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February 25, 1999

Ms. Ann Baines
Program Management Company
835 Springdale Dr Suite 201
Exton, PA 19341-2859

RE: Response to Table of Toxicity Information sent to NMED as part of facility-wide risk assessment Protocol, submitted January 1999

Dear Ms Baines:

The RCRA Permits Management Program (RPMP) of the Hazardous and Radioactive Materials Bureau (HRMB) has reviewed the ecological toxicity data table that you sent to us in January of 1999. Our comments and recommendations for revision are attached. These comments reflect our understanding of the current guidance available for ecological risk assessment, and I encourage you to incorporate these comments in the risk assessment protocol document that you are submitting for Ft. Wingate Depot Activity.

If you have any questions please contact me at (505)827-1561 ext. 1039 or Kirby Olson of my staff at the above address or by telephone at (505) 827-1561 ext. 1034.

Sincerely,

Robert S. (Stu) Dinwiddie, Ph.D., Program Manager
RCRA Permits Management Program

cc:
Phil Solano, HRMB
Dwayne Ford, US COE-Ft. Worth
Larry Fisher, Tooele Army Depot
Chuck Hendrickson, EPA Region 6
Cheryl Overstreet, EPA Region 6

File: FW, 99
Track: FW, 2/25/99, FW/Baines, HRMB/KSO

Comments Regarding Ft. Wingate's Toxicity Table for Ecological Risk Assessment

1 . The table contains toxicity studies for mammals and birds, but no values for any invertebrates. Toxicity studies are not available for many compounds for invertebrates, but studies of toxicity of metals, some chlorinated organic compounds, and nitrobenzene in soil to earthworms are available.

2. Based on the description in the narrative accompanying the table, the column for "TBV-low" is equivalent to a chronic NOAEL, the endpoint normally derived for use in developing a screening level. There is no explanation in the text, but I assume the "TBV-high" values were derived for use in risk management decisions at sites which fail the ecological screen based on the "TBV-low" values. Any sites which the facility proposed to screen using the "TBV-high" values would need to include in the risk assessment protocol document a justification for how this is protective of the environment at those sites.

3. The use of Study Endpoint Uncertainty Factors (SEUF) as described in the text accompanying the table differs from the use of these factors as described in the 1997 EPA Guidance for Ecological Risk Assessments at Superfund sites and the book *Performing Ecological Risk Assessments* (1993, authors Calabrese and Baldwin, Lewis publishers, Chelsea, Michigan). The EPA approach described in the Superfund guidance was derived based on literature reviews comparing the spread between NOAELs and LOALs for a number of compounds. In particular, the use of a SEUF of 3 for nonlethal effects (including organ lesions and reproductive effects) instead of 10 for conversion from LOAEL to NOAEL results in some of the proposed TBVs being 10 or even 100 times larger than toxicity benchmarks derived using EPA's standard approach, which does not use different uncertainty factors for lethal and nonlethal effects. In particular, use of the lower nonlethal uncertainty factor for studies examining effects on reproduction may not be protective of a species. The facility risk assessor should include a description of how these factors were derived and a rationale for how they are protective of the environment. The Study Duration Uncertainty Factors also differ from those recommended in the guidance cited above because an uncertainty factor of 10 is commonly used to extrapolate from subchronic to chronic, versus the 5 cited in the document submitted by Ft. Wingate. Also, the distinction between subchronic versus chronic occurs at 30 days in the Ft. Wingate proposal, instead of the 90 day time span usually used for mammals and birds.

4. The use of toxicity values for benzo(a)pyrene as surrogates for other PAHs due to the lack of toxicity data appears to be justified, except for dibenzo(a,h)anthracene. There is a toxicity study for this compound, and it would yield a much lower TBV than the benzo(a)pyrene value.

5. There are references on pages 4 and 5 of the explanatory text to "significant adverse effects" but there are no clear criteria for which endpoints rank as significant effects. Some of the effects given a low SEUF (for example, a 5 or a 3) appear to me to be significant to the endpoints. For example, in the table entry for silver in birds, 29% mortality in the study is assigned a SEUF of 1; this is an effect that would substantially affect the population and a factor of 10 would be more appropriate. The same would seem to be true for thallium in rats, where a

dose causing postimplantation fetal loss was given a SEUF of 3 instead of 10.

6. The example of the LOAEL derivation given on the bottom of page 4 is incorrect; the calculation given actually produces an LC_{50} , which is not equivalent to a LOAEL. Similarly, the definition of NOAEL on page 3 as the *lowest* dose at which no effect was seen is not accurate; NOAEL is the highest dose at which no effect is seen.

7. The table includes a toxicity value for lead in birds, but none for lead in mammals. There is at least one study of mice that could be used. The table also contains no values for explosives compounds and birds, there is at least one study on redwing blackbirds available.

8. The TBV proposed for PCB-1254 is 3000 times a literature value for the same compound using a different study. The facility risk assessor should compare the studies and justify the choice of study for developing a TBV.

9. I have no value for cobalt toxicity in birds, but there are two studies in mammals that derive NOAELs closer to 0.5 mg/kg bw/d. The facility should justify the use of the chosen study over the other two studies.

10. The TBV for endrin in the short-tailed shrew is 20 times the NOAEL value for mice in the 1996 Toxicological Benchmarks for Wildlife issued through Oak Ridge National Labs (ORNL). The discrepancy may arise because the study cited in the table is extrapolated from an LC_{50}, whereas the study cited in the ORNL document is a chronic study on mice which generated a LOAEL. I suggest examining the 1969 Good and Ware study referenced in the ORNL document.

Recommendations:

1. In the full risk assessment protocol include factors for toxicity to invertebrates or include how this toxicity will be qualitatively addressed.
2. If the TBV-high values included with the table are going to be used for evaluating any of the sites, the facility should demonstrate that these values are protective of the environment.
3. My primary concern with the derived TBVs is not the choice of studies, but the application of the Study Endpoint and Study Duration Uncertainty Factors. If the facility does not wish to use the standard EPA extrapolation factors, then the source of the chosen factors should be included, along with a rationale for the criteria for their use and a demonstration of how these values are protective of the environment.
4. The additional toxicity information requested in comments 4,7, 8, 9 and 10 should be included in the revised table.