6/25 cc: Paul

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

August 18, 1998

Mr. Pedro F. Hernandez, P.E.
Manager, Environmental Engineering
Dade County Aviation Department
Post Office Box 592075
Miami, Florida 33159-2075

RE: Draft RBCA Report and Protocol, Petroleum Sites
Chapters 6 and 7
Miami International Airport (MIA), Miami FLD980709075

Dear Mr. Hernandez:

The Department has reviewed Chapters 6 and 7 of the draft Risk-Based Corrective Action Report and Protocol for the Miami International Airport. Please provide a response to the review comments from Ligia Mora-Applegate with the Technical Review Section of the Bureau of Waste Cleanup and Christine Halmes and Stephen Roberts with the University of Florida Center for Environment & Human Toxicology.

If you have any questions please contact me at (850) 487-3299 or the letter head address Mail Station 4575.

Sincerely,

Mike W. Sole, Chief
Bureau of Petroleum Storage Systems

MWS/jw
Attachments
cc: Wilbur Mayorga, DERM
Vivek Kamath, Southeast District
Ligia Mora-Applegate, BWC/TRS

Florida Department of

Memorandum **Environmental Protection**

TO: Michael Sole, Chief, BPSS

THROUGH: Jim Crane, Technical Review Section, BWC JJC

FROM: Ligia Mora-Applegate, Technical Review Section, BWC

DATE: August 5, 1998

SUBJECT: **RBCA Report and Protocol**
Chapters 6 and 7
Petroleum Sites
Miami International Airport (MIA)
Miami, Dade County, Florida

I have reviewed the subject document and the comments provided by Drs. Stephen Roberts and Christine Halmes (UF toxicologists on contract to FDEP). I concur with their comments especially the ones regarding Fraction from the Contaminated Source (FC) and recommend that they be addressed in their entirety. In addition, I would like to add the following:

Regarding the construction worker scenario and due to the difficulty in justifying very short term exposure durations and exposure frequencies when calculating SCTLs based on carcinogenicity, the Department has opted to rely on institutional/engineering controls for those areas where the health risk from exposure to contaminated soil is only from short term exposures. For this situation, the deed restriction will also need to stipulate that if subterranean construction activities are ever implemented on the site, construction workers will be notified that contamination exists and that they need to use appropriate protective clothing/equipment based on OSHA requirements.

Attachment

cc: Tim Bahr
John Wright
lm-a

UNIVERSITY OF
FLORIDA

Center for Environmental & Human Toxicology

P.O. Box 110885
Gainesville, Florida 32611-0885
Tel.: (352) 392-4700, ext. 5500
Fax: (352) 392-4707

July 28, 1998

AUG 01 1998

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

Dear Ms. Mora-Applegate:

At your request, we have reviewed the partial draft *Risk-Based Corrective Action Report and Protocol for the Miami International Airport*, prepared by the Miami Dade Aviation Department (MDAD) and dated May 27, 1998. This document is a draft for Chapters 6 and 7. Based on our review, we have the following comments:

Chapter 6, Human Health Exposure Pathway and Receptor Analysis for Petroleum Sites

Chapter 6 describes site-specific exposure scenarios used to derive Tier 3 (site-specific) cleanup levels at Miami International Airport (MIA). Cleanup levels were developed for on-site construction workers, fire-well and landscape maintenance workers, general and indoor airport workers, and trespassers.

One aspect of the construction worker scenario presented by MDAD is that of a construction supervisor. It is unclear why a construction supervisor scenario was developed, since the supervisor is assumed to have less contact with contaminated media than the construction workers themselves.

The 4-month construction worker is assumed to ingest 195 mg soil/day, and the 2- and 6-year construction workers are assumed to ingest 240 mg soil/day. The rationale for these soil ingestion rates is not stated. USEPA guidance suggests a value of 480 mg/day for construction workers (Supplemental Guidance to RAGS, Standard Default Exposure Factors, OSWER Directive 9285.6-03, 1991).

As we have expressed to the Department previously, we are concerned that soil target concentrations for carcinogens calculated using standard procedures, but based on very short or intermittent exposures, may be invalid. The issue is relevant here for the construction worker scenarios. The 6-year construction worker scenario proposed for MIA has sufficient exposure frequency and duration that this is probably not a problem, but it is less clear that soil calculations based on carcinogenicity for the 4-month or 2-year construction worker scenarios are appropriate. One solution may be to insure that soil calculations based on non-cancer health effects are always performed along with those based on carcinogenicity, and the lower of the two soil concentrations used as the target level. Alternatively, FDEP could rely instead on alternative means (e.g., OSHA compliance) to protect workers for short duration exposures, such as construction workers with limited site contact.

Some of the exposure assumptions for other scenarios are very limited, and the rationale for these assumptions is not always clear. For example, the fire-well maintenance worker is assumed to be exposed to groundwater for 10 days per year for 25 years and that, of the 10 days exposure, he/she will be exposed to contaminated groundwater 50% of the time. In effect, exposure to contaminated well water would occur 5 days per year. This implies that half of the fire wells are located in groundwater that is not impacted by contamination. Do current and future contaminant distributions at the site support this assumption? This worker is also assumed to be exposed to contaminated soil until airport construction is completed, and that there is a 10% contribution from contaminated surface soil. It is unclear what contaminant distribution the 10% contribution is based upon. Does this mean that 10% of the fire-wells are located in areas with surface soil contamination and 90% are in non-contaminated areas? Some additional clarification or explanation of the rationale for selection of these values would be helpful. When only a fraction of the contact area is assumed to be contaminated, this has important implications in how the exposure point concentration (EPC) is derived and used. This needs to be explained.

For the landscape/maintenance worker, contribution from impacted soil is assumed to be 50%. The explanation provided for this is that the worker will spend 50% of his/her time in landscaped areas and 50% in activities with no direct contact with surface soil. The soil ingestion rate selected for this scenario, 100 mg/day, is not particularly large for someone with frequent direct contact with the soil. It could be argued that 100 mg/day is appropriate for a landscape/maintenance worker with only 50% of activities involving direct soil contact, but the further incorporation of an FC of 0.5 in effect accounts for this twice. We would recommend either using a soil ingestion rate of 100 mg/kg with an FC of 1, or an FC of 0.5 coupled with a higher soil ingestion rate (e.g., 200 mg/day) appropriate for activities with rather extensive soil contact.

A similar situation exists with the general airport worker. A soil ingestion value of 50 mg/kg is selected, which is appropriate for individuals without substantial outdoor soil exposure (rates for indoor exposure range from 56 to 100 mg/day; Exposure Factors Handbook, 1997). It is proposed to couple this soil ingestion rate with an FC of 0.1, because the workers have little outdoor exposure to soil. Again, it appears that the same

issue is accounted for in two separate terms. The limited outdoor soil exposure should be addressed through the soil ingestion rate [preferably] or adjusting the FC value, but not both.

The trespasser (i.e., a child age 6-15) is assumed to visit the site weekly, with 50% contributions from contaminated surface soil, surface water, and sediment. Although we agree that the assumption of a weekly site visit is conservative, the basis for the assumption of a 50% contribution from contaminated areas is not stated. Is this assumption based on the location of contaminants at the airport in relation to areas most likely to be visited by a trespasser? In order to show that the 50% value is reasonable and justified, some additional explanation of its rationale would be helpful.

The surface area of the trespasser available for contact is assumed to be 2,000 cm^2. This seems a bit small given the temperatures in the Miami area and the clothing likely to be worn by an older child. An approximate average surface area for children age 6-15 assuming the hands, half of the arms, and half of the legs (i.e., short-sleeve shirt and shorts) available for contact is 3,286 cm^2 (Exposure Factors Handbook, 1997).

It is stated on page 6-8 that if "construction activities are or will occur in a particular area of the Airport, the surface soil target level will apply for the total soil column. If construction is not occurring, direct exposure to soils greater than 2 feet deep will not be applicable." This statement implies that consideration of construction in the future does not extend beyond the current project. How are areas chosen for which a future construction scenario does not apply? How would construction in these areas be prevented (e.g., through institutional controls)?

Appendix I describes equations used to calculate cleanup target levels for soil and groundwater. The source from which Equations 6-2 and 6-11 (calculation of the groundwater volatilization factor and calculation of the surface water volatilization factor, respectively) were obtained or adapted should be referenced. Equations 6-4 and 6-5 describe calculation of the particulate emission factor and soil-to-air volatilization factor, respectively. The Q/C value used in both of these equations is 85.61 g/m^2-s per kg/m^3, which is presented in the USEPA SSG Technical Background Document (EPA/540/R-95/128) as representative of a 0.5 acre site in Miami. Are contaminated areas in fact limited to 0.5 acres or less? If larger areas exist, a Q/C value appropriate for that size should be selected. Equation 6-9, calculation of the volatilization factor for transport from subsurface soil to indoor air, uses defaults recommended by ASTM. A default value of 1.7 g/cm^3 is used for ρ_s (dry soil bulk density). For consistency, the same default used in the equation to calculate the soil-to-air volatilization factor (Equation 6-5) should be used, i.e., 1.5 g/cm^3.

Chapter 7, Ecological Evaluation for Petroleum Sites

In general, the guidelines for ecological assessment follow USEPA guidance with respect to selecting ecological receptor groups. There are two species of protected birds

that utilize surface water at MIA as feeding areas, the least tern and the tri-colored heron. Due to lack of specific information in the literature about these species, the belted kingfisher was chosen as a surrogate species representative of the least tern, and the great blue heron was chosen as a surrogate species representative of the tri-colored heron. Table 7-3 describes exposure factors for the surrogate ecological receptors, the belted kingfisher and the great blue heron. As a minor point, the references for the table (USEPA 1993 a,b) are not listed with the other references on page 7-12. The reference is assumed to be the USEPA Wildlife Exposure Factors Handbook. There is no reference for the equation given in Figure 7-2 to calculate the daily exposure dose of ecological receptors.

We hope these comments are helpful. Should you have any further questions, please do not hesitate to contact us.

Sincerely,

Christine Halmes

N. Christine Halmes, Ph.D.

Stephen M. Roberts, Ph.D.