP
Greg Campbell, NASP
Allison Harris, Ensafe
Greg Wifley, CCI
Brian Caldwell, TtNUS
TtNUS file, Tallahassee
Ms. D Humbert, TtNUS (cover letter only)
Mr. Mark Perry TtNUS
Mr. Tom Dillion, NOAA

Response to Comments
United States Environmental Protection Agency, Region 4
Site 41, Operable Unit 16, Naval Air Station Pensacola
Dated April 5, 2006

Comment 1:
Overall, this document was well written and organized. It is obvious that a major investment of time and effort was put into this investigation. It is recommended that sections of the RI document be revised and be resubmitted for review, addressed in a response to comments memorandum, or addressed in an addendum to the RI report. The inclusion of laboratory and toxicology reports would be valuable for verification purposes.

Response:
The Navy agrees to revisions to this document being incorporated by addendum or errata pages. The toxicity report was included in Appendix G. The validated database summary of the chemistry samples were included in Appendices B, C and D. The Navy did not provide the laboratory reports for the chemistry samples as an appendix. The laboratory reports total over 100,000 pages. If EPA would like to view the laboratory reports, the reports can be made available.

Comment 2:
Sections 8.3.2 and 8.4.2 Refinement of Sediment and Surface Water Screening Level COPCs (respectively).

a) The methodology is not clear regarding the treatment of non-detected (ND) constituents that have proxy exposure point concentrations (EPCs) that exceed refinement values (RVs). It appears that those COPCs are not retained for further consideration in the risk assessment. The only justification or rationale for removing those chemicals seems to be "Parameter Not Detected" (e.g., Table 10-1-6: Total BHC). It is recommended that additional documentation/justification be included regarding removal of constituents from further consideration. Examples of additional justification are:
    i) describing if analytical interferences could have elevated the sample quantitation limit (SQL)
    ii) describing if the chemical was or was not suspected of being used at the site
    iii) describing if the chemical had been detected at another location at the facility
    iv) describing if the chemical is collocated with another chemical that is "driving" the risk assessment or if a remedial strategy for another chemical would address this issue.
b) Numerous constituents (primarily pesticides and SVOCs) are shown in the refinement tables that are accompanied by neither a screening value nor refinement value. It is recommended that the EPCs for these constituents be compared to a refinement value. Additional sources of refinement values could be used for these constituents (e.g., U.S. EPA Region 3 Ecological Benchmarks [2005], U.S. EPA Region 5 RCRA Ecological Screening Values [2003]). If no refinement values exist for a constituent, appropriate surrogate refinement values could be applied.
c) The circumstances presented in Comments to the Preparer 2a and 2b (if not addressed) could result in an underestimation of the risks to ecological receptors for the chemicals in question.

Response:
(a) The Navy did not retain parameters after refinement if it was not detected. Sample quantitation limits were elevated because of analytical interferences, including percent moisture of the samples.

(b) The Tier 1 Partnering Team agreed to use only the EPA Region 4 screening values and the FDEP PELs and TELs. Surrogate values were used for select chemicals in accordance with Team decisions.

(c) The Navy completed the data evaluation in accordance with Team decisions. The team members applied their best professional judgment on the data evaluation methods. In addition, the team sought the professional opinions of experts in ecological risk assessments, including representatives from University of Florida, EPA Region 4 Science & Ecosystems Support Division, and NOAA.

Comment 3:
<u>Table 8-5 and Section 8.7.1.5 Input Parameters for Food-Chain Models:</u>
The food ingestion rates for the food-chain model receptors Green Heron and Mink appear to be outdated or incorrect. The citations for those parameters in Table 8-5 refer to food ingestion rates and body weights presented in the U.S. EPA wildlife Exposure Factors Handbook (1993) for these receptors.

a) The Green Heron food ingestion rate is derived by using a regression equation developed by Jushlan (1978).

   Log (FI) = 0.966 log(BW)-0.640

   Where: FI = food ingestion rate
   BW = body weight of the organism (g – grams)

   Using the cited body weight of the green heron of 241 g (0.241 kg), the calculated FI would be 45.8 g/day (0.0458 kg/day). Table 8-5 lists the food ingestion rate for the green heron as 11.5 g/day (0.0115 kg/day). It is advised that this parameter be revised to use 45.8 g/day (0.0458 kg/day) for all green heron food-chain models.

b. The food ingestion rate for the mink is estimated in the Wildlife Exposure Factors Handbook as 0.22 g (food)/g (body weight)/day. The cited body weight in Table 8-5 for the mink is 550 g (0.550 kg). This value is the lowest reported value for the adult female (USEPA, 1993 and Mitchell, 1961). The body weight of the male mink does not appear to have been considered in this evaluation. A more representative body weight should be chosen for this species. The range of body weight cited in the WEF handbook for male mink (wild) is 1040 to 1233 g and for female mink (wild) is 550 to 586 g (ESEPA, 1993 and Mitchell, 1961). The average body weight for a chosen receptor is used when food-chain modeling is done. We propose that an average body weight for mink be 852.25 g (0.85225 kg). Using this value, the food ingestion rate for the mink would be 187.5 g/day (.1875 kg/day). Table 8-5 lists the food ingestion rate for the mink as 29 g/day (0.029 kg/day). It is advised that these parameters be revised using the body weight of 852.25 g (0.85225 kg) and food ingestion rate of 187.5 g/day (0.1875 kg/day) for all mink food-chain models.

c. The circumstances presented in 3a and 3b (if not addressed) could result in an underestimation of the risks to ecological receptors for the chemicals in question.

Response:
The ingestion rates and body weights used in the food chain models were provided to the Navy by USEPA Region 4 Science & Ecosystems Support Division, in an email dated December 5, 2003. The email and provided table are included as Attachment 1.

Comment 4:
Section 16.0 Conclusions and Recommendations

a) As summarized in Table 16-1 of the RI document, Wetlands 3, 5A, 64, and 10 (contingent on confirmatory sampling at location 033M00401) were recommended for a feasibility study (FS).

b) Wetlands 12 (Bilge Water Spill) and W1 (UST 18) are being assessed under the FDEP petroleum program according to the Preparer.

c) We think that wetlands 15, 16, 18-A & -B, 48 should also be considered for an FS. Wetlands 4 and 17 may need further evaluation as they appear to receive inputs (iron) from wetlands 3 and 18, respectively. Wetland 7 may need further evaluation as it may be impacted by contaminant transport via groundwater or storm water runoff. ILS recommends that Wetland 1B also be considered for an FS based on this wetland having a Mean ERM Quotient Category 3 (likely to cause adverse effects – Described in Section 8.3.2.6 of RI report) with emphasis on chlordane. The risks may be underestimated due to food-chain modeling using outdated or inappropriate model parameters for food ingestion rates of the green heron and mink. We recommend for these wetlands that any constituents not compared to refinement values be evaluated further and that the food-chain models be recalculated using the recommended input parameters for food-chain models.

d) Wetlands 1A, 5B, 6, 49, and 63A should be considered to have significant uncertainty associated with them. This uncertainty results from a combination of the Mean ERM Quotient Category 2 assignment (Described in Section 8.3.2.6 of RI report), incomplete evaluation of chemical comparisons to refinement values, and the underestimation of risk due to food-chain modeling using outdated or inappropriate model parameters for food ingestion rates of the green heron and mink. We recommend for these wetlands that any constituents not compared to refinement values be evaluated further and that the food-chain models be recalculated using the parameters recommended in comment 3.

Uncertainties associated with Wetlands in Comment to Preparer 4e

Wetland	Uncertainty
1A	Lead/DDT & Dieldrin FCM
5B	Pesticide/PCB FCM
6	DDT FCM
49	DDT FCM
63A	PCB FCM

f. All other wetlands (e.g. 13, 19A, 19B, 25, 27, 32, 33, 52, 56, 57, 58, 63B, 72, 75) could be considered for NFA.

Response:

a) The Navy agrees with completing a feasibility study on Wetland 3, 5A, 64 and 10.

b) Wetlands 12 and W1 will be addressed under Florida's petroleum program.

c) The Navy agrees to completing a feasibility study on Wetlands 15, 16, and 18 (A&B). The Navy agrees that Wetland 4 is receiving iron from Wetland 3. The treatment system (Interceptor trench) is currently being evaluated for optimization. The Navy proposes to collect additional sediment samples in Wetland 48 to assess the DDT detection. A decision on whether that wetland should be retained for a feasibility study will be made on the collected data.

Wetland 18 discharges to Redoubt Bayou and the inference that Wetlands 17 and 18 are connected is not clear.

d) The Navy evaluated all the wetlands in accordance with Team agreements regarding refinement values and food chain input parameters provided by EPA and FDEP.

f) The Navy agrees the remaining wetlands should be given a No Further Action status.

Comment 5:
<u>Section 17.0 References</u>
The reference section appears to be incomplete. Several citations were made in the RI report that were not included in references section. The preparer should check all citations in the RI report for inclusion in the references section.

Response:
Agreed. The Navy will review and revise the References Section for completeness.

Attachment 1
USEPA Region 4 Science & Ecosystems Support Division Email
December 5, 2003

From: <George.Linda@epamail.epa.gov>
To: <balbrecht@ensafe.com>
Date: 12/5/2003 12:37:31 PM

Barb,

The rest of the screening tables will be mailed out to you on Monday.

This excel table shows the exposure parameters that may be used for the food web models. The word file contains the citations of the parameter numbers used in the excel table. This file of references contains additional citations since I didn't go through and delete them. Just ignore the other citations. If you have any questions, please call me at (706) 355-8718.

thanks, Linda

(See attached file: 871Inputparametertable - final.xls)(See attached file: Referencesforexpparameters.doc)

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CC: <Lewis.Bobby@epamail.epa.gov>, <gbenfield@ensafe.com>

Table 1. Input parameters

Exposure Scenario	Body Weight (kg)	Dietary Composition	Area Use Factor/ Alternate AUF	PCB Concentration in Media (biotic/abiotic)	Food Ingestion Rate (kg/day dry weight)	Surface Water Ingestion Rate (L/day)	Sediment/Soil Ingestion Rate (kg/day dry weight)	TRVs NOAEL/LOAEL (mg/kg-body weight/day)
ASSESSMENT ENDPOINT 1 - Piscivorous Bird								
Representative Species - Green Heron (*Butorides virescens*)								
Maximum	0.241 [a]	100 percent fish	1/1	Max./Max.	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
RME	0.241 [a]	100 percent fish	1/1	95%UCL/95% UCL	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
Average	0.241 [a]	100 percent fish	1/1	Mean/Mean	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 2 - Carnivorous Bird								
Representative Species - Eastern Screech-Owl (*Otus asio*)								
Maximum	0.15 [g]	100 percent small mammals	1/0.6	Max./Max.	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
RME	0.15 [g]	100 percent small mammals	1/0.6	95%UCL/95%UCL	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
Average	0.15 [g]	100 percent small mammals	1/0.6	Mean/Mean	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 3 - Insectivorous Bird								
Representative Species - American Woodcock (*Scolopax minor*)								
Maximum	0.160 [i]	100 percent worms	1/1	Max./Max.	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
RME	0.160 [i]	100 percent worms	1/1	95%UCL/95%UCL	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
Average	0.160 [i]	100 percent worms	1/1	Mean/Mean	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 4 - Piscivorous Mammal								
Representative Species - Mink (*Mustela vison*)								
Maximum	0.55 [l]	100 percent fish	1/0.9	Max./Max.	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
RME	0.55 [l]	100 percent fish	1/0.9	95%UCL/95%UCL	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
Average	0.55 [l]	100 percent fish	1/0.9	Mean/Mean	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 5 - Carnivorous Mammal								
Representative Species - Long-tailed Weasel (*Mustela frenata*)								
Maximum	0.08 [o]	100 percent small mammals	1/0.4	Max./Max.	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
RME	0.08 [o]	100 percent small mammals	1/0.4	95%UCL/95%UCL	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
Average	0.08 [o]	100 percent small mammals	1/0.4	Mean/Mean	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 6 - Insectivorous Mammal								
Representative Species - Short-tailed Shrew (*Blarina brevicauda*)								
Maximum	0.012 [p]	100 percent worms	1-Jan	Max./Max.	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
RME	0.012 [p]	100 percent worms	1/1	95%UCL/95%UCL	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
Average	0.012 [p]	100 percent worms	1/1	Mean/Mean	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]

Note: The PCB concentration in water used for the maximum and RME scenarios in this assessment is 130 ug/L.
The PCB concentration in water used for the average scenario in this assessment is 24.5 ug/L.
The PCB concentration in sediment used for the Maximum scenario for this assessment is 16 mg/kg.
The PCB concentration in sediment used for the RME scenario for this assessment is 2.2 mg/kg.
The PCB concentration in sediment used for the average scenario in this assessment is 1.6 mg/kg.
The PCB concentration in soil used for the Maximum scenario for this assessment is 6400 mg/kg.
The PCB concentration in soil used for the RME scenario for this assessment is 173 mg/kg.
The PCB concentration in soil used for the average scenario in this assessment is 89.5 mg/kg.
For small mammal tissue, fish tissue and surface water concentrations, the 95%UCL values will be substituted in the RME scenario.

[a] Niethammer and Kaiser (1983).
[b] Kushlan (1978).
[c] Calder and Braun (1983).
[d] Estimated based on the results of Beyer et al. (1994).
[e] Derived from McLane and Hughes (1980).
[f] Derived from Peakall and Peakall (1973).
[g] Henny and Van Camp (1979).
[h] Nagy et al. (1999).
[i] Owen and Krohn (1973).
[j] Sheldon (1967).
[k] Beyer et al. (1994).
[l] Mitchell (1961).
[m] Bleavins and Aulerich (1981).
[n] Derived from Aulerich and Ringer (1977).
[o] Fagerstone (1987).
[p] Guilday (1957).
[q] Based on Morrison (1957)
[r] Chew (1951).

1. References

Alexander, G.R. 1977. Food of vertebrate predators on trout waters in north central lower Michigan. Michigan Academician 10:181–195.

Aulerich, R.J., and R.K. Ringer. 1977. Current status of PCB toxicity to mink, and effect on their reproduction. Arch. Environ. Contam. Toxicol. 6:279–292.

Belthoff, J.R., E.J. Sparks, and G. Ritchison. 1993. Home ranges of adult and juvenile eastern screech-owls. Size, seasonal variation and extent of overlap. J. Raptor Res. 27:8–15.

Beyer, W.N., E. Conner, and S. Gerould. 1994. Survey of soil ingestion by wildlife. J. Wildl. Manage. 58(2):375–382.

Birks, J.D.S., and N. Dunstone. 1985. Sex-related differences in the diet of the mink *Mustela vison*. Holarctic Ecology 8:245–252.

Blair, W.F. 1940. Notes on home ranges and populations of the short-tailed shrew. Ecology 21(2).

Blair, W.F. 1941. Some data on the home ranges and general life history of the short-tailed shrew, red-backed vole, and woodland jumping mouse in Northern Michigan. American Midland Naturalist 25:681–685.

Bleavins, M.R., and R.J. Aulerich. 1981. Feed consumption and food passage time in mink (*Mustela vison*) and European ferrets (*Mustela putorius* furo). Lab. Anim. Sci. 31(3):268–269.

Buckner, C.H. 1966. Populations and ecological relationships of shrews in tamarack bogs of southeastern Manitoba. J. Mammal. 47:181–194.

Calder, W.A., and E.J. Braun. 1983. Scaling of osmotic regulation in mammals and birds. Am. J. Physiol. 224:601–606.

Chew, R.M. 1951. The water exchanges of some small mammals. Ecol. Monogr. 21(3):215–225.

Cottam and Uhler. 1945. U.S. Fish and Wildlife Service Leaflet 272.

Craighead, J.J., and F.C. Craighead, Jr. 1969. Hawks, Owls, and Wildlife. Dover Publications, Inc. New York, NY. 443 Pp.

Davis, W.E., Jr., and J.A. Kushlan. 1994. Green heron. The Birds of North America 129. Academy of Natural Sciences, Philadelphia, PA.

Dunning, J.B., Jr. 1993. CRC handbook of avian body masses. CRC Press.

Dwyer, T.J., G.F. Sepik, E.L. Derleth. 1988. Demographic characteristics of Maine woodcock population and effects of habitat management. Research Report 4. U.S. Fish and Wildlife Service, Washington, DC.

Exponent. 1998. Sampling protocol: Fish sampling and monitoring, Lake Susie, Panola County, Mississippi. Prepared for El Paso Energy, Houston, TX. Exponent, Bellevue, WA.

Exponent. 1999. Screening level ecological risk assessment and baseline problem formulation for the Off-Facility Area at TGPL Station 871, Campbellsville, Kentucky. Prepared for Tennessee Gas Pipeline Company, Houston, TX. Exponent, Bellevue, WA.

Fagerstone, K.A. 1987. Black-footed ferret, long-tailed weasel, short-tailed weasel, and least weasel. pp. 548–573. In: Wild Furbearer Management and Conservation in North America. M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch (eds). Ministry of Natural Resources, Ontario.

Gehlbach, F.R. 1986. Odd couples of suburbia. Natural History 95(6):56–64, 66.

Gehlbach, F.R. 1994. The eastern screech owl. Life history, ecology and behavior in the suburbs and countryside. Texas A&M University Press, College Station, TX.

Gehlbach, F.R. 1995. Eastern screech-owl (*Otus asio*). Birds of North America, No. 165. A. Poole and F. Gill (eds). The Academy of Natural Sciences of Philadelphia, Philadelphia, PA. The American Ornithologists' Union, Washington, DC.

Gerell, R. 1970. Home ranges and movements of the mink (*Mustela vison* Schreber) in southern Sweden. Oikos 20:451–460.

Glasgow, L.L. 1958. Contribution to the knowledge of the ecology of the American woodcock, *Philohela minor* (Gmelin), on the wintering range in Louisiana. Unpub. Ph.D. Thesis, Texas A&M Univ., College Station, TX.

Gregg, L. 1984. Population ecology of woodcock in Wisconsin. Tech. Bull. No. 144. Wisconsin Dept. of Natural Resources.

Greeley, F. 1953. Sex and age studies in fall-shot woodcock (*Philohela minor*) from southern Wisconsin. J. Wildl. Manage. 17:29–32.

Guilday, J.E. 1957. Art. 5. Individual and geographic variation in *Blarina brevicauda* from Pennsylvania. Annals of Carnegie Museum 35.

Hamilton, W.J., Jr. 1933. The weasels of New York. Their natural history and economic status. Am. Midl. Nat. 14(4):289–344.

Hamilton, W.J. 1941. The food of small forest mammals in Eastern United States. J. Mammal. 22:250–263.

Hegdal, P.L., and B.A. Colvin. 1988. Potential hazard to eastern screech-owls and other raptors of brodifacoum bait used for vole control in orchards. Environ. Toxicol. Chem. 7:245–260.

Henny, C.J., and L.F. Van Camp. 1979. Annual weight cycle in wild screech owls. Auk 96:795–796.

Horton, G.I., and M.K. Causey. 1979. Woodcock movements and habitat utilization in central Alabama. J. Wildl. Manage. 43:414–420.

Howell, A.B. 1932. Florida bird life. Florida Department of Game and Fresh Water Fish.

Hudgins, J.E., G.L. Storm, and J.S. Wakeley. 1985. Local movements and diurnal habitat selection by male American woodcock in Pennsylvania. J. Wildl. Manage. 49:614–619.

Ingram, R.P. 1981. Woodcock habitat utilization and availability on the Francis Marion National Forest. M.S. thesis, Clemson University, Clemson, S.C., 65 pp. (not seen, as cited in Roberts 1993)

IT. 1997. Off-facility engineering evaluation and cost analysis for Station 871, Campbellsville, Kentucky. Tennessee Gas Pipeline Company, Houston, TX. International Technology Corporation, Houston, TX.

Keppie, D.M., and G.W. Redmond. 1985. Body weight and the possession of territory for male American woodcock. Condor 87:287–290.

Keppie, D.M., and G.W. Redmond. 1988. A review of possible explanations for reverse size dimorphism of American woodcock. Can. J. Zool. 66:2390–2397.

Keppie, D.M., and R.M. Whiting, Jr. 1994. American woodcock (*Scolopax minor*). In: The Birds of North America, No. 100. A. Poole and F. Gill (eds). The Academy of Natural Sciences, Philadelphia, PA. The American Ornithologists' Union, Washington, DC.

King, C.M. 1990. The natural history of weasels and stoats. E. Neal (ed). Comstock Publishing Associates, Ithaca, NY.

Kushlan, J.A. 1978. Feeding ecology of wading birds. pp. 249–297. In: Wading Birds. National Audubon Society.

McLane, M.A.R., and D.L. Hughes. 1980. Reproductive success of screech owls fed Aroclor® 1248. Arch. Environ. Contam. Toxicol. 9:661–665.

Mitchell, J.L. 1961. Mink movements and populations on a Montana river. J. Wildl. Manage. 25(1):48–54.

Morrison, P.R., M. Pierce, and F.A. Ryser. 1957. Food consumption and body weight in the masked and short-tail shrews. Am. Midl. Nat. 57(2):493–501.

Nagy, K.A., I.A. Girard, and T.K. Brown. 1999. Energetics of free-ranging mammals, reptiles, and birds. Annu. Rev. Nutr. 19:247–277.

Nelson, A.L., and A.C. Martin. 1953. Gamebird weights. J. Wildl. Manage. 17(1):36–42.

Niethammer, K.R., and M.S. Kaiser. 1983. Later summer food habits of three heron species in northeastern Louisiana. Colonial Waterbirds 6:148–153.

Owen, R.B., Jr., and W.B. Krohn. 1973. Molt patterns and weight changes of the American woodcock. Wilson Bull. 85(1):31–41.

Palmer, R.S. 1962. Handbook of North American birds. Yale University Press. 567 pp.

Peakall, D.B., and M.L. Peakall. 1973. Effect of a polychlorinated biphenyl on the reproduction of artificially and naturally incubated dove eggs. J. Appl. Ecol. 10:863–868.

Platt, W.J. 1976. The social organization and territoriality of short-tailed shrew (*Blarina brevicauda*) populations in old-field habitats. Anim. Behav. 24:305–318.

Polderboer, E.B., L.W. Kuhn, and G.O. Hendrickson. 1941. Winter and spring habits of weasels in central Iowa. J. Wildl. Manage. 5(1):115–119.

Quick, H.F. 1944. Habits and economics of the New York weasel in Michigan. J. Wildl. Manage. 8(1):71–78.

Quick, H.F. 1951. Notes on the ecology of weasels in Gunnison County, Colorado. J. Mammal. 32(3):281–290.

Ritchison, G., and P.M. Cavanagh. 1992. Prey use by eastern screech-owls: Seasonal variation in eastern Kentucky and a review of previous studies. J. Raptor Res. 26:66–73.

Schwarzbach, S.E., L. Shull, and C.R. Gau. 1988. Eggshell Thinning in Ring Doves Exposed to *p,p'*-Dicofol. Arch. Environ. Contam. Toxicol. 17: 219-227.

Schwarzbach, S.E., D.M. Fry, B.E. Rosson, and D.M. Bird. 1991. Metabolism and Storage of *p,p'*-Dicofol in American Kestrels (*Falco verius*) with Comparisons to Ring Neck Doves (*Streptopelia risoria*). Arch. Environ. Contam. Toxicol. 20: 206- 210.

Sepik, G.F., and E.L. Derleth. 1993. Habitat use, home range size, and pattern of movement of the American woodcock in Maine. pp. 41–49. In: Proceedings of the

Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service, Washington, DC.

Simms, D.A. 1978. North American weasels: Resource utilization and distribution. Can. J. Zool. 57:504–520.

Sheldon, W.G. 1967. The book of the American woodcock. Univ. Massachusetts Press, Amherst. 227 pp.

Svendsen, G.E. 1982. Weasels, *Mustela* species. pp. 613–628. In: Wild Mammals of North America: Biology, Management, and Economics. The John Hopkins University Press, Baltimore, MD.

Tufts, R.W. 1940. Some studies in bill measurements and body weights of American woodcock (*Philohela minor*). Can. Field. Nat. 54: 132–134.

Turner, L.J., and R.W. Dimmick. 1981. Seasonal prey capture by the screech owl in Tennessee. J. Tenn. Acad. Sci. 56(2): 56–59.

U.S. EPA. 1993. Wildlife exposure factors handbook. Volume II: Food ingestion factors. EPA/600/P-95/002Fb. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

U.S. EPA. 1996. Supplemental guidance to RAGS: Region 4 Bulletins. U.S. Environmental Protection Agency, Region 4, Waste Management Division, Office of Technical Services, Atlanta, GA.

U.S. EPA. 1997. Ecological risk assessment guidance for Superfund: Process for designing and conducting ecological risk assessments. Interim Final. EPA 540-R-97-006, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Van Camp, L.F., and C.J. Henny. 1975. The screech owl: Its life history and population ecology in northern Ohio. N. Am. Fauna, No. 71.

Vander Haegen, W.M. 1992. Bioenergetics of American woodcock during the breeding season on Moosehorn National Wildlife Refuge, Maine. Ph.D. dissertation, University of Maine, Orono. 103 pp.

Vander Haegen, W.M., W.B. Krohn, and R.B. Owen, Jr. 1993a. Care, behavior, and growth of captive-reared American woodcocks. pp. 57–65. In: Proceedings of the Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service.

Vander Haegen, W.M., W.B. Krohn, and R.B. Owen, Jr. 1993b. Effects of weather on earthworm abundance and foods of the American woodcock in spring. pp. 26–31. In: Proceedings of the Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service.

Whitaker, J.O., Jr., and M.G. Ferraro. 1963. Summer food of 220 short-tailed shrews from Ithaca, New York. J. Mammal. 44(3):419.

Response to Comments
Florida Department of Environmental Protection
Site 41 NAS Pensacola Wetlands
Dated January 23, 2006

Comment 1:
Total DDT concentrations: DDT concentrations in sediment were assessed through comparison of individual sample concentrations to a calculated "base wide level" of total DDT. Sample concentrations above the "base wide level" were considered to pose risk, while concentrations below were not. This total DDT threshold concentration was developed by generating a base wide value for each of the DDx metabolites (4,4′-DDE and 4,4′-DDD and 4,4′-DDT), then summing these values to obtain a base wide value for total DDT. However, the basis for determining each of the "base wide" levels of DDE, DDD, and DDT is not clear. It appears that DDx metabolite concentrations were examined from both IR-related and non-IR-related (reference) wetlands, and from there, a base wide concentration for each compound was agreed upon. A better explanation and justification for the base wide levels is needed because they are above ecological sediment screening values such as the Probable Effects Level (PEL) for Florida coastal waters.

Response:
The data provided in the Appendix was evaluated to determine the base wide levels indicative of routine application. The data were evaluated in a conference call with Tom Dillon (NOAA), David Grabka (FDEP), Allison Harris (EnSafe) and Ron Joyner (NAS Pensacola) on December 21, 1998. The members agreed to include all Site 40 and 41 data including data from other literature sources in the data evaluation and determination of base-wide levels.

The DDD basewide level of 50 ppb was based on the NOAA study and the highest detection in the "blue-coded" wetlands. The DDT basewide level of 20 ppb was based on the NOAA study and the highest detection in the "blue-coded" wetlands. The DDE basewide level is based on the highest detections in the "blue-coded" wetlands. Scatter plots of the data were used and can also be provided. The meeting minutes are provided in Attachment 1.

Note that DDT metabolites were not evaluated only using the basewide levels. All DDT metabolite data were assessed using food chain model, resulting in multiple lines of evidence to assess potential excess risk.

Comment 2:
Food chain modeling: Conclusions were made regarding ecological risk posed by bioaccumulative contaminants through the use of a food chain model. Three species were used in the model: the green heron (*Butorides virescens*), the mink (*Mustella vison*), and the rd drum. Food ingestion rates for the heron and mink were taken from sources dated 1978 and 1951, respectively. Ingestion rates for the heron and mink are about ten-times lower than the current EPA Ecological Exposure Factors for these species (see EPA website (www.epa.gov/epaoswer/hazwaste/id/hwirwste/sab03/vol2/2-chapt12.pdf). Since the LOAEL HQs for some contaminants were just below 1.0 resulting in conclusions of no ecological risk, it is recommended that these be re-calculated using the up-to-date food ingestion values from EPA. This may result in the food chain model revealing greater risk for these contaminants than originally described.

Response:
The ingestion rates and body weights used in the food chain models were provided to the Navy by USEPA Region 4 Science & Ecosystems Support Division in an email dated December 5, 2003. The email and provided table are included as Attachment 2.

Comment 3:
TPAH comparison to Swartz median effects concentration (MEC): For many wetlands, tPAH values were normalized to sample-specific TOC and compared to the Swartz 1999 Median Effects Concentration (MEC) of 1,800 ug/g. tPAHs were eliminated from concern if their concentrations fell below the MEC. The MEC is an indicator of median effects and lies within the transition between nontoxic and highly toxic sediment concentrations — it is simply a point near the middle of this gradient. According to Swartz, the MEC should "not be used to discriminate acceptable from unacceptable conditions." In other words, the MEC should not be used as a refining number since it does not offer any definitive information on toxicity. It is our recommendation that the Florida probable effects (TEL/PEL or TEC/PEC) sediment quality guidelines (MacDonald 2003) be given more weight through comparison to the dry weight tPAH concentrations. For example, in a case where the tPAH value is above the PEL (16.7 ug/g) but below the MEC, as in Wetland 1B, tPAHs should not be eliminated based on the MEC. Although the MEC takes organic carbon content into account through normalization, it has been shown that dry weight-based sediment quality guidelines such as the TEL and PEL are comparable in toxicological predictability to the organic carbon based guidelines for mixtures of contaminants, especially PAHs (Swartz 1999, MacDonald et al. 2000, Word 2004). An additional procedure that could aid in the assessment of tPAHs at Site 41 is the calculation of PEC quotients, which have been shown to be highly predictive in the case of chemical mixtures such as PAHs (MacDonald, 2003).

Response:
The Navy's approach for evaluating the sediment data were based on the professional judgment of the NAS Pensacola Partnering Team. In addition, the Team included ecological experts from the University of Florida, NOAA, and EPA Region 4 Ecological Services Division. Use of TOC-normalized data were approved by all parties in the July 29 and 30, 2003 meeting minutes provided in Attachment 3.

Comment 4:
Reference Wetland 25: Wetland 25, which is located on the north side of the base adjacent to Bayou Grande and near Redoubt Bayou, was used as a reference wetland to obtain reference values for screening inorganic constituents. Upon examination of the data in Table 6-2, Section 6 of Vol. II, it appears that iron is greatly elevated (18,500 mg/kg) in the sediment samples taken from this wetland compared to the other reference wetlands (e.g., 832 mg/kg in Wetland 32). It appears likely that iron contamination from Wetlands 18, 16, and/or 15 is reaching Wetland 25 via Redoubt Bayou. During the site visit, it was noted that iron flocculent is very prevalent along the shore of Redoubt Bayou, reaching all the way to Wetland 16 on the eastern confluence of Redoubt Bayou and Bayou Grande. Wetland 25 is located on Bayou Grande near the western confluence of the two water bodies, and it is very possible that iron is reaching Wetland 25. Therefore, the use of Wetland 25 as a reference wetland for iron is suspect, and any concentrations of iron that were

eliminated based on reference iron concentrations generated from Wetland 25 need to be re-evaluated. For example, iron was eliminated as a COPC for Wetland 10 using the reference concentration developed from Wetland 25.

Response:
Wetland 25 was used with Wetland 32 as freshwater reference wetlands. The reference wetland selection and subsequent use was approved by all members of the Pensacola Partnering Team, with consultation from NOAA, University of Florida and EPA Region 4 Ecological Services Division. Iron naturally occurs at high concentrations in the Sand and Gravel aquifer. NAS Pensacola does not obtain its potable water on the facility because of high iron concentrations. NAS Pensacola obtains its potable water from Corry Station, approximately 5 miles away. The inference of a connection between Wetlands 18, 16 and/or 15 and Wetland 25 is not clear.

Attachment 1
DDT Basewide Level Meeting Minutes

CONFERENCE CALL MINUTES
December 21, 1998
NAS Pensacola Sites 40 & 41

Participants: Tom Dillon, David Grabka, Allison Harris, Ron Joyner, Chuck Mason

Upper Trophic Level Fish Model

Action item: Chuck will call John Connolly at Quantitative Environmental Analysis to get a reference to support the transfer factor of 3 and the apparent effects level of 50 to 60.

Action item: Tom to call chuck Mason and provide paper developed by the EPA lab in Duluth Minn. concerning No Effects Level And Lower Effects Level of DDT residues.

Decision: Model is appropriate to present to the team if the above numbers can be supported.

DDT Background

Decision: Make the DDD background 50 ppb for Sites 40 & 41 based on the results of the NOAA study and the highest detect in the "blue" wetlands.

Decision: Make the DDT background 20 ppb for Sites 40 & 41 based on the results of the NOAA study and the highest detect in the "blue" wetlands.

Decision: Make the DDE background 40 ppb for Sites 40 & 41 based on the highest detect in the "blue" wetlands.

NOTE: The above numbers are derived from the upper range of the "blue" wetlands and are not to be multiplied by a factor of 2.

Action: Chuck will research the background levels that is being proposed, search for a spiked sample study and how the background levels relate to probable effects levels.

Attachment 2
USEPA Region 4 Science & Ecosystems Support Division Email
December 5, 2003

From: <George.Linda@epamail.epa.gov>
To: <balbrecht@ensafe.com>
Date: 12/5/2003 12:37:31 PM

Barb,

The rest of the screening tables will be mailed out to you on Monday.

This excel table shows the exposure parameters that may be used for the food web models. The word file contains the citations of the parameter numbers used in the excel table. This file of references contains additional citations since I didn't go through and delete them. Just ignore the other citations. If you have any questions, please call me at (706) 355-8718.

thanks, Linda

(See attached file: 871Inputparametertable - final.xls)(See attached file: Referencesforexpparameters.doc)

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CC: <Lewis.Bobby@epamail.epa.gov>, <gbenfield@ensafe.com>

Table 1. Input parameters

Exposure Scenario	Body Weight (kg)	Dietary Composition	Area Use Factor/ Alternate AUF	PCB Concentration in Media (biotic/abiotic)	Food Ingestion Rate (kg/day dry weight)	Surface Water Ingestion Rate (L/day)	Sediment/Soil Ingestion Rate (kg/day dry weight)	TRVs NOAEL/LOAEL (mg/kg-body weight/day)
ASSESSMENT ENDPOINT 1 - Piscivorous Bird								
Representative Species - Green Heron (*Butorides virescens*)								
Maximum	0.241 [a]	100 percent fish	1/1	Max./Max.	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
RME	0.241 [a]	100 percent fish	1/1	95%UCL/95% UCL	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
Average	0.241 [a]	100 percent fish	1/1	Mean/Mean	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 2 - Carnivorous Bird								
Representative Species - Eastern Screech-Owl (*Otus asio*)								
Maximum	0.15 [g]	100 percent small mammals	1/0.6	Max./Max.	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
RME	0.15 [g]	100 percent small mammals	1/0.6	95%UCL/95%UCL	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
Average	0.15 [g]	100 percent small mammals	1/0.6	Mean/Mean	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 3 - Insectivorous Bird								
Representative Species - American Woodcock (*Scolopax minor*)								
Maximum	0.160 [i]	100 percent worms	1/1	Max./Max.	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
RME	0.160 [i]	100 percent worms	1/1	95%UCL/95%UCL	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
Average	0.160 [i]	100 percent worms	1/1	Mean/Mean	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 4 - Piscivorous Mammal								
Representative Species - Mink (*Mustela vison*)								
Maximum	0.55 [l]	100 percent fish	1/0.9	Max./Max.	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
RME	0.55 [l]	100 percent fish	1/0.9	95%UCL/95%UCL	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
Average	0.55 [l]	100 percent fish	1/0.9	Mean/Mean	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 5 - Carnivorous Mammal								
Representative Species - Long-tailed Weasel (*Mustela frenata*)								
Maximum	0.08 [o]	100 percent small mammals	1/0.4	Max./Max.	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
RME	0.08 [o]	100 percent small mammals	1/0.4	95%UCL/95%UCL	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
Average	0.08 [o]	100 percent small mammals	1/0.4	Mean/Mean	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 6 - Insectivorous Mammal								
Representative Species - Short-tailed Shrew (*Blarina brevicauda*)								
Maximum	0.012 [p]	100 percent worms	1-Jan	Max./Max.	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
RME	0.012 [p]	100 percent worms	1/1	95%UCL/95%UCL	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
Average	0.012 [p]	100 percent worms	1/1	Mean/Mean	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]

Note: The PCB concentration in water used for the maximum and RME scenarios in this assessment is 130 ug/L.
The PCB concentration in water used for the average scenario in this assessment is 24.5 ug/L.
The PCB concentration in sediment used for the Maximum scenario for this assessment is 16 mg/kg.
The PCB concentration in sediment used for the RME scenario for this assessment is 2.2 mg/kg.
The PCB concentration in sediment used for the average scenario in this assessment is 1.6 mg/kg.
The PCB concentration in soil used for the Maximum scenario for this assessment is 6400 mg/kg.
The PCB concentration in soil used for the RME scenario for this assessment is 173 mg/kg.
The PCB concentration in soil used for the average scenario in this assessment is 89.5 mg/kg.
For small mammal tissue, fish tissue and surface water concentrations, the 95%UCL values will be substituted in the RME scenario.

[a] Niethammer and Kaiser (1983).
[b] Kushlan (1978).
[c] Calder and Braun (1983).
[d] Estimated based on the results of Beyer et al. (1994).
[e] Derived from McLane and Hughes (1980).
[f] Derived from Peakall and Peakall (1973).
[g] Henny and Van Camp (1979).
[h] Nagy et al. (1999).
[i] Owen and Krohn (1973).
[j] Sheldon (1967).
[k] Beyer et al. (1994).
[l] Mitchell (1961).
[m] Bleavins and Aulerich (1981).
[n] Derived from Aulerich and Ringer (1977).
[o] Fagerstone (1987).
[p] Guilday (1957).
[q] Based on Morrison (1957)
[r] Chew (1951).

1. References

Alexander, G.R. 1977. Food of vertebrate predators on trout waters in north central lower Michigan. Michigan Academician 10:181–195.

Aulerich, R.J., and R.K. Ringer. 1977. Current status of PCB toxicity to mink, and effect on their reproduction. Arch. Environ. Contam. Toxicol. 6:279–292.

Belthoff, J.R., E.J. Sparks, and G. Ritchison. 1993. Home ranges of adult and juvenile eastern screech-owls. Size, seasonal variation and extent of overlap. J. Raptor Res. 27:8–15.

Beyer, W.N., E. Conner, and S. Gerould. 1994. Survey of soil ingestion by wildlife. J. Wildl. Manage. 58(2):375–382.

Birks, J.D.S., and N. Dunstone. 1985. Sex-related differences in the diet of the mink *Mustela vison*. Holarctic Ecology 8:245–252.

Blair, W.F. 1940. Notes on home ranges and populations of the short-tailed shrew. Ecology 21(2).

Blair, W.F. 1941. Some data on the home ranges and general life history of the short-tailed shrew, red-backed vole, and woodland jumping mouse in Northern Michigan. American Midland Naturalist 25:681–685.

Bleavins, M.R., and R.J. Aulerich. 1981. Feed consumption and food passage time in mink (*Mustela vison*) and European ferrets (*Mustela putorius* furo). Lab. Anim. Sci. 31(3):268–269.

Buckner, C.H. 1966. Populations and ecological relationships of shrews in tamarack bogs of southeastern Manitoba. J. Mammal. 47:181–194.

Calder, W.A., and E.J. Braun. 1983. Scaling of osmotic regulation in mammals and birds. Am. J. Physiol. 224:601–606.

Chew, R.M. 1951. The water exchanges of some small mammals. Ecol. Monogr. 21(3):215–225.

Cottam and Uhler. 1945. U.S. Fish and Wildlife Service Leaflet 272.

Craighead, J.J., and F.C. Craighead, Jr. 1969. Hawks, Owls, and Wildlife. Dover Publications, Inc. New York, NY. 443 Pp.

Davis, W.E., Jr., and J.A. Kushlan. 1994. Green heron. The Birds of North America 129. Academy of Natural Sciences, Philadelphia, PA.

Dunning, J.B., Jr. 1993. CRC handbook of avian body masses. CRC Press.

Dwyer, T.J., G.F. Sepik, E.L. Derleth. 1988. Demographic characteristics of Maine woodcock population and effects of habitat management. Research Report 4. U.S. Fish and Wildlife Service, Washington, DC.

Exponent. 1998. Sampling protocol: Fish sampling and monitoring, Lake Susie, Panola County, Mississippi. Prepared for El Paso Energy, Houston, TX. Exponent, Bellevue, WA.

Exponent. 1999. Screening level ecological risk assessment and baseline problem formulation for the Off-Facility Area at TGPL Station 871, Campbellsville, Kentucky. Prepared for Tennessee Gas Pipeline Company, Houston, TX. Exponent, Bellevue, WA.

Fagerstone, K.A. 1987. Black-footed ferret, long-tailed weasel, short-tailed weasel, and least weasel. pp. 548–573. In: Wild Furbearer Management and Conservation in North America. M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch (eds). Ministry of Natural Resources, Ontario.

Gehlbach, F.R. 1986. Odd couples of suburbia. Natural History 95(6):56–64, 66.

Gehlbach, F.R. 1994. The eastern screech owl. Life history, ecology and behavior in the suburbs and countryside. Texas A&M University Press, College Station, TX.

Gehlbach, F.R. 1995. Eastern screech-owl (*Otus asio*). Birds of North America, No. 165. A. Poole and F. Gill (eds). The Academy of Natural Sciences of Philadelphia, Philadelphia, PA. The American Ornithologists' Union, Washington, DC.

Gerell, R. 1970. Home ranges and movements of the mink (*Mustela vison* Schreber) in southern Sweden. Oikos 20:451–460.

Glasgow, L.L. 1958. Contribution to the knowledge of the ecology of the American woodcock, *Philohela minor* (Gmelin), on the wintering range in Louisiana. Unpub. Ph.D. Thesis, Texas A&M Univ., College Station, TX.

Gregg, L. 1984. Population ecology of woodcock in Wisconsin. Tech. Bull. No. 144. Wisconsin Dept. of Natural Resources.

Greeley, F. 1953. Sex and age studies in fall-shot woodcock (*Philohela minor*) from southern Wisconsin. J. Wildl. Manage. 17:29–32.

Guilday, J.E. 1957. Art. 5. Individual and geographic variation in *Blarina brevicauda* from Pennsylvania. Annals of Carnegie Museum 35.

Hamilton, W.J., Jr. 1933. The weasels of New York. Their natural history and economic status. Am. Midl. Nat. 14(4):289–344.

Hamilton, W.J. 1941. The food of small forest mammals in Eastern United States. J. Mammal. 22:250–263.

Hegdal, P.L., and B.A. Colvin. 1988. Potential hazard to eastern screech-owls and other raptors of brodifacoum bait used for vole control in orchards. Environ. Toxicol. Chem. 7:245–260.

Henny, C.J., and L.F. Van Camp. 1979. Annual weight cycle in wild screech owls. Auk 96:795–796.

Horton, G.I., and M.K. Causey. 1979. Woodcock movements and habitat utilization in central Alabama. J. Wildl. Manage. 43:414–420.

Howell, A.B. 1932. Florida bird life. Florida Department of Game and Fresh Water Fish.

Hudgins, J.E., G.L. Storm, and J.S. Wakeley. 1985. Local movements and diurnal habitat selection by male American woodcock in Pennsylvania. J. Wildl. Manage. 49:614–619.

Ingram, R.P. 1981. Woodcock habitat utilization and availability on the Francis Marion National Forest. M.S. thesis, Clemson University, Clemson, S.C., 65 pp. (not seen, as cited in Roberts 1993)

IT. 1997. Off-facility engineering evaluation and cost analysis for Station 871, Campbellsville, Kentucky. Tennessee Gas Pipeline Company, Houston, TX. International Technology Corporation, Houston, TX.

Keppie, D.M., and G.W. Redmond. 1985. Body weight and the possession of territory for male American woodcock. Condor 87:287–290.

Keppie, D.M., and G.W. Redmond. 1988. A review of possible explanations for reverse size dimorphism of American woodcock. Can. J. Zool. 66:2390–2397.

Keppie, D.M., and R.M. Whiting, Jr. 1994. American woodcock (*Scolopax minor*). In: The Birds of North America, No. 100. A. Poole and F. Gill (eds). The Academy of Natural Sciences, Philadelphia, PA. The American Ornithologists' Union, Washington, DC.

King, C.M. 1990. The natural history of weasels and stoats. E. Neal (ed). Comstock Publishing Associates, Ithaca, NY.

Kushlan, J.A. 1978. Feeding ecology of wading birds. pp. 249–297. In: Wading Birds. National Audubon Society.

McLane, M.A.R., and D.L. Hughes. 1980. Reproductive success of screech owls fed Aroclor® 1248. Arch. Environ. Contam. Toxicol. 9:661–665.

Mitchell, J.L. 1961. Mink movements and populations on a Montana river. J. Wildl. Manage. 25(1):48–54.

Morrison, P.R., M. Pierce, and F.A. Ryser. 1957. Food consumption and body weight in the masked and short-tail shrews. Am. Midl. Nat. 57(2):493–501.

Nagy, K.A., I.A. Girard, and T.K. Brown. 1999. Energetics of free-ranging mammals, reptiles, and birds. Annu. Rev. Nutr. 19:247–277.

Nelson, A.L., and A.C. Martin. 1953. Gamebird weights. J. Wildl. Manage. 17(1):36–42.

Niethammer, K.R., and M.S. Kaiser. 1983. Later summer food habits of three heron species in northeastern Louisiana. Colonial Waterbirds 6:148–153.

Owen, R.B., Jr., and W.B. Krohn. 1973. Molt patterns and weight changes of the American woodcock. Wilson Bull. 85(1):31–41.

Palmer, R.S. 1962. Handbook of North American birds. Yale University Press. 567 pp.

Peakall, D.B., and M.L. Peakall. 1973. Effect of a polychlorinated biphenyl on the reproduction of artificially and naturally incubated dove eggs. J. Appl. Ecol. 10:863–868.

Platt, W.J. 1976. The social organization and territoriality of short-tailed shrew (*Blarina brevicauda*) populations in old-field habitats. Anim. Behav. 24:305–318.

Polderboer, E.B., L.W. Kuhn, and G.O. Hendrickson. 1941. Winter and spring habits of weasels in central Iowa. J. Wildl. Manage. 5(1):115–119.

Quick, H.F. 1944. Habits and economics of the New York weasel in Michigan. J. Wildl. Manage. 8(1):71–78.

Quick, H.F. 1951. Notes on the ecology of weasels in Gunnison County, Colorado. J. Mammal. 32(3):281–290.

Ritchison, G., and P.M. Cavanagh. 1992. Prey use by eastern screech-owls: Seasonal variation in eastern Kentucky and a review of previous studies. J. Raptor Res. 26:66–73.

Schwarzbach, S.E., L. Shull, and C.R. Gau. 1988. Eggshell Thinning in Ring Doves Exposed to *p,p*'-Dicofol. Arch. Environ. Contam. Toxicol. 17: 219-227.

Schwarzbach, S.E., D.M. Fry, B.E. Rosson, and D.M. Bird. 1991. Metabolism and Storage of *p,p*'-Dicofol in American Kestrels (*Falco verius*) with Comparisons to Ring Neck Doves (*Streptopelia risoria*). Arch. Environ. Contam. Toxicol. 20: 206- 210.

Sepik, G.F., and E.L. Derleth. 1993. Habitat use, home range size, and pattern of movement of the American woodcock in Maine. pp. 41–49. In: Proceedings of the

Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service, Washington, DC.

Simms, D.A. 1978. North American weasels: Resource utilization and distribution. Can. J. Zool. 57:504–520.

Sheldon, W.G. 1967. The book of the American woodcock. Univ. Massachusetts Press, Amherst. 227 pp.

Svendsen, G.E. 1982. Weasels, *Mustela* species. pp. 613–628. In: Wild Mammals of North America: Biology, Management, and Economics. The John Hopkins University Press, Baltimore, MD.

Tufts, R.W. 1940. Some studies in bill measurements and body weights of American woodcock (*Philohela minor*). Can. Field. Nat. 54: 132–134.

Turner, L.J., and R.W. Dimmick. 1981. Seasonal prey capture by the screech owl in Tennessee. J. Tenn. Acad. Sci. 56(2): 56–59.

U.S. EPA. 1993. Wildlife exposure factors handbook. Volume II: Food ingestion factors. EPA/600/P-95/002Fb. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

U.S. EPA. 1996. Supplemental guidance to RAGS: Region 4 Bulletins. U.S. Environmental Protection Agency, Region 4, Waste Management Division, Office of Technical Services, Atlanta, GA.

U.S. EPA. 1997. Ecological risk assessment guidance for Superfund: Process for designing and conducting ecological risk assessments. Interim Final. EPA 540-R-97-006, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Van Camp, L.F., and C.J. Henny. 1975. The screech owl: Its life history and population ecology in northern Ohio. N. Am. Fauna, No. 71.

Vander Haegen, W.M. 1992. Bioenergetics of American woodcock during the breeding season on Moosehorn National Wildlife Refuge, Maine. Ph.D. dissertation, University of Maine, Orono. 103 pp.

Vander Haegen, W.M., W.B. Krohn, and R.B. Owen, Jr. 1993a. Care, behavior, and growth of captive-reared American woodcocks. pp. 57–65. In: Proceedings of the Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service.

Vander Haegen, W.M., W.B. Krohn, and R.B. Owen, Jr. 1993b. Effects of weather on earthworm abundance and foods of the American woodcock in spring. pp. 26–31. In: Proceedings of the Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service.

Whitaker, J.O., Jr., and M.G. Ferraro. 1963. Summer food of 220 short-tailed shrews from Ithaca, New York. J. Mammal. 44(3):419.

Attachment 3
July 29 and 30, 2003 Meeting Minutes

Minutes from the Eco-sub Group Meeting to Discuss Ecological Risk Assessments at PNAS Wetlands, held 29-30 July 03.

Participants:
B. Albrecht
G. Benfield
T. Dillon
P. Hardy
A. Harris
B. Lewis
H. Ochoa

PNAS has a total of 84 wetlands, several of which can be related to an IR Site. P. Hardy presented an overview of the wetlands to the group and explained how they were originally classified and eventually grouped.

The focus of this meeting was to develop the groundwork for Wetlands 5, 6, 64, and 18. An approach including a write-up and working Excel ERA tables on these Wetlands were provided to each team member prior to the meeting for review and comment.

H. Ochoa discussed looking at adjoining wetlands as one unit, even if they had physical differences (i.e., freshwater vs estuarine, isolated vs centrally located) that may warrant differing screening/refinement values since they would likely have the same receptors. Other suggestions from the group included: grouping wetlands that are closely related (spatially) to one-another or related in proximity to a IR site; grouping wetlands according to base watersheds (which were realistically dropped when stormwater outfalls were connected to the wetlands); and ranking them based on their ERM Categories. The group decided we needed to wait until the end of COPC refinement to decide how best to address exposure from multiple wetlands. We agreed that it would largely depend on the home range for the species used for input parameters into the food web modeling. The group decided that the best approach to handle exposure from multiple wetlands would be more appropriately addressed after COPC refinement, when the assessment and measurement endpoints have been agreed upon.

B. Lewis recommended using the USEPA process as a guide and reconfiguring the developed tables to conform to EPA's 8-step approach. During this 2-day meeting, the group agreed to review the tables as currently presented, provide comments and direction on the process.

The tables will be modified to reflect only screening information during the beginning process and provide refinement of COPCs later in the process. One difference from the USEPA methodology agreed to by the group was to keep the detected and nondetected COPCs separate (currently USEPA is accustomed to seeing this information combined). G. Benfield will rework the current tables for Wetland 5 and provide a template for Group review and concurrence.

Other factors agreed to by the group include:

Global application:

- Screening process will include the max detected HQ compared to the screening values (SV), which will be the lower of the FDEP TELs or the USEPA Region 4 sediment screening values.

- Refinement process will include the average detected HQ compared to the TEL, the max detected HQ compared to the PEL and the average detectedHQ compared to the PEL.

- Nutrients will be retained in the screening process, and if detected in reasonable concentrations (when compared to the reference concentrations) will be refined out by including a footnote indicating they are essential nutrients.

- ASLs (alternate screening levels) will be renamed Refinement Values (RV).
- All abbreviations used in tables will be defined in footnotes.
- Data qualifiers will be added to the tables to identify actual detections vs nondetects.
- Surface water tables will be presented in the same format as the sediment tables.
- Reference Wetlands will include (N = XX) to inform the reviewer of the size of the data set.
- Location of maximum concentration column will be kept since it is the only reference to spatial information in the tables.

Totals:

- COPCs which have individual screening/refinement values <u>and</u> are also a part of a total value will be screened/refined using both approaches.

- Tables showing totals calculations will be placed in an appendix.
- The TEL and PEL for BEHP will be used for all phthalate esters.

VOCs:

- VOCs will be retained (especially if these COPCs are detected in the ground water and may be entering surface water) as a class of contaminants even if they are non-detects (and then discussed in the uncertainty phase of the report) unless they were also detected in field and/or laboratory blanks.

- Field/equipment blank data will be reviewed for VOC or lab contaminants.

PAHs:

- The EnSafe team will evaluate the current PAH detections in all samples collected at NAS Pensacola to determine if PAH background can be developed for NAS Pensacola.

- PAHs will all be corrected to organic carbon (OC normalized)

Pesticides:

- Pesticide COPCs will be ranked to see if there is an obvious break in concentrations similar to the DDT basewide levels that would indicate normal applications.

- Total DDTs will be added to the constituent totals.

Site Specific Tools:

- ERMs will be kept as an additional tool (data tables will be moved to the appendix, graphs will be kept in the body of the report).

- ERMs will be most useful after COPC refinement during the problem formulation phase to help evaluate the current site specific toxicity data as well as focus any area where additional site specific toxicity work may be necessary.

The Group discussed the application of marine ERMs to freshwater sediments and agreed that Long & MacDonald address the difference between freshwater and saltwater application for the ERL and ERM COPCs and found minimal differences, so the approach is applicable. The Group agreed to this approach.

- Correlation of toxicity data with ERM quotients will verify that toxicity testing does answer questions of what's been done, and that toxicity data indicates what we expect. Group Category 2, 3, and 4, with toxicty outcomes for vertebrate and invertebrate species.

- Interpretive tool for metals will be used as an additional tool in this process (estuarine wetlands will be graphed by hand, freshwater wetlands will be plotted by Excel)

- Benthic information will be moved to the appendix section of the report.

G. Benfield stressed to the group that he is concerned that we are re-inventing the wheel since many sediment samples, toxicity tests, and models have been developed, applied, and published in a previous RI. His concerns are related to the client's perspective and does not want the client to feel that we are back-tracking. The Group acknowledged his concerns and indicated that as long as enough data is available to make informed decisions, and everyone keeps the endpoint (receptor) in mind, the best outcome can be achieved.

The Group discussed whether a stand alone model for each wetland (developed by max number models or average number models, or driven by COPCs remaining after the refinement) or if adjoining wetlands (Wetlands 5, 6, and 64) could be combined as a whole for a single unit? This approach enhanced the need to identify the assessment endpoints andidentify what type of data has already been collected (and that it is representative of the area). B. Albrecht will develop a matrix identifying what has/has not been collected for each wetland of concern.

The Group agreed that toxicity data will serve as the primary measurement endpoint for the assessment endpoint for benthos, and food web models utilizing fish tissue concentrations and BSAFs will serve as the measurement endpoint for the piscivorus birds assessment endpoint for. This information coupled with sediment, nearby soil & groundwater, and surface water can be applied to models identifying the home range and foraging areas for conservative species selected based on protective standards for the areas in question. The Group agreed it will be better to stay with smaller species (green heron vs the blue heron) because this approach is moreprotective of the area and includes smaller (more focused) ranges.

H. Ochoa is currently working on a new document for FDEP in which new sediment and soil screening values will be presented for secondary poisoning. He anticipates presenting the report to FDEP by Aug 2003.

The Group discussed some surface water values which were collected during periods of low average rainfall, and had high levels of turbidity (causing artifacts for inorganics). Phase II data was collected January 1996 and Phase III was collected roughly 20 months later during August 1997. HQs were an order of magnitude lower during Phase III than Phase II. The Group agreed if the only item between moving a wetland to NFA was high turbidity, then we should consider re-sampling. If re-sampling does occur, two samples will be analyzed (filtered and non-filtered) to alleviate this discrepancy. (The Ambient Water Quality Criteria were based on filtered data.)

The Group discussed basing risk decisions on toxicity tests, and asked if this was realistic and also a conservative approach? The Group decided to review this information by comparing the ERM quotients to toxicity data and seeing if this approach would direct the team to resample. Sediment quality triad analyses used in previous ERAs will be dropped from the current assessment, but the data used to generate the triad information will be added to an appendix in the document.

The following tasks were agreed to by the Group before the meeting ended:

- Minutes of the Eco-sub Group Meeting and revised tables will be circulated to the Group by 6 Aug 03
- Comments are due 13 Aug 03
- Every wetland (sediments only) through refinement will be due 30 Sept 03

Response to Comments
Florida Department of Environmental Protection
Site 41 NAS Pensacola Wetlands
Dated January 24, 2006

Comment 1, Wetland 3:
Wetland 3 has been retained for a feasibility study. While we concur with this decision, there are a couple of points worth noting. First, toxicity tests were conducted using sediment and surface water sampled during Phase III. As indicated by the results of the sediment tests, the laboratory control failed with respect to test organism emergence. Under optimum circumstances, these results would be discarded and the test repeated. Secondly, as a result of visiting the site, it is obvious that there is excessive iron contamination coating the sediments and vegetation of Wetland 3, extending through the culvert under the roadway and emptying into Wetland 4. The sediment and vegetation of Wetland 4 also exhibit iron contamination at the outfall of this culvert extending several yards into the wetland and along its banks. The interceptor trench installed in Wetland 3 to control landfill contamination was said to still be in operation. However, it is obvious that this trench is not sufficient to divert contamination from Wetland 3 and is not protective of Wetland 4. We recommend consideration of remediation methods for these two wetlands, as the contamination coming from the OU1 landfill appears to be constant and is not contained.

Response:
The remedial action (interceptor trench) for groundwater discharging to surface water is currently undergoing an optimization study. The results of that study will be provided to FDEP.

Comment 2, Wetland 15:
Elevated levels of pesticides in sediment and surface water were found within this wetland. Sediment contaminant concentrations were above the "basewide level" and exhibited double-digit PEL hazard quotient values for total DDT and 4.4'-DDD, while surface water levels of 4.4'-DDD exhibited maximum and average hazard quotients in the triple digits. Metals were also elevated with high sediment concentrations of lead, iron and arsenic. No toxicity testing of sediment and surface water from this wetland was conducted, despite the high concentrations of pesticides and metals. During Phase III, toxicity testing was conducted on one sample each from Wetlands 16 and 18B, and these results were considered representative of Wetland 15 based on similarity of contaminants and concentrations. The toxicity tests showed no effects, and this was used in part to justify No Further Action (NFA) for Wetland 15. As discussed below, we have strong reservations about using toxicity test results from a single sample to conclude no action is necessary when concentrations of pesticides and metals are high. Obviously, uncertainty is greater when these results are extrapolated from one wetland to another. With respect to the food chain modeling, outdated food ingestion rates were used, as discussed in our review of Site 41 methodology (January 23, 2006). Potential impacts through food chain exposure should be re-evaluated using updated values.

Response:
The ingestion rates and body weights used in the food chain models were provided to the Navy by USEPA Region 4 Science & Ecosystems Support Division, in an email dated December 5, 2003. The email and provided table are included as Attachment 1.

The "surface water" sample collected at Wetland 15 is not a true representative sample of surface water because a hole was dug for the collection of the water sample. A resampling event was attempted at Wetland 15, but could not be conducted as the location had no standing surface water.

In addition, the investigation at the NAS Pensacola wetlands was completed in phases with the input of ecological experts from FDEP, EPA and NOAA at every phase. All investigation locations and analysis and subsequent evaluation techniques were approved by the agencies and NAS Pensacola Tier 1 Partnering Team before being applied. The Navy agrees that there is greater uncertainty with the method used to evaluate risk at Wetland 15, but the Navy also believes that all Team members agreed that the uncertainty was at an acceptable level for all parties.

Comment 3, Wetland 16:
Wetland 16 was identified as one of the more impacted wetlands based on Phase II sampling results; therefore, additional sampling was conducted in Phase III for toxicity testing and community analysis. Diversity was low, but the toxicity test for this sample was negative. Based on the negative toxicity test, this wetland was recommended for NFA, despite high pesticide and metal concentrations. Because the chemistry and toxicity information appear contradictory (i.e., concentrations of contaminants orders of magnitude above the PELs and low community diversity on one hand, and a negative toxicity test result on the other), confidence in the negative toxicity testing results should be high in order to over-ride the chemistry and community analysis results. A single toxicity test conducted on a single sample from one location does not rise to this standard, in our opinion. Additional samples from this wetland will be required to demonstrate that contaminants present do not have an impact.

Response:
The investigation at the NAS Pensacola wetlands was completed in phases with the input of ecological experts from FDEP, EPA and NOAA at every phase. All investigation locations and analysis and subsequent evaluation techniques were approved by the agencies and NAS Pensacola Tier 1 Partnering Team before being applied. The Navy understood that all Team members agreed that the uncertainty was at an acceptable level for all parties.

Comment 4, Wetland 17:
Red iron flocculent was observed on the vegetation and sediment at this wetland. It appears to be receiving iron contamination originating from Wetland 18.

Response:
Wetland 18 discharges to Redoubt Bayou and the inference that Wetlands 17 and 18 are connected is not clear.

Comment 5, Wetland 18:
Wetland 18 lies in an area with an abundance of animal tracks. It appears that the area spanning Wetlands 16 to 18 is a major thoroughfare for wildlife such as deer, bobcat,

birds and raccoons. Therefore, it is of major ecological concern that Wetland 18 has exhibited some of the highest levels of metals and pesticides found across Site 41. Sediment iron concentrations have been observed at 128,000 mg/kg at sampling station 18B1, and the maximum concentration of 4.4'-DDT at sampling station 18A1 generated a PEL hazard quotient of one thousand and ten (1,010). Yet this wetland is not being considered for a feasibility study and was recommended for NFA. The rationale for this appears to be based at least partly on a negative toxicity test using only one sediment sample taken from station 18B1. The reasoning for testing only this station is questionable. Station 18A1 contained equally high concentrations of pesticides and should have been tested also. The elevated chemistry concentrations throughout this site, both in the freshwater and saltwater areas, suggest the possibility for adverse effects. Therefore, sufficient samples should have been taken to insure representative results. The report states that according to the results of the toxicity test, sediment chemistry and community analysis, the "sediment in Wetland 18B is not influencing flora and fauna in this wetland". We disagree with this statement. Contaminant concentrations measured during Phase III were lower than those observed in Phase II, but were still well above PELs.

During a site visit, a layer of red iron flocculent was observed, covering the sediment and vegetation within Wetland 18 and the adjacent shores of Redoubt Bayou. The report states that "iron is widespread in NAS Pensacola media, and is not considered a contaminant." This appears to contradict the approach for Wetland 3, where iron is a contaminant of concern. From an ecological standpoint, ferrous iron (dissolved iron) is not the only concern with this metal. The oxidized form of iron, ferric iron, results in iron flocculent, smothering benthic and epibenthic invertebrates and impairing reproduction of vertebrate fish species. Upon close examination of Wetland 18 sediment and surface water, none of the invertebrate or fish species indicating a healthy ecosystem were present (periwinkle snail, mussels, killifish, etc.) — only dead shells. These species can be found in similar, less impacted areas of Site 41.

In addition, the results of the food chain modeling used to support the conclusion that bioaccumulative contaminants do not pose acceptable risk were based on outdated food ingestion rates more than 10 times below the current values used by EPA (see our letter of January 23, 2006 regarding Site 41 methodology). Also, the food chain assessment was based upon site specific fish tissue data, which appear to consist of concentrations measured in one collected fish of unspecified taxonomy. The ability of this approach to adequately assess contaminant burdens in fish, "protecting fish visibility", and in calculating representative site-specific food chain models is questionable. It is our belief that an NFA classification for this wetland is not supported and that remediation methods/source control should be investigated.

Response:

The investigation at the NAS Pensacola wetlands was completed in phases with the input of ecological experts from FDEP, EPA and NOAA at every phase. All investigation locations and analysis and subsequent evaluation techniques were approved by the agencies and NAS Pensacola Tier 1 Partnering Team before being applied. The Navy understood that all Team members agreed that the uncertainty was at an acceptable level for all parties.

The ingestion rates and body weights used in the food chain models were provided to the Navy by USEPA Region 4 Science & Ecosystems Support Division, in an email dated December 5, 2003. The email and provided table are included as Attachment 1.

Comment 6, Wetland 48:
Samples collected from a central location within Wetland 48 revealed extensive DDT contamination. Hazard quotients were in the quadruple and triple digits for the TEL and PEL screening values, respectively. DDT and related compounds were retained through the refinement process and evaluated through food chain modeling. Food chain modeling indicated risk to all three ecological receptors; however, this wetland is recommended for NFA status. This recommendation is based on the risk "not being attributable to nearby IR sites", although the reasoning behind this conclusion is not provided. It is our opinion that this wetland is definitely an ecological risk to this area of "remaining wetlands," and the concentrated areas of DDT contamination should be removed.

Response:
The Navy agrees to conduct additional sampling in Wetland 48 to assess the DDT contamination. Based upon that data and its evaluation, the Navy will determine if a feasibility study is warranted.

Comment 7, Wetland 64/7 Complex:
This wetland is being retained for a feasibility study. We concur with this decision and would like to make note of the unresolved question of whether groundwater or storm water runoff is responsible for continuing contamination of this area. According to personal communication with EnSafe and Navy personnel, future plans to address this question will employ a Trident probe to assess the amount of groundwater contribution. We will be interested in seeing these results, as well as future remediation and source control proposals, as the ecological impairment of this wetland is of great concern. The contamination is linked not just to Wetlands 64 and 7, but has the ability to affect Pensacola Bay as well.

Response:
The Navy will provide the results of the Trident probe testing to FDEP after collection and analysis of the data.

Summary and Conclusions
EnSafe retained 4 out of 29 wetlands for a feasibility study (FS). These were wetlands 3, 5A, 64 and 10. It is our conclusion that an additional four wetlands, 15, 16, 18 and 48, should also be retained for the FS. Additionally, if re-evaluation is conducted regarding the methodology issues raised in our January 23, 2006 review letter, the NFA status and COPCs (PAHs) of other wetlands may also be affected. However, contamination at some of these wetlands, such as 17 and 4, could be resolved with the remediation or source control of contamination from neighboring wetlands such as 18 and 3.

Response:
The Navy agrees to completing a feasibility study on Wetlands 15, 16, and 18. The need for a feasibility study of Wetland 48 will be assessed after additional sampling and evaluation is completed. Wetland 18 discharges to Redoubt Bayou and the inference of connection to Wetland 17 is not clear. The interceptor trench at Wetland 3 is currently undergoing an optimization study.

Attachment 1
USEPA Region 4 Science & Ecosystems Support Division Email
December 5, 2003

Attachment 1
USEPA Region 4 Science & Ecosystems Support Division Email
December 5, 2003

From: <George.Linda@epamail.epa.gov>
To: <balbrecht@ensafe.com>
Date: 12/5/2003 12:37:31 PM

Barb,

The rest of the screening tables will be mailed out to you on Monday.

This excel table shows the exposure parameters that may be used for the food web models. The word file contains the citations of the parameter numbers used in the excel table. This file of references contains additional citations since I didn't go through and delete them. Just ignore the other citations. If you have any questions, please call me at (706) 355-8718.

thanks, Linda

(See attached file: 871Inputparametertable - final.xls)(See attached file: Referencesforexpparameters.doc)

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CC: <Lewis.Bobby@epamail.epa.gov>, <gbenfield@ensafe.com>

Table 1. Input parameters

Exposure Scenario	Body Weight (kg)	Dietary Composition	Area Use Factor/ Alternate AUF	PCB Concentration in Media (biotic/abiotic)	Food Ingestion Rate (kg/day dry weight)	Surface Water Ingestion Rate (L/day)	Sediment/Soil Ingestion Rate (kg/day dry weight)	TRVs NOAEL/LOAEL (mg/kg-body weight/day)
ASSESSMENT ENDPOINT 1 - Piscivorous Bird								
Representative Species - Green Heron (*Butorides virescens*)								
Maximum	0.241 [a]	100 percent fish	1/1	Max./Max.	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
RME	0.241 [a]	100 percent fish	1/1	95%UCL/95% UCL	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
Average	0.241 [a]	100 percent fish	1/1	Mean/Mean	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 2 - Carnivorous Bird								
Representative Species - Eastern Screech-Owl (*Otus asio*)								
Maximum	0.15 [g]	100 percent small mammals	1/0.6	Max./Max.	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
RME	0.15 [g]	100 percent small mammals	1/0.6	95%UCL/95%UCL	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
Average	0.15 [g]	100 percent small mammals	1/0.6	Mean/Mean	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 3 - Insectivorous Bird								
Representative Species - American Woodcock (*Scolopax minor*)								
Maximum	0.160 [i]	100 percent worms	1/1	Max./Max.	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
RME	0.160 [i]	100 percent worms	1/1	95%UCL/95%UCL	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
Average	0.160 [i]	100 percent worms	1/1	Mean/Mean	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 4 - Piscivorous Mammal								
Representative Species - Mink (*Mustela vison*)								
Maximum	0.55 [l]	100 percent fish	1/0.9	Max./Max.	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
RME	0.55 [l]	100 percent fish	1/0.9	95%UCL/95%UCL	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
Average	0.55 [l]	100 percent fish	1/0.9	Mean/Mean	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 5 - Carnivorous Mammal								
Representative Species - Long-tailed Weasel (*Mustela frenata*)								
Maximum	0.08 [o]	100 percent small mammals	1/0.4	Max./Max.	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
RME	0.08 [o]	100 percent small mammals	1/0.4	95%UCL/95%UCL	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
Average	0.08 [o]	100 percent small mammals	1/0.4	Mean/Mean	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 6 - Insectivorous Mammal								
Representative Species - Short-tailed Shrew (*Blarina brevicauda*)								
Maximum	0.012 [p]	100 percent worms	1-Jan	Max./Max.	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
RME	0.012 [p]	100 percent worms	1/1	95%UCL/95%UCL	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
Average	0.012 [p]	100 percent worms	1/1	Mean/Mean	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]

Note: The PCB concentration in water used for the maximum and RME scenarios in this assessment is 130 ug/L.
The PCB concentration in water used for the average scenario in this assessment is 24.5 ug/L.
The PCB concentration in sediment used for the Maximum scenario for this assessment is 16 mg/kg.
The PCB concentration in sediment used for the RME scenario for this assessment is 2.2 mg/kg.
The PCB concentration in sediment used for the average scenario in this assessment is 1.6 mg/kg.
The PCB concentration in soil used for the Maximum scenario for this assessment is 6400 mg/kg.
The PCB concentration in soil used for the RME scenario for this assessment is 173 mg/kg.
The PCB concentration in soil used for the average scenario in this assessment is 89.5 mg/kg.
For small mammal tissue, fish tissue and surface water concentrations, the 95%UCL values will be substituted in the RME scenario.

[a] Niethammer and Kaiser (1983).
[b] Kushlan (1978).
[c] Calder and Braun (1983).
[d] Estimated based on the results of Beyer et al. (1994).
[e] Derived from McLane and Hughes (1980).
[f] Derived from Peakall and Peakall (1973).
[g] Henny and Van Camp (1979).
[h] Nagy et al. (1999).
[i] Owen and Krohn (1973).
[j] Sheldon (1967).
[k] Beyer et al. (1994).
[l] Mitchell (1961).
[m] Bleavins and Aulerich (1981).
[n] Derived from Aulerich and Ringer (1977).
[o] Fagerstone (1987).
[p] Guilday (1957).
[q] Based on Morrison (1957)
[r] Chew (1951).

1. References

Alexander, G.R. 1977. Food of vertebrate predators on trout waters in north central lower Michigan. Michigan Academician 10:181–195.

Aulerich, R.J., and R.K. Ringer. 1977. Current status of PCB toxicity to mink, and effect on their reproduction. Arch. Environ. Contam. Toxicol. 6:279–292.

Belthoff, J.R., E.J. Sparks, and G. Ritchison. 1993. Home ranges of adult and juvenile eastern screech-owls. Size, seasonal variation and extent of overlap. J. Raptor Res. 27:8–15.

Beyer, W.N., E. Conner, and S. Gerould. 1994. Survey of soil ingestion by wildlife. J. Wildl. Manage. 58(2):375–382.

Birks, J.D.S., and N. Dunstone. 1985. Sex-related differences in the diet of the mink *Mustela vison*. Holarctic Ecology 8:245–252.

Blair, W.F. 1940. Notes on home ranges and populations of the short-tailed shrew. Ecology 21(2).

Blair, W.F. 1941. Some data on the home ranges and general life history of the short-tailed shrew, red-backed vole, and woodland jumping mouse in Northern Michigan. American Midland Naturalist 25:681–685.

Bleavins, M.R., and R.J. Aulerich. 1981. Feed consumption and food passage time in mink (*Mustela vison*) and European ferrets (*Mustela putorius* furo). Lab. Anim. Sci. 31(3):268–269.

Buckner, C.H. 1966. Populations and ecological relationships of shrews in tamarack bogs of southeastern Manitoba. J. Mammal. 47:181–194.

Calder, W.A., and E.J. Braun. 1983. Scaling of osmotic regulation in mammals and birds. Am. J. Physiol. 224:601–606.

Chew, R.M. 1951. The water exchanges of some small mammals. Ecol. Monogr. 21(3):215–225.

Cottam and Uhler. 1945. U.S. Fish and Wildlife Service Leaflet 272.

Craighead, J.J., and F.C. Craighead, Jr. 1969. Hawks, Owls, and Wildlife. Dover Publications, Inc. New York, NY. 443 Pp.

Davis, W.E., Jr., and J.A. Kushlan. 1994. Green heron. The Birds of North America 129. Academy of Natural Sciences, Philadelphia, PA.

Dunning, J.B., Jr. 1993. CRC handbook of avian body masses. CRC Press.

Dwyer, T.J., G.F. Sepik, E.L. Derleth. 1988. Demographic characteristics of Maine woodcock population and effects of habitat management. Research Report 4. U.S. Fish and Wildlife Service, Washington, DC.

Exponent. 1998. Sampling protocol: Fish sampling and monitoring, Lake Susie, Panola County, Mississippi. Prepared for El Paso Energy, Houston, TX. Exponent, Bellevue, WA.

Exponent. 1999. Screening level ecological risk assessment and baseline problem formulation for the Off-Facility Area at TGPL Station 871, Campbellsville, Kentucky. Prepared for Tennessee Gas Pipeline Company, Houston, TX. Exponent, Bellevue, WA.

Fagerstone, K.A. 1987. Black-footed ferret, long-tailed weasel, short-tailed weasel, and least weasel. pp. 548–573. In: Wild Furbearer Management and Conservation in North America. M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch (eds). Ministry of Natural Resources, Ontario.

Gehlbach, F.R. 1986. Odd couples of suburbia. Natural History 95(6):56–64, 66.

Gehlbach, F.R. 1994. The eastern screech owl. Life history, ecology and behavior in the suburbs and countryside. Texas A&M University Press, College Station, TX.

Gehlbach, F.R. 1995. Eastern screech-owl (*Otus asio*). Birds of North America, No. 165. A. Poole and F. Gill (eds). The Academy of Natural Sciences of Philadelphia, Philadelphia, PA. The American Ornithologists' Union, Washington, DC.

Gerell, R. 1970. Home ranges and movements of the mink (*Mustela vison* Schreber) in southern Sweden. Oikos 20:451–460.

Glasgow, L.L. 1958. Contribution to the knowledge of the ecology of the American woodcock, *Philohela minor* (Gmelin), on the wintering range in Louisiana. Unpub. Ph.D. Thesis, Texas A&M Univ., College Station, TX.

Gregg, L. 1984. Population ecology of woodcock in Wisconsin. Tech. Bull. No. 144. Wisconsin Dept. of Natural Resources.

Greeley, F. 1953. Sex and age studies in fall-shot woodcock (*Philohela minor*) from southern Wisconsin. J. Wildl. Manage. 17:29–32.

Guilday, J.E. 1957. Art. 5. Individual and geographic variation in *Blarina brevicauda* from Pennsylvania. Annals of Carnegie Museum 35.

Hamilton, W.J., Jr. 1933. The weasels of New York. Their natural history and economic status. Am. Midl. Nat. 14(4):289–344.

Hamilton, W.J. 1941. The food of small forest mammals in Eastern United States. J. Mammal. 22:250–263.

Hegdal, P.L., and B.A. Colvin. 1988. Potential hazard to eastern screech-owls and other raptors of brodifacoum bait used for vole control in orchards. Environ. Toxicol. Chem. 7:245–260.

Henny, C.J., and L.F. Van Camp. 1979. Annual weight cycle in wild screech owls. Auk 96:795–796.

Horton, G.I., and M.K. Causey. 1979. Woodcock movements and habitat utilization in central Alabama. J. Wildl. Manage. 43:414–420.

Howell, A.B. 1932. Florida bird life. Florida Department of Game and Fresh Water Fish.

Hudgins, J.E., G.L. Storm, and J.S. Wakeley. 1985. Local movements and diurnal habitat selection by male American woodcock in Pennsylvania. J. Wildl. Manage. 49:614–619.

Ingram, R.P. 1981. Woodcock habitat utilization and availability on the Francis Marion National Forest. M.S. thesis, Clemson University, Clemson, S.C., 65 pp. (not seen, as cited in Roberts 1993)

IT. 1997. Off-facility engineering evaluation and cost analysis for Station 871, Campbellsville, Kentucky. Tennessee Gas Pipeline Company, Houston, TX. International Technology Corporation, Houston, TX.

Keppie, D.M., and G.W. Redmond. 1985. Body weight and the possession of territory for male American woodcock. Condor 87:287–290.

Keppie, D.M., and G.W. Redmond. 1988. A review of possible explanations for reverse size dimorphism of American woodcock. Can. J. Zool. 66:2390–2397.

Keppie, D.M., and R.M. Whiting, Jr. 1994. American woodcock (*Scolopax minor*). In: The Birds of North America, No. 100. A. Poole and F. Gill (eds). The Academy of Natural Sciences, Philadelphia, PA. The American Ornithologists' Union, Washington, DC.

King, C.M. 1990. The natural history of weasels and stoats. E. Neal (ed). Comstock Publishing Associates, Ithaca, NY.

Kushlan, J.A. 1978. Feeding ecology of wading birds. pp. 249–297. In: Wading Birds. National Audubon Society.

McLane, M.A.R., and D.L. Hughes. 1980. Reproductive success of screech owls fed Aroclor® 1248. Arch. Environ. Contam. Toxicol. 9:661–665.

Mitchell, J.L. 1961. Mink movements and populations on a Montana river. J. Wildl. Manage. 25(1):48–54.

Morrison, P.R., M. Pierce, and F.A. Ryser. 1957. Food consumption and body weight in the masked and short-tail shrews. Am. Midl. Nat. 57(2):493–501.

Nagy, K.A., I.A. Girard, and T.K. Brown. 1999. Energetics of free-ranging mammals, reptiles, and birds. Annu. Rev. Nutr. 19:247–277.

Nelson, A.L., and A.C. Martin. 1953. Gamebird weights. J. Wildl. Manage. 17(1):36–42.

Niethammer, K.R., and M.S. Kaiser. 1983. Later summer food habits of three heron species in northeastern Louisiana. Colonial Waterbirds 6:148–153.

Owen, R.B., Jr., and W.B. Krohn. 1973. Molt patterns and weight changes of the American woodcock. Wilson Bull. 85(1):31–41.

Palmer, R.S. 1962. Handbook of North American birds. Yale University Press. 567 pp.

Peakall, D.B., and M.L. Peakall. 1973. Effect of a polychlorinated biphenyl on the reproduction of artificially and naturally incubated dove eggs. J. Appl. Ecol. 10:863–868.

Platt, W.J. 1976. The social organization and territoriality of short-tailed shrew (*Blarina brevicauda*) populations in old-field habitats. Anim. Behav. 24:305–318.

Polderboer, E.B., L.W. Kuhn, and G.O. Hendrickson. 1941. Winter and spring habits of weasels in central Iowa. J. Wildl. Manage. 5(1):115–119.

Quick, H.F. 1944. Habits and economics of the New York weasel in Michigan. J. Wildl. Manage. 8(1):71–78.

Quick, H.F. 1951. Notes on the ecology of weasels in Gunnison County, Colorado. J. Mammal. 32(3):281–290.

Ritchison, G., and P.M. Cavanagh. 1992. Prey use by eastern screech-owls: Seasonal variation in eastern Kentucky and a review of previous studies. J. Raptor Res. 26:66–73.

Schwarzbach, S.E., L. Shull, and C.R. Gau. 1988. Eggshell Thinning in Ring Doves Exposed to *p,p*'-Dicofol. Arch. Environ. Contam. Toxicol. 17: 219-227.

Schwarzbach, S.E., D.M. Fry, B.E. Rosson, and D.M. Bird. 1991. Metabolism and Storage of *p,p*'-Dicofol in American Kestrels (*Falco verius*) with Comparisons to Ring Neck Doves (*Streptopelia risoria*). Arch. Environ. Contam. Toxicol. 20: 206- 210.

Sepik, G.F., and E.L. Derleth. 1993. Habitat use, home range size, and pattern of movement of the American woodcock in Maine. pp. 41–49. In: Proceedings of the

Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service, Washington, DC.

Simms, D.A. 1978. North American weasels: Resource utilization and distribution. Can. J. Zool. 57:504–520.

Sheldon, W.G. 1967. The book of the American woodcock. Univ. Massachusetts Press, Amherst. 227 pp.

Svendsen, G.E. 1982. Weasels, *Mustela* species. pp. 613–628. In: Wild Mammals of North America: Biology, Management, and Economics. The John Hopkins University Press, Baltimore, MD.

Tufts, R.W. 1940. Some studies in bill measurements and body weights of American woodcock (*Philohela minor*). Can. Field. Nat. 54: 132–134.

Turner, L.J., and R.W. Dimmick. 1981. Seasonal prey capture by the screech owl in Tennessee. J. Tenn. Acad. Sci. 56(2): 56–59.

U.S. EPA. 1993. Wildlife exposure factors handbook. Volume II: Food ingestion factors. EPA/600/P-95/002Fb. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

U.S. EPA. 1996. Supplemental guidance to RAGS: Region 4 Bulletins. U.S. Environmental Protection Agency, Region 4, Waste Management Division, Office of Technical Services, Atlanta, GA.

U.S. EPA. 1997. Ecological risk assessment guidance for Superfund: Process for designing and conducting ecological risk assessments. Interim Final. EPA 540-R-97-006, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Van Camp, L.F., and C.J. Henny. 1975. The screech owl: Its life history and population ecology in northern Ohio. N. Am. Fauna, No. 71.

Vander Haegen, W.M. 1992. Bioenergetics of American woodcock during the breeding season on Moosehorn National Wildlife Refuge, Maine. Ph.D. dissertation, University of Maine, Orono. 103 pp.

Vander Haegen, W.M., W.B. Krohn, and R.B. Owen, Jr. 1993a. Care, behavior, and growth of captive-reared American woodcocks. pp. 57–65. In: Proceedings of the Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service.

Vander Haegen, W.M., W.B. Krohn, and R.B. Owen, Jr. 1993b. Effects of weather on earthworm abundance and foods of the American woodcock in spring. pp. 26–31. In: Proceedings of the Eighth American Woodcock Symposium. Biological Report 16. U.S. Fish and Wildlife Service.

Whitaker, J.O., Jr., and M.G. Ferraro. 1963. Summer food of 220 short-tailed shrews from Ithaca, New York. J. Mammal. 44(3):419.