Cook Composites and Polymers

Headquarters
P.O. Box 419389
Kansas City, MO 64141-6389
(816) 391-6000
FAX (816) 391-6215

August 24, 1994

Timothy Mulholland, Ph.D.
Wisconsin Department of Natural Resources
Division of Solid and Hazardous Waste
101 South Webster Street
Madison, WI 53707

RE: CONCEPTUAL DESIGN FOR SVE SYSTEM AT FORMER HAZARDOUS WASTE INCINERATOR, COOK COMPOSITES AND POLYMERS CO. - SAUKVILLE, WISCONSIN

Dear Tim:

This letter is to provide you with an update on the status and approach for remedial action under the Wisconsin hazardous waste regulations (NR 600) at the former hazardous waste incinerator at the Saukville facility. A brief history of the project, followed by Cook Composites and Polymers Co.'s (CCP's) preferred conceptual approach, is presented in the paragraphs that follow:

CCP operates a resin manufacturing facility in an area of mixed industrial/residential land use in Saukville, Wisconsin. Historical releases of compounds used in the resin manufacturing process, primarily aromatic hydrocarbons, have affected soil and groundwater at the site. CCP (formerly Freeman Chemical) has been performing interim corrective measures with regard to volatile organic compound (VOC) releases to the subsurface at the Saukville facility since the mid-1980's.

The geologic setting at the site has strongly influenced remedial progress. The CCP facility is underlain by a till layer that varies between 15 and more than 200 feet thick. The till is generally 15 to 30 feet thick, based on the on-site boring logs. The till contains considerable fine-grained material, and generally has low to moderate permeability. The till is underlain by a fractured dolomite aquifer that extends to a depth of greater than 500 feet below grade. The water table at the northern end of the site occurs in the till, and varies between 3 and more than 10 feet below grade over the period of record (1988 to present).

The remedial activities to date have focused mainly on the prevention of infiltration of rainwater at the site and the establishment of hydraulic control of affected groundwater in the shallow and deep groundwater flow systems. The shallow flow system occurs primarily in the till, and the deep flow system occurs primarily in the dolomite aquifer.

Remedial Action Objective

In suspected source areas at the site, such as at the former hazardous waste incinerator, residual aromatic hydrocarbons are thought to remain in the vadose zone, below the ground surface but above the water table. Thus, the current remedial action objective is to remove aromatic hydrocarbons from the vadose zone, and prevent further migration to the groundwater flow system.

Design Concepts

SVE wells were installed in the area of the former hazardous waste incinerator in the spring of 1993 to assess the feasibility of SVE as a remedial technology to remove residual aromatic hydrocarbons from the vadose zone. The pilot-scale test demonstrated the feasibility of SVE for the site, but excessive

water entered the system during the test (RMT, September 1993). As a result, CCP is proposing the installation of a hybrid soil vapor extraction/groundwater extraction system near the former hazardous waste incinerator. This system should allow remediation of the shallow soil and groundwater to continue, despite variations in groundwater elevations. During periods of high water, the SVE system may still be operated, because the water table in the immediate vicinity of the SVE wells will be depressed by groundwater pumping. During periods of low groundwater, the SVE system will be able to extract VOCs from a greater thickness of affected soil.

Specific features of the proposed system include the following:

- **Well Construction** - A typical SVE well is 4 inches in diameter. To accommodate the well pump and instrumentation, two 6-inch-diameter wells (VE-3 and VE-4) will be installed in locations near the former hazardous waste incinerator. The wells will be installed using the drive and wash drilling technique to minimize smearing of the borehole. The depth of the new wells will be approximately 20 feet, and the wells will be screened from 2 feet below grade to the depth. Figure 1 presents a conceptual cross section for the new extraction wells.

- **Pumping Rate** - Based on the soil types encountered and the aquifer properties, a pumping rate of 1 to 2 gallons per minute (gpm) per extraction well should provide a sufficient extraction rate to depress the water table in the vicinity of the new extraction wells.

- **SVE System Mechanics** - The two new extraction wells will be hard-piped through a separator tank to an explosion-proof regenerative blower. In addition, wells VE-1 and VE-2 will be piped into the system with a bleeder valve to prevent groundwater from being pulled into the SVE system. The extraction blower will be sized to provide an airflow on the order of 100 cfm per each new extraction well. This equipment and other ancillary controls will be housed in a small structure located adjacent to the former hazardous waste incinerator.

- **Expected Off-Gas Quality/Management** - Emissions from the proposed SVE system will be vented to the atmosphere. Table 1 presents a summary of off-gas measurements made during the September 1993 pilot test conducted by RMT. If we assume that the SVE system will be sized to provide approximately 100 cfm of airflow per extraction well, it can be estimated that emissions from the SVE system will be at the following levels:

VOCs:	0.93 pound per hour (22.41 pounds per 24-hour day)
Benzene:	0.0029 pound per hour (25.23 pounds per year)
Ethylbenzene:	0.16 pound per hour
Toluene:	0.12 pound per hour
Total xylenes:	0.63 pound per hour

  At these levels, emissions from the proposed SVE system should be significantly below respective *de minimus* levels found in §NR 445, Wisconsin Administrative Code. The estimated total organic compound emissions are also below the 5.7-pound-per-hour emission rate requiring a permit application under §NR 406. However, CCP will be required to file a remediation application form for the SVE system under §NR 419.07.

Based on the experience of CCP's consultant (RMT) at similar sites, the level of emissions from a full-scale SVE system drops off significantly after the first several weeks of operation. Therefore, CCP is proposing to monitor total VOC emissions during this period to demonstrate that the SVE system is operating below allowable operating limits specified in §NR 419. No add-on control technology is being proposed for this system.

- **Expected Water Quality/Management** - The proposed SVE system will involve the installation of pumps in the vapor extraction wells to maintain a water level at the bottom of the current screened interval, even under vacuum conditions. This would require treatment and disposal of the water due to the likely presence of dissolved BTEX compounds. CCP is proposing to manage this water, along with the shallow groundwater currently being pumped at the facility, by discharging the collected water to the Saukville water treatment plant.

CCP trusts that this summary will provide a useful update. CCP has tentatively scheduled the installation of the new SVE wells for the week of September 19, and will install the new wells at that time unless you direct CCP to do otherwise. Upon your approval of these concepts, final design and construction of the full-scale SVE system can proceed. Please call me at (816) 391-6025 if you have questions.

Sincerely,
Cook Composites and Polymers Co.

Craig R. Bostwick

Craig R. Bostwick, Manager
Safety & Environment

Enclosure

cc: Daniel Grasset - CCP
Eric Naimark - CCP
Gene L. McLinn - RMT
James S. Rickun - RMT
Leo H. Tramm - RMT

Table 1

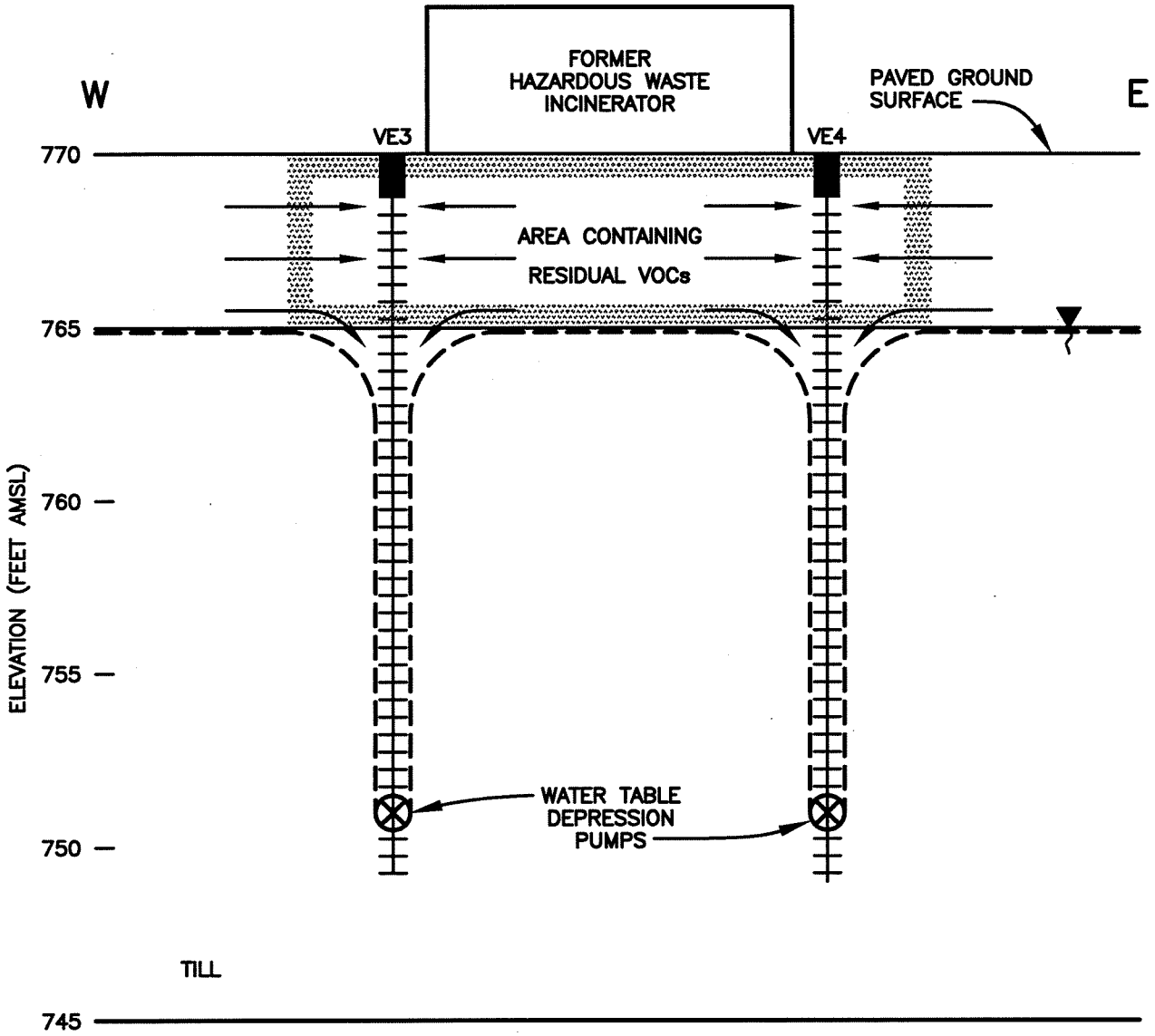
SUMMARY OF OFF-GAS MEASUREMENTS DURING SEPTEMBER 1993 PILOT TEST

Time	Exhaust Analysis (pounds/cubic foot)				Airflow (cfm)	Benzene Emission Rate (LBH)	Total VOC Emission Rate (LBH)
	Benzene	Ethylbenzene	Toluene	Total Xylenes			
VE-1							
09:30	-	-	-	-	45	-	-
10:00	-	7.9E-06	6.1E-06	3.7E-05	44	-	1.4E-01
10:30	-	9.6E-06	8.3E-06	4.1E-05	45	-	1.6E-01
11:00	-	9.2E-06	7.7E-06	4.0E-05	47	-	1.6E-01
11:30	-	7.3E-06	5.1E-06	3.4E-05	44	-	1.2E-01
12:00	-	5.9E-06	4.6E-06	2.8E-05	40	-	9.3E-02
12:15	-	-	-	-	40	-	-
12:25	-	7.3E-06	5.4E-06	3.3E-05	40	-	1.1E-01
Avg:	-	7.9E-06	6.2E-06	3.6E-05	43	-	1.3E-01
VE-2							
12:30	-	-	-	-	34	-	-
01:00	2.0E-07	1.6E-05	1.2E-05	6.2E-05	32	3.9E-04	1.8E-01
01:30	2.3E-07	1.8E-05	1.4E-05	6.9E-05	33	4.5E-04	2.0E-01
02:00	2.4E-07	1.9E-05	1.3E-05	7.0E-05	33	4.7E-04	2.0E-01
02:30	2.8E-07	2.2E-05	1.5E-05	7.7E-05	47	8.0E-04	3.2E-01
03:00	2.7E-07	2.1E-05	1.5e-05	7.8e-05	44	7.1E-04	3.0E-01
03:30	2.2E-07	1.8E-05	1.2E-05	6.4E-05	41	5.4E-04	2.3E-01
Avg:	2.4E-07	1.9E-05	1.4E-05	7.0E-05	38	5.6E-04	2.4E-01

NOTES:

cfm = Cubic feet per minute.
LBH = Pounds per hour.

$$DWG$$
$$PRF$$
$$SCALE$$



LEGEND

- CURRENT WATER TABLE
- WATER TABLE WHEN SVE IS OPERATING
- SOIL VAPOR FLOW LINE
- BENTONITE SEAL
- WELL SCREEN

NOTES

1. WATER TABLE NEAR FORMER HAZARDOUS WASTE INCINERATOR IS EXPECTED TO OSCILLATE BETWEEN 3 AND MORE THAN 10 FEET BELOW GRADE.
2. DEPTH TO BEDROCK AND AMOUNT OF WATER TABLE DEPRESSION ARE ESTIMATED.

CONCEPTUAL SVE DESIGN

COOK COMPOSITES AND POLYMERS COMPANY SAUKVILLE, WISCONSIN

RMT INC.

DWN. BY:	WJB
APPROVED BY:	
DATE:	AUGUST 1994
PROJ. #	1832.78
FILE #	18327801

FIGURE 1