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CLOSURE PLAN INFORMATION AND DATA FOR THE NORTH AND SOUTH SOLVENT TANKS - REV 1 - JANUARY 1995

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CLOSURE PLAN INFORMATION AND DATA FOR THE NORTH AND SOUTH SOLVENT TANKS

Revision 1
January 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Cincinnati, Ohio 45030

CLOSURE PLAN INFORMATION AND DATA FOR THE NORTH AND SOUTH SOLVENT TANKS

~~Revision 0~~
~~December 1994~~
REVISION 1
JANUARY 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

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CLOSURE PLAN INFORMATION AND DATA 6482

for the

North and South Solvent Tanks

U.S. Department of Energy

Fernald Environmental Management Project

Fernald, Ohio

1.0 FACILITY DESCRIPTION

1.1 GENERAL DESCRIPTION

The Fernald Environmental Management Project (FEMP) is a U.S. Department of Energy (DOE) owned facility located in both Hamilton and Butler Counties, in Fernald, Ohio. A map of the FEMP is presented in Figure 1-1. The FEMP, formerly known as the Feed Materials Production Center (FMPC), was operated to produce uranium fuel elements, target cores, and other uranium compounds for use at other DOE facilities in support of the U.S. Defense program. The FEMP facility was in operation at this site from approximately 1950 until 1989.

This Closure Plan Information and Data (CPID) deals with the North and South Solvent Tanks Hazardous Waste Management Unit (HWMU) located in the southwest segment of the process area and off the southwest corner of Building 13A. The site began operation of the North and South Solvent Tanks in 1954 for storage of mixed extraction solvents. These solvents were stored in the tanks before processing through other systems for recovery or reuse of the usable solvent ingredients. The tanks were not used to store hazardous wastes. The tanks were active through July 1989 when production ceased, but continued to store the solvents until April 21, 1993. At that time the waste was removed from both tanks and transported off site for incineration (see §1.5.4. for details). After production ceased, the mixture of solvents (as described in §1.5.4.) were designated as hazardous wastes under the Resource Conservation and Recovery Act (RCRA). The tanks were identified as HWMU No. 52 based upon continued storage after production in excess of the 90-day storage limit for hazardous wastes (OAC 3745-51-04(C) and 40 CFR 261.4(c)).

The North and South Solvent Tanks were included in the list of HWMUs in the latest RCRA Part A and Part B Permit Applications submitted to the Ohio Environmental Protection Agency (OEPA). The North and South Solvent Tanks were also identified as a HWMU in the RCRA compliance schedule submitted pursuant to the 1988 Consent Decree between the State of Ohio and the DOE, as amended by the Stipulated Amendment to the Consent Decree (SACD) in January 1993. The RCRA compliance schedule requires that a CPID be submitted for all identified HWMUs.

Consistent with the terms of the July 1986 DOE/U.S. Environmental Protection Agency (USEPA) Federal Facilities Compliance Agreement, as amended by the September 1991 Consent Agreement, the FEMP has divided the scope of the Remedial Investigation/Feasibility Study (RI/FS) into 5 operable units. The North and South Solvent Tanks, for which this CPID has been submitted, is included within the scope of Operable Unit 3 (OU3), Former Production Area and Suspect Facilities.

Section XI of the Amended Consent Agreement requires that response actions at the FEMP be performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements consistent with all applicable or relevant and appropriate requirements (ARARs).

1.1.1 Purpose

This CPID for the North and South Solvent Tanks is submitted in accordance with the 1993 SACD and RCRA compliance schedule and demonstrates compliance with requirements for RCRA closure. It specifies the procedures that will be followed to accomplish clean closure of the North and South Solvent Tanks and constitutes only a partial closure of the FEMP facility. Applicable RCRA closure requirements, under Ohio Administrative Code (OAC) 3745-66 (40 Code of Federal Regulations [CFR] Part 265, Subpart G), require owners or operators of hazardous waste treatment, storage, or disposal (TSD) facilities to have written and approved closure plans for those units.

It is the FEMP's intent to ensure efficient integration of all RCRA closure activities with related CERCLA response actions. This CPID has been prepared to ensure that

CERCLA response actions meet the RCRA requirements while adhering to the terms of the Amended Consent Agreement. The procedures described in this CPID are consistent with the requirements for response actions under CERCLA, other ARARs, and the Amended Consent Agreement. Copies of this CPID and any later revisions will be kept at the facility until final RCRA closure has been completed and certified according to OAC 3745-66-10 to 3745-66-15, (40 CFR§§ 265.110 to 265.115).

0' 1/2' 1' 2' 3' 4' 5' 6'

N

S.R. 126

BUTLER CO.
HAMILTON CO.

SANITARY LANDFILL

PIT #5

PIT #6

ETF

PIT #3

PIT #4

PIT #2

PIT #1

CLEAR WELL

SURGE LAGOON

PADDY'S RUN RD.

C.&O. RR

PRODUCTION WELL #1
PRODUCTION WELL #2
PRODUCTION WELL #3

DECONTAMINATION PAD

COAL PILE

SEWAGE TREATMENT AREA

STORM WATER RETENTION BASIN

STORM WATER RETENTION BASIN EXPANSION

S.W.R.B. OUTFALL EPA NUMBER 002

ASH PILE

TRIBUTARIES FEEDING PADDY'S RUN

SOUTH ACCESS RD.

WILEY RD.

FEMP HAZARDOUS WASTE MANAGEMENT UNIT (HWMU) LOCATIONS	DIMENSIONS
(1) FIRE TRAINING FACILITY	84'-8" x 68', 105' x 134'
(2) ~~PARTS CLEANER IN WELDING SHOP (BLDG. 12)~~	DELETED FROM HWMU LIST
(3) WASTE OIL STORAGE IN GARAGE	10' x 10'
(4) DRUM STORAGE AREA NEAR LOADING DOCK (LAB BLDG.)	40' x 76'
(5) DRUM STORAGE AREA SOUTH OF W-26 (LAB BLDG.)	31'-8" x 41'
(6) DRUMMED HF RESIDUE & ASSOCIATED STORAGE AREAS INSIDE PLT. 4	4' x 17'
(7) DRUMMED HF RESIDUE & ASSOCIATED STORAGE AREAS NW OF PLT. 4	25' x 30'
(8) DRUMMED HF RESIDUE & ASSOCIATED STORAGE AREAS SOUTH OF COOLING TOWERS	10' x 32'
(9) NITRIC ACID RAIL CAR AND AREA	10' x 40' x 15'
(10) NAR SYSTEM COMPONENTS	13,262 SQ. FT.
(11) TANK FARM SUMP	165' X 135'
(12) WHEELABRATOR (BLDG. 66)	24' X 20'
(13) WHEELABRATOR DUST COLLECTOR (BLDG. 66)	30' X 17'
(14) BOX FURNACE	14' X 18'
(15) OXIDATION FURNACE #1	85 SQ. FT.
(16) PRIMARY CALCINER	13.5' DIA. x 40' HIGH
(17) PLANT 8 EAST DRUM STORAGE PAD	18,330 SQ. FT.
(18) PLANT 8 WEST DRUM STORAGE PAD	12,304 SQ. FT.
(19) CP STORAGE WAREHOUSE BLDG. 56 (BUTLER BLDG.) *	50' x 180'
(20) PLANT 1 PAD *	480,000 SQ. FT.
(21) HILCO OIL RECOVERY	272 SQ. FT.
(22) ABANDONED SUMP WEST OF PILOT PLANT	2' DIA. x 14' DEEP
(23) ~~WELL DRILLING STORAGE AREA~~	DELETED FROM HWMU LIST
(24) ~~EQUIPMENT STORAGE AREA~~	DELETED FROM HWMU LIST
(25) PLANT 1 STORAGE BLDG. (BLDG. 67)	165' x 190'
(26) DETREX STILL	32" x 76" x 7'-6"
(27) WASTE PIT NO. 4	170' x 320' x 400' x 320' (5)
(28) TRANE THERMAL LIQUID INCINERATOR	50' x 52'
(29) PLANT 8 WAREHOUSE (BLDG. 80) *	60' x 170'
(30) ~~BARIUM CHLORIDE SALT TREATMENT FACILITY~~	CLOSED
(31) TANK FOR BULK STORAGE OF SOLVENTS, T-5	10' DIA.
(32) TANK FOR BULK STORAGE OF SOLVENTS, T-6	10' DIA.
(33) PILOT PLANT WAREHOUSE STORAGE AREA (BLDG. 68) *	7' X 62'
(34) KC-2 WAREHOUSE (BLDG. 63) *	346'-2 3/8" x 82'
(35) PLANT 9 WAREHOUSE (BLDG. 81) *	80' x 100'
(36) STORAGE PAD NORTH OF PLANT 6	8' x 40'
(37) PLANT 6 WAREHOUSE (BLDG. 79) *	100' x 170'
(38) HF TANK CAR	10' x 36' x 15'
(39) ~~CLEARWELL~~	DELETED FROM HWMU LIST
(40) BIO-SURGE LAGOON	160,000 SQ. FT
(41) SLUDGE DRYING BEDS	79' X 92'
(42) WASTE PIT NO. 5	184,000 SQ.FT.
(43) ~~LIME SLUDGE PONDS~~	DELETED FROM HWMU LIST
(44) ~~COAL PILE RUNOFF BASIN~~	DELETED FROM HWMU LIST
(45) ~~UST #5~~	DELETED FROM HWMU LIST
(46) URANYL NITRATE TANKS (NFS STORAGE AREA)	61'-7" x 53'-9"
(47) URANYL NITRATE TANKS (NORTH OF PLANT 2)	63'-6" x 40'-6"
(48) URANYL NITRATE TANKS (SOUTHEAST OF PLANT 2)	54'-7" x 45'-4"
(49) URANYL NITRATE TANKS (DIGESTION AREA)	127' x 20'
(50) URANYL NITRATE TANKS (RAFFINATE BLDG.)	14' x 50', 15' x 30'
(51) EXPERIMENTAL TREATMENT FACILITY (ETF)	20' x 48'
(52) NORTH & SOUTH SOLVENT TANKS (PILOT PLANT)	6'-6" DIA.
(53) SAFE GEOMETRY DIGESTION SUMP	8" DIA. x 12" DEEP
(54) THORIUM NITRATE STORAGE TANK, T-2	10' DIA.

*-HWMU'S THE FEMP IS SEEKING TO PERMIT

NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.
4	REVISED PER RES #2498	8/10/94	S.J.S.	GEP	
3	REVISED PER RES #2283	10/1/93	S.J.S.	GEP	
2	ADDED HWMU NO.53	2/10/92	S.J.S.	GEP	
1	REVISED PER RES #1841	1/29/92	S.J.S.	GEP	

NOTE: FERMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE
FRACTIONS ± 1/32
ANGLES ± 0° - 30'
DECIMALS
.X ± 0.1
.XX ± 0.03
.XXX ± 0.005
.XXXX ± 0.0010
ORIG. RELEASE DATE 6-9

APPROVALS					
CIVIL & STR.			SAFETY ENG.		
ELECTRICAL			MAINTENANCE		
ENGINEER			O.A.		
INSTRUMENT			FIRE PROTECT.		
MECHANICAL			WASTE MANAGE		
			SECURITY		
CHECKED			CRU		
APPROVED					

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald
Environmental Management Project
U.S. DEPARTMENT OF ENERGY

SITE PLAN — RCRA PART A
FIGURE 1-1
FACILITY LOCATION MAP
SCALE: 1" = 300'

RES #1626	75X-5500-X-00171	4
DATE 5-24-91		
DRAWN S.J.SMOCK		

DO NOT SCALE REDUCED DRAWING

FILE NAME: /9|RCRA/75XX00171.DGN 000009

R75xx00171.m(1234.ws15) steve@ws15. Thu Jan 5 13:10:06 CST 1995

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1.1.2 Mixed Radioactive and RCRA Wastes

As a result of process knowledge determinations, many FEMP wastes with a hazardous component or characteristic have been handled as mixed hazardous/ radioactive low-level wastes. The radioactive portion of mixed waste is exempt from RCRA regulation. Determination of the radionuclide component of most material on site is based upon process knowledge and analyses to assay the uranium content potentially recoverable from the material. When assay values have not been established, the FEMP considers materials generated in the uranium processing areas as being contaminated with radionuclides unless proven otherwise.

Recognizing the dual nature of these wastes, the FEMP stores mixed (hazardous and radioactive) wastes according to RCRA and Atomic Energy Act (AEA) regulations, and meets U.S. Department of Transportation (DOT) container and labeling requirements through DOE orders concerning low-level radioactive waste. These materials are stored pending the availability of acceptable treatment/disposal facilities for mixed waste.

In accordance with the January 1990 Stipulation and Settlement Agreement (Case No. 88-hw-016), DOE will provide the OEPA with the results of the radiological monitoring conducted during closure in accordance with existing FEMP operating procedures for informational purposes only consistent with the Trane Incinerator Stipulation and Settlement Agreement. The radiological monitoring conducted during the closure will be performed according to the existing FEMP Standard Operating Procedures (SOPs) that are used on all projects at the FEMP.

1.1.3 CERCLA Requirements for FEMP RCRA Closures

As discussed above, the RCRA closure described in this CPID will be undertaken in conjunction with CERCLA remediation activities at the FEMP. In 1986, the DOE initiated the ongoing RI/FS to evaluate and determine remediation requirements under CERCLA. Consistent with the scope of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the Amended Consent Agreement, all

remediation activities and any resulting changes to facility schedules must be coordinated and integrated with the RI/FS and CERCLA removal and remedial response actions. In addition, Section XI.c of the Amended Consent Agreement requires that all remediation activities (including RCRA closure activities) be consistent with the Final Record of Decision (ROD) for the operable unit containing the HWMU.

For each CERCLA response action, ARARs must be identified in accordance with 40 CFR § 300.400(g), and these ARARs must be attained, unless justifiably waived under 40 CFR § 300.430(f)(2)(C). For response actions that address units subject to RCRA closure, these ARARs include OEPA and USEPA requirements for HWMU closures. In addition, pursuant to the Amended Consent Agreement, the FEMP management will:

- Characterize chemical and radiological contamination at the FEMP and establish site cleanup objectives

- Conduct necessary short-term response actions to eliminate or minimize immediate threats to human health and the environment (i.e., removal actions)

- Implement any necessary long-term monitoring and surveillance of the facility and surrounding environment.

Based on the RI/FS, a proposed plan will be recommended for the CERCLA ROD for each operable unit. The Final ROD for each operable unit will specify the required final remediation or removal of contaminated media, equipment, and structures.

The FEMP is also developing an Interim ROD for OU3 to provide for final decontamination, removal, dismantling, and demolition of equipment and structures within OU3 (defined as the production area and production-associated facilities and equipment which includes the North and South Solvent Tanks). The information and data obtained from the RI/FS and completion of the Interim ROD will be used to determine the final remediation requirements under the Final ROD for OU3.

Remedial Design/Remedial Action (RD/RA) plans will be prepared to implement the requirements of the RODs (interim and final) to remediate each operable unit.

A number of removal actions have been identified to provide immediate response actions necessary to stabilize or remove contamination for protection of human health and the environment. Removal Actions No. 9, 12, and 17 are directly relevant to the closure of the North and South Solvent Tanks.

Removal Action No. 9, "Removal of Waste Inventories," provides for the disposition of low-level radioactive wastes generated by production, maintenance, construction, and environmental restoration activities at the FEMP. This removal action also includes procedures for packaging, shipping, and disposing of radioactively contaminated wastes. Where decontamination procedures performed during closure of the North and South Solvent Tanks fail to remove sufficient radioactivity, non-hazardous materials may be classified as low-level radioactive waste. If this were to occur, such waste would be handled under Removal Action No. 9.

Removal Action No. 12, "Safe Shutdown," was created to perform the safe shutdown of all process facilities in preparation of final remediation. Safe Shutdown entails the engineering, planning, and scheduling for isolation of process equipment, piping systems, and associated utilities; removing residual and excess materials, supplies, and combustibles to appropriate disposition and approved storage locations; and decontaminating process equipment and operating areas.

Safe Shutdown management activities include the following:

- Development of appropriate safety documentation (Risk Assessment, Risk Management Plan),
- Performance of task-specific hazard analyses (under Safe Shutdown Health and Safety Plan and Safety Assessment),
- Preparation of task-specific lesson plans,

- Review of SOPs and updates,
- Performance of a preliminary assessment for all process buildings and process equipment,
- Evaluation of the preliminary assessment,
- Preparation of work requests and Task Orders to address equipment isolation and clean out,
- Continuation of efforts to dispose of the surplus equipment and uranium contaminated materials,
- Evaluation of process buildings for future use or demolition,
- Initiation of the development of engineering studies and packages to guide equipment isolation/de-energization activities.

Currently under Safe Shutdown, all buildings are being inventoried for residual material and excess equipment. Necessary documentation is being processed to characterize and identify proper disposition of these materials.

Removal Action No. 17, "Improved Storage of Soil and Debris," provides specific criteria for the improved management of contaminated soil and debris and identifies options for its disposition including decontamination, offsite disposal, or storage in controlled stockpiles or an improved storage facility. For this CPID, Removal Action No. 17 applies to management of debris.

The identification and characterization of soil contamination in the Pilot Plant area (which encompasses the soils adjacent to the North and South Solvent Tanks) is being conducted as part of the RI/FS characterizations for OU3 and OU5.

1.1.4 Financial and Liability Exemptions

The FEMP is a federally owned facility. According to OAC 3745-66-40 (C), the Federal Government is exempt from financial requirements of OAC 3745-66-40 through OAC 3745-66-48. A similar exclusion from 40 CFR Part 265, Subpart H (Financial Requirements) is provided in 40 CFR § 265.140(c).

1.2 TOPOGRAPHIC MAP

The general topography of the FEMP production area is shown in Figure 1-1. The area around the North and South Solvent Tanks is relatively level with a slight slope to the southwest as indicated by surface water drainage in the area.

1.3 OTHER FEMP HWMUs

The FEMP has identified 53 HWMUs. They are listed in the RCRA Part A and Part B Permit Application as shown on Figure 1-1. Since the original Part A Application submittal, several HWMUs have been reclassified with concurrence from OEPA and are no longer managed as HWMUs. The closure of other HWMUs will be conducted in accordance with unit-specific schedules and documentation. Closure of the North and South Solvent Tanks, as described in this CPID, will constitute partial closure of the FEMP facility.

1.4 HYDROGEOLOGIC INFORMATION

The FEMP lies in the Till Plains section of the Central Lowland physiographic province, characterized by structural and sedimentary basins and domes. The underlying bedrock in the region is shale and fossiliferous limestone of Middle and Late Ordovician age.

The FEMP is located within a 2- to 3-mile wide sedimentary basin known as the New Haven Trough. The basin formed as a valley during the Pleistocene glaciation and subsequently filled with glacial outwash materials (predominantly sands) and is overlain by silty clay tills. The bedrock in the vicinity of the FEMP consists of

predominantly flat-lying, olive-gray Ordovician shales with thin, interbedded layers of limestone. This shale forms the base and sides of the New Haven Trough.

Groundwater monitoring compliance activities at the FEMP are now being conducted under the Project-Specific Plan for the Routine Groundwater Monitoring Program along the Downgradient Boundary of the FEMP, Revision 1, Oct 1993. This plan is the Alternate Program referenced in the Director's Findings and Orders that were signed by the DOE-FN, FERMCO, and OEPA on September 10, 1993.

1.5 TANK SYSTEM DESCRIPTION

The North (T-1S) and South (T-2S) Solvent Tanks were operated as part of a recovery system for contaminated extraction solvents. The solvent mixture was used as an extractant in the uranium and thorium refining processes. These solvents were stored in tanks T-1S and T-2S before being processed through other systems for recovery or reuse of usable solvent ingredients. These tanks were not used to store a hazardous waste.

The Pilot Plant performed several operations as part of thorium and uranium production. These operations included using mixtures of kerosene/DAAP (diamyl-amyl phosphonate) to extract thorium, uranium extraction using tributyl phosphate/kerosene, and the production of various uranium and thorium compounds.

1.5.1 The Tanks

These tanks are constructed of stainless steel. They are above ground and located in an uncovered, flat (elev. ~580.50 ft.) area outside and west of building 13A (Pilot Plant Wet Side - Figure 1-2). The are vertical, cylindrical, and have conical bottoms. Both tanks have a maximum capacity of 2200 gallons and measure 6'-6" in diameter by 6'-1" high. With support legs included, the tanks stand approximately 12'-7" tall (see photograph - Appendix 1). The top of each tank is equipped with a manway.

1.5.2 Ancillary Equipment

The following is a list of the North and South Solvent Tanks ancillary equipment:

- spigots, sightglass, drainlines, valves
- (1) transfer pump.

For purposes of decontamination, the boundary of the tanks extends to the edge of the flanges connected to process piping, but does not include the process piping (see FIGURE 1-4 and Photograph, Appendix 1)). The process piping is not a component of the HWMU because it was not used to store or transport hazardous waste and, therefore, does not meet the definition of ancillary equipment in OAC 3745-50-10 (A)(6).

1.5.3 Secondary Containment

The North and South Solvent Tanks are located within a reinforced concrete secondary containment structure (i.e., Dike 10B) that is coated with an impervious, asphaltic material. Rain water that accumulates in the secondary containment is pumped to the General Sump where it is tested and treated to remove radioactive contamination. The reinforced concrete containment structure is 14'-0" (w) x 23'-6" (l) x 2'-2" (h) with a total capacity of approximately 4500 gallons. No cracks in the secondary containment are evident (APPENDIX 1). HOWEVER, DURING CLOSURE ACTIVITIES, ANY POTENTIAL ROUTE OF RELEASE WILL BE SEALED IN ACCORDANCE WITH SECTION 2.3.1 OF THIS CPID.

A review of the FEMP Spill and Release records (see Table 1-1) indicates that no spills or releases to the environment have been recorded nor has any breach of the secondary containment occurred. Therefore, there is no reason to believe that there were releases to the surrounding environmental media.

TABLE 1-1 North and South Solvent Tanks Spill Summary

Date	Material Released	Released To	Released From	Response Action Taken
3/5/91	Dripping liquid TBP/Kerosene or DAAP/Solvesso	Containment Area-Dike 10B, West of Pilot Plant	Sight glass and associated valves of the solvent tanks T-1S/T-2S	The sight glass and valves were wrapped in plastic and containers were placed under locations to catch drips when they occurred.
11/10/91	Spotting on concrete of TBP/Kerosene or DAAP/Solvesso	Containment Area-Dike 10B, West of Pilot Plant	Slowly leaking drain line	Surface area of the concrete where spotting occurred was flushed into the sump.

1.5.4 Wastes Managed

The solvent mixture stored in the tanks consisted of diamyl-amyl phosphonate (DAAP), Solvesso 100, and tributyl phosphate and/or kerosene. A review of analytical information from the tank content samples taken in June 1991 revealed that the material demonstrated a flash point of 124°F, thereby making it characteristically hazardous for ignitability (RCRA Hazardous Waste Number D001). The contents of the tanks were analyzed again in March 1992 and January 1993 in preparation for disposal at the Toxic Substance Control Act (TSCA) Incinerator in Oak Ridge, Tennessee. Although these analyses indicated a flash point >140°F, the tanks are being managed in accordance with the first analyses which characterized the waste as ignitable (D001). Analytical results are included in Appendix 4.

Based on Material Safety Data Sheets (MSDS) (see Appendix 8), it was determined that Solvesso 100 and kerosene were the main contributors to the tank contents ignitability (flashpoint <140°F). The Solvesso 100 MSDS included a list of the hazardous ingredients or components found within Solvesso 100. The kerosene MSDS did not provide this level of detail, but the components were verified through a discussion with a project engineer from Technical Services of BP Oil Company. The

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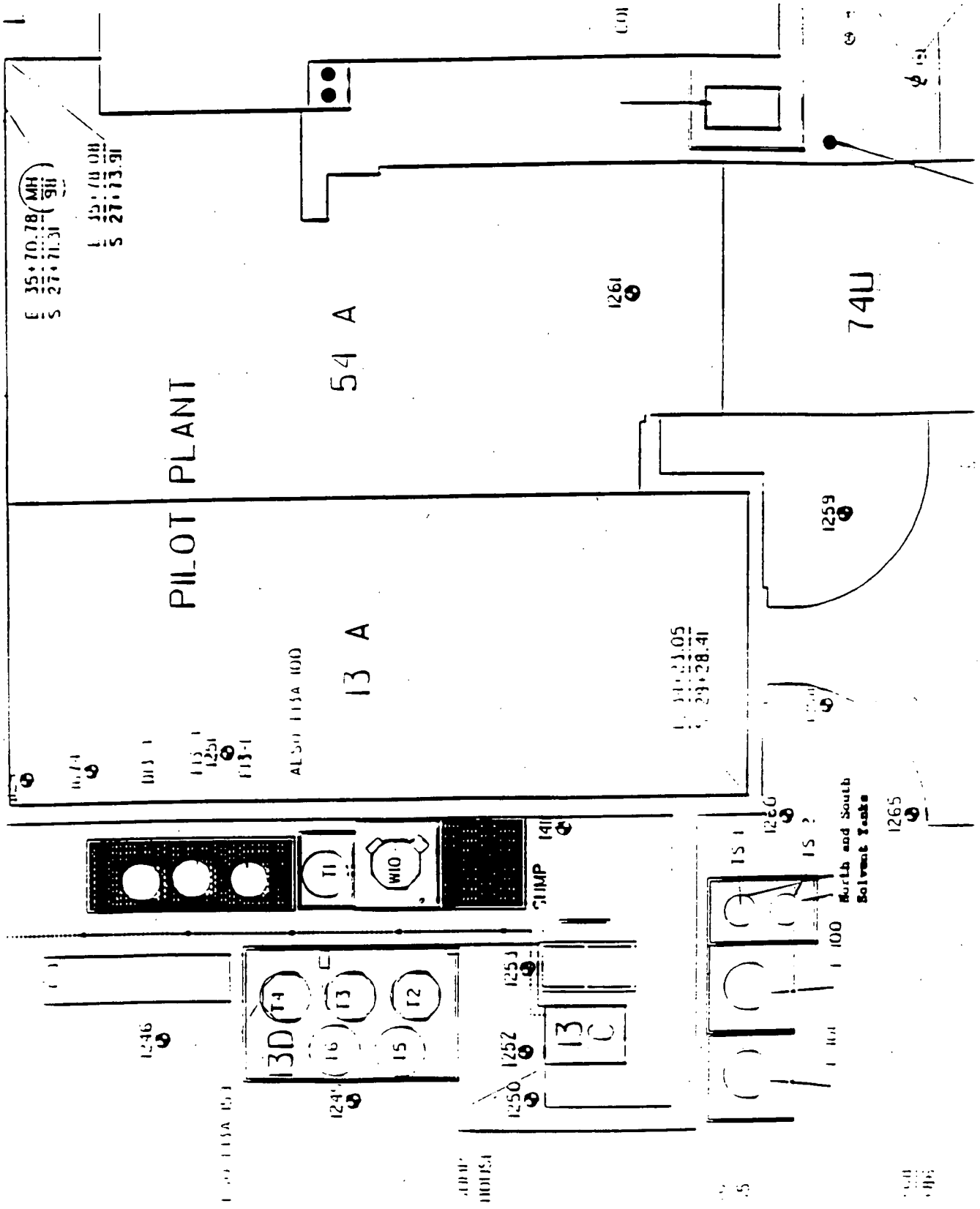
FIGURE 1-2 Area Location Map - North and South Solvent Tanks



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representative of BP Oil Company confirmed that benzene, toluene, ethyl benzene, and xylene (BTEX) are components of kerosene. Of these components, xylene and ethyl benzene were also found to be components of Solvesso 100. Therefore, benzene, toluene, ethyl benzene, and xylene (i.e., BTEX) were identified as indicator constituents to screen soil and rinseates for the presence of Solvesso 100 and/or kerosene.

On April 21, 1993, the total volume of the waste stored in the North (800 gallons and South (1060 gallons) Solvent tanks was removed and transported to Oak Ridge, Tennessee by Environmental Systems Inc. (ESI) for incineration at the TSCA Incinerator. The liquid waste was subsequently destroyed on June 27, 1993 in an incinerator compliant with and for which such treatment is applicable under 40 CFR 268, Subpart D. Copies of the signed manifest and certificate of disposal are included in Appendix 2.

The tanks were emptied by blanking off the process lines and pumping the contents out of the bottom of the tanks utilizing the existing pump and drain lines. Inspection of the tanks at this time revealed that no solvent material exist in the process lines, no residues (e.g., tar, oils, resins, waxes, greases, etc.) appear on the walls and bottoms of the tanks, no baffles are present inside the tanks, and little or no solvent remains remains in the tanks (Appendix 3).

The manifests (Appendix 2) for the shipment of the liquid wastes that were stored in the North and South Solvent Tanks indicate that both D001 and D008 wastes were transferred off site together. The shipment to the incinerator on April 21, 1993 included wastes that were stored in the tanks 17a, 17b, 5b, T-1S, and T-2S. Based on the sampling and analyses of these tanks for preparation of disposal, the waste transferred from tank No. 5B (a tank not associated with this CPID) was found to have lead levels higher than TCLP limits there by causing the liquid to be characterized as D008 waste (APPENDIX 2).

1.5.5 Soil Characterization

The North and South Solvent Tanks were identified as a HWMU strictly on the basis of exceeding the 90 day storage limit for hazardous wastes (OAC 3745-51-04(C), 40 CFR 261.4(c)) and not for spills or releases. No spills outside the secondary containment structure were documented for the North and South Solvent Tanks, although, over time, de minimis losses (i.e., releases during transfer of product) may have occurred. If a spill were to occur outside the secondary containment structure, BTEX would be present in the soil adjacent to the HWMU. As discussed below, analytical results for soil samples collected in November 1993 confirms that BTEX is not present in the soils adjacent to the secondary containment area.

Under Sample Plan No. 93-607, soil borings were taken in 4 locations surrounding the North and South Solvent Tanks (see Figure 1-3). Based on prior sampling efforts at the FEMP, volatile organic compounds (VOCs), if present in the soil, are detected within the 0-6" depth from the surface. Four soil samples were collected at a depth of 0-6" to test for presence of BTEX in soils adjacent to the North and South Solvent Tanks; none of these hazardous constituents were detected in analyses of the samples. In addition, a paint filter test procedure was performed to obtain liquids for ignitability characterization by flash point testing; no liquids were obtained to perform the flash point test. The results of these analyses are included in Appendix 5.

As discussed in Section 1.5.4, the wastes managed in the North and South Solvent Tanks were characteristically hazardous for ignitability (EPA HW No. D001). These tanks did not store listed hazardous wastes. OEPA 1993 Interim Final Closure Plan Review Guidance states that "soils contaminated with hazardous constituents originating solely from characteristic wastes shall be removed and managed as hazardous waste until sampling results and statistical analyses conducted in accordance with the characterization procedures described in USEPA Publication SW-846 (Chapter 9) indicate that the excavated material does not exhibit a characteristic of a hazardous waste". The soil is not contaminated with hazardous constituents from this HWMU (i.e. BTEX - see discussion in Section 1.5.4) and is not hazardous for the characteristic of ignitability. Therefore, no soil remediation is required for this closure. It is not necessary to demonstrate alternate sources of contamination in order

to accomplish closure because constituents of the wastes managed in this HWMU are not present in the soil. Soil contamination resulting from other sources (e.g. uranium and thorium contamination, see Appendix 5) will be addressed during facility closure under the CERCLA Final ROD for OU5.

1.6 OTHER ENVIRONMENTAL PERMITS

Liquid wastes generated during closure of the North and South Solvent Tanks that can be discharged to the WWTS will be evaluated against NPDES permit limitations before discharge through the WWTS.

1.7 ANTICIPATED WAIVERS OR EXEMPTIONS EXCEPT CLOSURE TIME

No waivers or exemptions are anticipated for the North and South Solvent Tanks HWMU.

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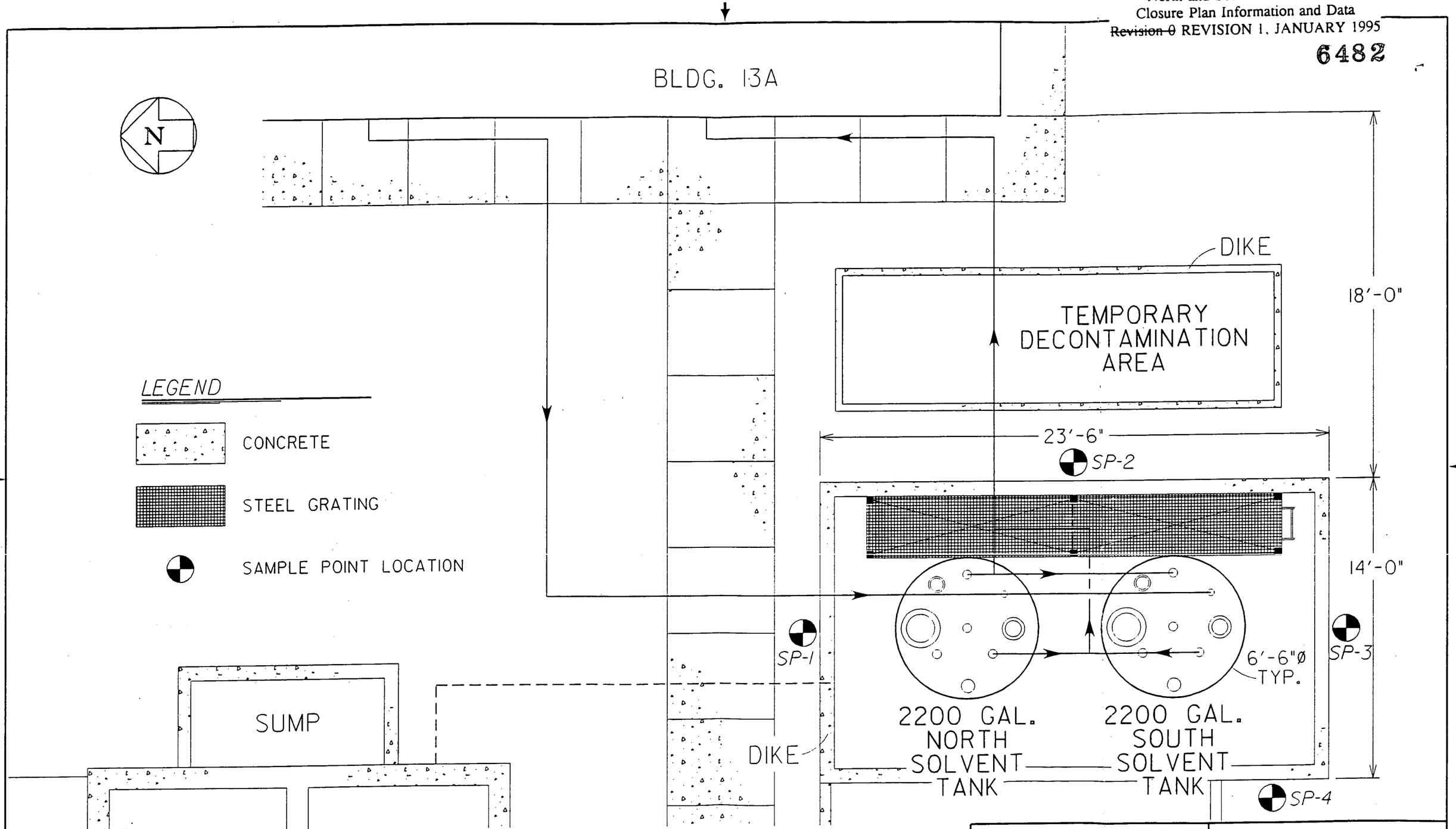


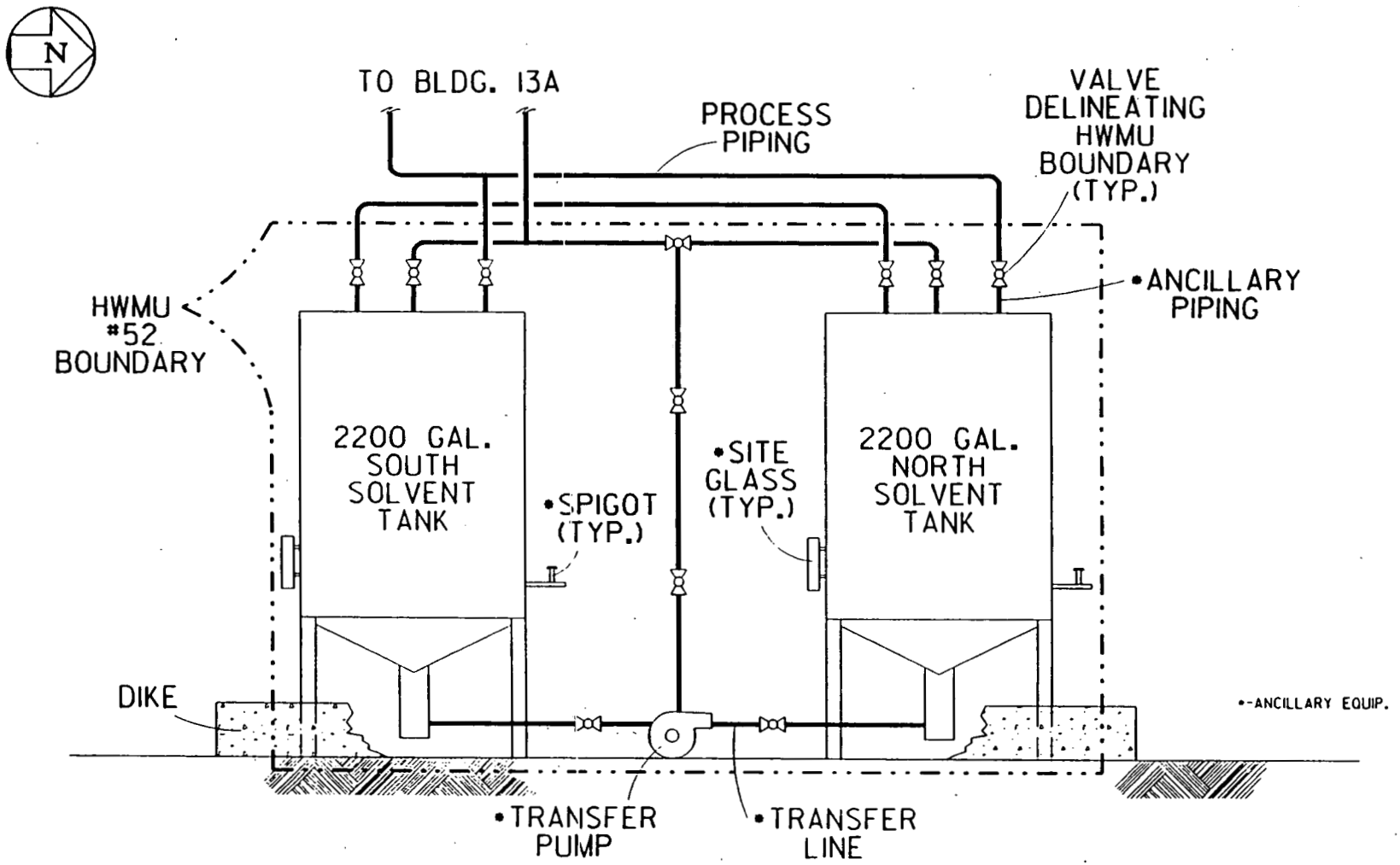
REF. DWG.S:
13X-5500-P-00202
13B-5500-M-00192

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

UNIT LOCATION MAP
FIGURE 1-3

DATE 12/16/94
DRAWN S.J.SMOCK

FILE NAME: /STEVE/MAPS/SOLVI-3.DGN



REF. DWG.S:
13X-5500-P-00202
13B-5500-M-00192

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

UNIT ELEVATION
FIGURE 1-4

DATE 12/16/94

North and South Solvent Tanks
Closure Plan Information and Data
~~Revision 0~~ REVISION 1, JANUARY 1995

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2.0 CLOSURE PROCEDURES

The objective of the FEMP is to close the North and South Solvent Tanks in accordance with applicable RCRA clean closure regulations. The RCRA closure will be managed and implemented in conjunction with existing CERCLA removal actions. These CERCLA actions are required by the Amended Consent Agreement. The specific CERCLA actions, as summarized in Section 1.1.3, are:

- Removal Action No. 12, "Safe Shutdown"
- Removal Action No. 9, "Removal of Waste Inventories"
- Removal Action No. 17, "Improved Storage of Soil and Debris"

The North and South Solvent Tanks closure actions will accomplish the clean closure performance standards prescribed by OAC 3745-66-11 (40 CFR § 265.111) by decontaminating the tanks and accomplishing the closure objectives described below.

- The clean closure will eliminate the need for post-closure maintenance associated with the North and Solvent Tanks by decontaminating the tanks and ancillary equipment.
- To the extent necessary to protect human health and the environment, the closure will control, minimize, or eliminate the escape of hazardous waste, hazardous waste constituents, contaminated rainfall, or waste decomposition products to the ground, to surface waters, or to the atmosphere.
- The closure will comply with the unit-specific closure requirements of OAC 3745-66-97 (40 CFR § 265.197) for tanks.

After closure of the North and South Solvent Tanks has been completed per this plan, the cleaned tanks will be locked and tagged out to prevent future use. Dismantlement and disposition will be completed during the CERCLA remediation of OU3 and is not

a part of this closure plan. Since the HWMU will be clean closed, the dismantled tanks (i.e. debris) will not be regulated under RCRA.

2.1 MAXIMUM QUANTITY OF INVENTORY TO BE REMOVED

The maximum inventory of hazardous waste stored in the North and South Solvent Tanks was 800 gallons in T-1S and 1,060 gallons in T-2S, as detailed in section 1.5.4. The waste was removed and transported for incineration off-site on April 21, 1993. The North and South Solvent Tanks and ancillary equipment are potentially contaminated on their internal and external surfaces with solvent residuals. However, there are no pumpable wastes or contaminated liquids in the tanks or piping and valves.

2.2 PROCEDURES FOR WASTE MANAGEMENT

The procedures for waste management include waste characterization, waste minimization, onsite waste management and storage. Table 2-1 lists the anticipated waste streams to be generated during the closure decontamination with a preliminary classification, primary minimization technique, and management of each.

TABLE 2-1 Anticipated Wastes from the North & South Solvent Tanks

WASTE	PRELIMINARY CLASSIFICATION	MINIMIZATION TECHNIQUE	DISPOSITION
Decontamination Water	Clean	Steam - low volume decon	WWTS
Decontamination Rinse Water	Clean	Recirculate	WWTS
Personnel Protective Equipment	Low Level Radioactive Waste	Segregate	Nevada Test Site (NTS)
Ancillary Equipment	Low Level Radioactive Waste	Dismantle	NTS or Recycle

2.2.1 Waste Characterization

Wastes generated during the RCRA closure will be characterized according to the FEMP Waste Analysis and Waste Determination Plans. Depending on which criteria a given waste stream satisfies, it will be characterized as clean (or decontaminated), hazardous, low level radioactive or mixed waste. Prior to characterization, these wastes will be treated as mixed wastes and placed in 90-day accumulation area on site.

2.2.2 Waste Minimization

The primary purpose of the FEMP waste minimization program is to avoid generating unnecessary, additional contaminated materials or wastes. The FEMP considers it essential to minimize the volume of any contaminated wastes. Specific actions designed to minimize additional wastes will include: isolating or removing non-contaminated equipment or materials; limiting additional liquids or other materials introduced during decontamination and demolition; and covering non-contaminated or decontaminated equipment or facilities to prevent spread of contamination through spills or releases.

Each individual employee at the FEMP is charged with a responsibility for minimizing wastes. The principal responsibility for implementing and enforcing measures to minimize wastes associated with closing the North and South Solvent Tanks will reside with the Closure Site Supervisors and Health and Safety Officers. In addition, the Site Supervisors will be responsible for training site personnel in project-specific waste minimization practices.

2.2.2.1 Decontamination Wastes

Sampling Wastes - Sampling wastes will be minimized by two methods: proper sampling techniques, and sample waste screening and segregation. Sample procedures, as described in the SAP (Appendix 6), will minimize the number of samples required, as well as the potential for resampling.

Protective Clothing - Use, handling, storage, and disposal of contaminated protective clothing are routine functions at the FEMP and are addressed in existing SOPs (FMPC-0516, FMPC-2128, RM-0009I, FMPC-2151). Protective clothing will be divided into two categories: disposable and reusable. Paper coveralls and surgeon's gloves are examples of disposable protective clothing. Boots and respirators are examples of clothing that can be decontaminated and reused. Methods that will be used to reduce this volume include: identifying zones of increasing levels of protective clothing; covering and sealing contaminated equipment and facilities that could spread contamination to surrounding areas; and minimizing personnel entry into contaminated areas.

2.2.3 Onsite Waste Management/Storage

Personnel will accumulate and containerize wastes as necessary during the closure action in order to segregate and prevent cross contamination. They will sample these wastes according to procedures included in Appendix 6. It is anticipated that the liquid waste will meet the requirements for discharge through the FEMP Waste Water Treatment System (WWTS). Until characterization is completed, the FEMP Transportation staff will transfer wastes from the vicinity of the North and South Solvent Tanks directly into permitted storage areas or 90-day accumulation areas where containers will be held pending analytical results and characterization per existing site procedures.

Recognizing the dual nature of mixed wastes, the FEMP stores mixed wastes according to RCRA and AEA regulations and meets DOT container and labeling requirements, pursuant to DOE Orders concerning low-level radioactive wastes. Mixed wastes are not expected to be generated in conjunction with closing the North and South Solvent Tanks, but if the liquid wastes are characterized as mixed, they will be stored onsite pending the availability of acceptable treatment and/or disposal facilities for mixed waste.

2.3 PROCEDURES FOR DECONTAMINATION/DISPOSAL

The FEMP will implement an array of specific procedures to achieve RCRA closure of the North and South Solvent Tanks. As indicated in the description above, these procedures will be implemented in conjunction with existing CERCLA actions. Sections 2.3.1 and 2.3.2 describe how these CERCLA actions will be applied in closing the North and South Solvent Tanks. The SAP, Appendix 6, provides detailed descriptions of the sampling and analytical techniques for completion of this closure.

The ongoing Safe Shutdown program, CERCLA Removal Action No. 12, is designed to take necessary actions to ensure that FEMP process systems and ancillary facilities are in safe, stable conditions in terms of chemical, radiological, and physical hazards. Orderly completion of Safe Shutdown will ensure that, while awaiting final disposition, the equipment and ancillary facilities pose no significant risk to human health and the environment.

Safe Shutdown field activities include:

- Isolation of process equipment
- Removal of excess equipment and materials
- Removal of residual materials from process equipment
- Decontamination.

2.3.1 Decontamination of North and South Solvent Tanks and Secondary Containment

Prior to performing any work, a radiation survey will be conducted and a Radiological Work Permit (RWP) will be issued. A visual inspection will be made of the integrity of the secondary containment system to identify potential routes of release (e.g., cracks, control joints, deteriorating concrete, etc.). If a crack is discovered it will be sealed. A hazard assessment will be completed per the Safe Shutdown program Health and Safety Plan to determine the applicable work permits.

The extension of process piping, concrete support curbs, secondary containment structure, structural steel members, tank exteriors, and equipment will be brushed, swept or vacuumed with a HEPA-filtered vacuum until visibly clean (i.e., no loose debris). The material will be collected and drummed for waste characterization. A final radiological survey will be performed on the cleaned structures and equipment.

Sections 2.3.1.1 through 2.3.1.3 discuss the process for removal of hazardous wastes and decontamination rinseates under the Safe Shutdown program, RA No. 12. THE TANKS WILL BE DECONTAMINATED WITH A HIGH-PRESSURE STEAM WASH (218° C / 150 PSI) AND THREE 100-GALLON RINSES USING PRESSURIZED WATER. THE DECONTAMINATION METHOD IS A PERFORMANCE-BASED PHYSICAL EXTRACTION METHOD AS SPECIFIED IN *OHIO EPA CLOSURE PLAN REVIEW GUIDANCE FOR RCRA FACILITIES, INTERIM FINAL, SEPTEMBER 1993.* THIS METHOD WAS SELECTED BECAUSE THE CHEMICAL EXTRACTION METHOD (I.E., DETERGENT WASH AND RINSE) REQUIRES THAT THE CONTAMINANTS MUST BE SOLUBLE TO AT LEAST 5% BY WEIGHT IN THE SOLUTION OR 5% BY WEIGHT IN THE EMULSION, AS APPLICABLE. TRIBUTYL PHOSPHATE IS SLIGHTLY SOLUBLE IN WATER (0.6%) AND KEROSENE AND SOLVESSO 100 ARE INSOLUBLE IN WATER. THEREFORE, DECONTAMINATION OF THE TANKS WILL BE VERIFIED BY USING THE "CLEAN DEBRIS SURFACE" STANDARD SPECIFIED IN THE *OHIO EPA CLOSURE PLAN REVIEW GUIDANCE* FOR PHYSICAL EXTRACTION TECHNOLOGIES.

Rinse water generated during decontamination of the North and South Solvent Tanks HWMU will be characterized for disposition through the WWTS as described in the Sampling and Analysis Plan (Appendix 6). If the rinse water exhibits a hazardous characteristic it will be placed in an approved RCRA storage facility at the FEMP. If the rinse water does not exhibit a hazardous characteristic and meets NPDES criteria, the water will be sent to the FEMP WWTS for discharge. If the water does not exhibit a hazardous characteristic and does not meet NPDES criteria, the water will be placed into appropriate storage on site until it can be treated for disposal. If a visible sheen is present in the wastewater, then oil absorbing pads will be used to remove the sheen prior to entering into the WWTS. The absorbent pads will be

drummed and transferred to an appropriate site storage area pending waste characterization.

2.3.1.1 The Tanks (T-1S and T-2S)

1. All process piping (including the drain lines) connected to the tanks will be disconnected from the tank flanges and blanked off to prevent steam cleaning and rinse waters from escaping. It will also be verified that the drain valve is in the closed position. All electrical connections to equipment will be disconnected, tagged, and locked out.

2. Each tank will be rinsed with approximately 100 gallons of pressurized water (i.e., 5% of the tank capacity). The rinse water will be drained and containerized in an approved storage container(s).

3. After each tank is rinsed and the bottom drain valve closed, a steam line will be inserted into the manway of each tank to remove residues adhering to the side walls and bottom. After the steam line is removed, the drain valve underneath the tank will be opened to release the accumulated water into an approved storage container. The drain valve will then be closed.

4. Each tank will be rinsed again with approximately 100 gallons of pressurized water (i.e., 5% of the tank capacity). The rinse water will be drained and containerized in an approved storage container(s).

5. The drain valve will be closed again prior to performing a final ~~verification~~ rinse. The ~~verification~~ rinse will use an additional 100 gallons of clean water per tank (i.e., 5% of the tank capacity). Each tank will be drained once more and the rinseate containerized, sampled and analyzed for flashpoint and BTEX to CHARACTERIZE THE WASTE FOR DISPOSITION. ~~determine if the tank has been successfully decontaminated as discussed in Section 4.0.~~

6. The interior of the tanks will be visually inspected AND RECORDED WITH A VIDEO CAMERA. ~~and~~ Observations will be logged into the field handbook.

2.3.1.2 Ancillary Equipment

1. Within the project site, an area will be prepared for decontamination of the ancillary equipment (i.e. spigots, drain lines, sight glass, valves and transfer pump) (SEE FIGURE 1-3). Plastic sheeting will be used to construct a pad with curbs (i.e., diking) to place within it a leak-tight container (e.g. white metal box). As the ancillary equipment is dismantled from the HWMU, it will be placed inside this container and flushed with water to clean off any residuals. THE ANCILLARY EQUIPMENT WILL BE ACCUMULATED IN THE CONTAINER AND RINSED WITH WATER UNTIL ALL COMPONENTS ARE SUBMERSED. THE PORTALS OF THE EQUIPMENT WILL BE VISUALLY INSPECTED AFTER RINSING TO ENSURE GROSS CONTAMINATION HAS BEEN REMOVED. The rinseate generated by this process will be pumped into an appropriate container.

2. The ancillary equipment PIECES will be managed as HAZARDOUS DEBRIS UNTIL IT CAN BE DEMONSTRATED THAT IT DOES NOT MEET THE DEFINITION OF HAZARDOUS DEBRIS. ~~a solid waste (i.e., debris) after it is removed from the HWMU. In order to characterize the debris,~~ THE rinseate from the equipment will be sampled DIRECTLY FROM THE DECONTAMINATION CONTAINER and analyzed for flashpoint and ~~TCLP benzene~~ BTEX ~~as described in the Sampling and Analysis Plan (Appendix 6)~~. IF THE FLASHPOINT AND BTEX RESULTS ARE BELOW THE FINAL RINSEATE STANDARDS SHOWN IN TABLE 4-1, THE ANCILLARY EQUIPMENT PIECES WILL BE DECLARED NON-RCRA. Until characterization is completed, the ancillary equipment will be moved to permitted storage areas or 90-day accumulation areas. ~~pending analytical results and characterization per existing site procedures.~~

2.3.1.3 Secondary Containment Structure

1. The secondary containment structure (i.e., concrete walls and slab) will be rinsed with a pressurized water spray. APPROXIMATELY 100 GALLONS WILL BE USED TO RINSE THE SECONDARY CONTAINMENT STRUCTURE. The rinseate will be pumped into an appropriate storage container.

2. After allowing the secondary containment structure to dry, the secondary containment structure will be rinsed with APPROXIMATELY 100 GALLONS OF water for final decontamination verification. The rinseate will be pumped into an approved storage container, sampled, and analyzed for flashpoint and BTEX to determine if the secondary containment has been successfully decontaminated AND TO CHARACTERIZE THE RINSEATE FOR DISPOSITION, as discussed in Section 4.0.

2.3.2 Decontamination of Equipment Used During Closure

Only clean equipment will be used for sampling and decontamination. The FEMP CRU3 Health and Safety Plan has identified contamination area zones to prevent the spread of removable surface contamination to other areas of the FEMP. The equipment being used to steam clean and rinse the North and South Solvent Tanks will be decontaminated in accordance with FEMP site procedures as referenced by the Safe Shutdown Task-Specific work plans. Decontamination of sampling equipment is addressed in the Appendix 6. Wastes generated from equipment decontamination will be managed as described in Section 2.2.2.1.

2.4 DESCRIPTION OF SECURITY SYSTEMS

As with all DOE facilities, security at the FEMP is strict. The entire FEMP processing area which includes the North and South Solvent Tanks is surrounded by chain link fencing and monitored by on-site security personnel. All employees and visitors enter through one of several guarded entrances into the administration and

processing area. The North and South Solvent Tanks have been marked off with stanchions, yellow plastic chains and warning signs to restrict unauthorized entry.

3.0 CLOSURE SCHEDULE

3.1 EXPECTED YEAR OF CLOSURE

Closure of the North and South Solvent Tanks will be performed in accordance with RCRA closure regulations and in conjunction with series of CERCLA actions described in Section 2.0. Clean closure of the North and South Solvent Tanks HWMU is anticipated to be complete in calendar year 1994.

3.2 FREQUENCY OF PARTIAL CLOSURE

This CPID for the North and South Solvent Tanks is submitted in accordance with the 1993 SACD and RCRA compliance schedule and demonstrates compliance with requirements for RCRA closure. This CPID is for closure of the North and South Solvent Tanks HWMU and constitutes only a partial closure of the FEMP facility.

3.3 MILESTONE CHART

Following approval by OEPA, the FEMP will identify specific closure action personnel, prepare FEMP Site work package documentation (Health and Safety Plan, RWP), and conduct training in accordance with the work package documentation. Following the selection of the removal organization, all closure site preparations will be completed. Activities that will occur include conducting decontamination steam cleaning, rinsing, VISUALLY INSPECTING, and collecting rinse samples for decontamination verification of the North and South Solvent Tanks, the tank components and the secondary containment structure (see unit descriptions in Section 1 and summary of closure methodology in Section 2). ~~An 8-month~~ A 21-WEEK period has been identified from the time of OEPA approval has been received for completion of this action and certification of closure.

Consistent with the requirements of OAC 3745-66-15 and 40 CFR § 265.115, a 60-day time period is scheduled following completion of the closure for preparation of the certification documents as described in Section 4.3. Table 3-1 summarizes the North and South Solvent Tanks' closure schedule.

~~TABLE 3-1 Milestones for the Closure Action Schedule~~

~~Milestone~~	~~Activity Duration(months)~~	~~Cumulative Duration (months)[1]~~
~~Received OEPA approval~~	~~0~~	
~~Complete Closure Actions: Decontamination Steam Cleaning and Rinse(s) of the Tank, ancillary equipment and the Secondary Containment Structure; Collecting Rinse Samples for Decontamination Verification and Review Analytical Data.~~	~~6~~	~~6~~
~~Final Report~~	~~2~~	~~8~~

~~[1] Number of months from approval of the CPID.~~

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TABLE 3-1 MILESTONES FOR THE CLOSURE ACTION SCHEDULE

MILESTONES	ACTIVITY DURATION (WEEKS)	CUMULATIVE DURATION (WEEKS)[1]
RECEIVE OEPA APPROVAL	0	0
PREPARE TANKS AND SECONDARY CONTAINMENT FOR STEAM CLEANING (VACUUM, SEALING)	2	2
REMOVE PROCESS PIPING AND PUMP	1	3
STEAM, 1ST, 2ND, & 3RD RINSE, VISUALLY INSPECT NORTH TANK, AND SAMPLE RINSEATE	1	4
STEAM, 1ST, 2ND, & 3RD RINSE, VISUALLY INSPECT SOUTH TANK, AND SAMPLE RINSEATE	1	5
RINSE AND SAMPLE SECONDARY CONTAINMENT	1	6
REMOVE, RINSE, VISUALLY INSPECT ANCILLARY EQUIPMENT (PUMP, PIPING, SIGHT GLASS, SPIGOTS), AND SAMPLE VERIFICATION RINSEATE	1	7
REVIEW ANALYTICAL DATA	6	13
FINAL CERTIFICATION REPORT	8	21

[1] NUMBER OF DAYS FROM CPID APPROVAL

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During the closure performance schedule, personnel will continue to inspect equipment and facilities at the North and South Solvent Tanks and conduct activities prescribed by the existing FEMP Spill Prevention, Control, and Countermeasures Plan (SPCC). Standard procedures for RCRA closures require that the FEMP management contact both the independent, registered, professional engineer(s) and OEPA's facility inspector(s) at least 5 business days prior to any significant activity.

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4.0 CLEANUP LEVEL AND CLOSURE CERTIFICATION

The following sections describe activities to be conducted, appropriate analyses to be performed, the criteria for evaluating adequacy, the schedule of inspections, and the types of documentation needed for proper RCRA closure of the North and South Solvent Tanks HWMU.

4.1 RCRA CLOSURE STANDARDS

In order to clean close the North and South Solvent Tanks HWMU, Tanks T-1S and T-2S, and secondary containment structure will be decontaminated and the ancillary equipment removed. OEPA 1993 Interim Final Closure Plan Review Guidance specifies that in order to achieve clean closure of a HWMU, hazardous waste residues should be removed to the maximum extent practicable and the following rinseate standards met:

(1) Fifteen times the public drinking water maximum contaminant level (MCL) for hazardous constituents as promulgated in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and 40 CFR 141.12 and OAC 3745-81-12 for organics;

(2) If an MCL is not available for a particular contaminant, then fifteen times the maximum contaminant level goal (MCLG) as promulgated in 40 CFR 141.50 shall be used as the clean standard. If the MCLG is zero, use fifteen times the contaminants practical quantitation limit in ground water; or

(3) If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL or MCLG is available for a particular contaminant, 1 mg/l shall be used as the clean standard.

Successful decontamination of ~~Tanks T-1S, T-2S, and~~ the secondary containment AND THE ANCILLARY EQUIPMENT will be confirmed ~~and clean closure will be achieved~~ when analyses of the final rinseate sample meets the criteria specified in Table 4-1. The hazardous constituents shown in Table 4-1 are components of the hazardous waste stored in the North and South Solvent Tanks and are therefore used

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to indicate the presence of hazardous waste residues (see discussion in Section 1.5.4, Wastes Managed).

TABLE 4-1 RINSEATE DECONTAMINATION VERIFICATION LEVELS

Analyte	MCL/MCLG	Rinseate Concentration
Flashpoint	Not applicable	> 140°F (60°C)
Xylene	10 mg/l	1 mg/l
Toluene	1 mg/l	1 mg/l
Benzene	0.005 mg/l	0.075 mg/l
Ethyl benzene	0.7 mg/l	1 mg/l

~~If the final rinseate from Tanks T-1S and T-2S contains hazardous constituents greater than the rinseate concentrations specified in Table 4-1, then "~~e "Clean debris surface" standards described below will be used to evaluate successful decontamination (i.e. clean closure) of the tanks.

OEPA 1993 Interim Final Closure Plan Review Guidance specifies: "In lieu of analytical standards, the owner/operator may use performance-based physical extraction methods [to] demonstrate that a structure has been properly decontaminated. Physical extraction methods include ... high pressure steam and water sprays. This decontamination standards requires ... treatment to a 'clean debris surface.' A 'clean debris surface' is a surface that, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste, except that residual staining caused by waste consisting of light shadows, slight streaks, or minor discolorations, and waste in cracks, crevices, and pits may be present provided that such staining and waste in cracks, crevices, and pits shall be limited to no more than 5% of the total surface area." Note that the requirements for decontaminating porous material are not applicable to the closure of the tanks.

If the tanks or secondary containment do not meet the "clean" standards prescribed in this section after closure activities are conducted, the North and South Solvent Tanks will continue to be managed as a HWMU until dismantlement under the Interim ROD for OU3. At that time, the waste materials will be managed as low level radioactive, hazardous, or mixed wastes as determined by waste characterization.

4.2 CERTIFICATION INSPECTIONS

Certification inspections will be conducted by a qualified, independent registered professional engineer licensed in Ohio or his/her designated representatives to ensure that the actions performed to achieve closure are conducted consistent with the discussions in this CPID. Representatives of DOE and Fernald Environmental Restoration Management Corporation (FERMCO) will also conduct inspections during the performance of response actions. The major emphasis of the closure inspection will be:

- To ensure that the equipment from the North and South Solvent Tanks HWMU including the tanks, ancillary equipment and secondary containment are properly cleaned and decontaminated.

- To ensure that all wastes resulting from this closure action are properly stored, labeled and characterized.

4.3 CERTIFICATION DOCUMENTS

Actions taken in accordance with the approved CPID for HWMUs must be certified by both the owner or operator and a qualified, independent registered professional engineer licensed in Ohio. The FEMP has agreed to provide this certification. The certification provided by the FEMP will include the following:

- Certification Statement (see Section 4.4)

- Approved plan or reference to this plan

- Description and volume of waste removed
- Correspondence regarding closure activity after OEPA approval
- Details of sampling and analysis methods (including copies of shipping records, and chain of custody forms used for sample handling and tracking)
- Copies of laboratory analyses reports
- Narrative describing all activities during closure (this narrative may be presented in the form of a daily log of activities or field notes recorded by the owner or operator)
- Signatures of the qualified, independent registered professional engineer and the owner or operator.

4.4 STATEMENT OF CERTIFICATION

The DOE, and an independent, qualified, registered Professional Engineer will submit certification of closure within 60 days after unit closure is complete. The certification will meet the requirements of OAC 3745-50-42(D) and OAC 3745-66-15 (40 CFR 270.11(d) and 40 CFR 265.115). The certification statement will be worded as follows:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____

U.S. Department of Energy

I hereby certify that the hazardous waste management unit has been closed in accordance with the specifications in the approved closure plan.

_____

Ohio Registered Professional Engineer

4.5 POST-CLOSURE PLAN

Because this plan contemplates clean closure of the North and South Solvent Tanks HWMU as defined in this CPID, no specific post-closure care for this unit is anticipated.

4.6 NOTICE IN DEED

A notation in the property deed is required under OAC 3745-66-19(b)(1) (40 C.F.R. § 265.119) for areas that require post-closure care. Because the North and South Solvent Tanks HWMU will not require unit-specific, post-closure care, these notice requirements will not be necessary.

5.0 SAMPLING PLAN AND ANALYTICAL PROCEDURES

Closing the North and South Solvent Tanks will involve sampling the following types of materials:

- Decontamination steam cleaning water and rinseate from decontamination of the tanks, ancillary equipment, and secondary containment.

Sampling and analysis will be conducted as described in the SAP, Appendix 6. All sampling and analyses for radioactive contamination and/or constituents will be conducted in accordance with existing FEMP SOPs as described in CERCLA Removal Action No. 12, "Safe Shutdown" and the Sitewide CERCLA Quality Assurance Project Plan (SCQ). As they are generated and collected, materials will be containerized and kept within the project exclusion zones until sampled. After sampling, the containerized materials will be and transported to appropriate FEMP RCRA storage areas or 90-day RCRA accumulation area to await analytical results, characterization, and final disposition per existing site procedures. Analytical procedures will be performed in accordance with methods specified in SW-846.

5.1 NATURE, RATE, AND EXTENT OF CONTAMINATION

Soil sampling conducted prior to development of this CPID has shown that contamination from this HWMU does not extend to the soil, therefore no additional soil sampling or soil removal will be conducted for the closure of this HWMU.

5.2 EQUIPMENT, CALIBRATION, AND EXPERIENCE OF OPERATORS

The following equipment will be used to collect liquid samples:

- 500 ml amber glass widemouth bottle with teflon-lined closure
- Thermal coolers and freezer packs
- Sample labels
- Waterproof marking pen
- Field sampling logbook and field data forms

- Acid resistant gloves
- Polyethylene or other approved impervious sheeting
- Dedicated, clean rinseate sample collection drums
- Coliwasa sampler
- Peristaltic sampling pump(s)
- Tygon tubing.

The list can be modified as appropriate by a trained, qualified sampling supervisor or manager. Any change to the sampling equipment will be noted in the field sampling logbook or in the field sampling plan. All sampling activities will be performed by personnel trained in accordance with the SCQ.

5.3 PROCEDURES FOR GROUNDWATER MONITORING ANALYSIS

Groundwater monitoring analysis will not be required for the North and South Solvent Tanks HWMU, as no releases to the environment from the HWMU are documented or are suspected. This fact was confirmed by soil sampling as described in Section 1.5.5.

5.4 NUMBER, LOCATION, AND FREQUENCY OF SAMPLES

The number, location, and frequency of samples are detailed in the SAP contained in Appendix 6. In the event that additional samples are required, they will be determined by a trained, qualified site sampling supervisor or manager.

6.0 AIR AND WASTEWATER MANAGEMENT PLANS

6.1 CONTROL OF AIRBORNE PARTICULATES

Closure of the North and South Solvent Tanks will use FEMP Standard Operating Procedures (SOP) designed to minimize the generation of airborne particulates. These procedures have been established to prevent release of radioactivity to the air and require use of a HEPA vacuum to collect and control airborne particulate during dust generating activities. These procedures also effectively control airborne release of chemically contaminated particulates.

6.2 CONTROL OF RUNOFF TO SURFACE WATER

The North and South Solvent Tanks are equipped with secondary containment and, as such, prevent runoff to surface water. Water accumulated in the secondary containment during closure operations will be tested and treated, as necessary, prior to discharge through the FEMP WWTS. If water exhibits a hazardous characteristic, it will be containerized and stored onsite in the appropriate RCRA storage area.

6.3 CONTROL OF RINSEATE RUNOFF

Spill prevention and control measures will be employed during all closure operations, in accordance with FEMP SOPs and the SPCC. As discussed above, the HWMU is equipped with secondary containment. Section 2.3.1 describes actions to be taken to ensure the integrity of the secondary containment to prevent releases to the environment. Water accumulated in this dike will be handled as described above.

6.4 CONTROL OF HAZARDOUS CONSTITUENTS

If the North and South Solvent Tanks HWMU cannot be clean closed as described in Section 4.1, it will continue to be managed as a HWMU until dismantlement under the Interim ROD for OU3. At that time, the waste materials generated by dismantlement of the HWMU will be managed as low level radioactive, hazardous or mixed wastes as determined by waste characterization.

6.5 WASTEWATER TREATMENT

Liquid decontamination wastes will be collected, labeled, and stored in designated RCRA storage areas or 90-day accumulation areas. characterization is complete. Upon completion of characterization, the decontamination wastes are anticipated to be processed through the FEMP Waste Water Treatment System. If a visible sheen is present in the wastewater, the oil absorbent pads will be used to remove the sheen prior to entering the WWTS. The absorbent pads will be drummed pending waste characterization. Decontamination wastes will be managed in accordance with Sections 2.2. If the liquid wastes do not meet the requirements for processing through the WWTS, the waste will be stored in a storage area onsite until a treatment or disposal option can be established.

7.0 PERSONNEL SAFETY AND FIRE PREVENTION

North and South Solvent Tanks closure operations will be conducted in accordance with an approved Health and Safety Plan. Before initiating field operations, a health and safety briefing will be provided for all closure personnel. This briefing will address Health Safety Plan issues such as personal protective equipment (PPE), fire prevention, and any other pertinent information.

In order to minimize the potential for fires and their impact, proper fire prevention and protection procedures are necessary. The following list includes some fire prevention rules that will be implemented during the closure action.

- No smoking is allowed in the FEMP process area which houses the North and South Solvent Tanks.

- All sources of ignition are prohibited within a 50-foot radius of substances or operations which constitute a fire hazard. These operations or areas shall be posted with signs indicating: NO SMOKING OR OPEN FLAMES.

- All tanks, containers, and pumping equipment, whether portable or stationary, will be Underwriters Laboratory (UL) or Factory Mutual (FM) approved if they are being used for the storage or transfer of flammable and/or combustible liquids. Storage containers will also meet all applicable Occupational Safety and Health Administration (OSHA) regulations.

- Equipment requiring flammable liquid fuel will be shut down during refueling, servicing, or maintenance. This requirement can be waived for diesel-powered machinery serviced by a closed system provided that there are attachments to prevent spillage.

Additional fire prevention rules will be implemented if deemed necessary by the health and safety manager.

7.1 GUIDELINES FOR PREPARATION OF HEALTH AND SAFETY PLANS

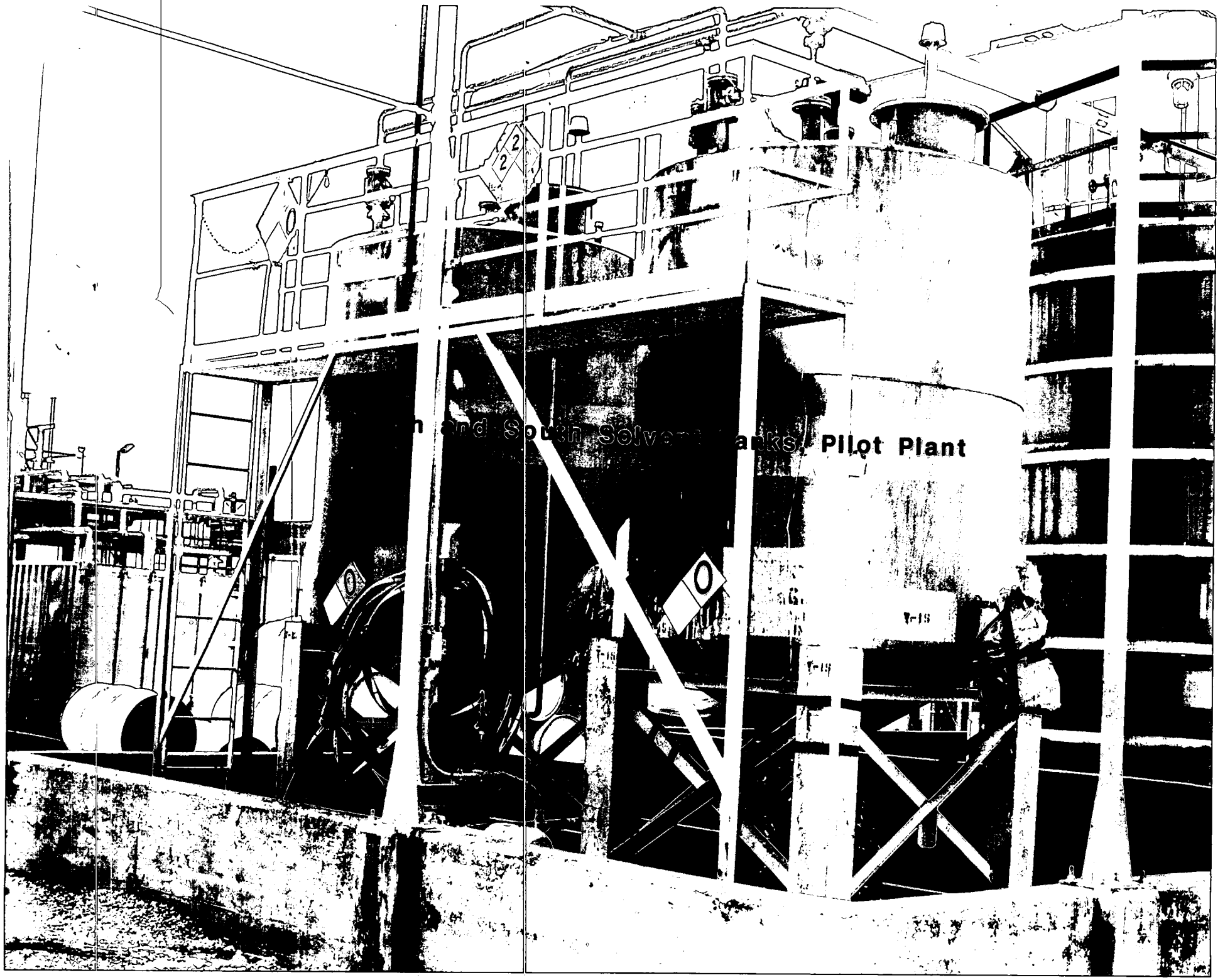
A Task/Project-Specific Health and Safety Plan, pursuant to requirements in the current FEMP Comprehensive Environmental Safety and Health Plan and Safe Shutdown Health and Safety Plan, will be required before RCRA closure activities are initiated. The specific procedures, including personnel and equipment decontamination procedures, will be based on the required health and safety hazard analysis that will characterize hazards and conditions applicable at the time. Appendix 7 includes a copy of the guidelines for the preparation of the Task/Project Specific Health and Safety Plan.

APPENDIX 1

PHOTOGRAPHS OF NORTH AND SOUTH SOLVENT TANKS AND SECONDARY CONTAINMENT

~~Revision 0~~
~~December 1993~~
REVISION 1
JANUARY 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030


2
2
Pilot Plant

SECONDARY CONTAINMENT OF NORTH/SOUTH SOLVENT TANKS
VIEW TO THE SOUTH

SECONDARY CONTAINMENT OF NORTH/SOUTH SOLVENT TANKS
VIEW TO THE SOUTH

SECONDARY CONTAINMENT OF NORTH/SOUTH SOLVENT TANKS
VIEW TO THE NORTH

SECONDARY CONTAINMENT OF NORTH/SOUTH SOLVENT TANKS
VIEW TO THE WEST

6482

APPENDIX 2

MANIFEST AND CERTIFICATE OF DISPOSAL - OAK RIDGE, TN.

AND ANALYTICAL DATA FROM TANKS 17A, 17B, AND 5B

~~Revision 0~~
~~December 1993~~
Revision 1
January 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

RCRA
OPERATING RECORD

6482

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. 0.H.6.8.9.0.0.0.8.9.7.6 | Manifest Document No. 9.3.0.0.1 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
U. S. Dept. of Energy, Fernald Environmental Mgmt. Project
7400 Willey Road, Fernald, OH 45030

A. State Manifest Document Number

4. Generator's Phone (513) 738-6200

B. State Generator's ID (TN)OKD98160536

5. Transporter 1 Company Name: Environmental Transportation Services | 6. US EPA ID Number: O.K.D.9.8.1.6.0.5.3.6.3 | C. State Transporter's ID (OH)53819-HW | D. Transporter's Phone 1-800-677-1772

7. Transporter 2 Company Name | 8. US EPA ID Number | E. State Transporter's ID | F. Transporter's Phone

9. Designated Facility Name and Site Address
U.S. Dept. of Energy, K-25 Site
Blair Road
Oak Ridge, TN 37831

10. US EPA ID Number: T.N.0.8.9.0.0.9.0.0.0.4

G. State Facility's ID

H. Facility's Phone (615) 574-3282

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. X RQ Waste Flammable Liquid, N.O.S., (D001), 3, UN1993, (PG III). C Contains Kerosene ~1	001	TT	4408	G	D001 D008
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
Diamyl Amyl Phosphonate & Kerosine,
Tributyl Phosphate & Kerosine Mixture
Net Weight 33080 lbs.

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Emergency Response Guide #27 Attached
Emergency Contact: FEMP/AEDO (513)738-6200
MEF #1952 Tank #'s 17A, 17B, 5B, T-1S & T-2S.
DISPOSAL #20566

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: John P. MUSKOFF Jr. | Signature: John P. Muskoff | Month 9 Day 4 Year 10 12 6193

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: David Bell | Signature: David Bell | Month 10 Day 12 Year 6193

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

FACILITY

19. Discrepancy Indication Space: Change authorized in Block 11-A per K.D. Crosson ms 4-26-93

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: On behalf of US DOE Mark Sanders | Signature: On behalf of US DOE Mark Sanders | Month 10 Day 12 Year 6193

ORIGINAL — RETURN TO GENERATOR

000055

U.S. EPA Form 8700-22

Read all instructions before completing this form.

This form has been designed for use on a 12-pitch (elite) typewriter; a firm point pen may also be used — press down hard.

Federal regulations require generators and transporters of hazardous waste and owners or operators of hazardous waste treatment, storage, and disposal facilities to use this form (8700-22) and, if necessary, the continuation sheet (Form 8700-22A) for both inter- and intrastate transportation.

Federal regulations also require generators and transporters of hazardous waste and owners or operators of hazardous waste treatment, storage and disposal facilities to complete the following information:

GENERATORS

Item 1. Generator's U.S. EPA ID Number — Manifest Document Number

Enter the generator's U.S. EPA twelve digit identification number and the unique five digit number assigned to this Manifest (e.g., 00001) by the generator.

Item 2. Page 1 of —

Enter the total number of pages used to complete this Manifest (i.e., the first page (EPA Form 8700-22) plus the number of Continuation Sheets (EPA Form 8700-22A), if any.

Item 3. Generator's Name and Mailing Address

Enter the name and mailing address of the generator. The address should be the location that will manage the returned Manifest forms.

Item 4. Generator's Phone Number

Enter a telephone number where an authorized agent of the generator may be reached in the event of an emergency.

Item 5. Transporter 1 Company Name

Enter the company name of the first transporter who will transport the waste.

Item 6. U.S. EPA ID Number

Enter the U.S. EPA twelve digit identification number of the first transporter identified in item 5.

Item 7. Transporter 2 Company Name

If applicable, enter the company name of the second transporter who will transport the waste. If more than two transporters are used to transport the waste, use a Continuation Sheet (EPA Form 8700-22A) and list the transporters in the order they will be transporting the waste.

Item 8. U.S. EPA ID Number

If applicable, enter the U.S. EPA twelve digit identification number of the second transporter identified in item 7.

Note — If more than two transporters are used, enter each additional transporter's company name and U.S. EPA twelve digit identification number in items 24-27 on the Continuation Sheet (EPA Form 8700-22A). Each Continuation Sheet has space to record two additional transporters. Every transporter used between the generator and the designated facility must be listed.

Item 9. Designated Facility Name and Site Address

Enter the company name and site address of the facility designated to receive the waste listed on this Manifest. The address must be the site address which may differ from the company mailing address.

Item 10. U.S. EPA ID Number

Enter the U.S. EPA twelve digit identification number of the designated facility identified in item 9.

Item 11. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number (UN/NA))

Enter the U.S. DOT Proper Shipping Name, Hazard Class, and ID Number (UN/NA) for each waste as identified in 49 CFR 172 through 177.

Note.—If additional space is needed for waste descriptions, enter these additional descriptions in item 26 on the Continuation Sheet (EPA Form 8700-22A).

Item 12. Containers (No. and Type)

Enter the number of containers for each waste and the appropriate abbreviation from Table I (below) for the type of container.

Table I — Types of Containers

DM = Metal drums, barrels, kegs	CY = Cylinders
DW = Wooden drums, barrels, kegs	CM = Metal boxes, cartons, cases (including roll-offs)
DF = Fiberboard or plastic drums, barrels, kegs	CW = Wooden boxes, cartons, cases
TP = Tanks portable	CF = Fiber or plastic boxes, cartons, cases
TT = Cargo tanks (tank trucks)	BA = Burlap, cloth, paper or plastic bags
TC = Tank cars	
DT = Dump truck	

Item 13. Total Quantity

Enter the total quantity of waste described on each line.

Item 14. Unit (Wt./Vol.)

Enter the appropriate abbreviation from Table II (below) for the unit of measure.

Table II — Units of Measure

G = Gallons (liquids only)	L = Liters (liquids only)
P = Pounds	K = Kilograms
T = Tons (2000 lbs.)	M = Metric tons (1000 kg.)
Y = Cubic yards	N = Cubic meters

Item 15. Special Handling Instructions and Additional Information

Generators may use this space to indicate special transportation, treatment, storage, or disposal information or Bill of Lading information. States may not require additional or different information in this space. For international shipments, generators must enter in this space the point of departure (City and State) for shipments destined for treatment, storage, or disposal outside the jurisdiction of the United States.

Item 16. Generator's Certification

The generator must read, sign (by hand), and date the certification statement in mode *other than* highway is used, the word "highway" should be lined out and appropriate mode (rail, water, or air) inserted in the space below. If another mode *in addition to* the highway mode is used, enter the appropriate additional (e.g., *and rail*) in the space below.

Primary exporters shipping hazardous wastes to a facility located outside the United States must add to the end of the first sentence of the certification the following words "and conforms to the terms of the EPA Acknowledgment of Consent the shipment."

In signing the waste minimization certification statement, those generators who have not been exempted by statute or regulation from the duty to make a waste minimization certification under section 3002(b) of RCRA are also certifying that they have complied with the waste minimization requirements.

Generators may preprint the words, "On behalf of" in the signature block or hand write this statement on the signature block prior to signing the generator certifications.

Note.—All of the above information *except* the handwritten signature required in item 16 may be preprinted.

TRANSPORTERS

Item 17. Transporter 1 Acknowledgement of Receipt of Materials

Enter the name of the person accepting the waste on behalf of the first transporter. That person must acknowledge acceptance of the waste described on the Manifest by signing and entering the date of receipt.

Item 18. Transporter 2 Acknowledgement of Receipt of Materials

Enter, if applicable, the name of the person accepting the waste on behalf of the second transporter. That person must acknowledge acceptance of the waste described on the Manifest by signing and entering the date of receipt.

Note.—International Shipments — Transporter Responsibilities

Exports—Transporters must sign and enter the date the waste left the United States in item 18 of Form 8700-22.

Imports—Shipments of hazardous waste regulated by RCRA and transported to the United States from another country must upon entry be accompanied by a U.S. EPA Uniform Hazardous Waste Manifest. Transporters who transport hazardous waste into the United States from another country are responsible for complying the Manifest (40 CFR 263.10(c)).

OWNERS AND OPERATORS OF TREATMENT, STORAGE, OR DISPOSAL FACILITIES

Item 19. Discrepancy Indication Space

The authorized representative of the designated or alternate facility's owner or operator must note in this space any significant discrepancy between the waste described on the Manifest and the waste actually received at the facility.

Owners and operators of facilities located in unauthorized States (i.e., those States that administers the hazardous waste management program) who cannot resolve significant discrepancies within 15 days of receiving the waste must submit to the Regional Administrator (see list below) a letter with a copy of the Manifest describing the discrepancy and attempts to reconcile it (40 CFR 264.72 and 265.72).

Owners and operators of facilities located in authorized States (i.e., those States that have received authorization from the U.S. EPA to administer the hazardous waste program) should contact their State agency for information on State Discrepancy Report requirements.

EPA Regional Administrators

Regional Administrator, U.S. EPA Region I, JF Kennedy Fed. Bldg., Boston, MA 02203

Regional Administrator, U.S. EPA Region II, 26 Federal Plaza, New York, NY 10

Regional Administrator, U.S. EPA Region III, 6th and Walnut Sts., Philadelphia, PA 19106

Regional Administrator, U.S. EPA Region IV, 345 Courtland St., NE., Atlanta, GA 30365

Regional Administrator, U.S. EPA Region V, 230 S. Dearborn St., Chicago, IL 60

Regional Administrator, U.S. EPA Region VI, 1201 Elm Street, Dallas, TX 75270

Regional Administrator, U.S. EPA Region VII, 324 East 11th Street, Kansas City, 64106

Regional Administrator, U.S. EPA Region VIII, 1860 Lincoln Street, Denver, 80295

Regional Administrator, U.S. EPA Region IX, 215 Freemont Street, San Francisco, CA 94105

Regional Administrator, U.S. EPA Region X, 1200 Sixth Avenue, Seattle, WA 98

Item 20. Facility Owner or Operator: Certification of Receipt of Hazardous Materials Covered by This Manifest Except as Noted in Item 19

Print or type the name of the person accepting the waste on behalf of the owner or operator of the facility. That person must acknowledge acceptance of the waste described on the Manifest by signing and entering the date of receipt.

Items A-K are not required by Federal regulations for intra- or interstate transportation. However, States may require generators and owners or operators of treatment, storage, or disposal facilities to complete some or all of items A-K as part of the manifest reporting requirements. Generators and owners and operators of treatment, storage, or disposal facilities are advised to contact State officials for guidance in completing the shaded areas of the Manifest.

10/91

MANAGEMENT OF HAZARDOUS WASTES SUBJECT TO LAND DISPOSAL RESTRICTIONS (N)

LDR NOTIFICATION/CERTIFICATION FORM B

Notice from Generator to Treatment Facility for Wastes that do not meet LDR Treatment Standards

<NOTICE>

The wastes identified on *manifest* number 93801 and bearing the EPA Hazardous Waste Number(s) D001, D008 are subject to the land disposal restrictions of 40 CFR Part 268. The wastes do not meet the treatment standards specified in Part 268 Subpart D or do not meet the prohibitions specified in 268.32 or RCRA section 3004(d). The treatment standards or prohibition levels applicable to each waste are identified below:

(Check all boxes that apply.)

☐ This shipment includes F001-F005 spent solvents, as identified on the attached sheet. (If this box is checked, attach Table A.1, check the hazardous waste number(s) that applies, and circle or otherwise identify individual constituents likely to be present in the waste.)

☐ This shipment includes F039 multi-source leachate, as identified on the attached sheet(s). (If this box is checked, attach Table A.2 and circle or otherwise identify individual constituents likely to be present in the waste.)

☐ This shipment includes RCRA Section 3004(d) California list wastes, as identified on the attached sheet. (If this box is checked, attach Table A.3 and circle or otherwise indicate individual constituents likely to be present in the waste.)

☒ This shipment includes additional wastes identified below:

Hazardous Waste No.[1]	Subcategory[2]	Treatability group[3]	CFR reference for treatment standard[4]	Five-letter code(s)[5]
D001	High TOC > 10%	Non-W.W.	268.42	FSUBS; RORGS (or, INCIN
D008	(Lead)	Non-W.W.	268.41(a)	—

[1] Hazardous waste numbers can be determined from 40 CFR 261 Subparts C and D, e.g., D009.
[2] Subcategory (if any) can be determined from 268 Subpart D, e.g., low-mercury subcategory.
[3] Treatability group is either "wastewater" or "nonwastewater."
[4] To find the CFR reference for the treatment standard, look up the waste in 268.41(a) - Table CCWE: 268.42(a)(1), (a)(2), (c), and Tables 2 and 3; and 268.43(a) – Table CCW. The reference must include both the section and paragraph where the treatment standard is found, e.g., 268.42(a).
[5] Wherever the CFR reference is 268.42, a five-letter code (e.g. INCIN) from 268 Subpart D or 268 Appendix VI must be included.

A waste analysis for these wastes is attached, where available.

Source: McCoy and Associates, Inc., "The RCRA Land Disposal Restrictions: A Guide to Compliance, 1991 Edition," adapted from 268.7(a)(1)

This form completed by:
John Muskoff (Waste Characterization Group) JMJ 1-27-93

MARTIN MARIETTA

6482

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

June 28, 1993

K. Crossen
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

Certificate of Disposal

Enclosed you will find Certificate(s) of Disposal for waste destroyed at the TSCA Incinerator. The enclosed Certificate(s) of Disposal are listed below. Please sign, date, and return upon receipt.

If you have any questions, please do not hesitate to call.

B. S. Snyder

B. S. Snyder, K-1435I, MS 7345 (6-4976)

Enclosures:

1. COD# 0162 (Dac 20566)

cc/enc: B. V. Wojtowicz
File

I have received the Certificate(s) of Disposal for waste destroyed at the TSCA Incinerator.
COD# 0162 (Dac 20566)

Kevin P. Crosson
Signature

July 22, 1993
Date Received

000058

CERTIFICATE OF DISPOSAL

COD# 0162

DISPOSAL FACILITY NAME: US DOE K-25 SITE
P.O. BOX 2003 HWY 58 AT BLAIR RD.
OAK RIDGE, TN 37831-7345

EPA ID# TN 0890090004

Reference Manifest Number(s): OH6890008976-93001

Generator Facility: US DOE Fernald Environmental Management Project
7400 Willey Road
Fernald, OH 45030

I certify that the following identified Resource Conservation and Recovery Act (RCRA) Hazardous liquid waste, excluding the drums, was properly treated in an incinerator compliant with and for which such treatment is applicable under 40 CFR 268, Subpart D on June 27, 1993.

Request for Disposal	Container Numbers
20566	Shipment #1 (Tanker)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate, and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as a company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

TSCA Incinerator Division Director	Badge Number	Date Issued
[signature]	8771	6/28/93

SUMMARY OF ANALYTICAL DATA FOR TANKS 17A, 17B, AND 5B

THE ANALYTICAL RESULTS FROM TANKS 17A, 17B, AND 5B ARE ATTACHED. THE SAMPLE ANALYSES WERE COMPLETED PRIOR TO SHIPPING THE CONTENTS OF TANKS T1S AND T2S (NORTH AND SOUTH SOLVENT TANKS), TANKS 17A AND 17B, AND TANK 5B. IT SHOULD BE NOTED THAT TANKS 5B, 17A, AND 17B ARE NOT PART OF HWMU NO. 52.

THE TANK CONTENTS WERE ANALYZED IN JUNE 1992 BY MARTIN MARIETTA TO PROVIDE THE K-25 TSCA INCINERATOR IN OAK RIDGE, TENNESSEE, WITH THE INFORMATION REQUIRED TO ACCEPT THE WASTE FOR DISPOSAL. HOWEVER, THE ANALYTICAL RESULTS DID NOT PROVIDE ALL OF THE INFORMATION REQUIRED TO MAKE A HAZARDOUS WASTE DETERMINATION. IN PARTICULAR, SOME RESULTS FOR THE TOXICITY CHARACTERISTIC (TC) METALS WERE SHOWN TO BE AT OR BELOW DETECTION LIMITS, AND THESE DETECTION LIMITS WERE ABOVE THE TCLP REGULATORY THRESHOLD LEVELS. IN ADDITION, NO SAMPLE PLAN COULD BE OBTAINED TO DEMONSTRATE HOW THE 1992 SAMPLING WAS PERFORMED. THEREFORE, IT WAS DECIDED TO DEVELOP A CHARACTERIZATION SAMPLING PLAN AND RESAMPLE THE TANKS IN MARCH 1993.

THE SAMPLE RESULTS OBTAINED FROM THE MARCH 1993 SAMPLING EVENT WERE USED EXCLUSIVE OF THE MARTIN MARIETTA RESULTS (JUNE 1992) IN MAKING THE FINAL HAZARDOUS WASTE DETERMINATION OF THE WASTE. THE RESULTS INDICATED THAT THE CONTENTS OF TANK 5B WERE HAZARDOUS FOR LEAD AND IGNITABILITY (D001 AND D008). IT WAS DECIDED TO CARRY THESE TWO WASTE CODES THROUGH AFTER CONSOLIDATING THE TANK CONTENTS (TANKS 17A, 17B, 5B, AND NORTH AND SOUTH SOLVENT TANKS) FOR TRANSPORTATION. THESE TWO WASTE CODES WERE IDENTIFIED IN BOX I OF THE MANIFEST.

6482

ANALYTICAL DATA

FOR TANKS 5B AND 17A

MARCH 1993

Sampling Plan: REQ 227
Mat. Type: DAAP and TBP
Revised: 3-11-93

Review of Analyses

ATTACHMENT B
Part I

Rev. MK IV
CMW

Lab No. / Cust. No.	Organic Constituent(s):	Total (ppm)	Metal Constituent(s):	TCLP (ppm)	Radiological Constituent(s):		Other Analyses:		Rel #/ Lab	Date Met ?
930119-073	ALL		Arsenic	0.052	Alpha(pCi/ml)	56	FP	91	2634	Y Hg
92-227-5717	ANALYTES		Barium	11.8	Beta(pCi/ml)	110			CTC	Y VOA
SPA - 1(Tank 5B)	BELOW		Chromium	3.27						
2 Ph (Liquid)	DETECTION		Cadmium	0.0106						
87.5%	LIMITS		Silver	0.0286						
			Mercury	0.0067						
			Selenium	<0.005						
			Lead	11.34						
930119-074	ALL		Arsenic	<0.01	Alpha(pCi/ml)	70	FP	105	2634	Y Hg
92-227-5722	ANALYTES		Barium	<0.2	Beta(pCi/ml)	79			CTC	Y VOA
SPA - 2(Tank 5B)	BELOW		Chromium	0.0145						
2 Ph (Organic)	DETECTION		Cadmium	<0.005						
12.5%	LIMITS		Silver	<0.01						
			Mercury	0.0508						
			Selenium	0.008						
			Lead	0.037						
930119-075	ALL		Arsenic	<0.01	Alpha(pCi/ml)	760	FP	>200	2634	Y Hg
92-227-5718	ANALYTES		Barium	<0.2	Beta(pCi/ml)	460			CTC	Y VOA
SP-B(Tank 17A)	BELOW		Chromium	<0.01						
1 Ph (Organic)	DETECTION		Cadmium	<0.005						
	LIMITS		Silver	<0.01						
			Mercury	0.0428						
			Selenium	<0.005						
			Lead	0.009						

Sampling Plan: REQ 227
Mat. Type: DAAP and TBP
Revised: 3-11-93

Review of Analyses

ATTACHMENT B
Part I

Rev. MKM CMW

Lab No. / Cust. No.	Organic Constituent(s):	Total (ppm)	Metal Constituent(s):	TCLP (ppm)	Radiological Constituent(s):		Other Analyses:		Rel #/ Lab	Date Met ?
930119-076	ALL		Arsenic	<0.01	Alpha(pCi/ml)	770	FP	144	2634	Y Hg
92-227-5719	ANALYTES		Barium	<0.2	Beta(pCi/ml)	400			CTC	Y VOA
SP-C(SP-B DUP)	BELOW		Chromium	0.0108						
1 Ph (Organic)	DETECTION		Cadmium	<0.005						
	LIMITS		Silver	<0.01						
			Mercury	0.0507						
			Selenium	<0.005						
	TCLP VOA - BDL		Lead	0.024						
930125-087	Not		Arsenic	<0.01	Alpha(pCi/ml)	390	FP	150	2661	Y Hg
92-227-5725	Requested		Barium	<0.2	Beta(pCi/ml)	200			TCT	Y VOA
SP - A(Tank 1S)			Chromium	0.0227						
1 Ph (Liquid)			Cadmium	<0.005						
			Silver	<0.01						
			Mercury	0.0043						
			Selenium	<0.005						
	TCLP VOA - BDL		Lead	0.014						
930119-071	MIBK	4.0	ALL *		Alpha(pCi/ml)	<0.08	FP	NOT	2634	Y Hg
92-227-5715			ANALYTES		Beta(pCi/ml)	<0.18		REQUESTED	CTC	Y VOA
Field Blank			BELOW							
			DETECTION							
			LIMITS							

6482

ANALYTICAL DATA

FOR TANKS 5B, 17A AND 17B

JUNE 1992

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322 - 055

General Plant Westinghouse

Department _____

Generator EPA ID No. OH 6890008976

Quantity 100 (Lbs. or (Gal.) - Indicate one by circling

PCB _____ Non-PCB ✓

Tank 5-B

Drum Numbers:

NA					

Prepared by M. J. Hamel date 6/20/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-055

WASTE FORM

[✓] Liquid [ ] Solid [ ] Sludge

WASTE SOLUBILITY

[ ] Water Soluble [ ] Water Insoluble

GENERAL DESCRIPTION OF WASTE (check the boxes that best describe the waste constituency)

EPA Hazardous Waste Identification Code(s): _____

Is this waste classified as a carcinogen? [ ] yes [ ] no

TSCA Incinerator Waste Stream Identification Number: _____

	Constituent	Weight %		Constituent	Weight %
[✓]	Oil	.6 %	[ ]	Alcohols	_____ %
[ ]	Glycols	_____ %	[ ]	Water content	_____ %
[ ]	Liquid Scintillation Counting Solutions	_____ %	[ ]	soil	_____ %
[ ]	Discarded chemicals (describe)	_____ %	[ ]	Uncontainerized bulk solids (describe)	_____ %
[ ]	Miscellaneous solid laboratory waste (describe)	_____ %	[ ]	Organic solvents (specify VOA results)	_____ %
[ ]	Other (describe)	_____ %	[ ]	Unknown[a]	_____ %
	_____	_____ %			
	_____	_____ %			

Drummed Waste Certification:

Minimum 1 year drum shelf life:	[ ] yes	[ ] no
Drum Liner Compatibility	[ ] yes	[ ] no
Minimum 15% drum freeboard:	[ ] yes	[ ] no

[a] If process knowledge is inadequate to categorize the waste stream (i.e., percentage totals less than 75 %) report the results of analysis for total petroleum hydrocarbon and infrared analysis.

Prepared by _____ date _____

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
PHYSICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-055

PHYSICAL Parameters

Specific Gravity	.982	Heating Value (BTU/lb)	5818
Flash Point (°F)	>145	Ash Content (weight %)	1.11
Number of phases	2		

ANALYSIS OF PHYSICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Viscosity (cp)	5000		Viscosity (cp)	5000	10.96
Corrosivity (mm/yr)	< 6.35		Corrosivity (mm/yr)	< 6.35	<34
OR			OR		
pH (aqueous)	> 8-10		pH (aqueous)	8 -10	3 L

Prepared by M. L. Hewell date 6/26/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
CHEMICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____ Laboratory Number _____

METAL ANALYSIS

Metal	Result (µg/g)	Metal	Result (µg/g)	Metal	Result (µg/g)
Antimony	<8.1	Lithium	<0.65	Selenium	<8.1
Arsenic	<8.1	Magnesium	59	Sodium	59
Barium	11	Manganese	210	Thallium	<1.6
Copper	2.9	Nickel	4.5	Titanium	1.6
Iron	50	Silver	<0.98		

Drummed Liquids			Bulk Liquids		
Parameter	Limit (ppm)	Result (ppm)	Parameter	Limit (ppm)	Result (ppm)
Aluminum	20,000	_____	Aluminum	11,000	23
Beryllium	10	_____	Beryllium	5.0	<0.049
Cadmium	1,500	_____	Cadmium	500	<0.49
Chromium	6,000	_____	Chromium	3,300	8.6
Lead	2,500	_____	Lead	2,000	9.2
Mercury	200	_____	Mercury	60	<0.5
Zinc	65,000	_____	Zinc	65,000	1.5

URANIUM ANALYSIS

NOTE: Duplicate analysis required for criticality control. Uranium-235 assay is optional if Total Uranium analysis shows less than 5 ppm. Estimates based on process knowledge are adequate.

Analysis #1		Analysis #2	
Total Uranium	690 ppm	Total Uranium	1700 ppm
Uranium-235	1.04 % by weight	Uranium-235	1.03 % by weight

	Limit	Result	Uncertainty
Pu-239	246 pCi/g or 4 ppb	4.07E-1	+/- 5.8E-1

Prepared by M. L. Hoover date 6/26/92

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
CHEMICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-055

NON-METAL CHEMICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Total Chloride	89.0 %	_____ %	Total Chloride	89.0 %	<.05 %
Total Sulfur	6.0 %	_____ %	Total Sulfur	10.0 %	<.05 %
Total Fluoride	85.0 %	_____ %	Total Fluoride	25.0 %	.0047 %

Phosphorus 16,000 ppm

Water N.R. % by weight *

PCB ~~2200~~ 2.2 u ppm or _____ % by weight

Provide the following information (if applicable and known) for any equipment from which PCB wastes are removed:

Date removed from service _____

Does this waste contain brominated compounds? [] yes [] no

* Not required unless requested by TSCA Operations.

Prepared by M. L. Howell date 6/26/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART III
RADIONUCLIDE PARAMETERS
ALL SITES EXCEPT ORNL

Disposal Number _____ Laboratory Number 920322-055

NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)	NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)
Tc^{99}	6.87E1	+/- 6.0E1	Pa^{234m}	3.62E1	+/- 1.8E1
Cs^{137}	-1.76E-2	+/- 1.3E-1	U-alpha	2.83E1	+/- 3.1
Th^{228}	8.72E-2	+/- 1.7E-1	Np^{237}	4.68	+/- 2.0
Th^{230}	8.72E-2	+/- 5.5E-1	Pu^{238}	1.02	+/- 9.1E-1
Th^{232}	8.72E-2	+/- 1.7E-1	Pu^{239}	4.07E-1	+/- 5.8E-1
Th^{234}	2.08E1	+/- 1.7	Alpha	7.37E1	+/- 4.2
_____	_____	_____	Beta	4.74E1	+/- 2.8

SCREENING ANALYSIS

Gross Radioactivity Measured 1.55E3 ± 2.5E1 (pCi/g)

- Identify and quantify other radionuclides present in the waste, but not included on this list. Include explanation if any listed radionuclides are not expected to be present in the waste.

Prepared by M.L. Howell date 6/26/93

*This limit corresponds to 4 ppb (parts per billion).

TSCA INCINERATOR OPERATIONS
FIGURE 3.10. WASTE ANALYSIS FORM PART III
RADIONUCLIDE PARAMETERS
ORNL

Disposal Number _____ Laboratory Number _____

NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)	NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)
H^3			Th^{228}		
C^{14}			Th^{230}		
Co^{57}			Th^{232}		
Co^{60}			Th^{234}		
Kr^{85}			Pa^{234m}		
Sr^{90}			U-alpha		
Tc^{99}			Np^{237}		
I^{131} a			Pu^{238}		
Cs^{137}			Pu^{239}		
_____ b			_____		
_____			_____		

SCREENING ANALYSIS

Gross Radioactivity Measured _____ ± _____ (pCi/g)

See Attached page for additional comment

a If the waste has been in storage for more than six months, analysis for I^{131} is not required.

b Identify and quantify other radionuclides present in the waste, but not included on this list. Include explanation if any listed radionuclides are not expected to be present in the waste.

Prepared by _____ date _____

*This limit corresponds to 4 ppb (parts per billion).

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-052

General Plant Westinghouse

Department _____

Generator EPA ID No. OH6890008976

Quantity 1922 (Lbs. or Gal) - Indicate one by circling

PCB _____ Non-PCB ✓

TANK 17-A

Drum Numbers:

NA					

Prepared by _____ date _____

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-052

WASTE FORM

[✓] Liquid [ ] Solid [ ] Sludge

WASTE SOLUBILITY

[ ] Water Soluble [ ] Water Insoluble

GENERAL DESCRIPTION OF WASTE (check the boxes that best describe the waste constituency)

EPA Hazardous Waste Identification Code(s): _____

Is this waste classified as a carcinogen? [ ] yes [ ] no

TSCA Incinerator Waste Stream Identification Number: _____

	Constituent	Weight %		Constituent	Weight %
[✓]	Oil	68.78 %	[ ]	Alcohols	_____ %
[ ]	Glycols	_____ %	[ ]	Water content	<0.01 %
[ ]	Liquid Scintillation Counting Solutions	_____ %	[ ]	soil	_____ %
[ ]	Discarded chemicals (describe)	_____ %	[ ]	Uncontainerized bulk solids (describe)	_____ %
[ ]	Miscellaneous solid laboratory waste (describe)	_____ %	[ ]	Organic solvents (specify VOA results)	_____ %
[ ]	Other (describe)	_____ %	[ ]	Unknown*	_____ %
	_____	_____ %			
	_____	_____ %			

Drummed Waste Certification: Minimum 1 year drum shelf life: [ ] yes [ ] no
Drum Liner Compatibility [ ] yes [ ] no
Minimum 15% drum freeboard: [ ] yes [ ] no

_____

* If process knowledge is inadequate to categorize the waste stream (i.e., percentage totals less than 75 %) report the results of analysis for total petroleum hydrocarbon and infrared analysis.

Prepared by _____ date _____

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
PHYSICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-052

PHYSICAL Parameters

Specific Gravity	0.844	Heating Value (BTU/lb)	17,540
Flash Point (°F)	> 145	Ash Content (weight %)	0.69
Number of phases	1		

ANALYSIS OF PHYSICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Viscosity (cp)	5000		Viscosity (cp)	5000	7.97
Corrosivity (mm/yr)	< 6.35		Corrosivity (mm/yr)	< 6.35	< 6.35
OR			OR		
pH (aqueous)	> 8-10		pH (aqueous)	8 -10	8 <

Prepared by M. L. Howell date 6/26/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
CHEMICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____ Laboratory Number 920322-052

METAL ANALYSIS

Metal	Result (µg/g)	Metal	Result (µg/g)	Metal	Result (µg/g)
Antimony	<8.2	Lithium	<0.66	Selenium	<8.2
Arsenic	<8.2	Magnesium	<0.49	Sodium	7.2
Barium	0.57	Manganese	<0.16	Thallium	<1.6
Copper	<0.66	Nickel	<1.6	Titanium	<0.49
Iron	2.9	Silver	<0.99		

Parameter	Drummed Liquids Limit (ppm)	Result (ppm)	Parameter	Bulk Liquids Limit (ppm)	Result (ppm)
Aluminum	20,000	_____	Aluminum	11,000	<3.3
Beryllium	10	_____	Beryllium	5.0	<0.049
Cadmium	1,500	_____	Cadmium	500	<0.49
Chromium	6,000	_____	Chromium	3,300	3.2
Lead	2,500	_____	Lead	2,000	<8.2
Mercury	200	_____	Mercury	60	<0.5
Zinc	65,000	_____	Zinc	65,000	0.76

URANIUM ANALYSIS

NOTE: Duplicate analysis required for criticality control. Uranium-235 assay is optional if Total Uranium analysis shows less than 5 ppm. Estimates based on process knowledge are adequate.

Analysis #1 Total Uranium	890	ppm	Analysis #2 Total Uranium	900	ppm
Uranium-235	.93	% by weight	Uranium-235	.91	% by weight

	Limit	Result	Uncertainty
Pu-239	246 pCi/g or 4 ppb	1.05E-1	+/- 2.1E-1

Prepared by M. L. Hamel date 6/26/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
CHEMICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-052

NON-METAL CHEMICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Total Chloride	89.0 %	_____ %	Total Chloride	89.0 %	2.05 %
Total Sulfur	6.0 %	_____ %	Total Sulfur	10.0 %	2.05 %
Total Fluoride	85.0 %	_____ %	Total Fluoride	25.0 %	.002 %

Phosphorus 33,000 ppm

Water N.R. % by weight *

PCB 5.00 ppm or _____ % by weight

Provide the following information (if applicable and known) for any equipment from which PCB wastes are removed:

Date removed from service _____

Does this waste contain brominated compounds? [] yes [] no

* Not required unless requested by TSCA Operations.

Prepared by M. L. Harrell date 6/26/92

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TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART III
RADIONUCLIDE PARAMETERS
ALL SITES EXCEPT ORNL

Disposal Number _____ Laboratory Number 920322-052

NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)	NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)
Tc^{99}	2.46E2	+/- 8.2E1	Pa^{234m}	1.32E2	+/- 2.3E1
Cs^{137}	5.61E-2	+/- 2.0E-1	U-alpha	2.25E1	+/- 3.2
Th^{228}	0 s	+/- 3.4E-1	Np^{237}	1.36	+/- 7.5E-1
Th^{230}	0 s	+/- 3.4E-1	Pu^{238}	5.23E-1	+/- 4.7E-1
Th^{232}	0 s	+/- 3.4E-1	Pu^{239}	1.05E-1	+/- 2.1E-1
Th^{234}	1.32E2	+/- 2.9	Alpha *	8.64E2	+/- 1.5E1
_____	_____	_____	Beta	5.79E2	+/- 9.7

SCREENING ANALYSIS

Gross Radioactivity Measured 1.31E3 ± +/- 2.4E1 (pCi/g)

* Identify and quantify other radionuclides present in the waste, but not included on this list. Include explanation if any listed radionuclides are not expected to be present in the waste.

Prepared by M. L. Harrell date 6/26/92

*This limit corresponds to 4 ppb (parts per billion).

TSCA INCINERATOR OPERATIONS
FIGURE 3.10. WASTE ANALYSIS FORM PART III
RADIONUCLIDE PARAMETERS
ORNL

Disposal Number _____ Laboratory Number _____

NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)	NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)
H^3			Th^{228}		
C^{14}			Th^{230}		
Co^{57}			Th^{232}		
Co^{60}			Th^{234}		
Kr^{85}			Pa^{234m}		
Sr^{90}			U-alpha		
Tc^{99}			Np^{237}		
I^{131} a			Pu^{238}		
Cs^{137}			Pu^{239}		
_____ b			_____		
_____			_____		

SCREENING ANALYSIS

Gross Radioactivity Measured _____ ± _____
(pCi/g)

See Attached page for additional comment

a If the waste has been in storage for more than six months, analysis for I^{131} is not required.

b Identify and quantify other radionuclides present in the waste, but not included on this list. Include explanation if any listed radionuclides are not expected to be present in the waste.

Prepared by _____ date _____

This limit corresponds to 4 ppb (parts per billion).

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TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-050

General Plant Westinghouse

Department _____

Generator EPA ID No. OH6890008976

Quantity 6.52. (Lbs. or Gal.) - Indicate one by circling

PCB ✓ Non-PCB ~~✓~~

Tank #170

Drum Numbers:

NA					

Prepared by _____ date _____

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-050

WASTE FORM

[X] Liquid [ ] Solid [ ] Sludge

WASTE SOLUBILITY

[ ] Water Soluble [ ] Water Insoluble

GENERAL DESCRIPTION OF WASTE (check the boxes that best describe the waste constituency)

EPA Hazardous Waste Identification Code(s): _____

Is this waste classified as a carcinogen? [ ] yes [ ] no

TSCA Incinerator Waste Stream Identification Number: _____

	Constituent	Weight %		Constituent	Weight %
[X]	Oil	.22 %	[ ]	Alcohols	_____ %
[ ]	Glycols	_____ %	[ ]	Water content	94 %
[ ]	Liquid Scintillation Counting Solutions	_____ %	[ ]	soil	_____ %
[ ]	Discarded chemicals (describe)	_____ %	[ ]	Uncontainerized bulk solids (describe)	_____ %
[ ]	Miscellaneous solid laboratory waste (describe)	_____ %	[ ]	Organic solvents (specify VOA results)	_____ %
[ ]	Other (describe)	_____ %	[ ]	Unknown[a]	_____ %
	_____	_____ %			
	_____	_____ %			

Drummed Waste Certification: Minimum 1 year drum shelf life: [ ] yes [ ] no
Drum Liner Compatibility [ ] yes [ ] no
Minimum 15% drum freeboard: [ ] yes [ ] no

[a] If process knowledge is inadequate to categorize the waste stream (i.e., percentage totals less than 75 %) report the results of analysis for total petroleum hydrocarbon and infrared analysis.

Prepared by _____ date _____

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TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
PHYSICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-050

PHYSICAL Parameters

Specific Gravity	0.981	Heating Value (BTU/lb)	< 50
Flash Point (°F)	> 145	Ash Content (weight %)	0.48
Number of phases	1		

ANALYSIS OF PHYSICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Viscosity (cp)	5000	_____	Viscosity (cp)	5000	6.47
Corrosivity (mm/yr)	< 6.35	_____	Corrosivity (mm/yr)	< 6.35	< 6.35
OR			OR		
pH (aqueous)	> 8-10	_____	pH (aqueous)	8 -10	6 L

Prepared by M. L. Howell date 6/26/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
CHEMICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____ Laboratory Number 920322-050

METAL ANALYSIS

Metal	Result (µg/g)	Metal	Result (µg/g)	Metal	Result (µg/g)
Antimony	<8.1	Lithium	<0.65	Selenium	<8.1
Arsenic	<8.1	Magnesium	210	Sodium	27
Barium	210	Manganese	2.2	Thallium	<1.6
Copper	2.5	Nickel	4.5	Titanium	5.1
Iron	180	Silver	<0.98		

Drummed Liquids			Bulk Liquids		
Parameter	Limit (ppm)	Result (ppm)	Parameter	Limit (ppm)	Result (ppm)
Aluminum	20,000	_____	Aluminum	11,000	32
Beryllium	10	_____	Beryllium	5.0	<0.049
Cadmium	1,500	_____	Cadmium	500	<0.49
Chromium	6,000	_____	Chromium	3,300	4.1
Lead	2,500	_____	Lead	2,000	<8.1
Mercury	200	_____	Mercury	60	<0.5
Zinc	65,000	_____	Zinc	65,000	2.0

URANIUM ANALYSIS

NOTE: Duplicate analysis required for criticality control. Uranium-235 assay is optional if Total Uranium analysis shows less than 5 ppm. Estimates based on process knowledge are adequate.

Analysis #1		Analysis #2	
Total Uranium	200 ppm	Total Uranium	170 ppm
Uranium-235	.71 % by weight	Uranium-235	.68 % by weight

	Limit	Result	Uncertainty
Pu-239	246 pCi/g or 4 ppb	1.27E-1	+/- 2.5E-1

Prepared by M.J. Howell date 6/26/92

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
CHEMICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-050

NON-METAL CHEMICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Total Chloride	89.0 %	_____ %	Total Chloride	89.0 %	< .05 %
Total Sulfur	6.0 %	_____ %	Total Sulfur	10.0 %	< .05 %
Total Fluoride	85.0 %	_____ %	Total Fluoride	25.0 %	.004 %

Phosphorus 450 ppm

Water N.R. % by weight *

PCB .2004 ppm or _____ % by weight

Provide the following information (if applicable and known) for any equipment from which PCB wastes are removed:

Date removed from service _____

Does this waste contain brominated compounds? [] yes [] no

* Not required unless requested by TSCA Operations.

Prepared by M. L. Howell date 6/26/92

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART III
RADIONUCLIDE PARAMETERS
ALL SITES EXCEPT ORNL

Disposal Number _____ Laboratory Number 920322-050

NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)	NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)
Tc^{99}	1.74E2	+/- 6.3E1	Pa^{234m}	6.59E1	+/- 3.0E1
Cs^{137}	1.17E-1	+/- 2.2E-1	U-alpha	5.27E1	+/- 4.2
Th^{228}	1.99 J	+/- 8.3E-1	Np^{237}	5.07E-1	+/- 5.1E-1
Th^{230}	2.13E2 J	+/- 8.6	Pu^{238}	1.01	+/- 7.2E-1
Th^{232}	2.94 J	+/- 1.0	Pu^{239}	1.27E-1	+/- 2.5E-1
Th^{234}	2.49E1	+/- 2.4	Alpha *	4.98E2	+/- 1.1E1
_____	_____	_____	Beta	6.79E2	+/- 9.7

SCREENING ANALYSIS

Gross Radioactivity Measured 9.85E2 J ± 2.0E1 (pCi/g)

- Identify and quantify other radionuclides present in the waste, but not included on this list. Include explanation if any listed radionuclides are not expected to be present in the waste.

Prepared by M.L. Harrell date 6/26/92

*This limit corresponds to 4 ppb (parts per billion).

TSCA INCINERATOR OPERATIONS
FIGURE 3.10. WASTE ANALYSIS FORM PART III
RADIONUCLIDE PARAMETERS
ORNL

Disposal Number _____ Laboratory Number _____

NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)	NUCLIDE	RESULTS (pCi/g)	UNCERTAINTY (pCi/g)
H^3			Th^{228}		
C^{14}			Th^{230}		
Co^{57}			Th^{232}		
Co^{60}			Th^{234}		
Kr^{85}			Pa^{234m}		
Sr^{90}			U-alpha		
Tc^{99}			Np^{237}		
I^{131} a			Pu^{238}		
Cs^{137}			Pu^{239}		
_____ b			_____		
_____			_____		

SCREENING ANALYSIS

Gross Radioactivity Measured _____ ± _____ (pCi/g)

See Attached page for additional comment

a If the waste has been in storage for more than six months, analysis for I^{131} is not required.

b Identify and quantify other radionuclides present in the waste, but not included on this list. Include explanation if any listed radionuclides are not expected to be present in the waste.

Prepared by _____ date _____

*This limit corresponds to 4 ppb (parts per billion).

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APPENDIX 3

STATUS REPORT OF NORTH AND SOUTH SOLVENT TANKS

~~Revision 0~~
~~December 1993~~
Revision 1
January 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

FERMCO
Restoration Management Corporation

6482

RCRA OPERATING REC

INTEROFFICE MEMORANDUM

To:	Rick Enneking	Date:	May 4, 1993
Location:	Fernald	Reference:	
From:	James J. Campbell	FERMCO #:	M:RSO:(OP):93-162
Location:	Plant 8, M.S. 61	Client:	DOE DE-AC05-920R21972
Extension:	6798	Subject:	Hazardous Waste Management Unit #52 - North & Sought Solvent Tank

c: File 106.4.10.04
Robert Bischoff
Brenda Perkins

The north and south Solvent Tanks - HWMU #52 at the Pilot Plant was opened on April 28, 1993 to verify that they are empty. Both tanks are empty.

JJC/mke

Fernald Environmental
FERMCO
Restoration Management Corporation

INTEROFFICE MEMORANDUM

To:	Bob Bischoff	**Date:**	May 5, 1993
Location:	Fernald	**Reference:**	M:RSO:(OP):93:162
From:	Darryl Howe	**FERMCO #:**	M:ESH:EP:93:295
Location:	Fernald	**Client:**	DOE DE-AC05-920R21972
Extension:	6397	**Subject:**	North & South Solvent Tank (HWMU #52)

c: File Record Storage Copy 106.4.9.2
Bob Gardner
Stu Hinnefeld
Sue Hoskins
Joey Macy
Brenda Perkins
Otto Pollard

HWC&FI File
RCRA Operating Record

Attached is a copy of a memo from James J. Campbell verifying that the North ar South Solvent Tanks (HWMU #52) at the Pilot Plant are empty. Subsequently, th daily RCRA inspection intervals can now be changed to weekly intervals. A Chanc In Operation (CIO) to procedure 20-C-616 to incorporate this change is process.

Please feel free to call me on extension 6397 if you have any questions.

DLH:SH:kdh
Attachment

CC0088

[redacted]

North & South Solvent Tanks (P.Pit) 6482

Inspector's Name: William Wilson	Date: 4-21-93	Time: 10 [illegible]
Facility Owner's Signature: Rick Bischoff MSD	Date: 4-21-93	Time: 14:[illegible]

Item No.	Item Description	Accept-able	Unaccept-able	Observations/Corrective Actions To Be Completed	Date Act Complete
1	Signs: Danger-Authorized Personnel Only	✓			
2	No Smoking or Open Flame	✓			
3	Emergency Contact & Prior To Entry	✓			
4	Overfill/Spill Control Equipment	✓			
5	Corrosion Or Release Of Waste	✓		Drip containment OK	
6	Monitoring Equip. In Place (Content Level)	✓		Monitoring Equipment Doesn't Exist	
7	Surrounding Area And Unit Integrity	✓			
8	Secondary Containment Condition	✓			
9	Emergency & Spill Response Equipment	✓			
10	Manway Seal Unbroken	✓			
11	Boundary Markers (Chains. Rope. etc.)	✓			

Comments: North & South Tanks Pumped empty 4/21/93

Distribution:
Facility Owner: Facility owner reviews, signs and distributes log to: RCRA Field Implementation

RCRA Field Implementation Signature: [signature]	Date: 4-28-93

HWMU 52
NORTH & SOUTH SOLVENT TANKS (P. Pit)
Figure 52

APPENDIX 4

NORTH AND SOUTH SOLVENT TANK CONTENTS - ANALYTICAL DATA

~~Revision 0~~
~~December 1993~~
Revision 1
January 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

6482

1993

ANALYTICAL DATA

OF THE CONTENTS

IN THE

NORTH AND SOUTH

SOLVENT TANKS

6482

FERMCO Analytical Laboratory
Analytical Results

Client Sample No.: 92-227-5725
FERMCO Sample Number: 93J125-087
Date Received: January 25, 1993

Report Date: March 8, 1993
Release Number:2661
File Number: 26618

Date Collected: January 25, 1993
Matrix: DAAP & TBP Tank Sampling

FERMCO Procedure	Parameter	Detection Limit	Results	Date Analyzed
1056	TCLP Arsenic.....	NA.....	<0.010 mg/L	March 3, 1993
1059	TCLP Mercury.....	NA.....	0.0043 mg/L	February 26, 1993
1060	TCLP Lead.....	NA.....	0.014 mg/L	March 4, 1993
1061	TCLP Selenium.....	NA.....	<0.005 mg/L	March 6, 1993
9043	TCLP Silver.....	NA.....	<0.010 mg/L	February 24, 1993
9043	TCLP Barium.....	NA.....	<0.200 mg/L	February 24, 1993
9043	TCLP Cadmium.....	NA.....	<0.005 mg/L	February 24, 1993
9043	TCLP Chromium.....	NA.....	0.0227 mg/L	February 24, 1993
3064	Flashpoint.....	NA.....	150 Deg. F	February 17, 1993
8260	1,1-Dichlorethylene(TCLP).	NA.....	<100 ppm	February 8, 1993
8260	1,2-Dichloroethane(TCLP).	NA.....	<100 ppm	February 8, 1993
8260	Benzene (TCLP).....	NA.....	<100 ppm	February 8, 1993
8260	Carbon Tetrachloride (TCLP).	NA.....	<100 ppm	February 8, 1993
8260	Chlorobenzene (TCLP).....	NA.....	<100 ppm	February 8, 1993
8260	Chloroform (TCLP).....	NA.....	<100 ppm	February 8, 1993
8260	Tetrachloroethene (TCLP)..	NA.....	<100 ppm	February 8, 1993
8260	Trichloroethene (TCLP).....	NA.....	<100 ppm	February 8, 1993
8260	Vinyl Chloride (TCLP).....	NA.....	<200 ppm	February 8, 1993

NOTE: Pages 1 of 3 and 2 of 3 are omitted because they include analytical results from different tanks.

6482

1992

ANALYTICAL DATA

OF THE CONTENTS

IN THE

NORTH AND SOUTH

SOLVENT TANKS

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-053

General Plant Westing House

Department _____

Generator EPA ID No. OH6890008976

Quantity 1060 (Lbs. or Gal.) - Indicate one by circling

PCB _____ Non-PCB ✓

Tank T-5

Drum Numbers:

NA _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

Prepared by _____ date _____

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
PHYSICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-053

PHYSICAL Parameters

Specific Gravity	0.844	Heating Value (BTU/lb)	17,258
Flash Point (°F)	>145	Ash Content (weight %)	0.90
Number of phases	1		

ANALYSIS OF PHYSICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Viscosity (cp)	5000	_____	Viscosity (cp)	5000	9.67
Corrosivity (mm/yr)	< 6.35	_____	Corrosivity (mm/yr)	< 6.35	< 6.35
OR			OR		
pH (aqueous)	> 8-10	_____	pH (aqueous)	8 -10	6 L

Prepared by M. L. Howell date 6/26/92

000095

6482

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART I
GENERAL INFORMATION

Disposal Number _____ Laboratory Number 920322-054

General Plant Westinghouse

Department _____

Generator EPA ID No. OH6890008976

Quantity 800 (Lbs. or Gal.) - Indicate one by circling

PCB _____ Non-PCB ✓

Tank T6-5

Drum Numbers:

DB _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

Prepared by _____ date _____

000096

TSCA INCINERATOR OPERATIONS
WASTE ANALYSIS FORM PART II
PHYSICAL PARAMETERS FOR LIQUID WASTES

Disposal Number _____

Laboratory Number 920322-054

PHYSICAL Parameters

Specific Gravity	.827	Heating Value (BTU/lb)	17,268
Flash Point (°F)	>145	Ash Content (weight %)	0.87
Number of phases	1		

ANALYSIS OF PHYSICAL PARAMETERS

Drummed Liquids			Bulk Liquids		
Parameter	Limit	Result	Parameter	Limit	Result
Viscosity (cp)	5000		Viscosity (cp)	5000	5.98
Corrosivity (mm/yr)	< 6.35		Corrosivity (mm/yr)	< 6.35	< 6.35
OR			OR		
pH (aqueous)	> 8-10		pH (aqueous)	8 -10	7 ±

Prepared by M. F. Howell date 6/26/92

6482

1991

ANALYTICAL DATA

OF THE CONTENTS

IN THE

NORTH AND SOUTH

SOLVENT TANKS

4w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910605-119 Project: HWMU H006 Customer Sample ID: H006-1
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 5-JUN-1991 Date Sample Received: 5-JUN-1991
Sampled By: J.S,D.E Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WOA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
401320	4013	Alpha Activity - ISO RAD	310	pCi/mL	PA PAPET	4013-91-106	7-JUN-19
	4008	Beta Activity - ISO RAD	100	pCi/mL	PA PAPET	4013-91-106	7-JUN-19

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910605-119 *****

flash point by j. wentz
Clear amber liquid organic
Cannot run pH on organic
U by J.Roberts

4w
30t

6482

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910605-119 Project: HWMU H006 Customer Sample ID: H006-1
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 5-JUN-1991 Date Sample Received: 5-JUN-1991
Sampled By: J.S,D.E Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
330044	330044	U-235 - ISO TMS	1.00	WT%(U)	HR CHILES	4018-91-M059	28-JUN-1991

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910605-119 *****

flash point by j. wentz
Clear amber liquid organic
Cannot run pH on organic
U by J.Roberts

0001100

4w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910605-119 Project: HWMU H006 Customer Sample ID: H006-1
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 5-JUN-1991 Date Sample Received: 5-JUN-1991
Sampled By: J.S,D.E Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
		Physical Description	SEE	COMMENTS	EPM-LAB		15-OCT-19
300220	3002	Total U - BrPADAP AnL EPM	206	ppm	JJ STOECKEL	1	27-JUL-19
303320	3033	pH - Electrode AnL EPM	VOID		JJ STOECKEL	1	2-JUL-19
305920	3059	Total Th - Color. AnL	0.0039	g/L	FL MILLER	1	5-OCT-19
306420	3064	Flash Pt. - Pensky Martens AnL	124	Deg. F	JM WENTZ	1	2-JUL-19

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910605-119 *****

flash point by j. wentz
Clear amber liquid organic
Cannot run pH on organic
U by J.Roberts

4w
30t

6482

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910606-129 Project: HWMU H006 Customer Sample ID: H006-2
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 6-JUN-1991 Date Sample Received: 6-JUN-1991
Sampled By: J.S,D.E. Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
330044	330044	U-235 - ISO TMS	0.99	WT%(U)	HR CHILES	4018-91-M061	3-JUL-1991

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910606-129 *****

CLEAR MINERAL SPIRITS, PH CANNOT BE RUN ON THIS SAMPLE

4w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910606-129 Project: HWMU H006 Customer Sample ID: H006-2
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 6-JUN-1991 Date Sample Received: 6-JUN-1991
Sampled By: J.S,D.E. Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Complete
401320	4013	Alpha Activity - ISO RAD	300	pCi/mL	PA PAPET	4013-91-106	7-JUN-1
	4008	Beta Activity - ISO RAD	110	pCi/mL	PA PAPET	4013-91-106	7-JUN-1

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910606-129 *****

CLEAR MINERAL SPIRITS, PH CANNOT BE RUN ON THIS SAMPLE

4w
30t

6482

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910607-010 Project: HWMU H006 Customer Sample ID: H006-3
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 7-JUN-1991 Date Sample Received: 7-JUN-1991
Sampled By: T.S,D.E Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
		Physical Description	SEE	COMMENTS	EPM-LAB		15-OCT-1991
300220	3002	U - BrPADAP AnL	130	ppm	JJ STOECKEL	1	30-JUL-1991
303320	3033	pH - Electrode AnL EPM	VOID		JJ STOECKEL	1	30-JUL-1991
305920	3059	Total Th - Color. AnL	0.0010	g/L	FL MILLER	1	5-OCT-1991
306420	3064	Flash Pt. - Pensky Martens AnL	124	Deg. F	JM WENTZ	1	2-JUL-1991

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910607-010 *****

Clear Amber Liquid organic
sical description by J.Wentz
J.Roberts

000104

4w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910607-010 Project: HWMU H006 Customer Sample ID: H006-3
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 7-JUN-1991 Date Sample Received: 7-JUN-1991
Sampled By: T.S,D.E Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Complete
330044	330044	U-235 - ISO TMS	1.00	WT%(U)	HR CHILES	4018-91-M061	8-JUL-1

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910607-010 *****

Clear Amber Liquid organic
Physical description by J.Wentz
U by J.Roberts

Unable to do pH on Organic

4w
30t

6482

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910607-010 Project: HWMU H006 Customer Sample ID: H006-3
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 7-JUN-1991 Date Sample Received: 7-JUN-1991
Sampled By: T.S,D.E Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
401320	4013	Alpha Activity - ISO RAD	110	pCi/mL	PA PAPET	4013-91-108	11-JUN-1991
	4008	Beta Activity - ISO RAD	30	pCi/mL	PA PAPET	4013-91-108	11-JUN-1991

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910607-010 *****

Clear Amber Liquid organic
Physical description by J.Wentz
U by J.Roberts

Unable to do pH on Organic

4w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910606-129 Project: HWMU H006 Customer Sample ID: H006-2
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 6-JUN-1991 Date Sample Received: 6-JUN-1991
Sampled By: J.S,D.E. Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Complete
		Physical Description	SEE	COMMENTS	EPM-LAB		31-JUL-1
300220	3002	Total U - BrPADAP AnL EPM	481	ppm	JL ROBERTS	1	28-JUL-1
303320	3033	pH - Electrode AnL EPM	VOID		JL ROBERTS	1	28-JUL-1
306420	3064	Flash Pt. - Pensky Martens AnL	126	Deg. F	JL ROBERTS	1	28-JUL-1

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910606-129 *****

CLEAR MINERAL SPIRITS, PH CANNOT BE RUN ON THIS SAMPLE

4w
30t

6482

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910610-014 Project: HWMU H006 Customer Sample ID: H006-4
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 10-JUN-1991 Date Sample Received: 10-JUN-1991
Sampled By: J.S.,D.E. Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
330044	330044	U-235 - ISO TMS	0.99	WT%(U)	HR CHILES	4018-91-M061	3-JUL-1991

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910610-014 *****

F.P & phys. des. by J.Wentz
Amber clear liquid organic
pH cannot be determined on organic
U by F.Miller

4w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910610-014 Project: HWMU H006 Customer Sample ID: H006-4
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 10-JUN-1991 Date Sample Received: 10-JUN-1991
Sampled By: J.S.,D.E. Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Complete
401320	4013	Alpha Activity - ISO RAD	81	pCi/mL	PA PAPET	4013-91-108	11-JUN-1
	4008	Beta Activity - ISO RAD	31	pCi/mL	PA PAPET	4013-91-108	11-JUN-1

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910610-014 *****

F.P & phys. des. by J.Wentz
Amber clear liquid organic
pH cannot be determined on organic
U by F.Miller

4w
30t

6482

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910610-014 Project: HWMU H006 Customer Sample ID: H006-4
Customer: HAZARDOUS WASTE MANA Requisition Number:
Date Sampled: 10-JUN-1991 Date Sample Received: 10-JUN-1991
Sampled By: J.S.,D.E. Date Sample Completed:
Material Description: SOLVENT TANKS MINERAL SPIRITS Charge Number: WDA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
		Physical Description	SEE	COMMENTS	EPM-LAB		15-OCT-1991
300220	3002	Total U - BrPADAP AnL EPM	150	ppm	JJ STOECKEL	1	17-JUL-1991
303320	3033	pH - Electrode AnL EPM	VOID		JJ STOECKEL	1	12-JUL-1991
305920	3059	Th - Color AnL	0.0010	g/L	FL MILLER	1	5-OCT-1991
306420	3064	Flash pt - Pensky AnL	124	Deg. F	JM WENTZ	1	12-JUL-1991

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910610-014 *****

[illegible] & phys. des. by J.Wentz
[illegible]r clear liquid organic
[illegible]cannot be determined on organic
[illegible]by F.Miller

000110

6482

APPENDIX 5

ANALYTICAL DATA FROM SOIL BORING SAMPLES ADJACENT TO THE NORTH AND SOUTH SOLVENT TANKS

~~Revision 0~~
~~December 1993~~
Revision 1
January 1995

Fernald Office
U.S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

6482

11-29-93
SAE

TCT - St. Louis

Consulting Engineers, Scientists and Analytical Services

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114-5700
Phone (314) 426-0880
Fax (314) 426-4212

November 24, 1993
93FM-5945

Dr. Don Luken
Fernald Environmental Restoration Management Corporation
7400 Willey Road
Fernald, Ohio 45030

Re: CASE NARRATIVE Release: 5945

Dear Dr. Luken:

On November 13, 1993, TCT-St. Louis (TCTSL) received the following samples for analysis under contract 434286:

TCT No.	FERMCO ID	Matrix	Analysis
93008078	200022643	B	VOA
93008079	200022645	B	PAINT FILTER/IGN
93008080	200022647	B	VOA
93008081	200022649	B	PAINT FILTER/IGN
93008082	200022651	B	VOA
93008083	200022653	B	PAINT FILTER/IGN
93008084	200022655	B	VOA
93008085	200022657	B	PAINT FILTER/IGN
93008086	200022659	B	VOA
93008087	200022661	B	PAINT FILTER/IGN
93008088	200022663	A TBLK	VOA
93008089	200022665	A FBLK	VOA
93008091	200022668	A RBLK	VOA

The samples were requested for ASL B.

The samples were requested for normal turnaround. Dr. Luken informed us on November 17 that this release should be for priority turnaround.

The samples were analyzed in accordance with accepted USEPA protocols and the data are of known and documented quality.

The required holding time was met for each sample analysis reported.

Volatile Organics

The volatile organic analysis was performed for the Table 5 list by method 8260.

The target analyte list does not include the CLP matrix spike compounds. Therefore the matrix spike included all target compounds rather than the CLP matrix spike mix.

The matrix spike recoveries demonstrated acceptable recoveries of all compounds and the LCS was not necessary for this batch.

Paint Filter Test

The samples were analyzed by method 9095, Paint Filter Test. No free liquid was observed. If free liquid was observed, an ignitability test of the liquid was requested. Since liquids were not generated the ignitability test was required.

TCT-St. Louis is pleased to be of service to you. If you have any questions, please call me at (314) 426-0880.

Sincerely,

Fred Grabau
Project Manager

6482 ~~Trip~~ Blank

SP-1

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 9300807~~68~~ FB 11/24/93
FERMCO SITE ID - 200022643
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE B - SOIL
DATE ANALYZED - 11/18/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/KG)
ACETONE	10	ND
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	ND
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	115
4-BROMOFLUOROBENZENE	88
1,2-DICHLOROETHANE-d4	101

NON TARGET COMPOUNDS

N side of
SP-1
Sample No. 93-607
01

FERMCO INHISC ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008079
FERMCO SITE ID - 200022645
DATE RECEIVED - 11-13-93
DATE SAMPLED - 11-09-93

REPORT DATE - 11-24-93
MATRIX - B-SOIL
RELEASE NO. - 5945

PAINT FILTER TEST

METHODS	PARAMETER	FREE LIQUID (ml)	DATE ANALYZED
9095	PAINT FILTER TEST	0	11-23-93

6482 SP-2

Sample No. 93-607-0179

FERMCO TOTAL ANALYSIS

93FM

TCT SAMPLE NUMBER - 93008080
FERMCO SITE ID - 200022647
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE B - SOIL
DATE ANALYZED - 11/18/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/KG)
ACETONE	10	12
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	ND
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	5
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	110
4-BROMOFLUOROBENZENE	86
1,2-DICHLOROETHANE-d4	99

NON TARGET COMPOUNDS

SP-2
93-607-0179

FERMCO IHMISC ANALYSIS
93PM

TCT SAMPLE NUMBER - 93008081
FERMCO SITE ID - 200022649
DATE RECEIVED - 11-13-93
DATE SAMPLED - 11-09-93

REPORT DATE - 11-24-93
MATRIX - B-SOIL
RELEASE NO. - 5945

PAINT FILTER TEST

METHODS	PARAMETER	FREE LIQUID (ml)	DATE ANALYZED
9095	PAINT FILTER TEST	0	11-23-93

6482 SP-3
93-007-0180

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008082
FERMCO SITE ID - 200022651
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE B - SOIL
DATE ANALYZED - 11/18/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/KG)
ACETONE	10	13
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	ND
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	114
4-BROMOFLUOROBENZENE	93
1,2-DICHLOROETHANE-d4	78

NON TARGET COMPOUNDS

SP-3
93-607-01

FERMCO INMISC ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008083
FERMCO SITE ID - 200022653
DATE RECEIVED - 11-13-93
DATE SAMPLED - 11-09-93

REPORT DATE - 11-24-93
MATRIX - S-SOIL
RELEASE NO. - 5945

PAINT FILTER TEST

METHODS	PARAMETER	FREE LIQUID (ml)	DATE ANALYZED
9095	PAINT FILTER TEST	0	11-23-93

6482 SP-4

93-607-0180

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008084
FERMCO SITE ID - 200022655
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE B - SOIL
DATE ANALYZED - 11/18/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/KG)
ACETONE	10	ND
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	ND
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	116
4-BROMOFLUOROBENZENE	100
1,2-DICHLOROETHANE-d4	109

NON TARGET COMPOUNDS

000120

SP-4
93607-018

FERMCO INMISC ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008085
FERMCO SITE ID - 200022657
DATE RECEIVED - 11-13-93
DATE SAMPLED - 11-09-93

REPORT DATE - 11-24-93
MATRIX - B-SOIL
RELEASE NO. - 5945

PAINT FILTER TEST

METHODS	PARAMETER	FREE LIQUID (ml)	DATE ANALYZED
9095	PAINT FILTER TEST	0	11-23-93

6482

SP-5

13-607-CIS

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008086
FERMCO SITE ID - 200022659
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE B - SOIL
DATE ANALYZED - 11/18/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/KG)
ACETONE	10	ND
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	ND
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	117
4-BROMOFLUOROBENZENE	102
1,2-DICHLOROETHANE-d4	100

NON TARGET COMPOUNDS

SP5
93-607-0182

FERMCO INMISC ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008087
FERMCO SITE ID - 200022661
DATE RECEIVED - 11-13-93
DATE SAMPLED - 11-09-93

REPORT DATE - 11-24-93
MATRIX - B-SOIL
RELEASE NO. - 5945

PAINT FILTER TEST

METHODS	PARAMETER	FREE LIQUID (ml)	DATE ANALYZED
9095	PAINT FILTER TEST	0	11-23-93

6482 TB

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008088
FERMCO SITE ID - 200022663
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE A - WATER
DATE ANALYZED - 11/19/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/L)
ACETONE	10	ND
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
:THYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	ND
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	104
4-BROMOFLUOROBENZENE	97
1,2-DICHLOROETHANE-d4	100

NON-TARGET COMPOUNDS

SP FB

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008089
FERMCO SITE ID - 200022665
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE A - WATER
DATE ANALYZED - 11/19/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/L)
ACETONE	10	16
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	11
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	ND
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	93
4-BROMOFLUOROBENZENE	97
1,2-DICHLOROETHANE-d4	105

NON TARGET COMPOUNDS

6482

SP-13

FERMCO TOTAL ANALYSIS
93FM

TCT SAMPLE NUMBER - 93008091
FERMCO SITE ID - 200022668
DATE RECEIVED - 11/13/93
DATE SAMPLED - 11/09/93

REPORT DATE 11-24-93
RELEASE NO. 5945

TOTAL VOLATILE ORGANICS - METHOD 8260

MATRIX - CODE A - WATER
DATE ANALYZED - 11/19/93
QC BATCH NO. - 2883
DILUTION - 1:1

PARAMETER	DETECTION LIMIT	CONC (UG/L)
ACETONE	10	12
BENZENE	5	ND
CARBON DISULFIDE	5	ND
CARBON TETRACHLORIDE	5	ND
CHLOROBENZENE	5	ND
CYCLOHEXANONE	160	ND
ETHYL BENZENE	5	ND
ETHYL ACETATE	20	ND
ETHYL ETHER	5	ND
METHYL ETHYL KETONE	10	132
METHYL ISOBUTYL KETONE	10	ND
METHYLENE CHLORIDE	5	ND
TETRACHLOROETHYLENE	5	ND
TOLUENE	5	8
1,1,1-TRICHLOROETHANE	5	ND
1,1,2-TRICHLOROETHANE	5	ND
TRICHLOROETHYLENE	5	ND
TRICHLOROTRIFLUOROETHANE	5	ND
TRICHLOROFLUOROMETHANE	5	ND
TOTAL XYLENES	5	ND

SURROGATES	% REC
d8-TOLUENE	106
4-BROMOFLUOROBENZENE	92
1,2-DICHLOROETHANE-d4	103

NON TARGET COMPOUNDS

000126

Rec 12/14/93 pwl

TCT - St. Louis

Consulting Engineers, Scientists and Analytical Services

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114-5700
Phone (314) 426-0880
Fax (314) 426-4212

December 13, 1993
93FM-5945

Dr. Don Luken
Fernald Environmental Restoration Management Corporation
7400 Willey Road
Fernald, Ohio 45030

Re: CASE NARRATIVE Release: 5945

Dear Dr. Luken:

On November 13, 1993, TCT-St. Louis (TCTSL) received the following samples for radiochemical analysis under contract 434286:

Core No.	FERMCO ID	Matrix	Analysis
932175-5	200022612	C	TOTAL U, TOTAL TH
932175-6	200022616	C	TOTAL U, TOTAL TH
932175-7	200022620	C	TOTAL U, TOTAL TH
932175-8	200022624	C	TOTAL U, TOTAL TH
932175-9	200022630	C	TOTAL U, TOTAL TH
932175-12	200022634	A R BLK	TOTAL U, TOTAL TH
932175-13	200022669	A F BLK	TOTAL U, TOTAL TH

These samples were subcontracted to Core Laboratories.

The samples were requested for ASL B.

The samples were analyzed for Total Uranium by the KPA method.

The total Thorium analysis was performed by method CA-GLR-04.1R4. The two water samples required re-analysis and will be delivered later in the week. The QC results will also be delivered at that time.

The samples were analyzed in accordance with accepted USEPA protocols and the data are of known and documented quality.

The required holding time was met for each sample analysis reported.

TCT-St. Louis and Core Laboratories are pleased to be of service to you. If you have any questions, please call me at (314) 426-0880.

Sincerely,

Fred Grabau
Project Manager

000127

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-12	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022666	MATRIX -	WATER
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

RAD ANALYSIS

LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/L)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	ND		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/L)	ERROR (+/-)	DATE ANALYZED
CA-SLR-04.1R4	THORIUM				

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-13	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022669	MATRIX -	WATER
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

RAD ANALYSIS

LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/L)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	ND		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/L)	ERROR (+/-)	DATE ANALYZED
CA-SLR-04.1R4	THORIUM				

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-5	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022644	MATRIX -	SOIL
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

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RAD ANALYSIS

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LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/GM)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	60.6		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/GM)	ERROR (+/-)	DATE ANALYZED
CA-SLR-04.1R4	THORIUM	0.2	19.3	3.9	12/07/93

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-6	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022648	MATRIX -	SOIL
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

RAD ANALYSIS

LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/GM)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	43.7		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/GM)	ERROR (+/-)	DATE ANALYZED
EPA-GLR-04.1R4	THORIUM	0.2	13	3.2	12/07/93

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-7	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022652	MATRIX -	SOIL
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

==========

RAD ANALYSIS

==========

LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/GM)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	15.2		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/GM)	ERROR (+/-)	DATE ANALYZED
CA-GLR-04.1R4	THORIUM	0.2	5.9	1.7	12/07/93

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-8	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022656	MATRIX -	SOIL
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

RAD ANALYSIS

LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/GM)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	140		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/GM)	ERROR (+/-)	DATE ANALYZED
EA-GLR-04.1R4	THORIUM	0.2	27.3	5.1	12/07/93

FERMCO TOTAL ANALYSIS
93FM-5945

TCT SAMPLE NUMBER -	932175-9	REPORT DATE -	12/13/93
FERMCO SITE ID -	200022660	MATRIX -	SOIL
DATE RECEIVED -	11/13/93	RELEASE NO. -	5945
DATE SAMPLED -	11/09/93		

RAD ANALYSIS

LAB BATCH NO.- RAD#1
DILUTION FACTOR - 1

METHODS	PARAMETER	DETECTION LIMIT	CONC (UG/GM)	ERROR (+/-)	DATE ANALYZED
KPA	TOTAL URANIUM	0.1	148		11/30/93

METHODS	PARAMETER	DETECTION LIMIT	CONC (PCI/GM)	ERROR (+/-)	DATE ANALYZED
CA-SLR-04.1R4	THORIUM	0.2	207	96.4	12/07/93

APPENDIX 6

SAMPLING AND ANALYSIS PLAN

NORTH AND SOUTH SOLVENT TANKS

~~Revision 0~~
~~December 1993~~
REVISION 1
JANUARY 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) was prepared to support the Closure Plan Information and Data (CPID) for the North and South Solvent Tanks. The purpose of this SAP is to describe the sample collection and handling procedures, identify analyses to be conducted and specify the quality assurance/quality control procedures to characterize and verify decontamination of the North and South Solvent Tanks. Sampling that may be required for waste characterizations will be conducted in accordance with requirements of the FEMP Waste Analyses and Waste Determination Plans. Sampling and monitoring conducted for worker safety and health will be conducted in accordance with the requirements of the FEMP Comprehensive Environmental Safety and Health Plan.

Sampling and analyses of rinse waters from the solvent tanks and secondary containment structure will follow the procedures discussed in this SAP and will be conducted consistent with the FEMP Site-Wide CERCLA Quality Assurance Project Plan (SCQ).

1.1 SAMPLING OBJECTIVES

Sampling and analyses to be conducted for this CPID is required to support the following data needs:

1. Verify the results of decontamination efforts, as discussed in Section 3 of the CPID for the North and South Solvent Tanks.

2. Characterize decontamination steam cleaning water and rinse water and evaluate the proper disposal, treatment, or storage option.

3. Determine the appropriate level of health and safety requirements for protection of site workers during waste disposal, treatment, or storage.

1.2 SAMPLING APPROACH

All sampling and analysis activities must be conducted and documented in a manner ensuring that sufficient data of known quality are collected to support the end use of the data. The data quality objectives (DQOs) specified for each data collection activity are qualitative and quantitative statements specifying the quality of the data required to support decisions during remedial response activities. DQOs developed for data collection for the various response actions are maintained by FERMCO for reference and/or use to address similar data collection needs as the CERCLA removal and response action work plans are developed.

The FEMP SCQ defines analytical support levels (ASL) A, B, C, D, or E as a major component of DQOs. The ASL levels are described in Appendix 1 of this SAP and referenced below.

1.3 SAMPLE ANALYSES

Samples collected for lab analysis of flash point measurements will be analyzed using a *Pensky-Martens* or a *Setaflash* Closed Cup Tester. The waste constituents listed in Table A-1 will be used to ensure the wash and rinse wastewater meet the discharge limits imposed by the FEMP NPDES permit and local water quality standards. This sample will also be analyzed for xylene and toluene to determine if the tank, a former material storage tank, and secondary containment have been sufficiently decontaminated as discussed in Section 4.0. The test for flash point will verify decontamination of the HWMU tanks and secondary containment.

Quality Assurance and Quality Control (QA/QC) samples will also be collected from the final rinse consistent with the current requirements of the FEMP SCQ as discussed in Section 4.0 of this SAP.

TABLE A-1: NPDES Discharge Parameters for Wash and Rinse Waters

NPDES Parameters
Antinomy
Arsenic
Barium
Cadmium
Chromium
Copper
Lead
Nickel
Mercury
Selenium
Silver
Zinc
Oil & Grease
Radiological:
Uranium
Thorium

6482

2.0 SAMPLE COLLECTION

The following sections discuss the procedures to be used in collecting steam cleaning water and rinse water samples from the North and South Solvent Tanks. Outdoor sampling or decontamination activities will not be conducted during adverse weather (e.g., rain, snow).

2.1 SAMPLING EQUIPMENT

The following equipment may be used to collect steam cleaning water and rinse water samples:

- 500 mL amber glass widemouth bottle with teflon-lined closure
- Thermal coolers and freezer packs
- Sample labels
- Waterproof marking pen
- Field sampling logbook and field data forms
- Acid resistant gloves
- Polyethylene or other approved impervious sheeting
- Dedicated, clean rinseate sample collection drums
- Coliwasa sampler
- Peristaltic sampling pump(s)
- Tygon tubing
- Sludge Judge®
- *Pensky-Martens* Closed Cup Tester
- *Setaflash* Closed Cup Tester

This list may be modified as appropriate by a trained, qualified sampling supervisor or manager. Any change to this list will be noted in the field sampling logbook.

2.2 STEAM CLEANING WATER AND RINSE WATER SAMPLING

The following procedures will be followed to collect rinse water samples from the tanks and secondary containment:

1. A portion of the steam cleaning water and rinse water will be extracted, pumped, or drained directly into the sample containers or, if necessary, into dedicated sampling drums. As applicable, samples of the steam cleaning water and rinse water and QA/QC duplicates will be collected from the drum using a Coliwasa sampler or an appropriate sampling pump and tubing.

2. The steam cleaning water and rinse water samples will be lab analyzed for flash point using either the *Pensky-Martens* or the *Setaflash* Closed Cup Tester. For discharge at the WWTS, both the steam cleaning water and

the rinse water will be analyzed for the NPDES parameters listed in Table A-1.

3. Sample containers for the final rinseate to be used for decontamination verification will be managed as discussed in Section 2.3.

2.3 SAMPLE HANDLING AND MANAGEMENT OF SAMPLE CONTAINERS

Once a sample has been placed inside a sample container it will be managed as follows:

1. For all samples: Tightly close the lid, seal the lid with custody tape and attach appropriate label that has been filled out using indelible ink.

2. Record the sample label and container information in the field sampling logbook and on a Sitewide Sample Analysis Request/Custody Record (SWSAR/CR) form.

3. Immediately place sample containers into a sample cooler that will maintain samples at approximately 4°C.

4. Record all transfers of sample custody on the SWSAR/CR form.

5. To maintain chain-of-custody, ensure that access to all samples is controlled. This requires the sample collector or designated sample custodian to:

    5.1. Have constant direct physical control,
    5.2. Use a locked limited access area under his/her control,
    5.3 Affix signed container custody seals on samples or sample coolers.

When the planned sampling activity has been completed, secure the lid of the sample cooler and transfer the samples with the appropriate SWSAR/CR form to the FEMP Sample Processing Laboratory. The FEMP Sample Processing Laboratory will be responsible for ensuring custody records are maintained during shipment to the laboratory selected to conduct the analyses.

2.4 EQUIPMENT DECONTAMINATION

Personnel protective equipment (PPE) will be free of contamination prior to beginning the decontamination process and when handling any clean equipment. Equipment decontamination procedures are discussed in the following sections.

All sampling equipment that will be used must be clean or decontaminated prior to use. All reusable sampling equipment that has been used to collect a sample must be

decontaminated before it is used to collect additional samples. After decontamination, all equipment must be tagged and bagged as "clean".

2.4.1 Sampling Equipment Decontamination Supplies

Supplies used in decontamination may vary based on the media being sampled and the type of contamination encountered. The following basic list of supplies may be modified, as necessary, by a trained, qualified supervisor or manager:

- Non-phosphate detergent solution (e.g., alconox)
- Long-handled scrapers (stainless steel, glass)
- Long-handled, soft bristled brushes
- Portable low-pressure water sprayer
- Process water
- Deionized water (organic free)
- Reagent grade ethanol rinse
- Dilute (0.02 normal) hydrochloric or sulfuric acid rinse
- Polyethylene or other approved impervious sheeting
- Heavy duty plastic bags
- Absorbent materials, socks, and pads
- Wash/rinse tubs, buckets, or other approved containers

2.4.2 Sampling Equipment Decontamination Procedures

All reusable sampling equipment will be decontaminated after each use. If decontamination is not practical, the sampling equipment will be managed in a manner consistent with FEMP hazardous waste management practices pending RCRA waste determinations. The following procedures will be used to decontaminate sampling equipment:

1. Establish a decontamination area in a location that is protected from potential contamination. Use a double thickness of 6-mil polyethylene, or other approved impervious sheeting, to line the decontamination area including containment dikes or berms for run on/run off control.

2. Provide appropriate containers for containment, handling, and collection of wastes. Non-liquid wastes shall be collected in a heavy duty plastic bag, 55-gallon drum, or other suitable container. Liquid wastes will be transferred into 55-gallon drums, dumpsters or other suitable liquid storage containers and transferred to the FEMP waste water treatment system (WWTS). Solid wastes (i.e., PPE, debris, etc.) will be stored at the FEMP in an approved RCRA storage area pending RCRA waste characterizations and determinations.

3. Establish sample equipment decontamination line including the following:

3.1. Rinse with process water, wash with non-phosphate detergent, and rinse with process water. As necessary, use brushes and scrapers to remove visible contamination and stains. If needed, pressurized water or steam cleaning may be used as an alternate decontamination method.

3.2. Rinse with a dilute (0.02 normal) hydrochloric or sulfuric acid solution followed by a water rinse.

NOTE: Residual acids in used rinse solutions will be neutralized.

3.3. A solvent rinse (using an approved solvent, such as ethanol) followed by a final triple rinse with deionized water.

3.4. At least once per day, for each media being sampled and each decontamination line, collect a QC rinse sample of the final rinse. The sample will be collected using the procedures in section 4.1 of this SAP.

3.5. After the sampling equipment has been properly decontaminated, place it on a clean sheet of plastic or other suitable material to air dry. While air drying, loosely cover the equipment with another clean piece of sheeting to minimize the potential for contamination.

3.6. Upon completion of decontamination of sampling equipment, the buckets and other containers used for temporary storage of the decontamination wash and rinse wastes will be washed with clean detergent solution and rinsed twice with deionized water.

2.5 WASTES GENERATED DURING SAMPLING AND DECONTAMINATION

Wastes and materials generated during sampling and analyses will be managed in a manner consistent with approved Management of Investigation-Derived Wastes practices. Wastes and materials generated during sampling and analyses will be managed in a manner consistent with approved FEMP hazardous waste management practices. Equipment decontamination wash and rinseate wastewater will be transferred to the FEMP WWTS and analyzed for the flash point and the NPDES discharge constituents listed in Table A-1. Other solid wastes (e.g., personnel protective equipment, plastic sheeting, etc.) will be characterized and placed as appropriate into containers, and stored in a RCRA Storage area pending characterization following Waste Determination Plans. Based on the waste characterizations, wastes will be managed and disposed according to all applicable hazardous and solid waste rules and regulations.

3.0 FIELD DOCUMENTATION AND SAMPLE HANDLING

Sample handling and documentation procedures shall conform to approved FEMP procedures applicable at the time closure activities are conducted. The information in the following sections presents the procedures to follow during and after the samples have been collected.

3.1 FIELD SAMPLING LOGBOOK

A field sampling logbook will be kept and updated to document information pertinent to the RCRA closure sampling activities. At a minimum, the entries in the logbook will include the following:

- Name of supervisor(s) responsible for HWMU management
- Name of FEMP closure project manager
- Maps, drawings, or photographs of the sampling site
- Purpose of sampling (e.g., verification of decontamination)
- Description and location of sampling points
- Description of sampling methods and field sampling activities (e.g., containers, types of samples, etc.)
- Task review meetings
- Documentation of any deviations from this SAP
- Weather conditions at the time samples are collected
- Number, type, and volume of samples taken
- Date and time of collection
- Field sample identification number(s)
- Names of sampling personnel
- Date and time of transfer to sample receiving/shipping area
- Field observations (e.g., spills or other activities nearby)
- Data from field measurements (e.g., pH, specific conductance)
- Signatures of persons responsible for maintaining the logbook

The logbook will record information sufficient to reconstruct the sampling event without reliance on the collector's memory. The logbook shall be stored and maintained according to FEMP document control procedures.

3.2 ON-SITE HANDLING/PROCESSING PROCEDURES

Sample coolers, along with the signed and completed SWSAR/CR form, will be taken to the FEMP Sample Processing Laboratory. Each person who relinquishes or takes possession of the samples or sample coolers shall sign the Custody Record and record the date and time of transfer.

The FEMP will characterize radiation levels associated with the samples to determine disposition of the samples.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) procedures are required to identify, evaluate, and control conditions and activities that can affect the quality and validity of the analytical data obtained from sampling and analyses. Validation of data requires accurate records to document procedures and conditions during the sampling and analyses. At a minimum, these records will include:

- An updated field sampling logbook,
- Properly completed sample labels,
- Field and laboratory QA/QC samples, and
- Completed SWSAR/CR forms

Quality assurance procedures will include:

- Only clean sample containers will be used.
- Clean PPE will be used whenever contact is made with the sampling equipment.
- Sampling containers and collection equipment shall be handled, stored, and maintained in a manner that prevents cross-contamination.
- Any field conditions, events, or activities that may affect analytical results will be documented in the field sampling logbook (see Section 3.1 of this SAP).

Sampling activities will be conducted consistent with applicable FEMP QA/QC procedures as defined in the current revision of the SCQ. The following sections discuss field QA/QC, laboratory QA/QC, and SWSAR/CR forms.

4.1 FIELD QA/QC PROCEDURES

Since no volatile and semi-volatile compounds are included in the parameters of concern, no trip blanks will need to be taken. However, to minimize the potential for field contamination of samples to be analyzed for the NPDES parameters listed in Table A-1, field and equipment blanks will be taken. Only clean or decontaminated sampling equipment will be used. As a normal practice, it is presumed that the decontamination procedures are adequate for reuse of decontaminated equipment, as needed, even though QA/QC analyses is not complete. The following procedures will be used to collect sampling equipment decontamination rinse samples:

1. Pour deionized water over and through the cleaned surfaces of the decontaminated sampling equipment.

2. Collect the deionized water rinseate using an appropriate sample container.

3. Follow sample container management procedures in Section 2.3 of the SAP.

Field and equipment blanks will be collected and analyzed as part of normal QC procedures. At a minimum, the following samples will be collected during each sampling event:

- One field blank consisting of a grab sample of the deionized rinse water supply (used for sampling equipment rinse), taken into the field and exposed to the airborne contamination that may impact sample data.

- Two duplicate samples will be taken to evaluate the impact of field sampling activities on analytical precision (i.e., repeatability of results). These samples will be included in two of the three decontamination verification rinse samples.

4.2 LABORATORY QA/QC PROCEDURES

The analytical laboratory shall use the approved SW-846 Methods as specified in the SCQ for the constituents of concern. The laboratory will document the use and results of laboratory quality control samples and analyses. Laboratory samples for quality control (QC) may include:

- Sample preparation blanks to detect residual contamination of analytical equipment that may affect analytical results.

- Duplicate samples prepared in the laboratory to evaluate the precision (i.e., the ability to reproduce analytical results) achieved by the methods used,

- Laboratory control and calibration verification samples (to verify calibration of the equipment), and

- Matrix-spike samples to evaluate analytical recovery rates.

All pertinent information concerning problems and conditions that may affect the validity of the analytical data must be clearly identified. In addition to laboratory QC and analytical data, information to be provided by the laboratory will include:

- Name of person receiving the sample,

- Date and time of sample receipt,

- Laboratory sample number (if different from field ID),

- Date and time of sample analysis, and
- Signature of the laboratory supervisor.

Conditions outside the control of the laboratory that could affect sample quality and validity of analytical results shall also be documented by the laboratory. These conditions include items such as:

- Discrepancies between sample shipping records, sample analytical requests, custody records and the sample shipments as received by the laboratory,
- Sample containers and packaging problems, such as broken containers, loose lids, and broken custody seals.

To prevent any laboratory bias, field duplicate samples submitted shall not be identifiable as duplicates in any of the information provided to identify samples or any special conditions/qualifying statements to support the request for analysis. Field duplicate samples will be noted in the field sampling logbook for use in FEMP QA/QC review of analytical reports.

4.3 SAMPLE ANALYSIS REQUEST/CHAIN-OF-CUSTODY PROCEDURES

Each sample container shall be labeled with the sample number and identification that is consistent with the SWSAR/CR form. Prior to relinquishing possession of a sample, the person that collected the sample shall complete and sign a SWSAR/CR. Each person that accepts custody will also sign and date the custody record. A complete record of custody transfers shall be maintained on the SWSAR/CR form.

All samples taken to the FEMP Sample Processing Laboratory must be accompanied by the completed SWSAR/CR form. An Off-Site Sample Analysis Request/Custody Transfer Record will be prepared and accompany samples to be sent off-site for laboratory analyses.

The laboratory conducting the analyses will be responsible for maintaining sample custody logs until samples are returned to the FEMP or disposed after obtaining FEMP approval. The Custody Records will document sample possession from the time of collection through analyses by the laboratory. Records of any custody seals used on sample containers shall be maintained. The laboratory will document the condition of any custody seals on containers that they receive. Laboratories conducting analyses are required to provide the FEMP a copy of all completed laboratory custody records.

The completed sample Analysis Request/Custody Record, Off-Site Analysis Request/Custody Transfer Record, and laboratory custody forms will be signed and

returned with the analytical report for the samples identified on the form(s). These documents will be filed in the FEMP RCRA HWMU Closure files.

5.0 HEALTH AND SAFETY

Prior to conducting any field activities at the FEMP, a health and safety assessment must be conducted to characterize existing hazards and conditions. Based on the findings of the health and safety assessment, the Project/Task Specific Health and Safety Plan will specify required health and safety procedures, including personnel protection equipment, entry and exit requirements, and personnel/PPE decontamination procedures. Guidelines for the Preparation of FEMP CRU-Specific Health and Safety Plan are included in Appendix 7.

As part of the safety assessment, radioactivity screening will be done over the area to determine radiation protection requirements. Additional screening, including on-site laboratory analyses for radionuclides, may be required to further categorize radiation levels and hazards before the samples can be shipped to an off-site laboratory. Radiation survey procedures and requirements for shipping samples to off-site laboratories for analysis will be in accordance with approved FEMP/FMPC procedures.

6.0 ANALYTICAL SUPPORT LEVELS

The intended use of acquired data is to assess the nature of the site and the degree and extent of potential problems resulting from past activities, to evaluate the potential hazard to human health and the environment, to evaluate remedial actions, to choose and implement preferred remedial actions, and to monitor the migration of contaminants and the effectiveness of remedial actions.

Data Quality Objectives (DQOs) are qualitative and quantitative statements specifying the quality of data required to support decision making. Because they are based on end use of the data to be collected, different uses require different levels of data quality. There are five Fernald Environmental Management Project (FEMP)-defined analytical levels that will be assigned depending on intended use of the data and the Quality Assurance/Quality Control (QA/QC) methods required to achieve the desired level of quality. These levels are analogous to the 1987 EPA-defined DQO levels 1 through 5 (U.S. Environmental Protection Agency [EPA] 1987). However, because radionuclides comprise a large proportion of the analyses supporting FEMP programs and projects and because these radionuclide analyses have been used and verified by DOE and DOE contractors for many years, it is appropriate to address these measurements as standard. Therefore, in order to maintain consistency in definition of DQO levels and to avoid confusion between EPA and DOE/EPA programs, DQO levels at FEMP will be referred to as analytical support levels (ASL) A through E.

6.1 ASL A (QUALITATIVE FIELD ANALYSIS)

Provides the most rapid (real or short time) results. ASL A is often used for health and safety monitoring at the site, preliminary comparison to Applicable or Relevant and Appropriate Requirements (ARARs), initial site characterization to locate areas for subsequent and more accurate analyses, field screening of samples to select those for fixed laboratory analysis, and engineering screening of alternatives (bench-scale tests). These types of data include those generated on site through the use of Photo- or Flame-Ionization Detectors (PID or FID), pH, conductivity, alpha and beta-gamma friskers, or radiological wipe samples. ASL A is analogous to EPA DQO Level 1.

Example: Field screening for alpha, beta, and gamma radiation conducted with portable field equipment provides real time qualitative analysis for the presence or absence of radioactive isotopes.

Example: Field screening for chemical gases in the well bore of groundwater monitoring wells using Photo-Ionization Detectors provides real time qualitative analyses for presence of volatile compounds (e.g., benzene, toluene).

6.2 ASL B (SEMI-QUANTITATIVE/QUANTITATIVE AND QUALITATIVE ANALYSES)

Provides more quality control checks than ASL A and results may be qualitative, semi-quantitative, or quantitative. ASL B can be assigned when rapid turnaround results are needed. FEMP-specified analytical protocols shall be used. There are two sublevels available for specifying QA/QC, data reporting, and data validation requirements.

Sublevel 1 specifies QA/QC, data reporting, and data validation requirements for FEMP-specified analytical protocols, which are similar to those used for ASLs C and D, but with different QA/QC sample type and frequency, quality control criteria for acceptance ranges, and requirements for data packages.

Sublevel 2 specifies user-defined and special requirements. The data user shall specify QA/QC, data reporting, and data validation requirements based on intended data use and regulatory requirements. Specific requirements shall be defined in project specific plans (PSPs).

Methods may range from more sophisticated screening techniques to fully defined methods similar to ASL C or D for radiological and non-radiological parameters, but with reduced QA/QC frequency and data reporting requirements for more rapid turnaround times. Also included in ASL B are standard methods (e.g., EPA 500-series drinking water methods with QA/QC requirements different than those specified for ASLs C and D) and conventional parameter analysis in support of regulatory requirements such as NPDES permit monitoring.

Example: Measurement of gross alpha and beta radioactivity in water in compliance with the Safe Drinking Water Act to provide information on drinking water quality.

Example: Determination of volatile halogenated organic compounds (e.g., chloroform) in water by purge and trap gas chromatography without second column confirmation, with a limited suite of field and laboratory QC samples, and a minimal data package.

6.3 ASL C (QUANTITATIVE WITH FULLY DEFINED QA/QC)

Provides data generated with full QA/QC checks of types and frequencies specified for ASL D according to FEMP-specified analytical protocols for radiological and non-radiological parameters. The analytical methods are identical to ASL D for QA/QC sample analysis and method performance criteria. However, the data package does not typically contain raw instrument output but does include summaries of QA/QC sample results. ASL C may be used when analyses require a rigid, well-defined protocol, but where other information is available, so that a complete raw data package validation effort is not required. Laboratories shall be required to retain, in the project file, raw instrument data required to upgrade ASL C reports to ASL D.

Example: Analysis of total uranium by the fluorimetric method with a full set of QA/QC samples as specified for ASL D. A summary data package is provided including QA/QC sample performance without raw instrument output. A limited level of data validation is required because only the summary forms need review.

Example: Determination of volatile organic compounds in soil by purge and trap gas chromatography/mass spectrometry with a full complement of QA/QC samples as specified for ASL D. A summary data package is provided including QA/QC sample performance without raw instrument output. A limited level of data validation is required because only the summary forms need review.

6.4 ASL D (CONFORMATIONAL WITH COMPLETE QA/QC AND REPORTING)

Provides data generated with a full complement of QA/QC checks of specified types and frequencies according to FEMP-specified analytical protocols for radiological and non-radiological parameters. The data package includes raw instrument output for validation of ASL D data. It may be used to confirm data gathered at ASLs B and C and when full validation of raw data is required.

Example: Analysis of total uranium by the fluorimetric method, with a full set of QA/QC samples per analytical batch with analytical results and the full raw data package reported from the laboratory.

Example: Determination of volatile organic compounds in soil or water by purge and trap gas chromatography/mass spectrometry with a full complement of field and laboratory QA/QC samples. A complete raw data package is provided and validated for the analyses.

6.5 ASL E (NON-STANDARD)

Analyses by non-standard protocols that often require method development or validation (e.g., when exacting detection limits or analysis of an unusual chemical compound are required). ASL E methods may be significantly different from those specified for ASLs B, C, or D data. New methods may be developed for ASL E data to allow for parameters or matrices that cannot be analyzed using existing standard methods. This could be caused by interferences, analyses performed outside of accepted requirements for existing methods, or new methods developed to meet site requirements or project-specific requirements that cannot be met by existing analytical methods.

Example: Analysis or evaluation of a geotextile material for suitability to use as a component of a remedial action at the site. Existing evaluation methods may not be adequate to evaluate site-specific needs so development of a new method is required.

Example: Determination of organic compounds (e.g., benzo(a)anthracene) in drinking water at sub-part per billion levels by special method on-column injection gas chromatography/mass spectrometry with selective ion monitoring detection and a full suite of field and laboratory QA/QC samples as required for ASLs C and D data. A complete raw data package may be required for validation.

APPENDIX 7

GUIDELINES FOR PREPARATION OF HEALTH AND SAFETY PLANS

~~Revision 0~~
~~December 1993~~
Revision 1
January 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

NOTE: This plan and associated permits shall be reviewed with each worker and be posted at the work site at all times. Review of the listed sections is required prior to work start.

CRU3 S&H PLAN GUIDELINE

1.0 **CRU3 Description and History**

- 1.1 FEMP Site History
- 1.2 Characterization
- 1.3 Define Scope or Goal of the Work
  - 1.3.1 Short Term
  - 1.3.2 Long Term
- 1.4 Goal of this Project

2.0 **Work Area (for this project) and Management**

- 2.1 Define Work Area within FEMP
- 2.2 Define Management Chain of Command
  - 2.2.1 Program Manager
  - 2.2.2 Project Manager
  - 2.2.3 S&H Officer

3.0 **General Safety Requirements**

- 3.1 Permits and Postings
- 3.2 Safety Equipment List
- 3.3 Heat Stress
- 3.4 Cold Stress
- 3.5 Material Safety Data Sheets (MSDS) Locations
- 3.6 Illumination
- 3.7 Sanitation at Temporary Worksites
- 3.8 Standard Operating Procedure and Other Requirements

4.0 **Site Control**

- 4.1 FEMP Requirements
- 4.2 Work Site Requirements for Entry
- 4.3 How Work Site will be defined (Safety Fence - CHAWLWK Fence)
- 4.4 Exclusion Zones

11.0 Hazard (Risk) Assessment and Accident Prevention

11.1 Industrial Hygiene Issues (Identify the Physical, Chemical and Health Hazards)
- 11.1.1 Explosive Chemical Contaminants
- 11.1.2 Heavy Metals
- 11.1.3 Organic

11.2 Radiological Safety Issues (Identify the Physical, Chemical and Health Hazards)

11.3 Industrial Safety Issues (Identify the Physical, Chemical and Health Hazards)

11.4 Fire Protection Issues (Identify the Physical, Chemical and Health Hazards)

11.5 Nuclear Safety Issues (Identify the Physical, Chemical and Health Hazards)

11.6 Natural Occurrence Issue (Weather) (Identify the Physical, Chemical and Health Hazards)

11.7 (Identify and State Action to Correct Each Noted Hazard)

12.0 Emergency/Contingency Plans

12.1 Reporting
- 12.1.1 Numbers
  - 12.1.1.1 Emergency Phone Number
  - 12.1.1.2 Emergency Radio Number
- 12.1.2 Site Notification Procedure
- 12.1.3 What/How to Report

12.2 Evacuation Routes/Accountability
- 12.2.1 Rally Point Accountability
- 12.2.2 Plant Wide Accountability
- 12.2.3 In Place Accountability

12.3 Available Emergency Equipment
- 12.3.1 Site Equipment
- 12.3.2 Plant Equipment
- 12.3.3 Off-Site Equipment

12.4 Emergency Response

12.4.1 Medical Emergencies
12.4.2 Fire Emergencies
12.4.3 Explosion Emergency
12.4.4 Chemical Emergency
12.4.4.1 Splashes
12.4.4.2 Employee Contamination

12.4.5 Radiological Emergencies
12.4.5.1 Releases
12.4.5.2 Employee Contamination

12.4.6 Weather Limitations/Adverse Condition

12.4.7 Accident Investigation

13.0 Changes/Amendments to Safety and Health Plan

APPENDIX 8

MATERIAL SAFETY DATA SHEETS

~~Revision 0~~
~~December 1993~~
Revision 1
January 1995

Fernald Office
U. S. Department of Energy
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

NOTE: This plan and associated permits shall be reviewed with each worker and be posted at the work site at all times. Review of the listed sections is required prior to work start.

N-BUTYL PHOSPHATE
N-BUTYL PHOSPHATE
N-BUTYL PHOSPHATE

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY CONTACTS
GASTON L. PILLORI
(201) 796-7100

DATE: 05/04/86
PO NBR: N/A
ACCT: 878202-02
INDEX: 12-8612-10106
CAT NO: B4044

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SUBSTANCE IDENTIFICATION

CAS-NUMBER 126-73-8

SUBSTANCE: **N-BUTYL PHOSPHATE**

TRADE NAMES/SYNONYMS: TRI-N-BUTYL PHOSPHATE; TBP; TRIBUTYL PHOSPHATE; PHOSPHORIC ACID, TRIBUTYL ESTER; PHOSPHORIC ACID TRIBUTYL ESTER; B-104

CHEMICAL FAMILY:
ESTER, NON-CARBOXYLIC

MOLECULAR FORMULA: C12-H27-O4-P MOL WT: 266.32

CERCLA RATINGS (SCALE 0-3): HEALTH=2 FIRE=1 REACTIVITY=0 PERSISTENCE=0

COMPONENTS AND CONTAMINANTS

PERCENT: 100.0 COMPONENT: N-BUTYL PHOSPHATE

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
5 MG/M3 OSHA TWA;
0.2 PPM (2.5 MG/M3) ACGIH TWA; 0.4 PPM (5 MG/M3) ACGIH STEL (NOTICE OF INTEND TO CHANGE 1984-1985)

PHYSICAL DATA

DESCRIPTION: ODORLESS, COLORLESS TO PALE YELLOW LIQUID.

BOILING POINT: 560 F (293 C) MELTING POINT: -112 F (-80 C)

SPECIFIC GRAVITY: 0.98 VAPOR PRESSURE: 13.7 MM @ 20 C MMHG

EVAPORATION RATE: NOT AVAILABLE SOLUBILITY IN WATER: INSOLUBLE

SOLVENT SOLUBILITY: MISCIBLE IN ALCOHOL OR ETHER VAPOR DENSITY: 9.1

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
A SLIGHT FIRE HAZARD OR EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME OR BY REACTION WITH INCOMPATIBLE SUBSTANCES.

FLASH POINT: 295 F (146 C) (OC) UPPER EXPLOSION LIMIT: NOT AVAILABLE

LOWER EXPLOSION LIMIT: NOT AVAILABLE AUTOIGNITION TEMP.: 900 F (543 C)

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

FIREFIGHTING:
MOVE CONTAINERS FROM FIRE AREA IF POSSIBLE. COOL CONTAINERS EXPOSED TO FLAMES WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

EXTINGUISH USING AGENTS INDICATED; DO NOT USE WATER DIRECTLY ON MATERIAL. IF LARGE AMOUNTS OF COMBUSTIBLE MATERIALS ARE INVOLVED, USE WATER SPRAY OR FOG IN FLOODING AMOUNTS. USE WATER SPRAY TO ABSORB CORROSIVE VAPORS. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING CORROSIVE VAPORS; KEEP UPWIND (BUREAU OF EXPLOSIVES, EMERGENCY HANDLING OF HAZARDOUS MATERIALS IN SURFACE TRANSPORTATION, 1981).

TOXICITY

3000 MG/KG ORAL RAT LD50; 100 MG/KG INTRAVENOUS RAT LDLO; CARCINOGEN STATUS: NONE.

N-BUTYL PHOSPHATE IS A SEVERE PULMONARY, SKIN, AND MUCOUS MEMBRANE IRRITANT. SEVERE EXPOSURE MAY AFFECT THE CENTRAL NERVOUS SYSTEM. PERSONS WITH A HISTORY OF CHRONIC RESPIRATORY OR SKIN DISEASE MAY BE AT AN INCREASED RISK FROM EXPOSURE.

HEALTH EFFECTS AND FIRST AID

INHALATION:
CORROSIVE. 1300 MG/M3 IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.
ACUTE EXPOSURE- EXPOSURE TO THE LIQUID MAY IRRITATE EYES, SKIN, THROAT, NOSE, MUCOUS MEMBRANES, OR MAY CAUSE HEADACHE, NAUSEA, WEAKNESS, FEVER, OR COUGHING. SEVERE EXPOSURE MAY CAUSE PROLONGED PULMONARY EDEMA, NARCOSIS, OR COMA.

CHRONIC EXPOSURE- HAS NOT BEEN REPORTED.

FIRST AID- REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON

WARM AND AT REST. GET MEDICAL ATTENTION.

SKIN CONTACT:
IRRITANT.
ACUTE EXPOSURE- MAY CAUSE IRRITATION. PROLONGED CONTACT MAY CAUSE BURNS.

CHRONIC EXPOSURE- MAY CAUSE DERMATITIS.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION.

EYE CONTACT:
IRRITANT.
ACUTE EXPOSURE- MAY CAUSE IRRITATION. PROLONGED CONTACT MAY CAUSE BURNS, TEMPORARY EPITHELIAL INJURY, OR VISUAL DISTURBANCES.

CHRONIC EXPOSURE- MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). IN PRESENCE OF BURNS, APPLY STERILE BANDAGES LOOSELY WITHOUT MEDICATION. GET MEDICAL ATTENTION.

INGESTION:
CORROSIVE.
ACUTE EXPOSURE- MAY CAUSE ABDOMINAL PAIN, VOMITING, OR DIARRHEA. TOXIC AMOUNTS WILL CAUSE NARCOSIS.

FIRST AID- IF VICTIM IS CONSCIOUS, IMMEDIATELY GIVE 2 TO 4 GLASSES OF WATER, AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. GET MEDICAL ATTENTION IMMEDIATELY.

REACTIVITY

REACTIVITY:
STABLE UNDER NORMAL CONDITIONS. REACTS VIOLENTLY WITH STRONG OXIDANTS.

INCOMPATIBILITIES:
REACTS VIOLENTLY WITH STRONG OXIDANTS.

DECOMPOSITION:
ON COMBUSTION EMITS TOXIC OXIDES OF NITROGEN AND TOXIC OXIDES OF PHOSPHORUS.

POLYMERIZATION:
NOT KNOWN TO OCCUR.

****

CONDITIONS TO AVOID

MAY BE IGNITED BY HEAT OR FLAMES. CONTAINER MAY EXPLODE IN HEAT OF FIRE. VAPOR EXPLOSION HAZARD INDOORS. AVOID CONTACT OR STORAGE WITH STRONG OXIDANTS.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
SHUT OFF IGNITION SOURCES. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA. KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION OR GENERAL DILUTION VENTILATION TO MEET PERMISSIBLE EXPOSURE LIMITS.

RESPIRATOR:
EXPOSURE LIMITS TO 50 MG/M3-
50 MG/M3- SUPPLIED-AIR RESPIRATOR.
SELF-CONTAINED BREATHING APPARATUS.

250 MG/M3- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONT- OR BACK-MOUNTED CANISTER) WITH A DUST AND MIST FILTER.
SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE, HELMET, OR HOOD.
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

1300 MG/M3- TYPE 'C' SUPPLIED -AIR RESPIRATOR OPERATED IN PRESSURE-DEMAND, OTHER POSITIVE-PRESSURE, OR CONTINUOUS-FLOW MODE.

ESCAPE- GAS MASK WITH AN ORGANIC VAPOR CANISTER WITH A HIGH -EFFICIENCY PARTICULATE FILTER.
SELF-CONTAINED BREATHING APPARATUS.

FIREFIGHTING- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
WEAR FACESHIELD (8 INCH MINIMUM) AND VENTED SAFETY GOGGLES. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS.

AUTHORIZED - ALLIED FISHER SCIENTIFIC
CREATION DATE: 01/11/85 REVISION DATE: 10/22/85

-ADDITIONAL INFORMATION-

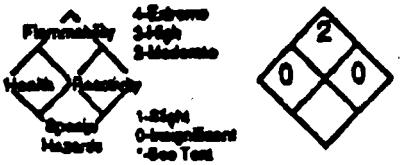
THE INFORMATION BELOW IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS

SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

6482 10055

BP OIL

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA FIRE HAZARD SYMBOL
BP America (In Ohio): 800-362-8059 (Outside Ohio): 800-321-8642 CHEMTREC Assist: 800-424-9300	216-441-8124	
MSDS Number > 1294		

MANUFACTURER/SUPPLIER: BP Oil Company
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375

IDENTIFICATION

TRADE NAME:
BP KEROSINE

CAS NUMBER:	8008-20-6
SYNONYM(S):	KEROSINE; MIDDLE DISTILLATE; PROCESS STREAM
CHEMICAL FAMILY:	PETROLEUM HYDROCARBONS
MOLECULAR FORMULA:	MIXTURE
MOLECULAR WEIGHT:	NA
PRODUCT CODE:	P 1410 **HIERARCHY:** 040.020

PRODUCT HAZARD SUMMARY

HEALTH	DANGER! HARMFUL OR FATAL IF SWALLOWED ASPIRATION HAZARD IF SWALLOWED--CAN ENTER LUNGS AND CAUSE DAMAGE VAPORS MAY BE HARMFUL MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT HEATED MATERIAL MAY CAUSE THERMAL BURNS SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS
FLAMMABILITY	CAUTION! COMBUSTIBLE LIQUID & VAPOR
REACTIVITY	STABLE

held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation results. Thermal burns require immediate medical attention.

INHALATION:
Remove affected person from source of exposure. If not breathing, ensure open airway an institute cardiopulmonary resuscitation (CPR). If breathing is difficult, administer oxygen if available. Get medical attention.

[redacted]

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, prevent aspiration. Individuals intoxicated by middle distillates should be hospitalize immediately, wit acute and continuing attention to neurologic and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for sever days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

PERSONAL PROTECTION INFORMATION

EYE PROTECTION:
Avoid eye contact with this material. Wear safety glasses or chemical goggles. Provide an eyewash station in the work area. Do not wear contact lenses when working with this substance.

SKIN PROTECTION:
Avoid skin contact. When working with this substance, wear appropriate chemical protective gloves. Depending upon conditions of use, additional protection may be necessary such as face shield, apron, armcovers, etc.

RESPIRATORY PROTECTION:
If exposure limits are exceeded or if irritation is experienced, NIOSH approved respiratory protection should be worn. Ventilation and other forms of engineering controls are often the preferred means for controlling chemical exposures. Respiratory protection may be needed for non-routine or emergency situations.

PHYSICAL PROPERTIES

BOILING POINT:	148.900 C (300 F)
SPECIFIC GRAVITY:	0.825 @ 60 F
MELTING POINT:	NA
% VOLATILE:	100.000
VAPOR PRESSURE:	0.400 MM HG @ 68 F
EVAPORATION RATE (WATER=1):	SLOWER
VAPOR DENSITY (AIR=1):	4.700
VISCOSITY:	1.300- 2.200 CST @ 100 F
% SOLUBILITY IN WATER:	NEGLIGIBLE
OCTANOL/WATER PARTITION COEFFICIENT:	ND
POUR POINT:	-34.400 C (-30 F)

ND = No Data
NA = Not Applicable

Do not cut, grind, drill, weld, reuse or dispose containers unless adequate precautions are taken against these hazards.

TRANSPORTATION REQUIREMENTS

D.O.T. PROPER SHIPPING NAME (49 CFR 172.101):	KEROSENE, 3, UN 1223, PG III
D.O.T. HAZARD CLASS (49 CFR 172.101):	3
UN/NA CODE (49 CFR 172.101):	UN 1223
BILL OF LADING DESCRIPTION (49 CFR 172.202):	KEROSENE, 3, UN 1223, PG III
D.O.T. LABELS REQUIRED (49 CFR 172.101):	COMBUSTIBLE
D.O.T. PLACARDS REQUIRED (49 CFR 172.504):	COMBUSTIBLE LIQUID

INGREDIENTS/HAZARDOUS IDENTIFICATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REF.
Kerosine	8008-20-6	99.90-100	None established
Remaining components not determined hazardous and/or hazardous components present at less than 1.0% (0.1% for carcinogens).	NA	Trace	NA

REVISION DATE: 05-feb-1992 REPLACES SHEET DATED: 30-oct-1991

COMPLETED BY: BP OIL HSEQ DEPARTMENT

ND = No Data
NA = Not Applicable

6482 [illegible]

MATERIAL SAFETY DATA SHEET

11/05/91
LAST REVISED: October 15, 1991

SECTION I PRODUCT SPECIFICATIONS

CAT NO. 3505A Diamyl(amyl)phosphonate
CAS NO. 6418-56-0 OTHER NAME: Dipentyl phosphonate
Supplied by CHEM SERVICE, Inc. PO BOX 3108, WEST CHESTER, PA, 19381 (215)692-3026
EMERGENCY PHONE #: 215-692-3026

SECTION II TOXICITY DATA

ORAL RAT OR MOUSE LD50	RTECS#	OSHA PEL (TWA)	ACGIH TLV (TWA)
NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE

NO TOXICITY DATA HAS BEEN FOUND. Assume this chemical to be hazardous.

SECTION III PHYSICAL DATA

MELTING POINT	BOILING POINT	DENSITY	VAPOR PRESSURE	VAPOR DENSITY	EVAPORATION RATE (Butyl acetate=1
NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE

ODOR	COLOR	PHASE	SOLUBILITY IN WATER
NOT AVAILABLE	NOT AVAILABLE	Liquid	NOT AVAILABLE

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: DATA NOT AVAILABLE
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical powder or spray.
No explosion limits are available for this compound.

SECTION V HEALTH HAZARD DATA

Contact lenses should not be worn in the laboratory.
All chemicals should be considered hazardous - Avoid direct physical contact!
May be harmful if absorbed through the skin. May be harmful if inhaled.
May be fatal if absorbed through the skin! May be fatal if inhaled! May be fatal if swallowed!
Vapors and/or direct eye contact can cause severe eye burns. Can cause skin burns.

SECTION VI FIRST AID

An antidote is a substance intended to counteract the effect of a poison. It should be administered only by a physician or trained emergency personnel. Medical advice can be obtained from a POISON CONTROL CENTER.

In case of contact: Flush eyes continuously with water for 15-20 minutes. Flush skin with water for 15-20 minutes. If no burns have occurred-use soap and water to cleanse skin.
If inhaled remove patient to fresh air. Administer oxygen if patient is having difficulty breat hing. If patient has stopped breathing administer artificial respirations.
If patient is in cardiac arrest administer CPR.
Continue life supporting measures until medical assistance has arrived.

SECTION VII REACTIVITY DATA

Reacts with Acid halides and anhydrides. Corrosive.

SECTION VIII SPILL OR LEAK PROCEDURES

Spills or leaks: Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area. Absorb on vermiculite or similar material. Sweep up and place in an appropriate container. Hold for disposal. Wash contaminated surfaces to remove any residues.
DISPOSAL: Burn in a chemical incinerator equipped with an afterburner and scrubber.

SECTION IX PRECAUTIONS TO BE TAKEN IN HANDLING

This chemical should be handled only in a hood. Eye shields should be worn. Use appropriate OSHA/MSHA approved safety equipment. Avoid contact with skin, eyes and clothing. Keep tightly closed in a cool dry place. Store only with compatible chemicals.

SECTION X SPECIAL PRECAUTIONS AND COMMENTS

The above information is believed to be correct on the date it is published and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded MSDS must be made available to the employee within three months. Responsibility for updates lies with the employer and not with CHEM SERVICE, Inc. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied, including merchantability or fitness for any particular purpose.

This product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticidal products, food additives or as household chemicals.

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET 6482

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

SOLVESSO 100

DATE PREPARED: NOV 7, 1991
NO.: 92957652

SECTION 1 PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

PRODUCT NAME: SOLVESSO 100

CHEMICAL NAME:
Aromatic Hydrocarbon CAS 64742-95-6

CHEMICAL FAMILY:
Petroleum Hydrocarbon

PRODUCT DESCRIPTION:
Clear colorless liquid.

EMERGENCY TELEPHONE NUMBERS: EXXON CHEMICAL AMERICAS 713-870-6000
CHEMTREC 800-424-9300

SECTION 2 HAZARDOUS INGREDIENT INFORMATION

The composition of this mixture may be proprietary information. In the event of a medical emergency, compositional information will be provided to a physician or nurse. This product is hazardous as defined in 29 CFR1910.1200, based on the following compositional information:

COMPONENT	OSHA HAZARD
Hydrocarbons	Combustible
Trimethylbenzene	OSHA PEL;ACGIH TLV
Xylene	OSHA PEL;ACGIH TLV
Cumene	OSHA PEL;ACGIH TLV
Ethylbenzene	OSHA PEL;ACGIH TLV

For additional information see Section 3.

SECTION 3 HEALTH INFORMATION & PROTECTION

NATURE OF HAZARD

EYE CONTACT:
Slightly irritating but does not injure eye tissue.

SKIN CONTACT:
Frequent or prolonged contact may irritate and cause dermatitis.
Low order of toxicity.
Skin contact may aggravate an existing dermatitis condition.

INHALATION:
High vapor/aerosol concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

INGESTION:
Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild-to-severe pulmonary injury, possibly progressing to death.
Minimal toxicity.

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

FIRST AID

EYE CONTACT:
Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:
Flush with large amounts of water; use soap if available. Remove grossly contaminated clothing, including shoes, and launder before reuse.

INHALATION:
Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:
If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

ACUTE TOXICITY DATA IS AVAILABLE UPON REQUEST.

WORKPLACE EXPOSURE LIMITS

OSHA REGULATION 29CFR1910.1000 REQUIRES THE FOLLOWING PERMISSIBLE EXPOSURE LIMITS:
A TWA of 25 ppm (125 mg/m3) for Trimethyl Benzene.
A TWA of 100 ppm (435 mg/m3) and a STEL of 150 ppm (655 mg/m3) for Xylenes.
A TWA of 50 ppm (245 mg/m3) for Cumene (skin).
A TWA of 100 ppm (435 mg/m3) and a STEL of 125 ppm (545 mg/m3) for Ethyl Benzene.

THE ACGIH RECOMMENDS THE FOLLOWING THRESHOLD LIMIT VALUES:
a TWA of 25 ppm (123 mg/m3) for Trimethyl Benzene.
A TWA of 100 ppm (434 mg/m3), and a STEL of 150 ppm (651 mg/m3) for Xylene .
a TWA of 50 ppm (246 mg/m3) for Cumene (skin).
a TWA of 100 ppm (434 mg/m3), and a STEL of 125 ppm (543 mg/m3) for Ethyl Benzene.

EXXON RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:
50 ppm total hydrocarbon based on composition.

PRECAUTIONS

SPECIAL PRECAUTIONS:
Health studies have shown that many petroleum hydrocarbons pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

PERSONAL PROTECTION:
For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where contact may occur, wear safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

VENTILATION:
The use of local exhaust ventilation is recommended to control process emissions near the source. Laboratory samples should be stored and handled in a lab hood. Provide mechanical ventilation of confined spaces. See respiratory protection recommendations.

SECTION 4 FIRE & EXPLOSION HAZARD

FLASHPOINT: 106 Deg F. METHOD: TCC NOTE: Approximately.
FLAMMABLE LIMITS: LEL: 0.6 UEL: 7.0
AUTOIGNITION TEMPERATURE: 869 Deg F.

GENERAL HAZARD:
Combustible Liquid, can form combustible mixtures at temperatures at or above the flashpoint.
Static Discharge, material can accumulate static charges which can cause an incendiary electrical discharge.
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING:
Use water spray to cool fire exposed surfaces and to protect personnel.
Isolate "fuel" supply from fire.
Use foam, dry chemical, or water spray to extinguish fire.
Avoid spraying water directly into storage containers due to danger of boilover.
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

HAZARDOUS COMBUSTION PRODUCTS:
No Unusual

SECTION 5 SPILL CONTROL PROCEDURE

LAND SPILL:
Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 7) notify the National Response Center.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL:
Remove from surface by skimming or with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters. Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION 6 NOTES

HAZARD RATING SYSTEMS:
This information is for people trained in:
National Paint & Coatings Association's (NPCA)
Hazardous Materials Identification System (HMIS)
National Fire Protection Association (NFPA 704)
Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704
HEALTH	2	1
FLAMMABILITY	2	2
REACTIVITY	0	0

KEY
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

SECTION 7 REGULATORY INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):
DOT PROPER SHIPPING NAME:
Naphtha Petroleum, Combustible Liquid, UN 1255
DOT HAZARD CLASS: Combustible Liquid
DOT IDENTIFICATION NUMBER: UN 1255
NAME: Naphtha, petroleum

TSCA:
This product is listed on the TSCA Inventory as a UVCB (Unknown, Variable Composition or Biological) Chemical at CAS Registry Number 64742-95-6

CERCLA:
This product, as sold, is derived from a fraction of crude oil and is excluded from the spill reporting requirements by CERCLA Section 101(14)(F). When this product is used in a mixture or as an ingredient in another product or in a manufacturing operation, the petroleum exclusion terminates and an accidental spill may require reporting to the National Response Center at 800-424-8802.
This product contains approximately 7% of Xylene.
The reportable quantity of Xylene is 1,000 pounds.
This product contains approximately 5% of Cumene.
The reportable quantity of Cumene is 5,000 pounds.
This product contains approximately 1% of Ethylbenzene.
The reportable quantity of Ethylbenzene is 1,000 pounds.

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

SOLVESSO 100

DATE PREPARED: NOV 7, 1991
NO.: 92957652

SARA TITLE III:
Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reautnorization Act, this product is classified into the following hazard categories:
Delayed Health, Fire.
This product contains the following Section 313 Reportable Ingredients:

COMPONENT	CAS NO.	MAXIMUM %
1,2,4-Trimethylpentane	95-63-6	24.0
Cumene	98-82-8	5.0
Xylene	1330-20-7	5.0
Ethylbenzene	100-41-4	1.5

SECTION 8 TYPICAL PHYSICAL & CHEMICAL PROPERTIES

SPECIFIC GRAVITY:
0.88 at 60
Density: 7.3 lbs/gal at 59

SOLUBILITY IN WATER, WT. % AT °F:
Less Than 0.10 at 68

SP. GRAV. OF VAPOR, at 1 atm (Air=1):
4.10

EVAPORATION RATE, n-Bu Acetate=1:
0.2

VAPOR PRESSURE, mmHg at °F:
10 at 100 Approximately

VISCOSITY OF LIQUID, CST AT °F:
1 at 77

FREEZING/MELTING POINT, °F:
-63

BOILING POINT, °F:
305 to 340 Approximately

SECTION 9 REACTIVITY DATA

STABILITY:
Stable

CONDITIONS TO AVOID INSTABILITY:
Not Applicable

HAZARDOUS POLYMERIZATION:
Will not occur

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Nitric acid, sulfuric acid, strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
None

SECTION 10 STORAGE AND HANDLING

ELECTROSTATIC ACCUMULATION HAZARD:
Yes, use proper grounding procedure

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MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

SOLVESSO 100

DATE PREPARED: NOV 7, 1991
NO.: 92957652

STORAGE TEMPERATURE, °F:
Ambient

LOADING/UNLOADING TEMPERATURE, °F:
Ambient

STORAGE/TRANSPORT PRESSURE, mmHg:
Atmospheric

VISC. AT LOADING/UNLOADING TEMP., cST:
1

REVISION SUMMARY:
Since MAY 14, 1991 this MSDS has been revised in Section(s):
7

REFERENCE NUMBER:	DATE PREPARED:	SUPERSEDES ISSUE DATE:
HDHA-C-25064	November 7, 1991	May 14, 1991

FOR ADDITIONAL PRODUCT INFORMATION, CONTACT YOUR TECHNICAL SALES REPRESENTATIVE
FOR ADDITIONAL HEALTH/SAFETY INFORMATION, CALL 713-870-6885