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LETTER REGARDING U S NAVY TECHNICAL APPROACH FOR A FOCUSED RISK  
ASSESSMENT FOR MCCOY ANNEX GOLF COURSE WITH ATTACHMENT NTC ORLANDO  
FL  
3/6/1998  
BROWN & ROOT ENVIRONMENTAL



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98-E131

March 6, 1998

Dr. Stephen Roberts  
Center for Environmental and Human Technology  
Midway Road, Bldg 471  
Gainesville, Florida

Reference: CLEAN Contract No. N62467-94-D-0888  
Contract Task Order No. 0024

Subject: Focused Risk Assessment for the McCoy Annex Golf Course

Dear Dr. Roberts:

I have enclosed an outline for the technical approach to a focused Risk Assessment (RA) for the McCoy Annex golf course at the Naval Training Center in Orlando, Florida. The golf course overlies a military landfill which is currently undergoing an RI/FS investigation. Prior to completing the RI/FS and implementing any necessary remedial action, the Navy desires to lease the property to the City of Orlando and has requested that the focused RA be performed. The schedule is fairly tight with the results to be presented to the Orlando Partnering Team on April 22-23.

The outline is brief but hopefully there is sufficient information for you to review and comment on the general approach. A similar letter has been sent to Dr. Ted Simon of the U.S. EPA for his review. We have arranged for a teleconference with Dr. Simon on Tuesday, March 10, at 1:00 PM to discuss the RA and address questions. I hope that you will have had an opportunity to review the outline and can join the teleconference. Matt Shoemith, who prepared the outline, or I will contact you on Monday to see if you can join the conference or set another time to receive your comments. If you have questions regarding this matter, please contact Matt or me at (423) 483-9900.

Sincerely,

Steven B. McCoy  
Task Order Manager

Enclosure

SBM/smc

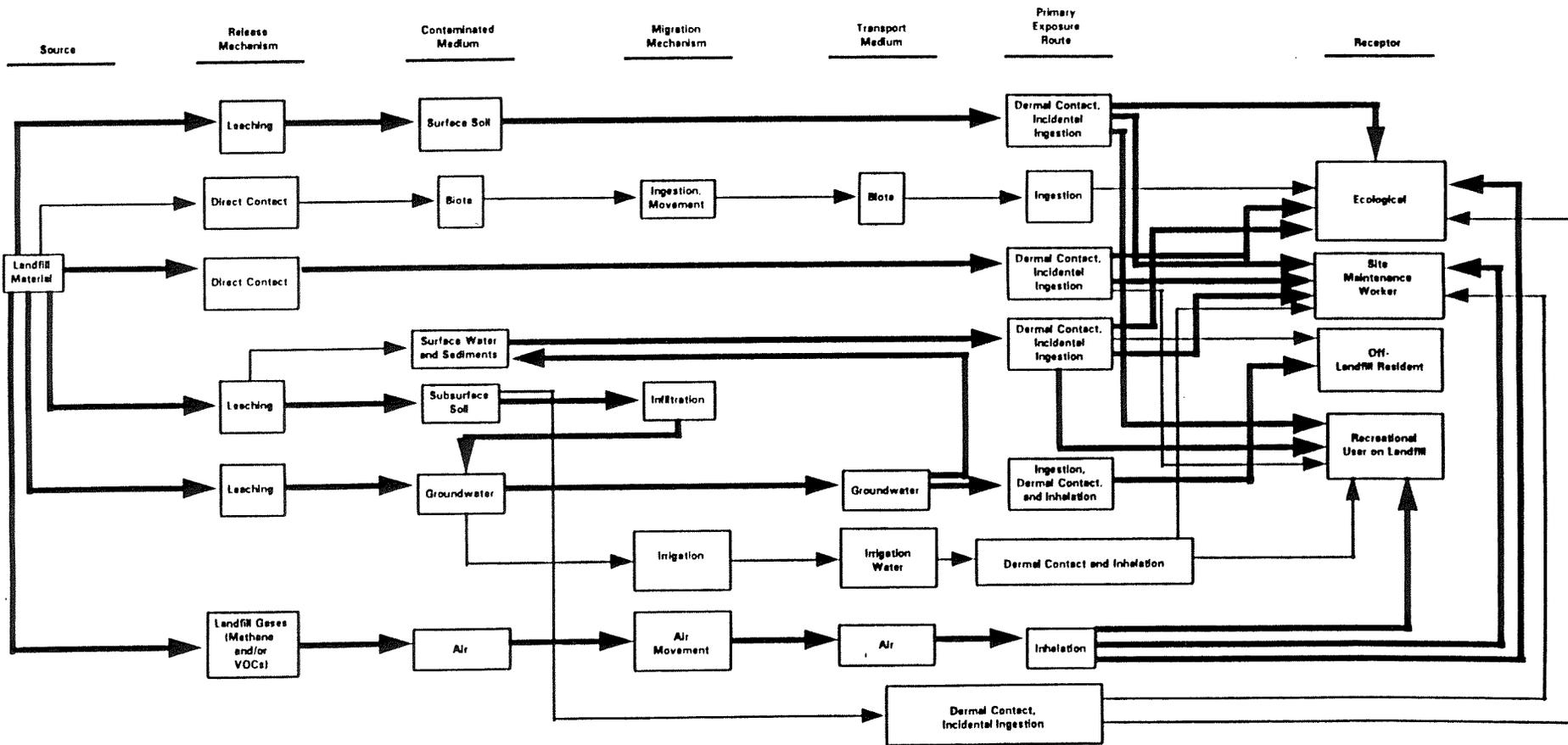
cc: Barbara Nwokike, SOUTHDIV  
Bob Cohose, Bechtel  
Wayne Hanzel, SOUTHDIV  
John Kaiser, ABB-ES  
John Mitchell, FDEP  
Nancy Rodriguez, USEPA  
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**OPERABLE UNIT 2  
MCCOY ANNEX LANDFILL  
Golf Course Risk Assessment Outline**

1. Develop contaminants of potential concern (COPCs) for the golf course
  - a. Limit data set to samples taken on or adjacent to golf course.
  - b. Determine distribution of Dataset (i.e., normal versus log normal)
  - c. Determine representative concentrations using the lesser of the maximum and the 95% UCL.
  - d. Screen out inorganic analytes that have representative concentrations less than twice the arithmetic mean of the background values as presented by ABB-ES in the Background sampling report (1995).
  - e. Screen out analytes that were detected in less than 5% of the samples that were analyzed for the analyte.
  - f. Screen out analytes that have representative concentrations less than the Florida Residential SCGs and USEPA Region IV Residential PRGs (for a HQ of 0.1 and ELCR of  $1 \times 10^{-6}$ ).
2. Prepare Exposure Assessment
  - a. The Site Maintenance Worker and Recreational User on Landfill as defined in the RI/FS Workplan (Figure 2.4) will be the only receptors. No future scenarios or groundwater exposure pathways will be addressed.
  - b. Reasonable maximum exposure parameters recreational receptor and the site maintenance worker are shown in the following Tables A-1 and A-2, respectively.
3. Prepare Toxicity Assessment

Dose response tables including all COPCs will be generated using IRIS and HEAST data when available.
4. Risk Characterization
  - a. Quantify ELCR and HI to each receptor from each exposure route
  - b. Compare ELCR and HI to levels of significant risk (HI of 1.0 and ELCR of  $1 \times 10^{-6}$ ) to determine if any significant human health risk exists from using golf course.
5. Remedial Goal Options (RGOs)

RGOs for all COPCs will be calculated for any receptor which has an HI >1 or an ELCR >  $1 \times 10^{-6}$ .
6. Conclusions Recommendations
  - a. If all receptors risk values are below significant levels it will be recommended that the golf course is suitable to be leased to the city.
  - b. If any receptors are found to have significant risk RGOs can be used to identify areas that may require remediation.



**Legend**

———— Probable Condition

———— Potential Deviation

**Assumption:** Landfill soil cover is existing. No utilities exist that are in contact with landfill waste. This model represents current and future uses.

**FIGURE 2.4**  
**CONCEPTUAL SITE MODEL,**  
**McCOY ANNEX LANDFILL,**  
**OPERABLE UNIT 2**



**R1/FS WORK PLAN, OPERABLE**  
**UNIT 2, McCOY ANNEX LANDFILL**  
**NAVAL TRAINING CENTER**  
**ORLANDO, FLORIDA**

TABLE A-1

EXPOSURE PARAMETERS FOR RECREATIONAL USER (ADULT AND ADOLESCENT)  
OU2 MCCOY ANNEX LANDFILL NAVAL TRAINING CENTER ORLANDO, FLORIDA

$\text{INTAKE}_{\text{ing}} = \frac{\text{CS} \times \text{IR}_{\text{soil}} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days / year}}$ $\text{INTAKE}_{\text{dermal}} = \frac{\text{CS} \times \text{AF} \times \text{ABS}_d \times \text{CF} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days / year}}$ $\text{INTAKE}_{\text{inh}} = \frac{\text{CA} \times \text{IR}_{\text{air}} \times \text{ET} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days / year}}$ $\text{CA} = \text{CS} \times \frac{1}{\text{PEF}}$					
Parameter	Symbol	Adolescent (Age 6-16)	Adult	Units	Source
Concentration in Soil	CS			Chemical-specific	
Particulate Emission Factor	PEF	1.24X10 <sup>9</sup>	1.24X10 <sup>9</sup>	m <sup>3</sup> /kg	Florida default
Soil Ingestion Rate	IR <sub>soil</sub>	100	100	mg/day	Assumption
Fraction Ingested	FI	62.5%	62.5%	unitless	Assumption based on 5 hr ET
Conversion Factor	CF	1X10 <sup>-6</sup>	1X10 <sup>-6</sup>	kg/mg	
Exposure Frequency	EF	45	45	days/year	Assumption
Exposure Duration	ED	10	10	years	Assumption
Exposure Time <sub>1</sub>	ET	5	5	hours/day	Assumption
Averaging Time	AT				
Cancer		70	70	years	[2]
Non-cancer		10	20	years	Assumption
Surface Area	SA		5750	cm <sup>2</sup>	[3]
Age-weighted Surface Area	SA <sub>soil/adj</sub>	1136		cm <sup>2</sup> -year/kg	[3]
Inhalation Rate	IR <sub>air</sub>	0.833	0.833	m <sup>3</sup> /hr	[2]
Body Weight	BW	40	70	kg	[2,5]
Adherence Factor	AF	1	1	mg/cm <sup>2</sup> -event	[3]
Absorption Fraction	ABS <sub>d</sub>			unitless	[4]
Concentration in Air	CA			mg/m <sup>3</sup>	
References:					
[1] Exposure Time is used only in the Inhalation of Particulate Scenario.					
[2] USEPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Parameters".					
[3] USEPA, 1992d. Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; January, 1992					
[4] USPEA Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment (Interim Guidance). Waste Management Division, Office of Health Assessment, 1995.					
[5] USEPA, Exposure Factors Handbook; epa/600/8-89/043; July 1989					

TABLE A-2

EXPOSURE PARAMETERS FOR SITE MAINTANANCE WORKER  
OU2 MCCOY ANNEX LANDFILL NAVAL TRAINING CENTER ORLANDO, FLORIDA

$\text{INTAKE}_{\text{ing}} = \frac{\text{CS} \times \text{IR}_{\text{soil}} \times \text{FI} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days / year}}$ $\text{INTAKE}_{\text{dermal}} = \frac{\text{CS} \times \text{AF} \times \text{ABS}_d \times \text{CF} \times \text{SA} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days / year}}$ $\text{INTAKE}_{\text{inh}} = \frac{\text{CA} \times \text{IR}_{\text{air}} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT} \times 365 \text{ days / year}}$ $\text{CA} = \text{CS} \times \frac{1}{\text{PEF}}$				
Parameter	Symbol	Value)	Units	Source
Concentration in Soil	CS	Chemical-specific		
Particulate Emission Factor	PEF	1.24X10 <sup>9</sup>	m <sup>3</sup> /kg	Florida default
Soil Ingestion Rate	IR <sub>soil</sub>	50	mg/day	[1]
Fraction Ingested	FI	100%	unitless	Assumption
Conversion Factor	CF	1X10 <sup>-6</sup>	kg/mg	
Exposure Frequency	EF	250	days/year	[1]
Exposure Duration	ED	25	years	[1]
Averaging Time	AT			
Cancer		70	years	[1]
Non-cancer		25	years	[1]
Surface Area	SA	3160	cm <sup>2</sup>	[2]
Inhalation Rate	IR <sub>air</sub>	20	m <sup>3</sup> /day	[1]
Body Weight	BW	70	kg	[1]
Adherence Factor	AF	1	mg/cm <sup>2</sup> -event	[2]
Absorption Fraction	ABS <sub>d</sub>	Chemical-specific	unitless	[3]
Concentration in Air	CA	Chemical-specific	mg/m <sup>3</sup>	
References:				
[1] USEPA Risk Assessment Guidance for Superfund (RAGS), Volume 1, Part B, 1991				
[2] USEPA, Dermal Exposure Assessment: Principles and Applications; EPA/600/8-91/011B; January, 1992.				
[3] USPEA Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment (Interim Guidance). Waste Management Division, Office of Health Assessment, 1995.				