



- The hazard ratings (health-flammability-reactivity) must be 2 or less.
  - The cost must be less than \$100/liter.
  - The solvent must be compatible with plutonium and glove boxes.
  - The melting point must be less than 20° C.
  - The solvent's viscosity must be less than 10 centipoise.
  - Omit suspected cancer causing agents.
  - Omit halogenated compounds other than perfluoro compounds.
  - Omit odoriferous compounds such as mercaptans, thiols, and disulfides.
  - Omit polymerizable compounds such as acrylates.
  - Omit silicon compounds.
2. Technical point of contact for CCl<sub>4</sub> replacement discussions: Steven Walter (to be coordinated through Gary Anderson at extension 5747).
  3. Information on the waste oil proposed as a possible remediation application is attached (4 pp.).
  4. Possible ER applications for RFP soils: There is no demonstrated ability of this technology to treat non-petroleum organics to cleanup standards in the range of 5 ppb; it was decided not to try to include such a test as part of the FY91 SITE demonstration program.

#### B. Tech Tran

1. Assess feasibility of utilizing Tech Tran's technology for a SITE demonstration at RFP:  
  
A working session between DOE-RFO, EG&G, CDH, EPA, and EPA's SITE contractor (PRC) was held February 15, 1991 to further develop plans for implementing such a demonstration.
2. Provide outline of actions required to make a SITE demonstration a reality:  
  
The February 15, 1991 work session was a step toward developing this action outline; key issues identified follow:
  - a. Negotiate with EPA and CDH how this program is to integrate with IAG-required treatability studies.
  - b. Determine security and escort requirements for this demonstration.
  - c. Determine impacts upon RFP Community Relations (CR) plans and how to coordinate with Rocky Flats Environmental Monitoring Council,

municipalities, and other interested parties. A work session on issues is scheduled for February 28, 1991.

- d. Establish required permitting and agency approvals (in addition to a., above).
  - e. Determine quantity and quality of readily available aqueous source with radionuclide contamination.
  - f. Assemble appropriate RFP Health and Safety, Quality Assurance, and other documents to guide EPA/SITE contractor.
  - g. Establish procedures for management of test-derived hazardous, radioactive, or mixed waste residuals (sludges, filters, piping, etc.) as well as equipment decontamination. A work session will be held (probably in March) to allow Tech Tran to present estimates of quality and quantity of residuals to RFP Waste Management and permitting staff, so that procedures can be identified. PRC staff proposes to have a draft workplan for review by DOE-RFO, EG&G, EPA/SITE, EPA Region VIII, and CDH no later than April 26, 1991.
3. Determine the most suitable site(s) for Tech Tran demonstration and provide required additional information:

We have provisionally selected the Interceptor Trench Pump House (ITPH) at the solar evaporation ponds, as this piping system is currently in operation and contains high concentrations of radionuclides (uranium). A high-plutonium source is not readily available. Required additional information will be provided in response to the more-precisely defined needs to be developed at work sessions following the February 15, 1991 meeting.

4. Point of contact for this SITE demonstration is Gary Anderson of Environmental Restoration's Remediation Programs Division. He will coordinate with Scott Grace of your staff in the definition and execution of this demonstration.

Robert M. Nelson, Jr.  
February 19, 1991  
91-RF-0763  
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For further information, please contact me or Gary Anderson of my staff at extension 5747.



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Environmental Restoration & Waste Management  
EG&G Rocky Flats, Inc.

GMA:plf

Orig. and 1 cc - R. M. Nelson, Jr.

Attachment:  
As Stated

## 6.11 FBI Oil

### 6.11.1 Generation Process

Various operations within RFP generate waste oil that is contaminated with both hazardous and radiological constituents. This oil has been accumulated and stored at Building 774 with the intent of treatment through incineration in the Fluidized Bed Incinerator (FBI). Hence, the reference to this material as the FBI Oil.

Over 28,000 gallons of waste oil has been accumulated. The primary storage is in two 10,000 gallon tanks. One of the tanks is completely full and locked, the other has some capacity left. The remaining inventory of FBI Oil is being stored in drums inside buildings or cargo containers at various plant locations. The oil is currently being generated at the rate of 4700 gal/yr.

### 6.11.2 Waste Characterization

The FBI Oil has been mixed as it has accumulated in the two 10,000 gallon tanks. The full, locked tank has been sampled twice, once as part of the Waste Stream Identification and Characterization Program in 1986, and again in 1988. The results of these analyses are given below. The variability in many of the analytical results indicates an inhomogeneous material. Oil is very likely stratified because of entrained solids and water. Additional sampling and analyses will be necessary to determine if stratification exists and, if so, its effect on subsequent treatments.

### 6.11.2.1 Volatiles

Nine compounds were detected in at least one of the samples as shown in the following table.

<u>Compounds</u>	<u>Concentration, ppb</u>	
	<u>9/86 Sample</u>	<u>4/88 Sample</u>
1,1-Dichloroethane		24
Chloroform	40	
1,1,1-Trichloroethane	8,000	1,374
Carbon Tetrachloride		200
Trichloroethane	30	
1,1,2-Trichloro-1,2,2,- Trifluoroethane*	7,900	154
1,1,2,2-Tetrachloroethane	10	
Toluene		1,044
Ethylbenzene		424

\* Freon TF

### 6.11.2.2 Semivolatiles

No semivolatiles were observed in either sample.

### 6.11.2.3 Metals

The metals found in the single sample analyzed, and the concentration of each, are as follows.

<u>Metal</u>	<u>Concn. ppm</u>	<u>Metal</u>	<u>Concn. ppm</u>
Aluminum	26	Manganese	3
Antimony	<2	Mercury	<1
Arsenic	<1	Molybdenum	Not detected
Barium	11	Nickel	4
Beryllium	6	Potassium	305
Cadmium	<1	Selenium	<1
Calcium	230	Silver	Not detected
Chromium	6	Sodium	692
Cobalt	1	Strontium	1
Copper	6	Titanium	<1

<u>Metal</u>	<u>Concn. ppm</u>	<u>Metal</u>	<u>Concn. ppm</u>
Iron	82	Vanadium	Not Detected
Lead	92	Zinc	70
Magnesium	57		

#### 6.11.2.4 Radiochemistry

Radiochemical analyses were performed on both samples, but not for all the same nuclides. The results of the analyses are as follows:

<u>Analysis</u>	<u>Concentration, pCi/L</u>	
	<u>9/86 Sample</u>	<u>4/88 Sample</u>
Gross Alpha	44,000 ± 2,000	55,000 ± 4,000
Gross Beta	16,000 ± 1,000	
Pu-239	220 ± 30	10,000 ± 1,000
U-233,234	29,000 ± 1,000	
U-238	21,000 ± 1,000	
Uranium (Total)		46,000 ± 7,000
Tritium	400 ± 220	

#### 6.11.2.5 RCRA Characteristics

Ignitability - The single test gave a flash point of 49.2°C. This qualifies the oil as ignitable.

Corrosivity - The oil has a pH of 5.9. It is therefore noncorrosive.

EP Toxic Metals - The single sample analyzed for EP Toxic metals indicated that only lead exceeded the limit at a measured concentration of 200 ppm.

#### 6.11.2.6 Other Characteristics

Several other characteristics were investigated for one of the samples with the following results:

<u>Test</u>	<u>Result</u>
Total Chloride	0.224 wt %
Specific Gravity at 25°C	0.8869
Heat Content	22,168.5 ± 1,872.8 BTU/lb
Viscosity at 100°F	210.4 ± 1.4 SUS

#### 6.11.2.7 Applicable EPA Hazardous Waste Numbers

FBI Oil is generated from a variety of processes. Because of this, the individual batches would be expected to have varying characteristics. Just how varied would have to be determined by additional sampling. But based on the data available, the following Hazardous Waste Numbers would be applicable.

RCRA Characteristics - The hazardous waste characteristics applicable to FBI Oil are D001 and D008.

The processes in which much of the oil is generated leads to the potential for general metal contamination. The available data show only lead exceeding RCRA characteristic limits, but the total metal analytical data suggest that other metals could exceed the limits on some batches of oil. Additional samples and analyses for EP Toxic metals would likely be required to insure that D008 is the only number that is applicable.

RCRA Listed Wastes - During cleaning/degreasing activities, the oils are contaminated with hazardous materials. This process knowledge is the primary reason this waste is considered hazardous. The applicable Hazardous Waste Numbers are F001, F002, F003 and F005.

Again, additional sampling of the accumulated oil will be required to better characterize the concentration of individual solvents present. However, it is unlikely that solvents requiring additional Hazardous Waste Numbers will be identified.