

Department of Environmental Protection

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Lawton Chiles
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2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

N00204.AR.001673
NAS PENSACOLA
5090.3a

July 9, 1998

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Bill Hill
Code 1851
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 190010
North Charleston, South Carolina 29419-9010

RE: Letter on Use of Fraction Ingested/Fraction Contacted Term
in Risk Assessments at NAS Pensacola

Dear Mr. Hill:

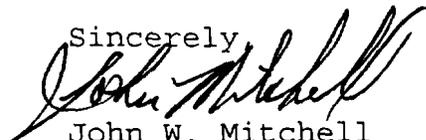
I have completed the technical review **of** the **your** letter dated June 16, 1998 (received June 22, 1998) that was submitted in response to my e-mail (copy attached) dated May 6, 1998.

As stated in **my** e-mail, I did not preclude using a fraction ingested/fraction contacted (FI/FC) factor less than one. I indicated that without adequately defensible and quantifiable usage patterns being provided, then the default value **of 1** should be applied for FI/FC and the results recalculated for the constituents to which a value less than 1 was applied. The above described usage patterns are not currently defensible within the remedial investigation reports where an FI/FC value less than 1 was used. The attached letter from Stephen M. Roberts, Ph.D. addresses the usage pattern issue as well as other factors needed before a FI/FC factor less than 1 can be used.

Concerning your question **of** where this is referenced, the value of 1 for FI/FC is used in the calculations which determined the states Soil Cleanup Target Levels (SCTLs) (Technical Report, 1998) and is also included in Chapter 62-785, F.A.C.

If I can be of any further assistance with this matter, please contact me at (904) 921-9989.

Sincerely,



John W. Mitchell
Remedial Project Manager

Mr. Bill Hill
July 9, 1998
FI/FC Letter
Page two

cc: Ron Joyner, NAS Pensacola
Gena Townsend, USEPA Region IV
Brian Caldwell, EnSafe, Knoxville
Allison Dennen, EnSafe, Memphis
Karen Atchley, Bechtel, Knoxville
Tom Dillon, NOAA CRC, USEPA Region IV
Tom Moody, FDEP Northwest District

TJB B JJC JJC ESN ESN

Date: 5/6/98 3:00:47 PM
From: John Mitchell TAL
Subject: OU 2 Risk Assessment - FI/FC
J: See Below

Team:

I have discussed the FI/FC issue with Dr. Roberts, Ligia, and Tim Bahr. It is the states opinion that in using the FI/FC in the exposure calculations at the OU 2 sites that the default value of 1 should be applied. We do not agree with the percentages applied at the various sites. *Also*, it appears these were applied for the potential future resident which is in appropriate **as** the usage patterns could not be adeqautely determined. FI/FC could potentially be used in a current use scenario, but the usage patterns at the site would have to be adeqautely quantified and defensible. Those constituents which used a FI/FC factor less than 1 should be recalculated using the default value of 1.

Thanks, John

To: KAREN ATCHLEY
To: BRIAN CALDWELL
To: ALLISON DENNEN
To: BILL HILL
To: Bill Kellenberger PEN
To: GENA TOWNSEND
To: RON JOYNER
To: Paul Stoddard
To: Tom Dillon
To: Joe Land
CC: Tim Bahr TAL



July 7, 1998

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

Dear Ms. Mora-Applegate:

The issue of the use of FI/FC in risk calculations has come up again in the context of OU2 at NAS Pensacola. There are circumstances where the use of an FI or FC value of less than 1 can be justified. An example might be a situation in which a worker spends a defined fraction of the workday at a contaminated site, and the remainder of the workday at an uncontaminated site. Of course this division of time and/or activity pattern would have to be documented, and may not be applicable to future exposure scenarios where activity patterns might change.

The use of FI/FC proposed at NAS Pensacola is different — here FI/FC is based on the distribution of contaminants within an exposure area. This use of FI/FC is, in my opinion, almost always a mistake. Variability in concentrations of contaminants within the exposure area is best dealt with in the derivation of the exposure point concentration (EPC). Here, there are a number of statistical tools available through which the impact of the variability on risk estimates can be addressed through the development of confidence limits (e.g. the upper 95% confidence limit estimate on the mean). While a statistical approach could also be taken in developing an FYFC for an area, in practice this is done much more subjectively. As a result, the reliability of these estimates is suspect.

Looking at Site 25 in OU2 specifically, we have a situation in which the 95% UCL is greater than the maximum concentration. Under these circumstances, risk assessment guidance from the U.S. EPA indicates that the maximum concentration value should be used as the exposure point concentration. It is my understanding that the Navy objects to using the maximum concentration (and an FI/FC of 1) at this site as being overly conservative. A 95% UCL greater than the maximum concentration is indicative that the site has not been adequately characterized to develop a good estimate of the mean concentration. Selecting an FI/FC value less than 1 based on assumptions regarding site distribution of contaminants certainly reduces the conservatism, but doesn't address the

underlying problem of poor characterization of contaminant concentrations. I have looked over the memorandum of June 16, 1998 in which the derivation and use of an FI/FC term of 0.4 for this site is described, but the source of some of the critical assumptions (e.g., that the area of Aroclor-impacted soils is approximately 5,300 square feet) is not explained. Frankly, in looking at a map showing the sampling locations for this site, it appears that other assumptions regarding the size of the contaminated area are equally supported by the limited available data, including areas larger than 5,300 square feet.

If the Navy and their contractor insist on using FI/FC in estimating the **risks** posed by this site, the extent of the contaminated area must be carefully defined and justified. This has not been done in any of the documents for this site that I have reviewed. To do this well, additional sampling will probably be required. The derivation of an estimate of the contaminated area should include, if possible, an upper confidence limit estimate on the boundaries. Also, a 0.5-acre total exposure area (as proposed in the June 16, 1998 memo) may be reasonable, but should be justified in a site-specific context. Under some circumstances (e.g., commercial use of the property with contamination in a loading dock area), plausible human activity patterns may necessitate the use of a smaller area for some receptors. This needs to be discussed and documented.

I hope that these comments are helpful. Please let me know if I can be of further assistance on this site.

Regards,



Stephen M. Roberts, Ph.D.
Associate Professor and Program Director