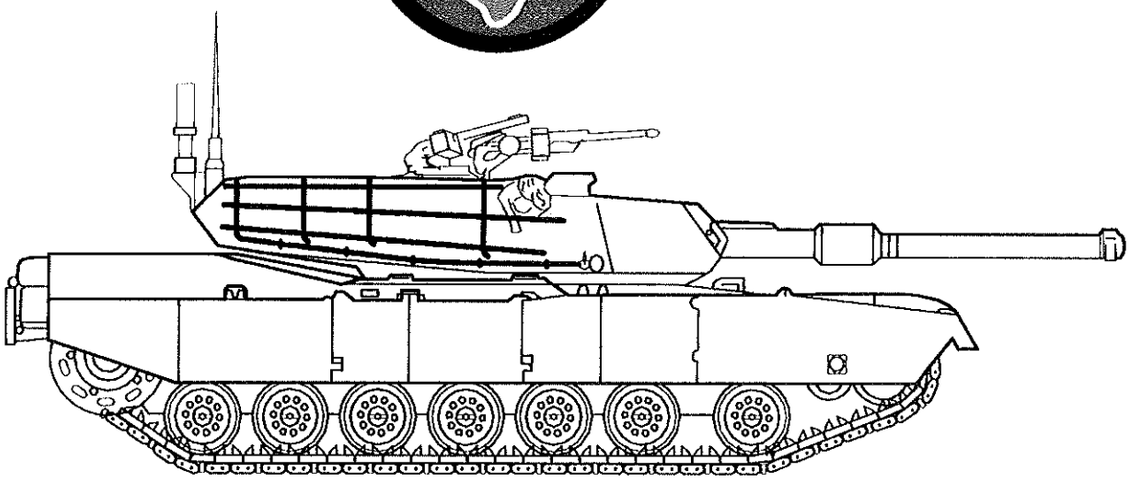
Corrected Final
Phase I RCRA Facility Investigation Report
For 24 Solid Waste Management Units
At Fort Stewart, Georgia

Volume I of III



May 1996

Job No. 87528.000

Prepared For

US Army Corps of Engineers
Savannah District

Prepared By

RUST ENVIRONMENT & INFRASTRUCTURE

DOCUMENT 3

CORRECTED FINAL

PHASE I
RCRA FACILITY INVESTIGATION REPORT
FOR 24 SOLID WASTE MANAGEMENT UNITS
AT FORT STEWART, GEORGIA
VOLUME I OF III

Prepared For

UNITED STATES ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract DACA21-93-D-0029
Delivery Order 0005
Rust Project No. 87528.000
May 1996

Prepared By
RUST ENVIRONMENT AND INFRASTRUCTURE
2694 Lake Park Drive
Charleston, South Carolina 29406
803/572-5600

1.0 INTRODUCTION

This Corrected Final Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for 24 Solid Waste Management Units (SWMUs) provides the results of implementation of the Phase I RFI Work Plan performed at Fort Stewart, Georgia. This Corrected Final Phase I RFI Report has been prepared by RUST Environment and Infrastructure, Inc. (RUST E&I) for the United States Army Corps of Engineers (USACE), Savannah District, Contract No. DACA21-93-D-0029, Delivery No. 0005.

The information provided in this report is based upon data provided by the USACE and Geraghty and Miller, Inc. Environmental Services (G&M). The field activities were completed in accordance with the Corrected Final Phase I RFI Work Plan (April, 1993) prepared by G&M. The Corrected Final Phase I RFI Report has been prepared in accordance with the USACE Scope of Work dated August 17, 1993 and is presented in the same format as the Corrected Final Phase I RFI Work Plan.

Twenty-four (24) SWMUs are discussed in this report. Two (2) SWMUs not included in this report are SWMU8 EOD Area (FST-008) and SWMU13 Fire Training Pit (FST-013) which are being addressed under other contracts.

The G&M field activities included the installation of 30 new ground-water monitoring wells at various SWMUs throughout the installation. During well drilling, G&M collected soil samples for analysis. The USACE completed all other sampling (ground-water, soil, sediment, surface soil, surface water, wastewater and sludge).

The soil samples for the G&M field investigations were analyzed by Savannah Laboratories in Savannah, Georgia and the Quality Assurance (QA) soil samples were analyzed by the USACE South Atlantic Division (SAD) Laboratory in Marietta, Georgia. The soil samples for the USACE field investigations were analyzed by James H. Carr and Associates, Inc.

(Carr Laboratory) in Columbia, South Carolina and International Technology Corporation Analytical Services (IT Laboratory) in Knoxville, Tennessee. The USACE QA samples were also submitted to the SAD Laboratory. All raw data from the laboratories has been included in Volume III, Appendix U of this Corrected Final Phase I RFI Report.

A Quality Control Summary Report (QCSR) and Analytical Package was prepared by G&M for the work completed by G&M in one (1) 3-ring notebook (1994). A QCSR was also prepared by USACE for the work completed by USACE in three (3) 3-ring notebooks (Volumes I, II and III)(1994).

With the exception of the following changes, the sampling program adhered to the approved Corrected Final Phase I RFI Work Plan (1993).

- Two (2) up-gradient surface water samples were collected at SWMU1, instead of the proposed one (1) up-stream and one (1) down-stream samples. The proposed down-gradient surface water sample was mistakenly taken in an up-gradient location.
- Due to drought, one (1) surface soil sample was collected at the Tac-X Landfill SWMU3 in lieu of surface water and leachate samples.
- Based on the field records, soil samples were not collected below six feet below land surface or to the water table in the location chosen for soil boring MW4 at Burn Pit SWMU4B because of sustained OVA readings above the health and safety action levels. This soil boring was abandoned and the monitoring well SWMU4B, MW4(b) was later installed by the USACE.
- Four (4) extra surface soil samples were taken at EOD Area SWMU12.
- One (1) extra surface water sample and one (1) extra QA surface water sample were collected at the Industrial Wastewater Treatment Plant SWMU18.
- No sludge sample was available at the Radiator Shop SWMU24A.
- Five (5) extra ground-water samples and five (5) extra soil samples were collected at the Waste Oil Tanks SWMU25.

- Two (2) extra soil samples and two (2) surface soil samples were collected at the 724th Tanker Purging Station SWMU26.
- Field duplicated soil samples were mistakenly collected and submitted by G&M for laboratory analysis by pH and specific conductance at SWMU2, SWMU4A through 4F, and SWMU14.
- The analytical methods used to analyze the ground-water samples were inadvertently switched by the laboratory from SW-846 Method 8080 to Method 608. During all future sampling and analyses, it will be ensured that only SW-846 methods will be utilized.
- The detection limits for vinyl chloride and toxaphene were inadvertently higher than their MCLs, SMCLs, and/or action levels. During all future sample analyses, it will be ensured that the detection limits for all parameters are less than, or equal to, their MCLs, SMCLs, and/or action levels.

5.14 Radiator Shop SWMU24A(ST-24A) and the Paint Booth SWMU24B(FST-024B)

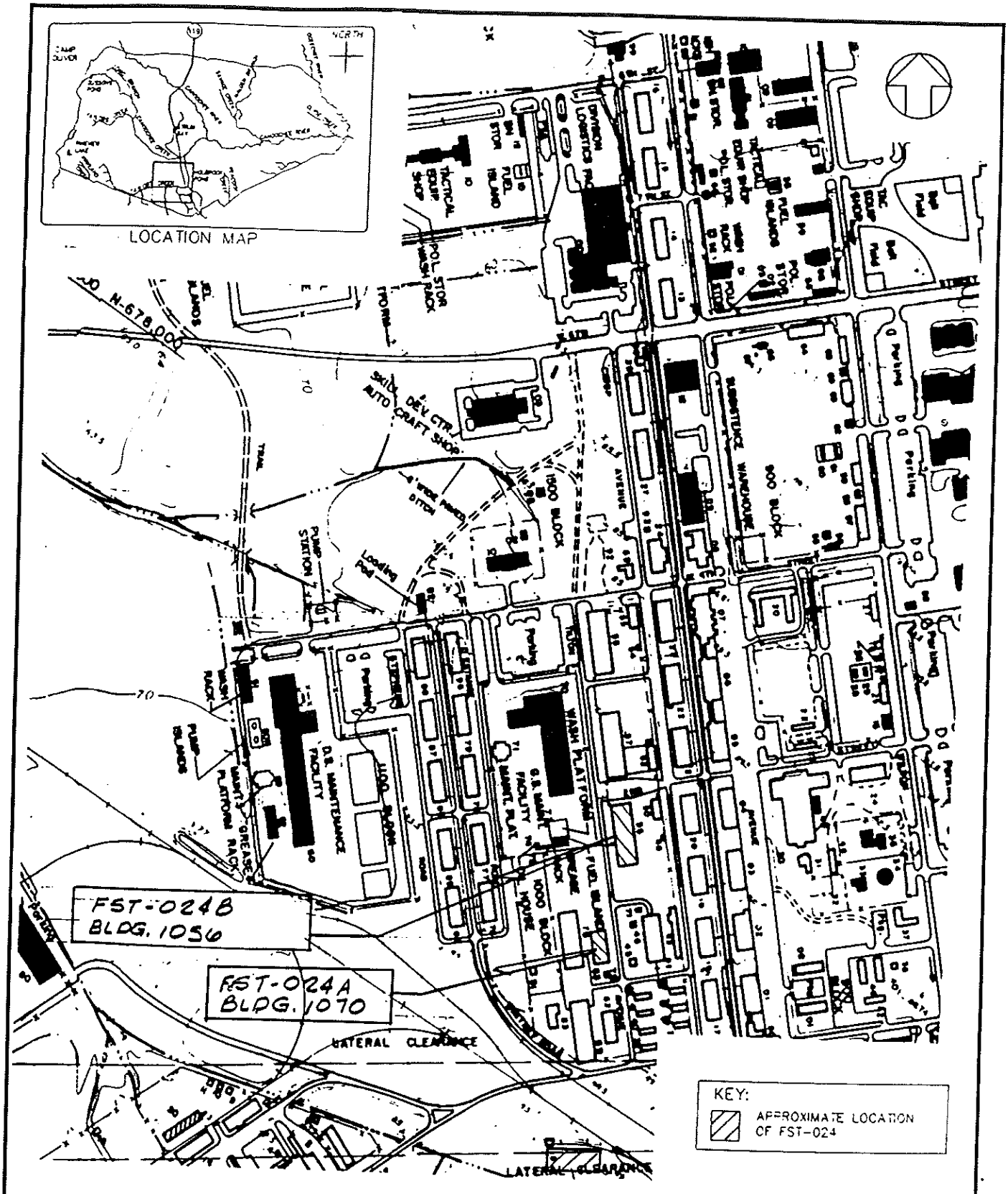
5.14.1 Site Description

The Radiator Shop SWMU24A(FST-24A) and the Paint Booth SWMU24B(FST-024B) are located in the southern portion of the cantonment area (Figure 5-131). The Radiator Shop is located on the western side of Tilton Avenue, in Building 1070. Operations in the Radiator shop began in 1980 (G&M, 1993). The Paint Booth is located on the eastern side of Tilton Avenue in Building 1056, which used to be the Old Radiator Shop.

A sample location map for the Radiator Shop SWMU24A is provided in Figure 5-132. Photographs from a recent site inspection (November 10, 1993) of SWMU24A are shown in Figure 5-133.

The new Radiator Shop (SWMU24A) (including a welding shop for radiator repair and a paint booth) burned in March, 1993. A new building to replace the burned shop was under construction at the time of the site visit. The new building is accessed by a concrete drive off of Tilton Avenue. The new building is constructed over a concrete slab floor. The former radiator shop was located in the west-central portion of the building under construction. The former paint shop was located at the northwest end of the present building. The former welding shop was located in the central portion of the north side of the present building. The radiator shop to be constructed will be located on the northwest end of Building 1069 (the building adjacent to the southeast end of Building 1056.

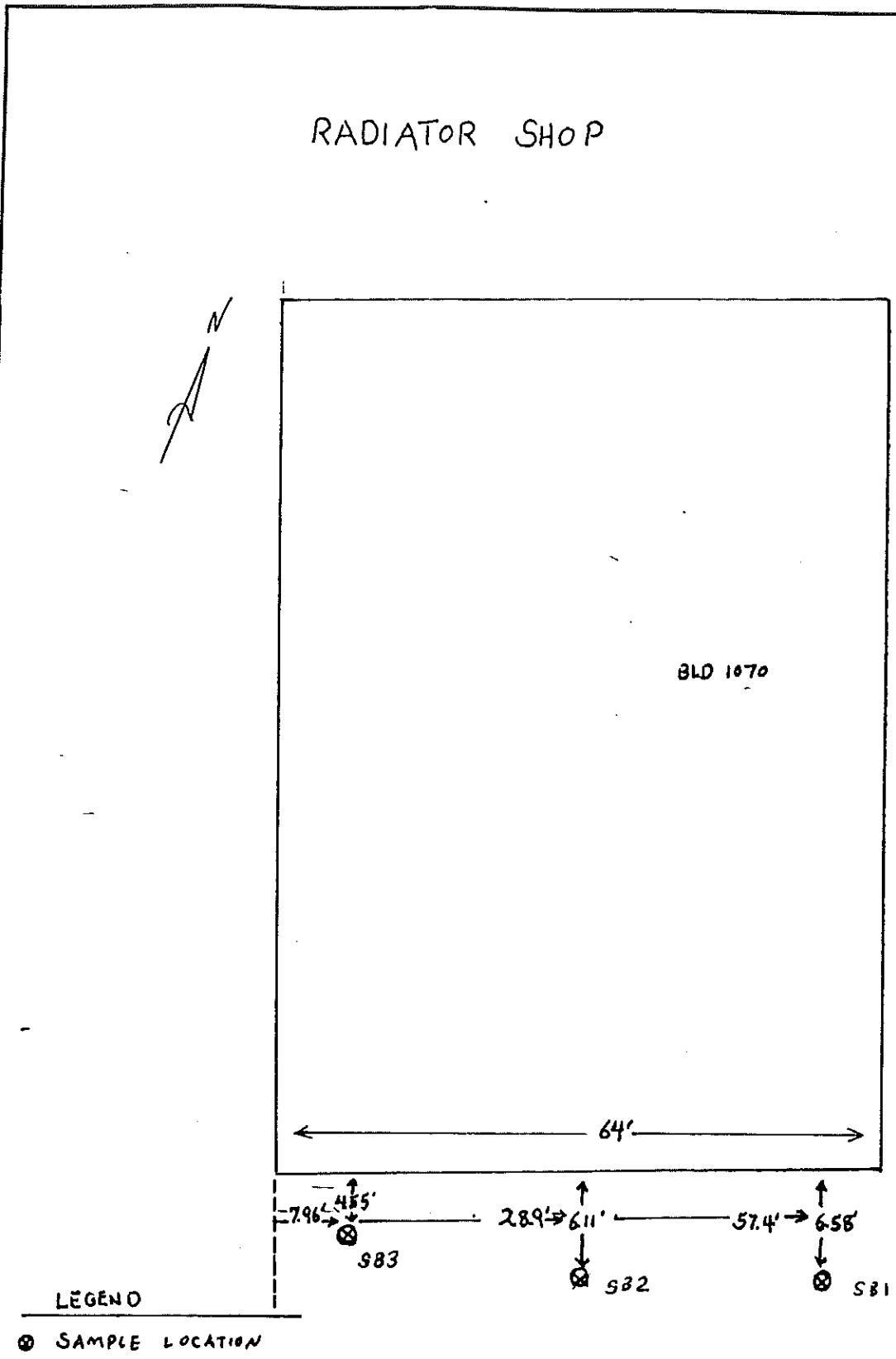
Operations at the new Radiator Shop included descaling of radiators by soaking in an aqueous solution of sodium hydroxide, encapsulating the caustic waste solution by mixing with concrete and sodium silicate and disposing in the landfill. Encapsulating is no longer performed, but was used until the facility burned in 1993. After descaling, radiators were leak tested with fluorescein dye, then painted in a wet curtain spray paint booth (G&M, 1993). Discussions with Mr. Wayne Kennedy, the former Radiator Shop operator, indicate



RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5-131

LOCATION MAP
SWMU-24A (FST-024 A) RADIATOR SHOP
SWMU-24B (FST-024 B) PAINT BOOTH
FORT STEWART, GEORGIA
PROJECT NO. 87528.000

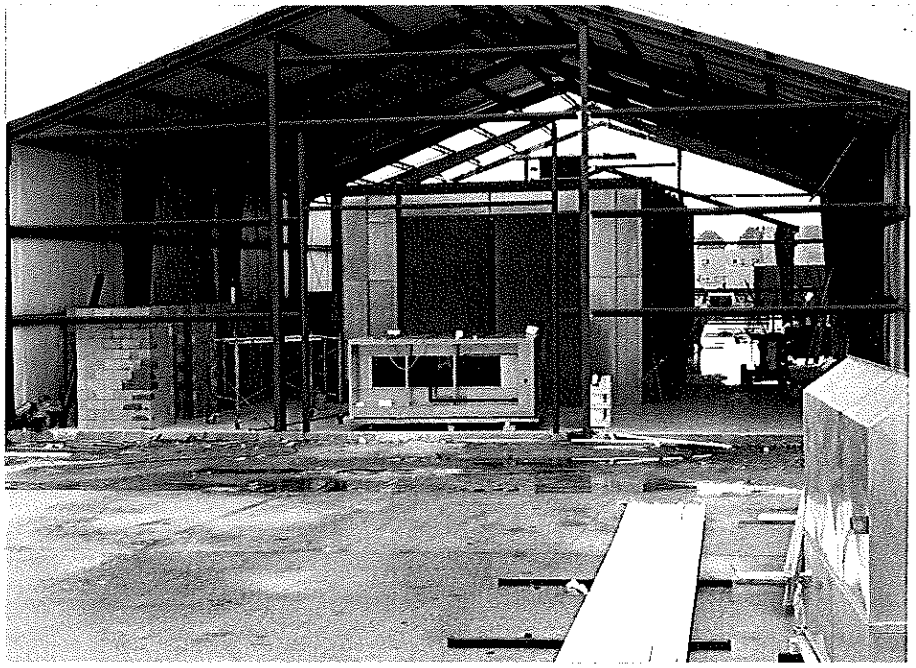


RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5-132

SOIL BORING LOCATIONS
SWMU-24A (FST-024 A)

RADIATOR SHOP, FORT STEWART, GEORGIA
PROJECT NO. 87528.000



BUILDING UNDER CONSTRUCTION ON FORMER RADIATOR SHOP LOCATION

BUILDING UNDER CONSTRUCTION ON FORMER RADIATOR SHOP LOCATION

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5-133

PHOTOGRAPHS
SWMU-24A(FST-024 A)
RADIATOR SHOP, FORT STEWART, GEORGIA
PROJECT NO. 87528.000

the sodium hydroxide material used was Caustic Soda # 37-"Barbite" (see Material Safety Data Sheet (MSDS), Appendix N1). According to the MSDS, sodium hydroxide does not contain any hazardous ingredients, however, it does have the potential to be a health hazard.

The Paint Booth (SWMU24B) is currently used as an equipment repair and storage area. Photographs from the November 10, 1993 site inspection are shown in Figure 5-134. Transmissions are stored under an aluminum awning on the building's northeast side. One longtime Building 1056 worker reported the old paint booth to have been located in the northern building corner, and to have been out of use for about 18 years. The two Building 1056 employees that were interviewed, indicated that they were not aware of the materials used in the old paint booth and neither employee expressed awareness of a radiator shop having been located in the building. The interviewees were not aware of where or when Building 1056 piping was connected with the IWTP, however, both interviewees believed that all drains in the building lead to the IWTP. A former cut through Tilton Avenue is visible approximately 15 feet southeast of the northwest end of Building 1056. The connection between Building 1056 piping and the IWTP is believed to have been placed beneath this former cut. The Fort Stewart Plumbing/Mechanical and Electrical Department was not able to define where or when the hook-up from the Building 1056 piping to the IWTP occurred.

5.14.2 Work Completed

The RFI Work Plan (G&M, 1993) specified that one sample of "sludge" at the Radiator Shop SWMU24A site would be collected for laboratory analyses of TCLP constituents, VOCs, and pH. The Radiator Shop building (1070) burned in March, 1993 and is currently being rebuilt, therefore the "sludge" sample was not obtained. Three soil boring samples were collected and analyzed for TCLP constituents. An analytical results summary is provided in Section 5.24.5.

The apparent location of a pipe installed under Tilton Avenue connecting the drain in Building 1056 with the industrial wastewater pipeline located across the road was

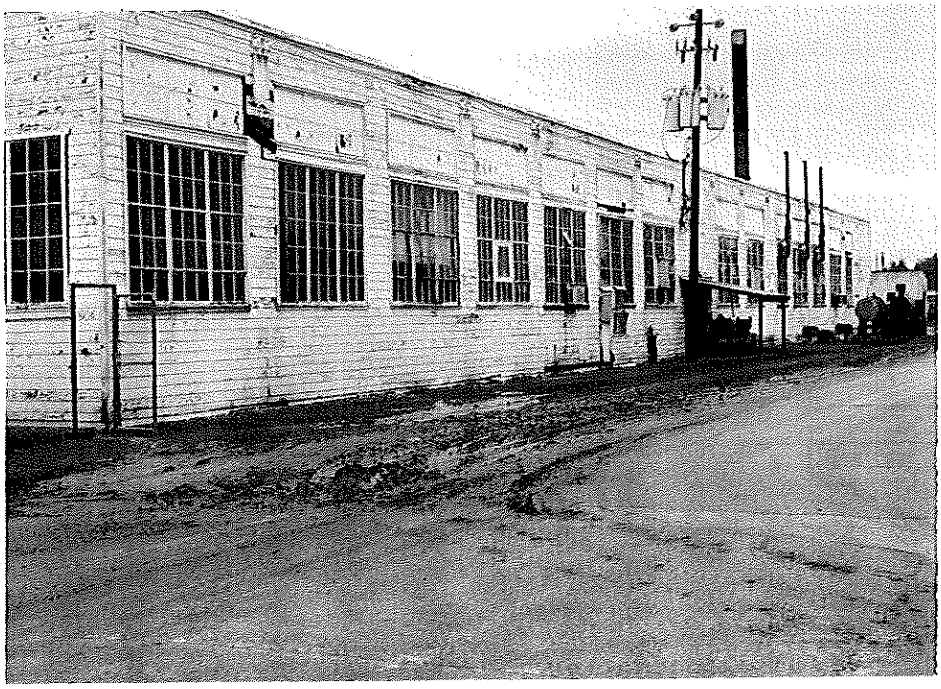


PHOTO SOUTHEASTWARD, DRAIN PIPE CUT ACROSS TILTON AVENUE IN FOREGROUND

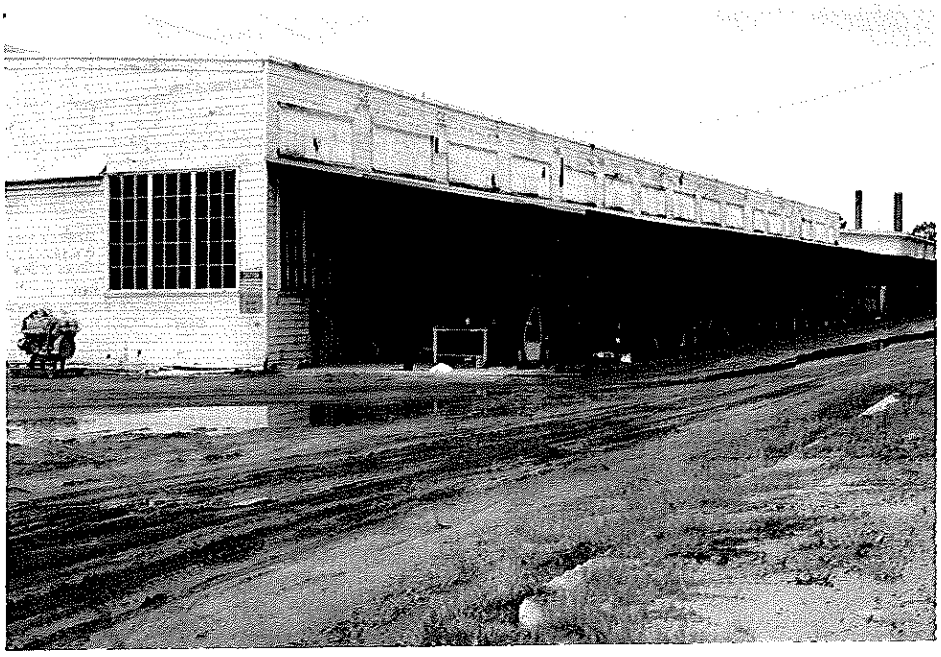


PHOTO NORTHWESTWARD, PAINT BOOTH WAS LOCATED IN NORTHERN CORNER OF BUILDING

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5-134

PHOTOGRAPHS
SWMU-24B (FST-024 B)
PAINT BOOTH, FORT STEWART, GEORGIA
PROJECT NO. 87528.000

determined to be approximately 15 feet southeast of the northeast end of Building 1056.

An interview with the former Radiator Shop operator indicated the encapsulating process was used until the Radiator Shop burned in March, 1993. It is uncertain whether the encapsulating process will be used in the future when the Radiator Shop activities resume. Written documentation demonstrating that only non-hazardous materials have been used in Building 1056 since the drains were installed has not been forthcoming. In order to verify that hazardous materials have not impacted the ditch(es) adjacent to Tilton Avenue, the ditch(es) will be sampled during the Phase II Investigation.

A detailed description of the caustic chemical descaling process was documented. A drainage schematic illustrating the apparent position of the paint booth (Building 1056) drain pipe was compiled.

5.14.3 Site Characterization

The Radiator Shop (SWMU24A) soil boring location map is provided in Figure 5-132. The soil boring logs are provided in Appendix N2. Soils reported underlying the site are predominantly sands. The highest FID/PID measurements reported for soil borings SB-1, SB-2 and SB-3 were 11.0/15.5, 20/19.8, and 26/20.4, respectively. The FID/PID measurements generally increased with increasing depth. Soils from borings were reported to appear "saturated with an oily black liquid that smells of diesel" at depths below 4.7 feet. Contaminant distributions are discussed in Section 5.14.5.

5.14.4 Waste Characterization

Material Characterization for the Radiator Shop SWMU24A(FST-024) is related to the maintenance and cleaning of radiators. Materials included: used caustic cleaning solutions, sodium hydroxide, water-based fluorescein dye solution, and spent recirculation water from the wet curtain spray paint booth (G&M, 1993). A Material Safety Data Sheet for the caustic cleaning solutions is included in Appendix N1.

5.14.5 Analytical Results

The following section presents a brief summary of the results of the laboratory analyses of the soil samples collected at the Radiator Shop. The soil boring samples were collected from three (3) locations and are shown in Figure 5-132. The soil boring samples were collected by the USACE on August 12, 1993 and analyzed for full TCLP.

5.14.5.1 Action Levels and Clean-Up Standards

Table 5-29 summarizes the analytical results for the soil boring samples collected from the Radiator Shop. The table highlights (in bold) the parameters detected above the TC regulatory levels. The complete analytical results are included in the USACE QCSR (February, 1994) and Appendix U of this report.

5.14.5.2 Sediment

TCLP

A cadmium concentration of 0.13 mg/kg was reported in soil boring sample SB1 but was below the TC regulatory level of 1.0 mg/kg. Figure 5-135 shows the TCLP metal distribution in the sediment at the site.

5.14.5.3 Data Evaluation

The USACE QCSR (February, 1994) states that both the data quality objectives and completeness criteria were met in SWMU24A, and that the data met the project objectives.

5.14.6 Evidence of Release from the Site

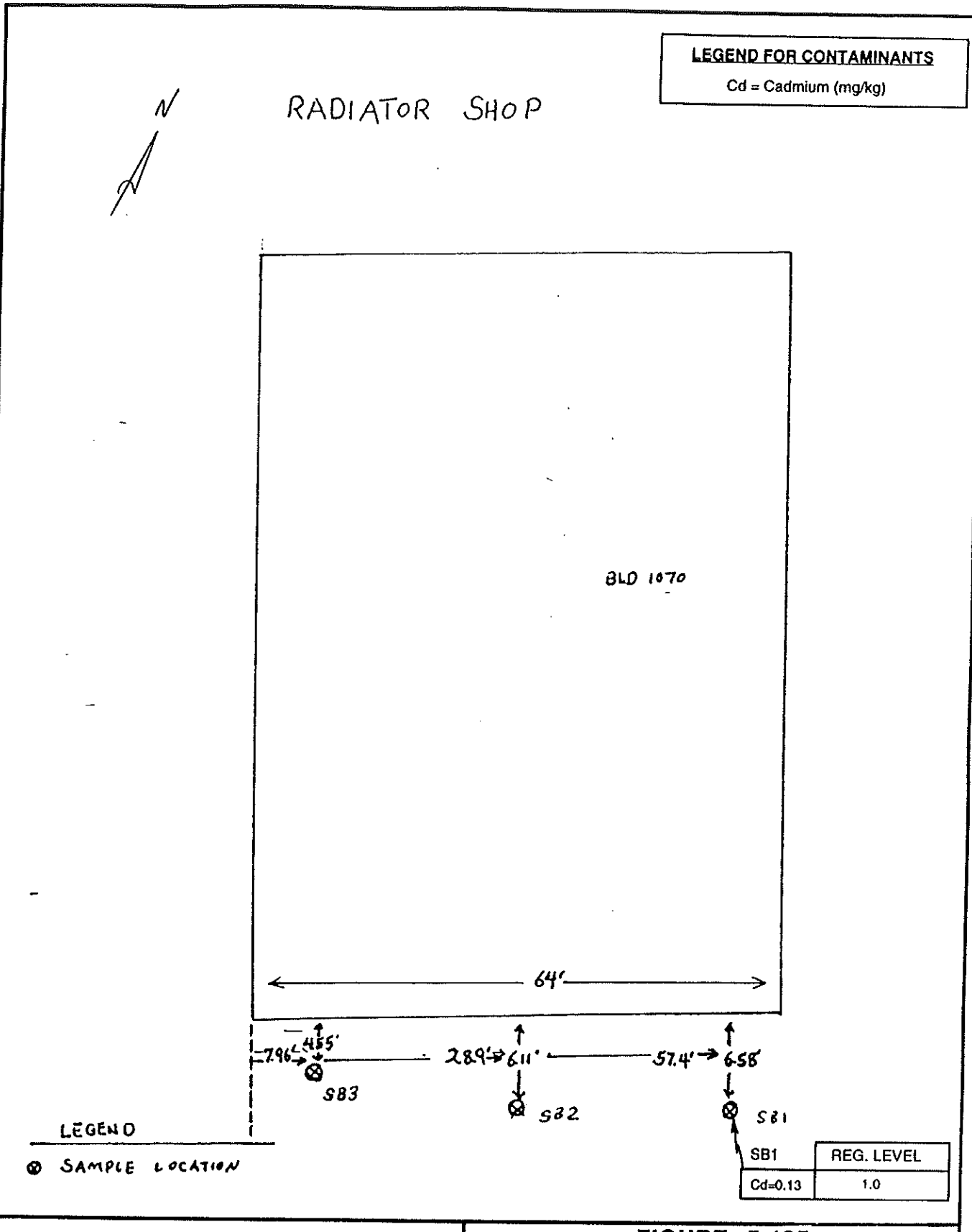
The analytical results do not indicate a release from the new Radiator Shop SWMU24A. However, the Old Radiator Shop location may have had a release associated with the fire. In order to verify that the former paint booth SWMU24B (Building 1056) hazardous materials have not impacted the ditch(es) adjacent to Tilton Avenue, the ditch(es) will be sampled during a Phase II investigation (see Phase I Work Plan). A schematic of the approximate drain pipe location is presented in Figure 5-135-A.

TABLE 5-29
SUMMARY OF SOIL BORING ANALYTICAL RESULTS
SWMU24A(FST-024A) - RADIATOR SHOP
AUGUST 12, 1993

ID	TCLP (ppm)
SB1	Cd 0.13
SB2	BDL
SB3/SB3 DUP	BDL/BDL
REGULATORY LEVEL	Cd 1.0

NOTES:

BDL = Below Detection Level
Cd = Cadmium
DUP = Duplicate



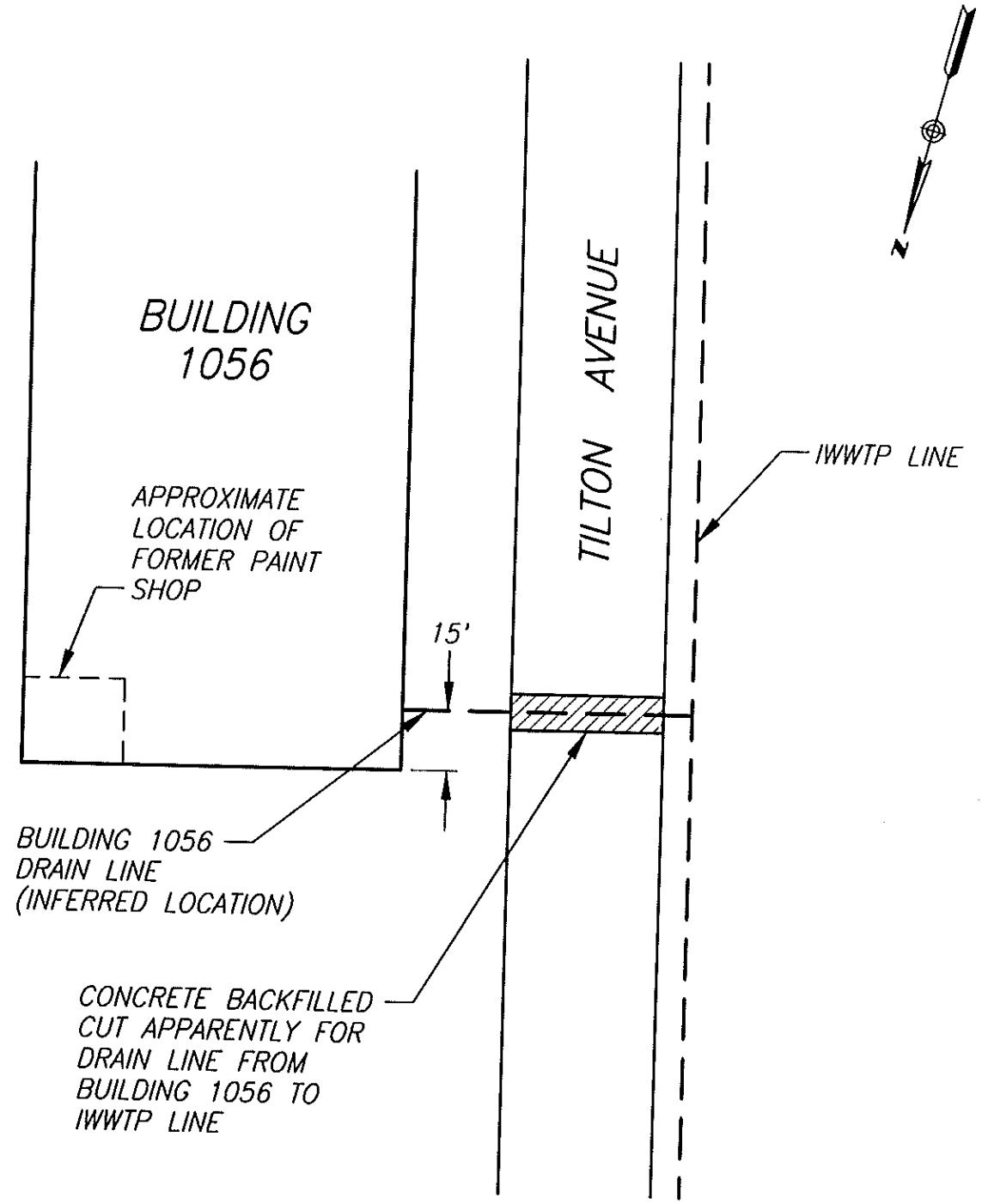
RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5-135

TCLP CONTAMINANT DISTRIBUTION IN SOILS
SWMU-24A (FST-024 A)

RADIATOR SHOP, FORT STEWART, GEORGIA

PROJECT NO. 87528.000



RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5-135A

DRAIN LINE SCHEMATIC
SWMU-24B (FST-024 B)
PAINT BOOTH, FORT STEWART, GEORGIA
PROJECT NO. 87528.000

5.14.7 Health and Environmental Assessment

The objective of the Health and Environmental Assessment (HEA) is to provide information necessary to evaluate the need for appropriate interim corrective measures or for a Corrective Measures Study (CMS). No analytical data were available to quantitatively evaluate the potential risk to human and ecological receptors at SWMU24B.

5.14.8 Potential for Phase II Investigation

In that the analytical results indicated concentrations were below the TC regulatory level for the New Radiator Shop, SWMU24A, no further action is recommended at this site. However, soil samples are recommended to be collected at the Old Radiator Shop and analyzed for Appendix VII Part 261 constituents as part of a Phase II investigation.

As stated in Section 5.14.6, a Phase II investigation is recommended for the paint booth ditch SWMU24B. The Phase II investigation would include soil sampling and analysis for TCLP.

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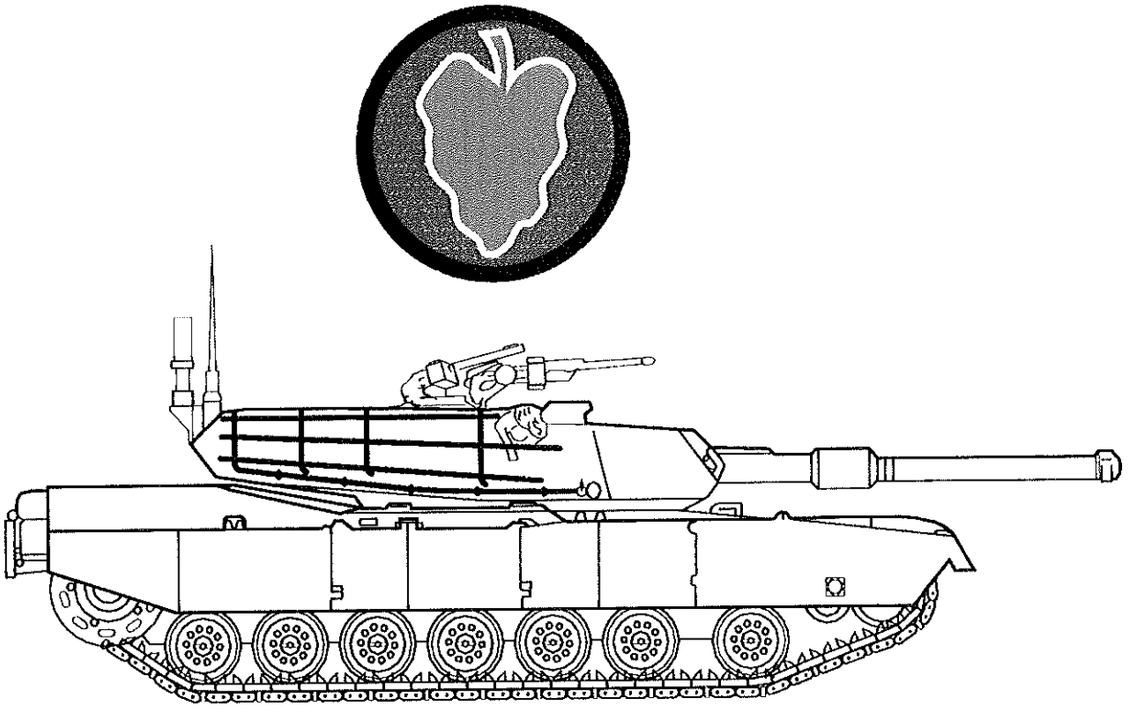

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Appendix N

SWMU24A (FST-024A) Radiator Shop

Appendix N1

MSDS for Caustic Soda #37 "Barbite"

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
The Barbee Co,, Inc.	502-584-2155

ADDRESS (Number, Street, City, State, and ZIP Code)
418 E. Breckinridge St. Louisville, KY.

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
Sodium Hydroxide - Caustic Soda	Caustic Soda - #37 BARBITE
CHEMICAL FAMILY: Alkali	FORMULA: NaOH

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Not Applicable = N.A.		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	N.A.	SPECIFIC GRAVITY (H_2O=1)	N.A.
VAPOR PRESSURE (mm Hg.)	N.A.	PERCENT, VOLATILE BY VOLUME (%)	N.A.
VAPOR DENSITY (AIR=1)	N.A.	EVAPORATION RATE (_____ =1)	N.A.
SOLUBILITY IN WATER	Appreciable		
APPEARANCE AND ODOR	White powder (Flake, bead or granule)		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
None	N.A.		

EXTINGUISHING MEDIA: N.A.

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

(Continued on reverse side)

SECTION V · HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 2 mg/M^3

EFFECTS OF OVEREXPOSURE: Severe burns to skin, eyes and respiratory system. Fatal if swallowed.

EMERGENCY AND FIRST AID PROCEDURES

Skin contact - flush with water

Eye contact - rinse out eyes with water for at least 15 mins - call a physician.

Inhalation - Remove to fresh air and call a physician.

Ingestion - Give water or milk and call a physician immediately.

SECTION VI · REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Excessive moisture
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*: Wool, leather clothing, aluminum, tin, zinc and their alloys, reacts violently with many organics. Hot water causes flash boiling.

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII · SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Avoid contact. Sweep up and dispose with solid wastes. Flush remainder to drain.

WASTE DISPOSAL METHOD

Neutralize with acid and dilute with water. Flush to sewer. 20% of acid to amount of spillage

SECTION VIII · SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: U.S. Bureau of Mines approved safety mask toxic dust & fumes.

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES: Liquid proof rubber

EYE PROTECTION: Safety monogoggles

OTHER PROTECTIVE EQUIPMENT: Rubber shoes and apron - cotton clothing.

SECTION IX · SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid adding to hot water. Wear proper protective equipment when handling

OTHER PRECAUTIONS

Appendix N2

Soil Boring Logs

Hole No. FST-024A-SB1

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION FORT STEWART, GA.	SHEET 1 OF 1 SHEETS

1. PROJECT	PHASE 1 RCRA FACILITY INVESTIGATION
2. LOCATION (Coordinates or Station)	SWMU-024A NEW RADIATOR SHOP
3. DRILLING AGENCY	SAVANNAH DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	FST-024A-SB1
5. NAME OF DRILLER	DOUGLAS LAROUCHE
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	8.75'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	8.75'
10. SIZE AND TYPE OF BIT	ROCK BIT AND 4" AUGER
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	N/A
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 550
13. TOTAL NO. OF SOIL SAMPLES TAKEN	DISTURBED 1 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	0
15. GROUND WATER ELEVATION	8.75
16. DATE HOLE	STARTED 12 AUG 93 / COMPLETED 12 AUG 93
17. ELEVATION TOP OF HOLE	N/A
18. TOTAL CORE RECOVERY FOR BORING	N/A %
19. SIGNATURE OF INSPECTOR	JUDSON D. SMITH

ELEVATION (FT) a	DEPTH (FT) b	SYMBOLS c	CLASSIFICATION OF MATERIALS (Description) d	FID/PID e	JAR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Concrete.			
	1		(SM) Light tan silty SAND.	6.0/11.9		Dry, no odor.
				6.0/12.0		
	2		Dark tan.	7.0/12.2		Smells faintly like diesel, lightly moist.
				6.0/12.0		
	3			6.0/11.6		
			(SW) Gray fine grade SAND.	6.0/10.5		Lightly moist, no odor.
	4			6.0/10.5		
			With black patches.	6.0/12.2		
	5		(SM) Oily black silty SAND.	6.0/13.4		Appears saturated with an oily black liquid that smells of diesel, damp to very wet.
				6.0/12.1		
	6			7.0/13.2		
				9.0/14.5		
	7			10.0/12.9		
				10.0/13.6		
	8			10.0/14.1		
				11.0/15.5	1	Lab sample taken.
	9		BOTTOM OF HOLE AT 8.75'			
			GROUNDWATER			
	10					
	11		NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASS-IFICATION SYSTEM.			
	12					
	13					
	14					
	15					

N-3

Hole No. FST-024A-SB2

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: FORT STEWART, GA.	SHEET 1 OF 1 SHEETS

1. PROJECT	PHASE 1 RCRA FACILITY INVESTIGATION
2. LOCATION (Coordinates or Station)	SWMU-024A NEW RADIATOR SHOP
3. DRILLING AGENCY	SAVANNAH DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	FST-024A-SB2
5. NAME OF DRILLER	DOUGLAS LAROUCHE
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	8.75'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	8.75'
10. SIZE AND TYPE OF BIT	ROCK BIT AND 4" AUGER
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	N/A
12. MANUFACTURER'S DESIGNATION OF DRILL	CME 550
13. TOTAL NO. OF SOIL SAMPLES TAKEN	DISTURBED 1 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	0
15. GROUND WATER ELEVATION	8.75
16. DATE HOLE	STARTED 12 AUG 93 / COMPLETED 12 AUG 93
17. ELEVATION TOP OF HOLE	N/A
18. TOTAL CORE RECOVERY FOR BORING	N/A %
19. SIGNATURE OF INSPECTOR	JUDSON D. SMITH

ELEVATION (FT) a	DEPTH (FT) b	SYMBOLS c	CLASSIFICATION OF MATERIALS (Description) d	FID/PID e	JAR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Concrete.			
	1		(SM) Gray and tan silty SAND.	9.0/21.7		Dry, no odor.
			Gray and black.	8.0/14.0		Lightly moist, faint fuel odor.
	2			8.0/13.7		
				8.0/14.5		
	3		(SW) Tan fine grade SAND.	6.0/14.0		Lightly moist, no odor.
				6.5/14.8		
	4			7.0/14.3		
			With gray patches.	7.0/14.4		
	5		(SM) Oily black silty SAND.	10/15.9		Appears saturated with an oily black liquid that smells of diesel, damp to very wet.
				11/16.4		
	6			10/16.9		
				16/17.8		
	7			16/19.4		
				17/19.1		
	8			16/19.1		
				20/19.8	1	Lab sample taken.
	9		BOTTOM OF HOLE AT 8.75' GROUNDWATER			
	10					
	11		NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASS-IFICATION SYSTEM.			
	12					
	13					
	14					
	15					

N-4

Hole No. FST-024A-SB3

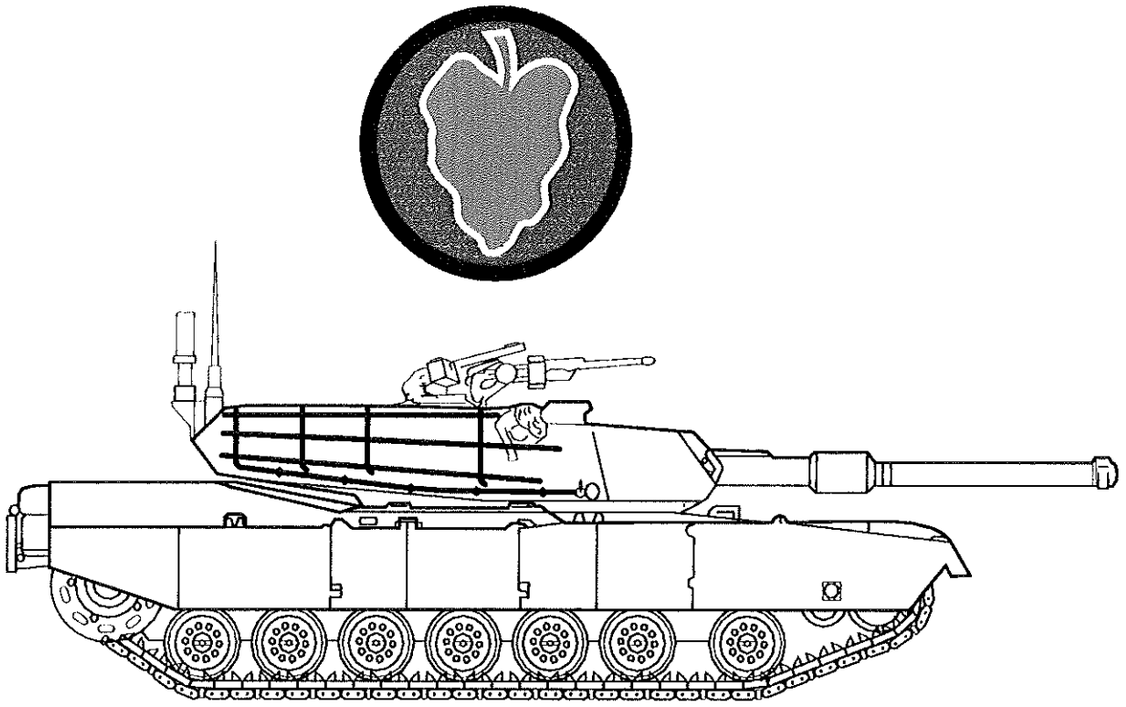
DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: FORT STEWART, GA.	SHEET 1 OF 1 SHEETS
1. PROJECT: PHASE 1 RCRA FACILITY INVESTIGATION		10. SIZE AND TYPE OF BIT: ROCK BIT AND 4" AUGER	
2. LOCATION (Coordinates or Station): SWMU-024A NEW RADIATOR SHOP		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): N/A	
3. DRILLING AGENCY: SAVANNAH DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: CME 550	
4. HOLE NO. (As shown on drawing title and file number): FST-024A-SB3		13. TOTAL NO. OF SOIL SAMPLES TAKEN: DISTURBED 1 / UNDISTURBED 0	
5. NAME OF DRILLER: DOUGLAS LAROUCHE		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. GROUND WATER ELEVATION: 8.75	
7. THICKNESS OF OVERBURDEN: 8.75'		16. DATE HOLE: STARTED 12 AUG 93 / COMPLETED 12 AUG 93	
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: N/A	
9. TOTAL DEPTH OF HOLE: 8.75'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: JUDSON D. SMITH	

ELEVATION (FT) a	DEPTH (FT) b	SYMBOLS c	CLASSIFICATION OF MATERIALS (Description) d	FID/PID e	JAR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Concrete.			
	1		(SW) Tan fine grade SAND.	9.0/19.2		Dry, no odor.
	2		(SM) Black silty SAND.	8.0/19.7		Lightly moist, light fuel odor.
				6.0/18.5		
				6.0/19.6		
	3		(SW) Gray and tan fine grade SAND.	6.0/20.0		Lightly moist, no odor.
	4			7.0/21.1		
				6.0/21.1		
				6.0/21.9		
	5		(SM) Oily black silty SAND.	6.0/22.2		Appears saturated with an oily black liquid that smells of diesel, damp to very wet.
	6			8.0/20.5		
				9.0/19.7		
	7			10/18.6		
				16/19.8		
	8			19/20.6		
				26/19.2		
				26/20.4	1	Lab sample taken.
	9		BOTTOM OF HOLE AT 8.75' GROUNDWATER			+ QA and QC
	10					
	11		NOTE: SOILS VISUALLY FIELD CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASS-IFICATION SYSTEM.			
	12					
	13					
	14					
	15					

N-S

Corrected Final
Phase I RCRA Facility Investigation Report
For 24 Solid Waste Management Units
At Fort Stewart, Georgia

Volume III of III



May 1996

Job No. 87528.000

Prepared For

US Army Corps of Engineers
Savannah District

Prepared By

RUST ENVIRONMENT & INFRASTRUCTURE

CORRECTED FINAL

PHASE I
RCRA FACILITY INVESTIGATION REPORT
FOR 24 SOLID WASTE MANAGEMENT UNITS
AT FORT STEWART, GEORGIA
VOLUME III OF III

Prepared For

UNITED STATES ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract DACA21-93-D-0029
Delivery Order 0005
Rust Project No. 87528.000
May 1996

Prepared By
RUST ENVIRONMENT AND INFRASTRUCTURE
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08/27/93

Mr. Judson Smith
US Army Engr. Dist., Sav.
P.O. Box 889
Savannah, GA 31402

Dear Mr. Smith:

The following are the results of the parameters you requested we check on your FST-024 samples listed below.

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 08/12/93 In House # 08-5120-93 Source: SB3-8-93 Location: FT.STEWART							
Metals Sample Preparation - water	JAG	08/20/93	10:00	0.000		0.00	
TCLP Extraction, excluding Volatile cpds	JAG	08/24/93	10:00	< 0.000		0.00	
TCLP Extraction, Volatile cpds. only	JAG	08/24/93	10:00	< 0.000		0.00	
Pesticide extraction - TCLP	SB	08/20/93	10:00	< 0.000		0.00	
Herbicide extraction - TCLP	SS	08/23/93	13:00	< 0.000		0.00	
Base Neutrals - TCLP extraction	SB	08/23/93	06:30	< 0.000		0.00	
Acid - TCLP extraction	SB	08/23/93	06:30	< 0.000		0.00	
Arsenic - TCLP	CW	08/24/93	15:20	< 0.500	ppm	0.50 ppm	206.2
Selenium - TCLP	CW	08/24/93	02:09	< 0.100	ppm	0.10 ppm	270.2
Barium - TCLP	CMP	08/27/93	09:00	< 10.000	ppm	10.00 ppm	200.7
Cadmium - TCLP	CMP	08/27/93	09:00	< 0.100	ppm	0.10 ppm	200.7
Chromium - TCLP	CMP	08/27/93	09:00	< 0.500	ppm	0.50 ppm	200.7
Lead - TCLP	CW	08/24/93	20:50	< 0.500	ppm	0.50 ppm	239.2
Mercury - TCLP	KAH	08/25/93	11:00	< 0.200	ppm	0.05 ppm	245.1
Silver - TCLP	CMP	08/27/93	09:00	< 0.500	ppm	0.50 ppm	200.7
Benzene - TCLP	KG	08/26/93	11:05	< 0.500	mg/l	0.50 mg/l	624.
Carbon Tetrachloride - TCLP	KG	08/26/93	11:05	< 0.500	mg/l	0.50 mg/l	624.
Chlorobenzene - TCLP	KG	08/26/93	11:05	< 100.000	mg/l	100.00 mg/l	624.
Chloroform - TCLP	KG	08/26/93	11:05	< 6.000	mg/l	6.00 mg/l	624.
1,4-Dichlorobenzene - TCLP	KG	08/26/93	11:05	< 7.500	mg/l	7.50 mg/l	624.
1,2-Dichloroethane - TCLP	KG	08/26/93	11:05	< 0.500	mg/l	0.50 mg/l	624.
1,1-Dichloroethylene - TCLP	KG	08/26/93	11:05	< 0.700	mg/l	0.70 mg/l	624.
Methyl Ethyl Ketone - TCLP	KG	08/26/93	11:05	< 200.000	mg/l	200.00 mg/l	624.
Tetrachloroethylene - TCLP	KG	08/26/93	11:05	< 0.700	mg/l	0.70 mg/l	624.
Trichloroethylene - TCLP	KG	08/26/93	11:05	< 0.500	mg/l	0.50 mg/l	624.
Vinyl Chloride - TCLP	KG	08/26/93	11:05	< 0.200	mg/l	0.20 mg/l	624.
O-Cresol - TCLP	AT	08/25/93	10:02	< 200.000	mg/l	200.00 mg/l	625.
M-Cresol - TCLP	AT	08/25/93	10:02	< 200.000	mg/l	200.00 mg/l	625.
P-Cresol - TCLP	AT	08/25/93	10:02	< 200.000	mg/l	200.00 mg/l	625.
Pentachlorophenol - TCLP	AT	08/25/93	10:02	< 100.000	mg/l	100.00 mg/l	625.
2,4,5-Trichlorophenol - TCLP	AT	08/25/93	10:02	< 400.000	mg/l	400.00 mg/l	625.
2,4,6-Trichlorophenol - TCLP	AT	08/25/93	10:02	< 2.000	mg/l	2.00 mg/l	625.
2,4-Dinitrotoluene - TCLP	AT	08/25/93	10:02	< 0.130	mg/l	0.13 mg/l	625.
Hexachlorobenzene - TCLP	AT	08/25/93	10:02	< 0.130	mg/l	0.13 mg/l	625.
Hexachlorobutadiene - TCLP	AT	08/25/93	10:02	< 0.500	mg/l	0.50 mg/l	625.
Hexachloroethane - TCLP	AT	08/25/93	10:02	< 3.000	mg/l	3.00 mg/l	625.
Nitrobenzene - TCLP	AT	08/25/93	10:02	< 0.130	mg/l	0.13 mg/l	625.
Pyridine - TCLP	AT	08/25/93	10:02	< 5.000	mg/l	5.00 mg/l	625.
Toxaphene TCLP - liquid	RMK	08/24/93	18:22	< 0.500	mg/l	0.50 mg/l	608
2,4-D TCLP - liquid	RMK	08/25/93	19:47	< 10.000	mg/l	10.00 mg/l	509.
Silvex TCLP - liquid	RMK	08/25/93	19:47	< 1.000	mg/l	1.00 mg/l	509.
Chlordane TCLP - liquid	RMK	08/24/93	18:22	< 0.030	mg/l	0.03 mg/l	608.

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 08/12/93 In House # 08-5120-93		Source: SB3-8-93 - CONTINUED -		Location: FT.STEWART			
Endrin TCLP - liquid	RMK	08/24/93 18:22	<	0.020	mg/l	0.02 mg/l	608.
Heptachlor TCLP - liquid	RMK	08/24/93 18:22	<	8.000	ug/l	8.00 ug/l	608.
Heptachlor Epoxide TCLP - liquid	RMK	08/24/93 18:22	<	8.000	ug/l	8.00 ug/l	608.
Lindane TCLP - liquid	RMK	08/24/93 18:22	<	0.400	mg/l	0.40 mg/l	608.
Methoxychlor TCLP - liquid	RMK	08/24/93 18:22	<	10.000	mg/l	10.00 mg/l	608.

Comments:
TCLP Extracts were prepared and analyzed according to SW846 method 1311.

Sample Date: 08/12/93 In House # 08-5121-93 Source: SEECOMMENT Location: FT.STEWART

Metals Sample Preparation - water	JAG	08/20/93 10:00		0.000		0.00	
TCLP Extraction, excluding Volatile cpds	JAG	08/24/93 10:00	<	0.000		0.00	
TCLP Extraction, Volatile cpds. only	JAG	08/24/93 10:00	<	0.000		0.00	
Pesticide extraction - TCLP	SB	08/20/93 10:00	<	0.000		0.00	
Herbicide extraction - TCLP	SS	08/23/93 13:00	<	0.000		0.00	
Base Neutrals - TCLP extraction	SB	08/23/93 06:30	<	0.000		0.00	
Acid - TCLP extraction	SB	08/23/93 06:30	<	0.000		0.00	
Arsenic - TCLP	CW	08/24/93 15:27	<	0.500	ppm	0.50 ppm	206.2
Selenium - TCLP	CW	08/24/93 02:16	<	0.100	ppm	0.10 ppm	270.2
Barium - TCLP	CMP	08/27/93 09:04	<	10.000	ppm	10.00 ppm	200.7
Cadmium - TCLP	CMP	08/27/93 09:04	<	0.100	ppm	0.10 ppm	200.7
Chromium - TCLP	CMP	08/27/93 09:04	<	0.500	ppm	0.50 ppm	200.7
Lead - TCLP	CW	08/24/93 21:11	<	0.500	ppm	0.50 ppm	239.2
Mercury - TCLP	KAH	08/25/93 11:00	<	0.200	ppm	0.05 ppm	245.1
Silver - TCLP	CMP	08/27/93 09:04	<	0.500	ppm	0.50 ppm	200.7
Benzene - TCLP	KG	08/26/93 11:31	<	0.500	mg/l	0.50 mg/l	624.
Carbon Tetrachloride - TCLP	KG	08/26/93 11:31	<	0.500	mg/l	0.50 mg/l	624.
Chlorobenzene - TCLP	KG	08/26/93 11:31	<	100.000	mg/l	100.00 mg/l	624.
Chloroform - TCLP	KG	08/26/93 11:31	<	6.000	mg/l	6.00 mg/l	624.
1,4-Dichlorobenzene - TCLP	KG	08/26/93 11:31	<	7.500	mg/l	7.50 mg/l	624.
1,2-Dichloroethane - TCLP	KG	08/26/93 11:31	<	0.500	mg/l	0.50 mg/l	624.
1,1-Dichloroethylene - TCLP	KG	08/26/93 11:31	<	0.700	mg/l	0.70 mg/l	624.
Methyl Ethyl Ketone - TCLP	KG	08/26/93 11:31	<	200.000	mg/l	200.00 mg/l	624.
Tetrachloroethylene - TCLP	KG	08/26/93 11:31	<	0.700	mg/l	0.70 mg/l	624.
Trichloroethylene - TCLP	KG	08/26/93 11:31	<	0.500	mg/l	0.50 mg/l	624.
Vinyl Chloride - TCLP	KG	08/26/93 11:31	<	0.200	mg/l	0.20 mg/l	624.
O-Cresol - TCLP	AT	08/25/93 11:53	<	200.000	mg/l	200.00 mg/l	625.
M-Cresol - TCLP	AT	08/25/93 11:53	<	200.000	mg/l	200.00 mg/l	625.
P-Cresol - TCLP	AT	08/25/93 11:53	<	200.000	mg/l	200.00 mg/l	625.
Pentachlorophenol - TCLP	AT	08/25/93 11:53	<	100.000	mg/l	100.00 mg/l	625.
2,4,5-Trichlorophenol - TCLP	AT	08/25/93 11:53	<	400.000	mg/l	400.00 mg/l	625.
2,4,6-Trichlorophenol - TCLP	AT	08/25/93 11:53	<	2.000	mg/l	2.00 mg/l	625.
2,4-Dinitrotoluene - TCLP	AT	08/25/93 11:53	<	0.130	mg/l	0.13 mg/l	625.
Hexachlorobenzene - TCLP	AT	08/25/93 11:53	<	0.130	mg/l	0.13 mg/l	625.
Hexachlorobutadiene - TCLP	AT	08/25/93 11:53	<	0.500	mg/l	0.50 mg/l	625.
Hexachloroethane - TCLP	AT	08/25/93 11:53	<	3.000	mg/l	3.00 mg/l	625.
Nitrobenzene - TCLP	AT	08/25/93 11:53	<	0.130	mg/l	0.13 mg/l	625.
Pyridine - TCLP	AT	08/25/93 11:53	<	5.000	mg/l	5.00 mg/l	625.
Toxaphene TCLP - liquid	RMK	08/24/93 19:02	<	0.500	mg/l	0.50 mg/l	608
2,4-D TCLP - liquid	RMK	08/25/93 20:13	<	10.000	mg/l	10.00 mg/l	509.
Silvex TCLP - liquid	RMK	08/25/93 20:13	<	1.000	mg/l	1.00 mg/l	509.
Chlordane TCLP - liquid	RMK	08/24/93 19:02	<	0.030	mg/l	0.03 mg/l	608.
Endrin TCLP - liquid	RMK	08/24/93 19:02	<	0.020	mg/l	0.02 mg/l	608.
Heptachlor TCLP - liquid	RMK	08/24/93 19:02	<	8.000	ug/l	8.00 ug/l	608.
Heptachlor Epoxide TCLP - liquid	RMK	08/24/93 19:02	<	8.000	ug/l	8.00 ug/l	608.
Lindane TCLP - liquid	RMK	08/24/93 19:02	<	0.400	mg/l	0.40 mg/l	608.
Methoxychlor TCLP - liquid	RMK	08/24/93 19:02	<	10.000	mg/l	10.00 mg/l	608.

Comments:
Source: SB3-DUP-8-93, Location: Ft. Stewart.

TCLP Extracts were prepared and analyzed according to SW846 method 1311.

Sample Date: 08/12/93 In House # 08-5122-93 Source: SB2-8-93 Location: FT.STEWART

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 08/12/93 In House # 08-5122-93		Source: SB2-8-93		Location: FT.STEWART			
		- CONTINUED -					
Metals Sample Preparation - water	JAG	08/20/93 10:00		0.000		0.00	
TCLP Extraction, excluding Volatile cpds	JAG	08/24/93 10:00	<	0.000		0.00	
TCLP Extraction, Volatile cpds. only	JAG	08/24/93 10:00	<	0.000		0.00	
Pesticide extraction - TCLP	SB	08/20/93 10:00	<	0.000		0.00	
Herbicide extraction - TCLP	'SS	08/23/93 13:00	<	0.000		0.00	
Base Neutrals - TCLP extraction	SB	08/23/93 06:30	<	0.000		0.00	
Acid - TCLP extraction	SB	08/23/93 06:30	<	0.000		0.00	
Arsenic - TCLP	CW	08/24/93 16:05	<	0.500	ppm	0.50 ppm	206.2
Selenium - TCLP	CW	08/24/93 02:54	<	0.100	ppm	0.10 ppm	270.2
Barium - TCLP	CMP	08/25/93 17:29	<	10.000	ppm	10.00 ppm	200.7
Cadmium - TCLP	CMP	08/25/93 17:29	<	0.100	ppm	0.10 ppm	200.7
Chromium - TCLP	CMP	08/25/93 17:29	<	0.500	ppm	0.50 ppm	200.7
Lead - TCLP	CW	08/24/93 21:29	<	0.500	ppm	0.50 ppm	239.2
Mercury - TCLP	KAH	08/25/93 11:00	<	0.200	ppm	0.05 ppm	245.1
Silver - TCLP	CMP	08/25/93 17:29	<	0.500	ppm	0.50 ppm	200.7
Benzene - TCLP	KG	08/26/93 11:58	<	0.500	mg/l	0.50 mg/l	624.
Carbon Tetrachloride - TCLP	KG	08/26/93 11:58	<	0.500	mg/l	0.50 mg/l	624.
Chlorobenzene - TCLP	KG	08/26/93 11:58	<	100.000	mg/l	100.00 mg/l	624.
Chloroform - TCLP	KG	08/26/93 11:58	<	6.000	mg/l	6.00 mg/l	624.
1,4-Dichlorobenzene - TCLP	KG	08/26/93 11:58	<	7.500	mg/l	7.50 mg/l	624.
1,2-Dichloroethane - TCLP	KG	08/26/93 11:58	<	0.500	mg/l	0.50 mg/l	624.
1,1-Dichloroethylene - TCLP	KG	08/26/93 11:58	<	0.700	mg/l	0.70 mg/l	624.
Methyl Ethyl Ketone - TCLP	KG	08/26/93 11:58	<	200.000	mg/l	200.00 mg/l	624.
Tetrachloroethylene - TCLP	KG	08/26/93 11:58	<	0.700	mg/l	0.70 mg/l	624.
Trichloroethylene - TCLP	KG	08/26/93 11:58	<	0.500	mg/l	0.50 mg/l	624.
Vinyl Chloride - TCLP	KG	08/26/93 11:58	<	0.200	mg/l	0.20 mg/l	624.
O-Cresol - TCLP	AT	08/25/93 12:49	<	200.000	mg/l	200.00 mg/l	625.
M-Cresol - TCLP	AT	08/25/93 12:49	<	200.000	mg/l	200.00 mg/l	625.
P-Cresol - TCLP	AT	08/25/93 12:49	<	200.000	mg/l	200.00 mg/l	625.
Pentachlorophenol - TCLP	AT	08/25/93 12:49	<	100.000	mg/l	100.00 mg/l	625.
2,4,5-Trichlorophenol - TCLP	AT	08/25/93 12:49	<	400.000	mg/l	400.00 mg/l	625.
2,4,6-Trichlorophenol - TCLP	AT	08/25/93 12:49	<	2.000	mg/l	2.00 mg/l	625.
2,4-Dinitrotoluene - TCLP	AT	08/25/93 12:49	<	0.130	mg/l	0.13 mg/l	625.
Hexachlorobenzene - TCLP	AT	08/25/93 12:49	<	0.130	mg/l	0.13 mg/l	625.
Hexachlorobutadiene - TCLP	AT	08/25/93 12:49	<	0.500	mg/l	0.50 mg/l	625.
Hexachloroethane - TCLP	AT	08/25/93 12:49	<	3.000	mg/l	3.00 mg/l	625.
Nitrobenzene - TCLP	AT	08/25/93 12:49	<	0.130	mg/l	0.13 mg/l	625.
Pyridine - TCLP	AT	08/25/93 12:49	<	5.000	mg/l	5.00 mg/l	625.
Toxaphene TCLP - liquid	RMK	08/24/93 19:41	<	0.500	mg/l	0.50 mg/l	608
2,4-D TCLP - liquid	RMK	08/25/93 20:39	<	10.000	mg/l	10.00 mg/l	509.
Silvex TCLP - liquid	RMK	08/25/93 20:39	<	1.000	mg/l	1.00 mg/l	509.
Chlordane TCLP - liquid	RMK	08/24/93 19:41	<	0.030	mg/l	0.03 mg/l	608.
Endrin TCLP - liquid	RMK	08/24/93 19:41	<	0.020	mg/l	0.02 mg/l	608.
Heptachlor TCLP - liquid	RMK	08/24/93 19:41	<	8.000	ug/l	8.00 ug/l	608.
Heptachlor Epoxide TCLP - liquid	RMK	08/24/93 19:41	<	8.000	ug/l	8.00 ug/l	608.
Lindane TCLP - liquid	RMK	08/24/93 19:41	<	0.400	mg/l	0.40 mg/l	608.
Methoxychlor TCLP - liquid	RMK	08/24/93 19:41	<	10.000	mg/l	10.00 mg/l	608.

Comments:
TCLP Extracts were prepared and analyzed according to SW846 method 1311.

The quality control for this sample did not pass acceptable levels and is being reanalyzed to confirm the results reported.

Sample Date: 08/12/93 In House # 08-5123-93		Source: SB1-8-93		Location: FT.STEWART			
Metals Sample Preparation - water	JAG	08/20/93 10:00		0.000		0.00	
TCLP Extraction, excluding Volatile cpds	JAG	08/24/93 10:00	<	0.000		0.00	
TCLP Extraction, Volatile cpds. only	JAG	08/24/93 15:00	<	0.000		0.00	
Pesticide extraction - TCLP	SB	08/20/93 10:00	<	0.000		0.00	
Herbicide extraction - TCLP	'SS	08/23/93 13:00		0.000		0.00	
Base Neutrals - TCLP extraction	SB	08/23/93 06:30	<	0.000		0.00	
Acid - TCLP extraction	SB	08/23/93 06:30	<	0.000		0.00	
Arsenic - TCLP	CW	08/24/93 16:11	<	0.500	ppm	0.50 ppm	206.2
Selenium - TCLP	CW	08/24/93 03:01	<	0.100	ppm	0.10 ppm	270.2

Parameter	Analyst	Analysis Date -- Time		Results	Units	Lowest Detectable Level	Method Number
Sample Date: 08/12/93 In House # 08-5123-93		Source: SB1-8-93		Location: FT.STEWART			
		- CONTINUED -					
Barium - TCLP	CMP	08/25/93 09:08	<	10.000	ppm	10.00 ppm	200.7
Cadmium - TCLP	CMP	08/25/93 09:08		0.130	ppm	0.10 ppm	200.7
Chromium - TCLP	CMP	08/25/93 09:08	<	0.500	ppm	0.50 ppm	200.7
Lead - TCLP	CW	08/24/93 21:35	<	0.500	ppm	0.50 ppm	239.2
Mercury - TCLP	KAH	08/25/93 11:00	<	0.200	ppm	0.05 ppm	245.1
Silver - TCLP	CMP	08/25/93 09:08	<	0.500	ppm	0.50 ppm	200.7
Benzene - TCLP	KG	08/26/93 17:53	<	0.500	mg/l	0.50 mg/l	624.
Carbon Tetrachloride - TCLP	KG	08/26/93 17:53	<	0.500	mg/l	0.50 mg/l	624.
Chlorobenzene - TCLP	KG	08/26/93 17:53	<	100.000	mg/l	100.00 mg/l	624.
Chloroform - TCLP	KG	08/26/93 17:53	<	6.000	mg/l	6.00 mg/l	624.
1,4-Dichlorobenzene - TCLP	KG	08/26/93 17:53	<	7.500	mg/l	7.50 mg/l	624.
1,2-Dichloroethane - TCLP	KG	08/26/93 17:53	<	0.500	mg/l	0.50 mg/l	624.
1,1-Dichloroethylene - TCLP	KG	08/26/93 17:53	<	0.700	mg/l	0.70 mg/l	624.
Methyl Ethyl Ketone - TCLP	KG	08/26/93 17:53	<	200.000	mg/l	200.00 mg/l	624.
Tetrachloroethylene - TCLP	KG	08/26/93 17:53	<	0.700	mg/l	0.70 mg/l	624.
Trichloroethylene - TCLP	KG	08/26/93 17:53	<	0.500	mg/l	0.50 mg/l	624.
Vinyl Chloride - TCLP	KG	08/26/93 17:53	<	0.200	mg/l	0.20 mg/l	624.
O-Cresol - TCLP	AT	08/25/93 13:35	<	200.000	mg/l	200.00 mg/l	625.
M-Cresol - TCLP	AT	08/25/93 13:35	<	200.000	mg/l	200.00 mg/l	625.
P-Cresol - TCLP	AT	08/25/93 13:35	<	200.000	mg/l	200.00 mg/l	625.
Pentachlorophenol - TCLP	AT	08/25/93 13:35	<	100.000	mg/l	100.00 mg/l	625.
2,4,5-Trichlorophenol - TCLP	AT	08/25/93 13:35	<	400.000	mg/l	400.00 mg/l	625.
2,4,6-Trichlorophenol - TCLP	AT	08/25/93 13:35	<	2.000	mg/l	2.00 mg/l	625.
2,4-Dinitrotoluene - TCLP	AT	08/25/93 13:35	<	0.130	mg/l	0.13 mg/l	625.
Hexachlorobenzene - TCLP	AT	08/25/93 13:35	<	0.130	mg/l	0.13 mg/l	625.
Hexachlorobutadiene - TCLP	AT	08/25/93 13:35	<	0.500	mg/l	0.50 mg/l	625.
Hexachloroethane - TCLP	AT	08/25/93 13:35	<	3.000	mg/l	3.00 mg/l	625.
Nitrobenzene - TCLP	AT	08/25/93 13:35	<	0.130	mg/l	0.13 mg/l	625.
Pyridine - TCLP	AT	08/25/93 13:35	<	5.000	mg/l	5.00 mg/l	625.
Toxaphene TCLP - liquid	RMK	08/24/93 20:21	<	0.500	mg/l	0.50 mg/l	608
2,4-D TCLP - liquid	RMK	08/25/93 21:05	<	10.000	mg/l	10.00 mg/l	509.
Silvex TCLP - liquid	RMK	08/25/93 21:05	<	1.000	mg/l	1.00 mg/l	509.
Chlordane TCLP - liquid	RMK	08/24/93 20:21	<	0.030	mg/l	0.03 mg/l	608.
Endrin TCLP - liquid	RMK	08/24/93 20:21	<	0.020	mg/l	0.02 mg/l	608.
Heptachlor TCLP - liquid	RMK	08/24/93 20:21	<	8.000	ug/l	8.00 ug/l	608.
Heptachlor Epoxide TCLP - liquid	RMK	08/24/93 20:21	<	8.000	ug/l	8.00 ug/l	608.
Lindane TCLP - liquid	RMK	08/24/93 20:21	<	0.400	mg/l	0.40 mg/l	608.
Methoxychlor TCLP - liquid	RMK	08/24/93 20:21	<	10.000	mg/l	10.00 mg/l	608.

Comments:
TCLP Extracts were prepared and analyzed according to SW846 method 1311.

Laboratory ID # 40111

Very truly yours,

James H. Carr, Jr.
Chemist

FT. STEWART Number Key
FST-024

Carr Lab No.	FT STEWART ID
08-5120-93	SB3-8-93
08-5121-93	SB3DUP-8-93
08-5122-93	SB2-8-93
08-5123-93	SB1-8-93

LEGEND

QC SAmple Number: The identifying number on a sample or known which makes unique identification of each sample possible.

Val. 1, Val. 2: Concentrations of duplicate samples, presented for precision information. * indicates a spiked duplicate sample if this information is not presented elsewhere.

RPD: Relative Percent Difference:

$$RPD = \frac{abs(D_1 - D_2)}{(D_1 + D_2)/2} * 100$$

Spike Conc.: The concentraiton of spike material added to the sample to produce the spiked sample.

True Value: The target concentraiton for the spiked sample:

TV = Sample Conc. - Spike Conc.

Observed Value: The concentraiotn observed in the spiked sample upon analysis.

Percent Recovery: A measure of the concentraiton of the sppiked sample relative to the spiked concentration:

$$\% \text{ Recovery} = \frac{\text{Conc. spiked sample - Conc. unspiked sample}}{\text{spike concentration}}$$

QUALITY CONTROL FOR LEAD ANALYSIS

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/24/93

Date	QC Sample Number	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
08/24/93	WP28-2							
08/24/93	5180	<5.0	<5.0	0	5.0	30.0	35.5	118
08/24/93	CHK.STD	27.0	28.2	4.3		5.0	4.8	96
						25.0	27.0	108

QUALITY CONTROL FOR ARSENIC ANALYSIS

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/24/93

Date	QC Sample Number	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
08/24/93	WP28-2							
08/24/93	5121dig	<5.0	<5.0	0	10.0	86.0	91.4	106
08/24/93	5134dig	<5.0	<5.0	0	10.0	11.1	12.2	111
08/24/93	CHK.STD	52.5	47.8	9.4		10.0	8.5	85
						50.0	52.5	105

QUALITY CONTROL FOR SELENIUM ANALYSIS

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/24/93

Date	QC Sample Number	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
08/24/93	WP28-2							
08/24/93	5121dig	<5.0	<5.0	0	10.0	11.0	11.7	106
08/24/93	5180	<5.0	<5.0	0	5.0	10.0	10.4	104
08/24/93	CHK.STD	51.1	49.2	3.8		5.0	3.9	78
						50.0	49.2	98

QUALITY CONTROL FOR ICP ANALYSIS

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/27/93

Date	Element	QC Sample Number	Val. 1 (mg/l)	Val. 2 (mg/l)	% RPD	Spike Conc.	True Value	Obs. Value	% Rec.
08/27/93	Ba	ICP-07					1.00	0.88	88
08/27/93	Cr	ICP-19					1.00	1.09	109
08/27/93	Cd	ICP-19					1.00	1.03	103
08/27/93	Ag	ICP-07					1.00	0.68	68
08/27/93	Cr	5135	<.05			0.10	0.10	0.106	106
08/27/93	Cd	5135	<.01			0.10	0.10	0.093	93
08/27/93	Ag	5135	<.05			0.10	0.10	0.092	92
08/27/93	Ba	5135	0.52			0.10	0.62	0.620	100
08/27/93	Cr	5121	<.05	<.05	0				
08/27/93	Cd	5121	0.01	<.01	0				
08/27/93	Ag	5121	<.05	<.05	0				
08/27/93	Ba	5121	0.57	0.58	1.7				
08/27/93	Ba	CHK.STD	2.96	2.90	2.0		3.00	2.96	99
08/27/93	Ag	CHK.STD	2.48	2.70	8.5		3.00	2.70	90
08/27/93	Cr	CHK.STD	3.13	2.92	6.9		3.00	2.92	97
08/27/93	Cd	CHK.STD	3.05	2.96	3.0		3.00	2.96	99

QUALITY CONTROL FOR MERCURY ANALYSIS

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/24/93

Date	QC Sample Number	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
08/24/93	5066	<0.2	<0.2	0	1.0	1.00	0.99	99
08/24/93	5177	0.29	0.29	0	1.0	1.29	1.39	110
08/24/93	CHK.STD	1.21	1.13	6.8		1.00	1.13	113

QUALITY CONTROL FOR PESTICIDES

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/24/93

SPIKE RECOVERY DATA FOR 08/24/93

SPIKE QC SAMPLE NUMBER: SPK072393 spiked duplicate

Analyte	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
Alpha-BHC	0.084	0.081	3.6	0.08	0.08	0.081	102
Gamma-BHC	0.084	0.080	4.9	0.08	0.08	0.080	100
Beta-BHC	0.092	0.086	6.7	0.08	0.08	0.086	108
Heptachlor	0.086	0.077	11.0	0.08	0.08	0.077	96
Delta-BHC	0.065	0.059	9.7	0.08	0.08	0.065	81
Aldrin	0.081	0.079	2.5	0.08	0.08	0.081	102
Heptachlor Epox.	0.091	0.084	8.0	0.08	0.08	0.084	102
Endosulfan I	0.092	0.086	6.7	0.08	0.08	0.086	108
p,p - DDE	0.089	0.086	3.4	0.08	0.08	0.086	108
Endrin	0.090	0.099	9.5	0.08	0.08	0.090	113
p,p - DDD	0.084	0.094	11.2	0.08	0.08	0.084	105
Endosulfan II	0.089	0.085	4.6	0.08	0.08	0.085	106
Endrin Aldehyde	0.081	0.083	2.4	0.08	0.08	0.081	101
Endosulfan Sulf.	0.085	0.074	13.8	0.08	0.08	0.074	93
Methoxychlor	0.103	0.078	27.6	0.08	0.08	0.078	98
Endrin Ketone	0.114	0.077	38.7	0.08	0.08	0.077	96

(1-730)

BLANK DATA FOR PESTICIDES

All analytes less than 0.05 ug/L on all dates.

SURROGATE RECOVERIES FOR PESTICIDES

Sample Date	Sample Number	Theoretical Conc. (ug/l)	Observed Conc.(ug/l)	Percent Recovery
08/24/93	BLANK	1.0	0.78	78
08/24/93	08-5120-93	1.0	0.88	88
08/24/93	08-5121-93	1.0	0.81	81
08/24/93	08-5122-93	1.0	0.86	86
08/24/93	08-5123-93	1.0	0.84	84
08/24/93	08-5135-93	1.0	0.80	80
08/24/93	08-5135DUP	1.0	0.83	83
08/24/93	072393SPK	1.0	0.84	84
08/24/93	082093SPK	1.0	0.85	85

C1-731

QUALITY CONTROL FOR HERBICIDES

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/25/93;

SPIKE QC SAMPLE NUMBER: 082393 DUPLICATE SAMPLE NUMBER 08513593

Analyte	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
2,4-D	<.05	<.05	0	3.00	3.00	2.35	78
Silvex	<.05	<.05	0	0.30	0.30	0.216	72

SURROGATE RECOVERIES FOR HERBICIDES

Sample Date	Sample Number	Theoretical Conc. (ug/l)	Percent Recovery
08/25/93	BLANK	4.0	107
08/25/93	08-5120-93	4.0	64
08/25/93	08-5121-93	4.0	91
08/25/93	08-5122-93	4.0	94
08/25/93	08-5123-93	4.0	66
08/25/93	08-5135-93	4.0	102
08/25/93	08-5135DUP	4.0	91
08/25/93	082393SPK	4.0	84

U-732

QUALITY CONTROL FOR VOLATILES

SAMPLES NUMBERED: 08-5120-93 through 08-5123-93 analyzed 08/26/93.

SPIKE RECOVERY DATA FOR 08/26/93

SPIKE QC SAMPLE NUMBER: 08510893

Analyte	Val. 1 (ug/l)	Val. 2 (ug/l)	% RPD	Spike Conc.	True Value	Observed Value	Percent Recovery
1,1 Dichloroethene	<5	<5	0	50	50	31.0	62
Trichloroethene	<5	<5	0	50	50	53.5	107
Benzene	<5	<5	0	50	50	49.9	100
Toluene	<5	<5	0	50	50	50.6	101
Chlorobenzene	<5	<5	0	50	50	50.8	102

CL-7333

BLANK DATA FOR VOLATILES

All analytes on all dates <5 ug/L.

SURROGATE RECOVERIES FOR VOLATILES, PERCENT RECOVERY

Sample Date	Sample Number	1,2 dichloro-ethane d-4	Toluene d-8	Bromofloro benzene
08/26/93	BLANK	115	97	78
08/26/93	08-5120-93	105	88	82
08/26/93	08-5121-93	86	84	76
08/26/93	08-5122-93	103	87	81
08/26/93	08-5123-93	100	122	84
08/26/93	08-5108-93	106	89	83
08/26/93	08-5108SPK	92	79	73
08/26/93	08-5108SPK	101	91	83

ACIDS AND BASE-NEUTRALS QUALITY CONTROL DATA

SAMPLE NUMBERS: 08-5120-93 through 08-5123-93 analyzed 08/25/93;

DATE: 08/25/93
QC SAMPLE: SPK082393

DUPLICATE SAMPLE NO.: 08513493

Analyte	Dup. 1 ug/l	Dup. 2 ug/l	% RPD	Spike (ug/l)	True Value	Observed Value	Percent Recovery
1,4-Dichlorobenzene	<10	<10	0	100	100	56.2	56
2,4 Dinitrotoluene	<10	<10	0	100	100	81.3	81
Pentachlorophenol	<10	<10	0	100	100	58.0	58

SURROGATE RECOVERIES FOR BASE-NEUTRALS
PERCENT RECOVERY

Sample Date	Sample Number	Nitrobenzene-d-5	2-Fluorobiphenyl	Terphenyl d-14	Phenol d-5	2-Fluorophenol	2,4,6 Tribromophenol
08/25/93	BLANK	48	47	60	34	56	70
08/25/93	08-5120-93	60	56	61	34	57	64
08/25/93	08-5121-93	82	75	88	42	60	75
08/25/93	08-5122-93	23	27	31	16	25	43
08/15/93	08-5123-93	39	35	46	30	48	79
08/25/93	08-5134-93	36	30	44	32	51	63
08/25/93	08-5134DUP	32	35	46	30	50	74
08/25/93	SPK082393	70	70	67	23	36	56

C1-734

BLANK DATA FOR ACIDS AND BASE NEUTRALS

All Compounds less than the minimum detectable level.

Page ___

CARR LABORATORIES

CHAIN OF CUSTODY RECORD

Client CESAS — Project No. FST-024

Contact Toni Nicholson — Phone No. 912-652-5312

Address PO Box 889 Savannah GA 31402 — Fax No. 912-652-5311

Collected By Jason Smith — Client P.O.# ___

MT (Matrix Type)	AP (Analytical Program)
L=Liquid	W=Wastewater
(S)=Soil	G=Groundwater
O=Oil	D=Drinking Water
X=Other	(S)=Solid/Haz. Waste
	N=Nonregulated

Carr's Lab No.	Sample Source	Sample Location	Date/Time	Well	Grab	Composite	MT	AP	Number of Containers	Preserved Y or N	Analyses Requested
FST024-SB3-8 93	FT STEWART	FST-024	8/12/93 / 1420		X				2	(ICE) N	FULL TCLP 08-5120-93
FST-024-SB3-DUP-893	FT STEWART	FST-024	8/12/93 / 1420		X				2	(ICE) N	FULL TCLP 5121
FST-024-SB2-8-93	FT STEWART	FST-024	8/12/93 / 1445		X				2	(ICE) N	FULL TCLP 5122
FST-024-SB1-893	FT STEWART	FST-024	8/12/93 / 1500		X				2	(ICE) N	FULL TCLP 5123
											Temperature 3.3°C

Relinquished By	Received By	Date	Time
1.	Thomas Fairchild	8/13/93	09:00
2.	D. Hutto	8/13/93	1946
3.			

Received In Lab By D. Hutto — 8-13-93 — 19:46

JAMES H. CARR & ASSOCIATES, INC.
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Columbia, South Carolina 29290
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S3L-11

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the Phase I investigation (analytical results did not indicate a release had occurred, analytical results indicated concentrations were below the GAEPD guidelines and/or the site was never used), no further action is recommended at the following sites:

- SWMU4G(FST-004G) Burn Pit
- SWMU24A(FST-024A) New Radiator Shop
- SWMU27(FST-027) DOL Maintenance Motor Pool
- SWMU28(FST-028) 724th Battery Shop
- SWMU30(FST-030) Recirculating Wash Impoundment "Bird Bath"
- SWMU33(FST-033) DEH Pesticide Warehouse

Continued monitoring is recommended at SWMU20(FST-020) Wright Army Airfield Sewage Disposal Beds (Land Spray Application and Lagoon) in accordance with the NPDES permit.

Based on the Phase I results of the soil and ground-water analytical data and the exposure pathways analyses, a Phase II investigation is recommended at the following sites:

- SWMU1(FST-001) South Central Landfill
- SWMU2(FST-002) Camp Oliver Landfill
- SWMU3(FST-003) TAC-X Landfill
- SWMU4(FST-004) Burn Pits A through F
- SWMU9(FST-009) Inactive EOD Area
- SWMU10(FST-010) Inactive EOD Area
- SWMU11(FST-011) Inactive EOD Area
- SWMU12(FST-012) Active EOD Area
- SWMU14(FST-014) Old Fire Training Area
- SWMU17(FST-017) DRMO Hazardous Waste Storage Area
- SWMU18(FST-018) Industrial Wastewater Treatment Plant
- SWMU19(FST-019) Old Sludge Drying Beds

- SWMU24A(FST-024A) Old Radiator Shop
- SWMU24B(FST-024B) Paint Booth
- SWMU25(FST-025) Waste Oil Tanks (All 15 sampled tanks and the tanks that failed the tank tightness test)
- SWMU26(FST-026) 724th Tanker Purging Station
- SWMU27(FST-027) Motor Pools (All motor pools with oil/water separators)
- SWMU29(FST-029) Evans Army Heliport POL Storage Facility
- SWMU31(FST-031) DEH Asphalt Tanks
- SWMU32(FST-032) Supply Diesel Tank
- SWMU34(FST-034) DEH Equipment Wash Rack

RUST E&I recommends that a Phase II RFI Work Plan be prepared for the previously noted SWMUs at Fort Stewart. The Phase II RFI Work Plan will document procedures to be utilized for RCRA investigations at each of the SWMUs. Prior to initiation of Phase II field activities, the Phase II RFI Work Plan must meet GAEPD approval. The Phase II field investigations will include monitoring well installation, soil sampling and soil permeability testing, ground-water sampling, horizontal and vertical extent of contamination, ground-water flow rate calculations, map preparation, data quality objectives for risk assessment needs and any requirements that the GAEPD recommends.

Upon completion of Phase II field activities, a Phase II RFI Report will be submitted to the GAEPD that summarizes the results of all work completed. The results of the Phase II investigations will be evaluated along with the results of the Phase I investigations to confirm if Corrective Measure Studies (CMS) are warranted.