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Office of Emergency and Remedial Response
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PB94-964201

EPA

Superfund Record of Decision:

Vertac, AR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Vertac, Incorporated
Jacksonville, Arkansas

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Vertac, Incorporated site, Jacksonville, Arkansas, which was chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. This decision is based on the Administrative Record for this site.

The State of Arkansas concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This ROD is for the Vertac Onsite Operable Unit 1, which includes most of the above-ground media, such as buildings, process equipment, process vessel contents, spent activated carbon, miscellaneous drummed wastes (including Remedial Investigation wastes), shredded trash and pallets, and PCB transformer oils.

The major components of the selected remedy include:

- Onsite incineration of F-listed process vessel contents, shredded trash and pallets, and miscellaneous drummed wastes (except Remedial Investigation (RI) wastes such as used personal protective clothing and trash).
- Off-site incineration of transformer PCB oils.
- Onsite incineration and/or reactivation and reuse of spent carbon.
- If feasible, off-site treatment, disposal, or reuse of demonstrated non-F-listed process vessel contents (such as spent caustic, hydrochloric acid, kerosene/fuel oil, etc.) or onsite incineration.

- Off-site recycle/reuse of decontaminated process equipment (such as tanks, structural steel, pumps, etc.), to the maximum extent practicable.

- Onsite consolidation/containment of debris resulting from demolition of buildings (except the supervisor's office building, bagged soil storage building, and wastewater treatment plant building that would be left intact for continued use), and process equipment that is not practicable to be recycled/reused, and some containerized materials (RI wastes) in a RCRA Subtitle C landfill.

- Treatment residues - Incinerator ash and salt disposal shall be consistent with the disposal of ash and salt generated by onsite incineration of drummed wastes currently in progress. The United States Environmental Protection Agency (EPA) is in the process of developing and selecting a disposal option for the ash and salt being generated at the Vertac facility.

- Decontamination residues - Onsite incineration of used solvents, filter spools, etc. Onsite treatment and discharge of contaminated water.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.Because this remedy results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, EPA shall review the remedial action no less often than every five years after initiation of the selected remedial action.

6/30/93 — Myron O. Knudson

Date — for Joe D. Winkle, Acting Regional Administrator

VERTAC, INCORPORATED

Record Of Concurrences For Onsite Operable Unit 1 ROD

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THE DECISION SUMMARY

VERTAC ONSITE OPERABLE UNIT 1

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THE DECISION SUMMARY

VERTAC ONSITE OPERABLE UNIT 1

1. SITE NAME, LOCATION, AND DESCRIPTION

1.1 SITE NAME AND LOCATION

The Vertac, Incorporated Superfund Site (the "site") is located in Jacksonville, Pulaski County, Arkansas. The site is approximately 15 miles northeast of Little Rock. The approximate location of the site is shown on Figure 1-1 (United States Geological Survey (USGS) Cabot, Olmstead, Jacksonville, and McAlmont, Arkansas, 7.5 minute quadrangle map).

1.2 DESCRIPTION

Cultural features on the site and in the site area are shown in Figure 1-2. The site is bounded by Marshall Road to the east and the Union-Pacific Railroad to the west. Further west of the railroad tracks, the land is used for industrial/commercial purposes. The Little Rock Air Force Base occupies land farther to the north. Residential areas are immediately to the south and east of the site.

Land comprising the site consists of two parcels (Figure 1-2, Parcel 1 and Parcel 2) that were acquired at different times. Parcel 1, which contains the central process area, is approximately 93 acres and has been in nearly continuous industrial use since 1948. Parcel 2, which is approximately 100 additional acres to the north, was purchased by Vertac in 1978. In 1979, the 2,4,5-T waste storage shed was built. The storage shed was built adjacent to the Regina Paint Building, which today is believed to contain the empty Vertac 2,4,5-T waste drums. Parcel 2 does not contain production facilities. The central process area is wholly enclosed within a chain link fence that surrounds most of Parcels 1 and 2.

Topographically, the land has moderate relief, sloping from about 310 feet above mean sea level (MSL) in the north to approximately 260 feet near the southwestern corner. The central process area is located on a flat-topped, south plunging topographic nose bounded by Rocky Branch Creek on the west and Marshall Road on the east. Land on the west side of Rocky Branch Creek has not been used for manufacture or disposal and is generally isolated from the central process area by the creek. Land in the northern parts of the site has not been used for manufacture and is generally upslope from the central process area.

The central process area is separated into 11 sub-areas according to where operations took place while the plant was active (Figure 1-3). The sub-areas and their former uses include:

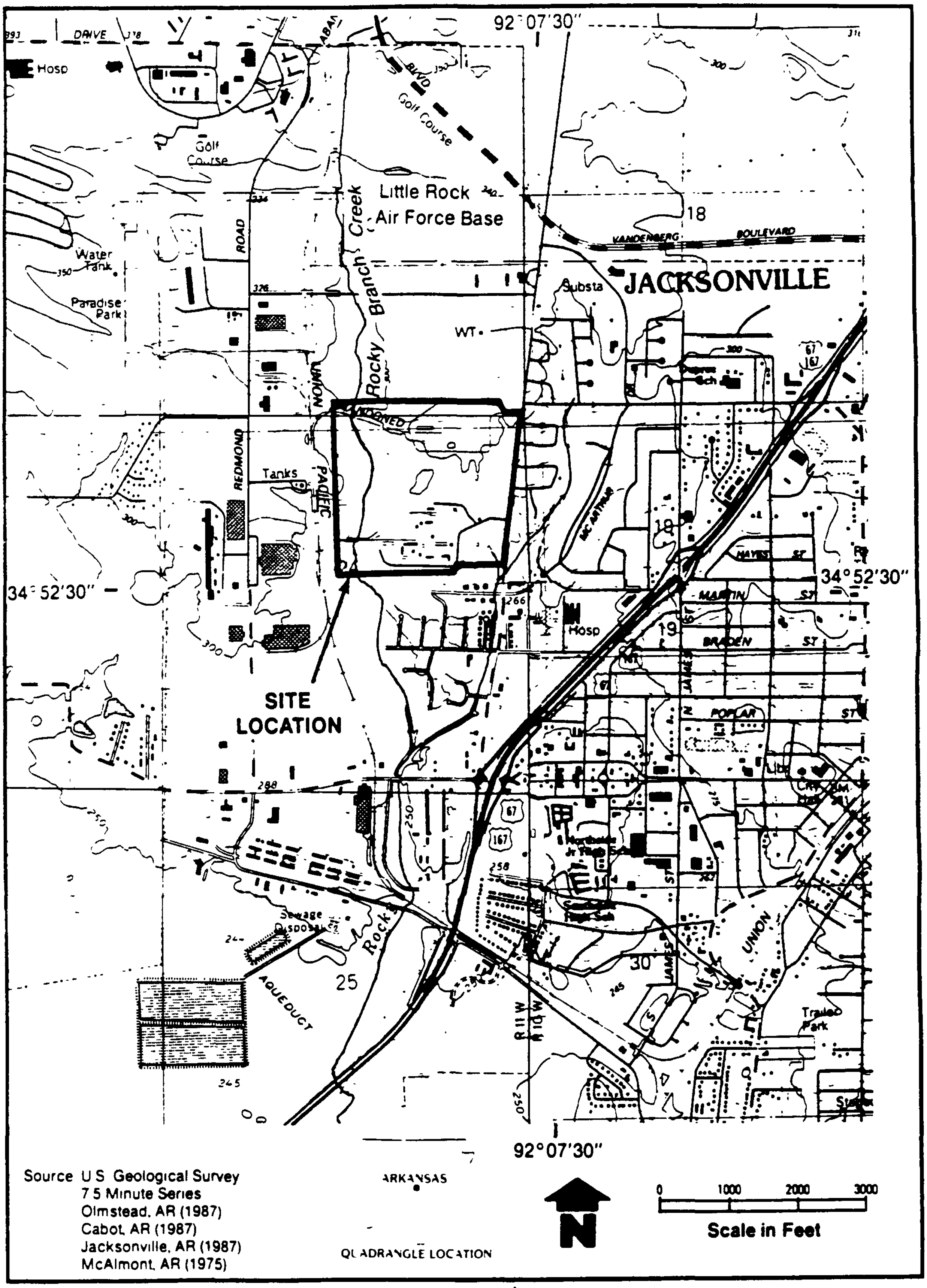

FIGURE 1-1 SITE LOCATION MAP, VERTAC SITE JACKSONVILLE, ARKANSAS

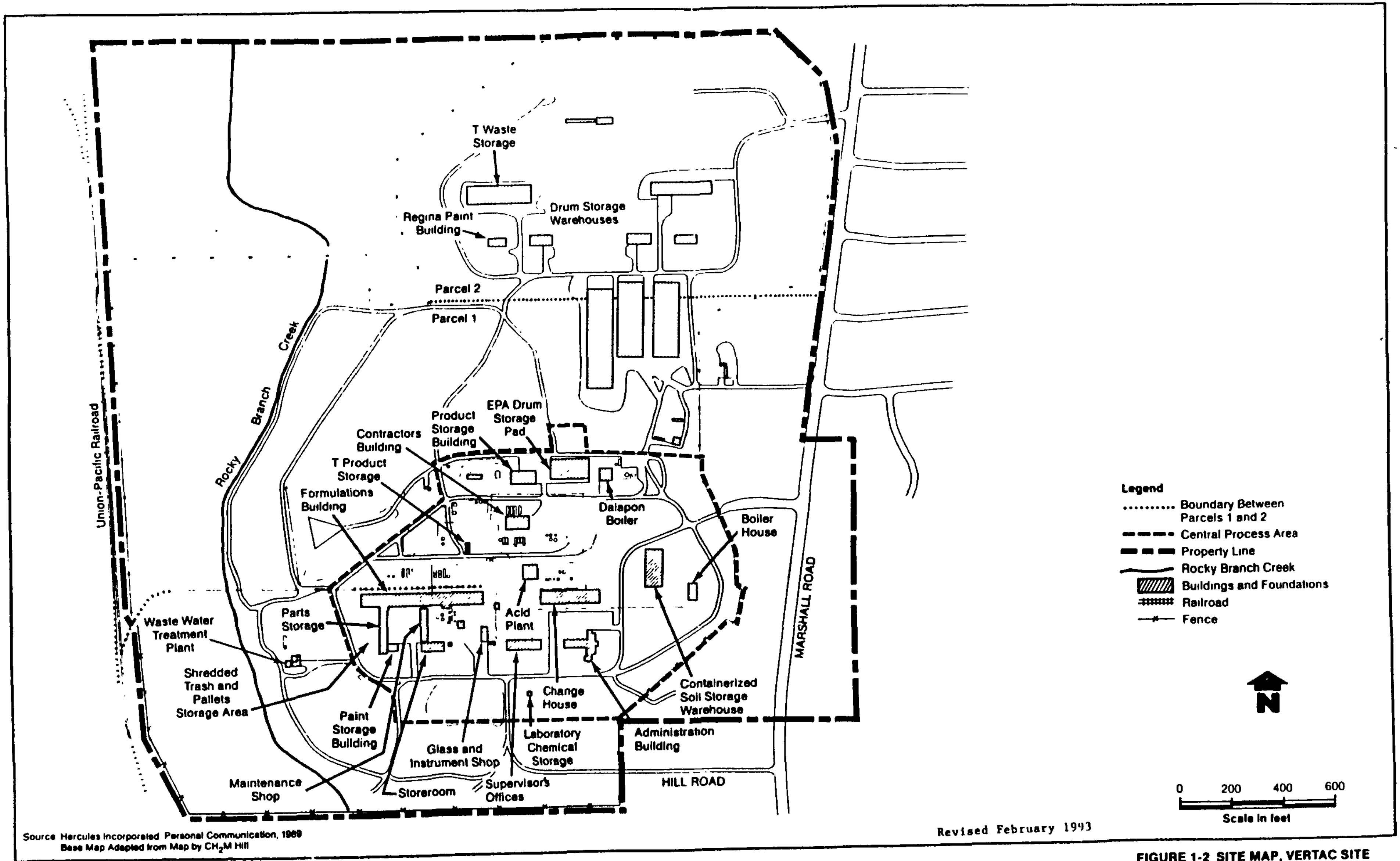

FIGURE 1-2 SITE MAP, VERTAC SITE
JACKSONVILLE, ARKANSAS

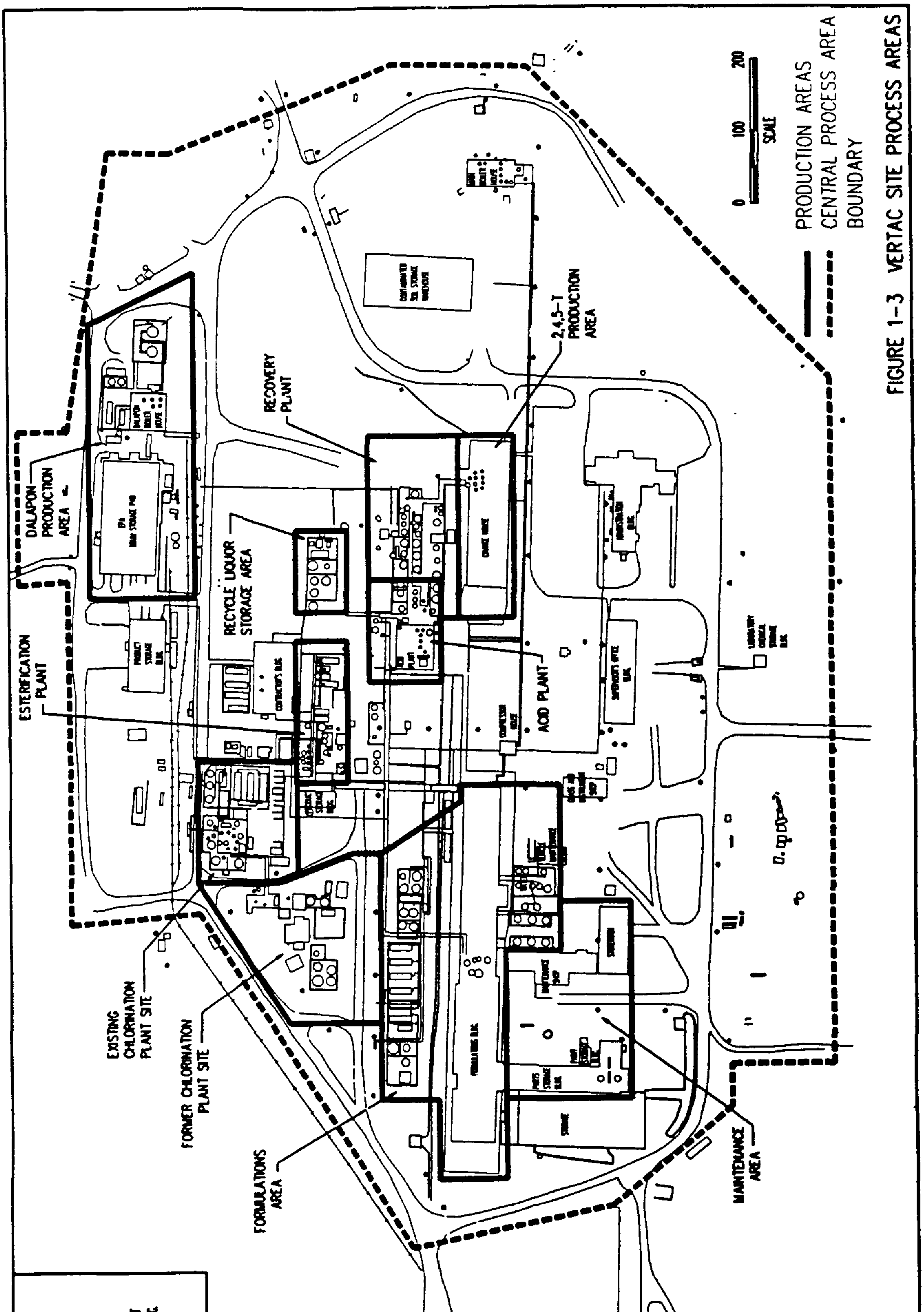

FIGURE 1-3 VERTAC SITE PROCESS AREAS

- Maintenance Area - Used for equipment repairs and storage of equipment, parts, and some process raw materials.

- Formulations Area - Used for the storage of raw and finished product (large warehouse and some process vessels).

- Former Chlorination Plant Area - Used in the manufacturing of 2,4-D.

- Existing Chlorination Plant Area - Built in the early 1980s and replaced the former chlorination plant.

- Esterification Plant - Used to add alcohols to increase the solubility of the herbicide in water.

- Dalapon (1,1,1-trichloropropionic acid) Production Area - Used in the manufacturing of Dalapon.

- Recycle Liquor Storage Area - Currently used to store drums generated by ongoing site activities.

- Recovery Plant - Used in the treatment of process wastes. 2,4-D wastes were recovered and drums containing 2,4-D wastes were washed.

- 2,4,5-T Production Area - Used in the manufacturing of 2,4,5-T.

- Waste water Treatment Plant - Formerly used to treat process waste water, and currently used to treat ground water and surface water from the central process area.

- Acid Plant - Chlorophenols were reacted with acetic and monochloroacetic acid to form phenoxyacetic acid herbicides.

The Regina Paint Building, located in Parcel 2, is the only study unit located outside of the Central Process Area that is included in Onsite Operable Unit 1.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 SITE HISTORY

The first facilities on the site were constructed by the United States Department of Defense (DOD) in the 1930s and 1940s. These facilities were part of a munitions complex that extended beyond the present site boundaries. In 1948, the Reasor-Hill Company purchased the property and converted the operations to manufacture insecticides such as DDT, aldrin, dieldrin, and toxaphene. During the 1950s, Reasor-Hill manufactured herbicides such as 2,4-

dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), and 2,4,5-tricholrophenoxypropionic acid (2,4,5-TP), which is also called Silvex. Drums of organic wastes were stacked in an open field immediately southwest of the production area, and untreated process water was discharged from the western end of the plant to Rocky Branch Creek.

Hercules Powder Company, now known as Hercules Incorporated (Hercules), purchased the Reasor-Hill property and plant in 1961 and continued to manufacture and formulate herbicides. The drums of organic wastes that were in the open area southwest of the central process area were buried in the 1960s by Hercules in what is now referred to as the Reasor-Hill Landfill. From 1964 to 1968, Hercules produced the herbicide Agent Orange, a 2,4-D/2,4,5-T mixture for DOD. Hercules discontinued operations at the site in 1971.

From 1971 to 1976, Hercules leased the plant to Transvaal, Inc., a predecessor company of Vertac Chemical Corporation (Vertac). Transvaal resumed production of 2,4-D and intermittently produced 2,4,5-T. Organic wastes from these manufacturing processes were stored and then buried onsite in the 1970s by Transvaal in what is now referred to as the North Landfill or the Hercules/Transvaal Landfill. Transvaal purchased the property and plant from Hercules in 1976. In 1978, Transvaal underwent a Chapter XI bankruptcy reorganization, and ownership of the site was transferred to the new company, Vertac, which is the present owner.

Arkansas Department of Pollution Control and Ecology (ADPC&E) issued an order in 1979 that required Vertac to improve its hazardous waste practices, and in 1980, the United States Environmental Protection Agency (EPA) and ADPC&E jointly filed suit in federal district court against Vertac and Hercules. A Consent Decree entered into by EPA, ADPC&E, Vertac, and Hercules in January 1982, required that an independent consultant assess the conditions of onsite wastes and develop a proposed disposal method for the wastes. The proposal, called the "Vertac Remedy," was deemed by EPA to be unsatisfactory. The court decided in favor of the proposed remedy, which was implemented in summer 1984 and completed in July 1986. As part of the remedy, the Vertac plant cooling water pond was closed, and sediment from this unit was removed and placed in an above-ground vault. The Reasor-Hill and Hercules/Transvaal Landfills were capped, and a french drain and leachate collection system were installed around the burial (landfills) area. Ground water monitoring wells were also installed, and a ground water monitoring program was initiated.

Vertac operated the plant until 1986. In January 1987, Vertac abandoned the site, leaving about 29,000 drums of 2,4-D and 2,4,5,-T wastes. Many of these drums were leaking. EPA and Hercules then took over management of the site. This management has included the maintenance and overpacking (placing a leaking drum in a larger new plastic drum) of nearly 29,000 drums of organic material by EPA. Hercules has operated the treatment plant that treats ground water collected in french drains, which were constructed by Vertac downgradient of the landfills as a part of the Vertac Remedy, and surface water runoff collected in ditches that drain to sumps. The water treatment plant treats surface water runoff and ground water by phase-separation followed by adsorption through granular activated carbon. Additionally, a series of drainage ditches and sumps, which surround the central process area, collects surface runoff and pumps it to the water treatment plant. The treated water is piped to the West Waste water Treatment Plant, owned and operated by the City of Jacksonville, and is then discharged into Bayou Meto.

Currently, there are no manufacturing operations at the site. At the time operations were shut down, Vertac "mothballed" the plant. Mothballing involved flushing process lines and draining many of the process vessels. However, many vessels and tanks still contain residues. Continuing activities at the site include operation of the water treatment plant by Hercules.

The Vertac, Incorporated site was added to the National Priorities List (NPL) of hazardous waste sites in 1982. Once the site was placed on the NPL, Superfund money became available to study the contamination problems at Vertac and find ways to correct them to protect public health and the environment, pursuant to CERCLA.

2.2 SITE INVESTIGATIONS

Previous investigations performed at the site began in April 1978, when Vertac participated in a nationwide survey of potential dioxin sites. Three recent activities that are of importance in formulating the site characterization activities are:

1. Beginning in March 1987 and continuing through April 1988, EPA performed an inventory of the process vessels (storage tanks, chemical reaction vessels, etc.) in the central process area. The inventory consisted of:

- Vessel identification.
- Geometric shape.
- Volume.
- Content level, volume, phase.
- Content visual description.
- Analytical data (specific vessels).

This inventory revealed that approximately 213 vessels were onsite. Of the total, 73 of the process vessels were determined to be empty. Of the 140 process vessels that were not empty, 96 were sampled and analyzed for 2,4-D, 2,4,5-T, and/or 2,3,7,8-TCDD (TCDD). The remaining 44 process vessels were not sampled because they contained material associated with a known process, such as manufacture of 2,4,5-T, water treatment, etc. Because sampling was performed as a general assessment, not every vessel onsite was sampled.

Of the 96 vessels sampled, 46 vessels contained TCDD at a concentration greater than the detection limit of 0.3 part per billion (ppb). TCDD concentrations ranged from non detect to 960 ppb. Concentrations of 2,4-D ranged up to a maximum concentration of 200,000 parts per million (ppm).

Samples of insulation from the outside of 52 insulated process vessels were collected for asbestos analysis. Asbestos was not found in any of these samples.

Samples were also collected from selected buildings, building components, and roofing materials for asbestos analysis. A total of six bulk samples were analyzed for asbestos and five tested positive. The locations and the reported results are:

- Boiler feed water pump =>3% Amosite.
- No. 3 boiler =>2% Chrysotile.
- Dalapon Pad Area =>20% Chrysotile.
- Formulations Building roof tile =>11% Chrysotile.
- Formulations Building wall tile =>11% Chrysotile.

Since February 1, 1987, U.S. EPA has managed onsite wastes, including trash and pallets. The trash included floor sweepings, scrap metal, packaging material, personal protective clothing, and other wastes typically generated in an industrial setting. EPA shredded the trash and placed it into 1.7-cubic-yard polyethylene-lined, nylon bags. An estimated 643 bags were generated. No previous analytical data characterizing the trash were available. The trash was considered to have been homogenized during the shredding process, which cut the trash into small pieces. During shredding, the trash was staged in a common area, shredded, and later transferred into the bags.

EPA also shredded 9,906 pallets and placed them into an estimated 675 polyethylene-lined, nylon bags with a capacity of 1.7 cubic yards. The bags of shredded pallets were generated with the trash. No previous analytical data characterizing the shredded pallets were available. After shredding, the pieces of the shredded pallets were staged in a common area and later were transferred into the bags.

2. The removal project performed by Hercules in the fall of 1988, under the terms of an Administrative Order on Consent, involved excavating residential surface soils contaminated with TCDD at a concentration > 1 ppb. Approximately 2,700 cubic yards of soil were excavated and stored in approximately 1,630 polyethylene-

lined, nylon bags (1.7-cubic-yard capacity). TCDD concentrations for most residential soils ranged from 1 to 10 ppb. Other site soils were also excavated and placed in bags. These soils came from onsite surface drainage areas that were excavated, and from the excavation for surface drainage collection sumps. TCDD concentrations in these onsite soils ranged from 100 to 200 ppb. The soils were collected in a common staging area and later transferred to the 1.7-cubic-yard bags. The excavating, staging, and transferring resulted in thorough mixing of soils. The soils are considered homogenized and the TCDD concentrations are expected to be similar among bags. These bags are currently stored in a warehouse built by Hercules, located near the boiler house, and were sampled during Operable Unit I Remedial Investigation.

3. In July 1989, Hercules signed an Administrative Order (AO) On Consent with EPA to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the Vertac onsite areas. Since the contamination problems at the Vertac onsite areas are complex, the onsite RI/FS was divided into two operable units. Onsite Operable Unit 1 consists of above-ground media, such as buildings, process equipment, etc. Onsite Operable Unit 2 addresses soils and ground water. RI/FS for Onsite Operable Unit 1 was completed in March 1991. The findings of this investigation are detailed in Section 5 (Summary of Site Characteristics) of this ROD.

2.3 ENFORCEMENT HISTORY

A Potentially Responsible Party (PRP) search was not conducted since the Agency knew the identities of former owners, operators, and some generators of waste at the Vertac site, and since litigation was already going on prior to CERCLA activities. However, CERCLA Section 104(e) information request letters were mailed in March 1990 and later to several companies, some of which had "tolling agreements" with the Vertac Chemical Corporation and/or Hercules Inc.

The following is a chronology of enforcement activity at the Vertac site:

1. Litigation was filed in 1980 under RCRA Section 7003 and other statutes by the United States and the State of Arkansas against Vertac Chemical Corp. and Hercules Inc. (the "Parties"). In January 1982, EPA and the State of Arkansas entered into a Consent Decree with Vertac Chemical Corp. and Hercules Inc. in the litigation for developing a remedial plan for certain onsite and off-site areas. After EPA invoked dispute resolution and a hearing on the remedy, the court ordered the implementation of the "Vertac Remedy" in July 1984. (See Site History for a discussion of the action taken.)

2. In July 1986, pursuant to an agreement between the parties and

entered by the court, Vertac established a Trust Fund, as part of a bankruptcy agreement. Vertac placed $6,700,000 in this fund to be used to remediate portions of the plant. A $4,000,000 letter of credit was later added to this Trust Fund. Both EPA and the State of Arkansas have access to this fund, and it is being used to incinerate the 29,000 drums.

3. In August 1986, EPA issued a Unilateral Administrative Order to all PRPs to require posting of warning signs and the fencing of portions of the West Waste water Treatment Plant and certain areas of Rocky Branch Creek. This work was performed by Hercules.

4. In January 1987, EPA issued a notice letter to Vertac Chemical Corp. that required Vertac Chemical Corp. to continue operation and maintenance of leachate collection and treatment system.

5. In June 1988, EPA signed an Administrative Order on Consent with Hercules to allow Hercules to implement fine grid sampling for off-site areas.

6. In September 1988, EPA signed an Administrative Order on Consent with Hercules that required Hercules to remove contaminated soils from residential yards.

7. In July 1989, EPA signed an Administrative Order on Consent with Hercules that required Hercules to conduct the onsite Remedial Investigation/Feasibility Study (RI/FS).

8. In March 1990, EPA sent CERCLA Section 104(e) information request letters to several companies which had been involved in business deals with Vertac Chemical Corp. and Hercules Inc., including "tolling agreements".

9. In July 1990, EPA sent General Notice letters to the PRPs regarding the proposed off-site remedial plan and other site actions.

10. In February 1991, the District Court entered a Consent Decree between the United States and the "Phoenix Parties," which are companies related to Vertac Chemical Corp., and which carried on the remaining business of Vertac under their names after Vertac abandoned the site. Hercules appealed entry of the Consent Decree to the Eighth Circuit Court of Appeals, which upheld entry of the Consent Decree in April 1992. Under the terms of the Consent Decree, the Phoenix Parties have contributed $1,840,000 to the RCRA Closure Trust Fund, and will contribute a percentage of pre-tax profits for 12 years, in return for a release from liability.

11. Hercules Inc. had opposed the United States' efforts to select

a remedy for the off-site area at Vertac. This opposition included a motion filed in September 1992, to enforce 1982 RCRA Consent Decree. The parties were ultimately unable to resolve their differences regarding this motion. In June 1992, the trial court entered an order denying Hercules' motion to enforce the Consent Decree, and allowed EPA to use CERCLA procedures to select remedies for Vertac.

12. The United States added CERCLA section 107 cost recovery claims against Hercules, The Dow Chemical Company and Uniroyal Chemical Limited of Canada in a complaint filed in March, 1992. By order of the trial court in June 1992, this complaint was administratively closed, and the claims asserted against Hercules, Dow and Uniroyal were consolidated with the existing litigation. Other parties, including BASF AG, Standard Chlorine and Velsicol, have been added to the litigation as third-party defendants.

13. Special notice letters for Remedial Design/Remedial Action (RD/RA) for the off-site areas were sent to the PRPs in August 1992. No good faith offers were received in response to this letter. A subsequent special notice letter was sent in December 1992, to the PRPs after EPA revised the scope of remedial work at the off-site areas. Negotiations regarding this work did not result in an RD/RA Consent Decree.

14. Discovery in the liability phase of the ongoing litigation has been completed. Pre-trial motions and negotiations are underway. The case has been set for trial on the issue of liability beginning on November 1, 1993. Following this trial, phases II and III will deal with the government's costs and apportionment of liability among the defendants, respectively.

15. Although it is not specifically enforcement-related, two separate citizens' suits have been filed seeking to halt incineration of dioxin still bottom wastes stored at the Vertac Site. The first suit, filed in 1990 by the National Toxics Campaign and others, resulted in denial of plaintiffs' request for a preliminary injunction against incineration. The second suit, filed in October 1992, by the Arkansas Peace Center and others, resulted in both a temporary injunction and a preliminary injunction prohibiting incineration being issued. The preliminary injunction is being appealed to the Eighth Circuit Court of Appeals, which has issued a stay of the preliminary injunction.

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan for the Vertac site was completed in 1983. This plan lists contacts and interested parties throughout government and the local community. It also establishes communication pathways to ensure timely dissemination of pertinent information. Numerous fact sheets, open houses and workshops have been conducted on the Vertac site. A satellite community relations office was established in Jacksonville in July 1990 to provide easy access to documents and information. The Vertac Site Remedial Investigation and Focused Feasibility Study For Operable Unit 1 was released to the public in March 1991. This document was made available at five local repositories (Jacksonville City Hall, Public Library, Police Courts Building, Air Force Base Library, and ADPC&E in Little Rock). The Administrative Record for this operable unit is maintained at EPA in Dallas, the Jacksonville City Hall and the Arkansas Department of Pollution Control and Ecology in Little Rock.

A Technical Assistance Grant (TAG) was awarded by EPA in 1989 to a citizens group called Jacksonville People With Pride Clean Up Coalition (JPWPCUC). This award was challenged by citizens groups that competed for the grant, who alleged that JPWPCUC was funded by the Potentially Responsible Parties (PRPs) for Vertac. Upon investigation by EPA, the grant was annulled after it was determined that the JPWPCUC TAG application listed their source of matching funds as a bank account shared with their larger "parent" group, the Jacksonville People With Pride. This parent group had indeed accepted monetary contributions from Vertac PRPs, and since these funds were not distinct from those of JPWPCUC, EPA determined that a possible conflict of interest could exist, resulting in annulment of the TAG in December 1991.

TAG availability was again advertised in January 1992, and the grant was awarded to the Concerned Citizens Coalition (CCC) in April 1993 after considerable effort by EPA to facilitate consolidation of four competing citizen groups. CCC is currently in the process of soliciting for a Technical Advisor.

The proposed plan for this operable unit was released on February 13, 1993. A public comment period was held from February 22 to April 23, 1993. In addition, an open house was held on February 13, 1993 and a public meeting was held on April 13, 1993 to present the results of the Remedial Investigation/Focused Feasibility Study and the proposed plan. All comments received by EPA prior to the end of the public comment period, including those expressed verbally at the public meeting, are addressed in the Responsiveness Summary section of this Record of Decision. Thus, public participation requirements of CERCLA Sections 113(K)(2)(B)(i-v) and 117 have been satisfied.

4. SCOPE AND ROLE OF ONSITE OPERABLE UNIT 1 WITHIN SITE STRATEGY

Since the Vertac Superfund Site is very large and complex, the site is divided into the following operable units:

Vertac Remedy - As required by the 1984 Consent Decree, the Vertac plant cooling water pond was closed and sediments from this unit were removed and placed in an above-ground sediment vault. The burial areas (landfills) were capped and a french drain and leachate collection system were installed around the burial areas. Ground water monitoring wells were also installed and a ground water monitoring program was initiated.

Vertac Off-Site - This Record of Decision, signed in September 1990, addresses the clean-up of the off-site areas that were contaminated as a result of untreated and partially treated surface and underground (city sewer) discharges of waste water and other releases from the plant. EPA has issued a Unilateral Administrative Order (UAO) to the PRPs for conducting RD/RA for this operable unit.

Drummed Wastes Incineration - When Vertac abandoned the plant in 1987, approximately 29,000 drums of 2,4-D and 2,4,5-T wastes were left onsite. In 1989, ADPC&E signed a contract to have these drummed wastes incinerated onsite. EPA provided incineration support, and has performed an engineering evaluation/cost analysis (EE/CA) for incineration support. Incineration of these wastes began in fall 1990. EPA also signed an action memorandum in September 1992, selecting incineration of these drummed wastes. ADPC&E terminated the incineration contract in early June 1993. EPA has taken over this drum incineration project.

Onsite Operable Unit 1 - In July 1989, Hercules Inc.(a Potentially Responsible Party) signed an Administrative Order on Consent, with EPA to conduct a Remedial Investigation/Feasibility Study (RI/FS) for above-ground items, such as buildings, process equipment, tanks and their contents, shredded trash and pallets, and bagged soils (removed from dioxin contaminated residential yards). This RI/FS was completed in March 1991.

Onsite Operable Unit 2 - This operable unit addresses surface and subsurface soils, underground storage tanks and piping and ground water. Hercules is conducting an RI/FS for this operable unit under the terms of the above-mentioned Administrative Order on Consent and this RI/FS is scheduled for completion by September 1994. This operable unit is expected to be further divided into two operable units (soils and ground water operable units).

The Onsite Operable Unit 1, the subject of this ROD, addresses the onsite above-ground units. The contaminated media (tank contents, spent carbon, drummed wastes, buildings and equipment, etc.) in this operable unit poses principal and low level threats. The purpose of this response is to address risks posed by this operable unit's media.

5. SUMMARY OF SITE CHARACTERISTICS

5.1 LAND USE/POPULATION

The Vertac site is zoned industrial and is located within the City of Jacksonville. Land use zoning near the Vertac plant is shown on Figure 5-1. The portion just south of the Vertac plant site, between Marshall Road and the Missouri-Pacific railroad tracks, south to West Main Street, is residential, a combination of single-family homes and apartments. The section immediately west of the railroad tracks and north of West Main Street is undeveloped. The area between West Main Street and South Redmond Road is commercial and light industrial. Just south of South Redmond Road is undeveloped, uninhabited land that includes the Jacksonville Sewage Treatment Plant, DuPree Park, and Lake DuPree. The rest of the area is either farmland, mainly irrigated rice fields in the area south of Jacksonville and Bayou Meto, woodlands, or residential. There is substantial suburban residential development on the strip of higher ground along Highway 161 and in the area north of Bayou Meto.

The population growth of Jacksonville has been as follows: 1950 - 2,474; 1960 - 14,488, 1965 - 18,078; 1970 - 19,832; 1980 - 26,788; and 1990 - 29,101.

5.2 GEOLOGY

The site lies in the transition zone between the Coastal Plain and the interior Highlands Physiographic Provinces. The surficial geology of the Coastal Plain Province in the region surrounding the site is dominated by a westward thinning wedge of unconsolidated sediment consisting of the Tertiary Age Claiborne Group, Wilcox Group, and Midway Formation.

The Claiborne Group and the Wilcox Group are undifferentiated along the fall line that occurs in the site area. The wedge onlaps the rocks of the Pennsylvanian Age lower Atoka Formation, which dominates the geology of the interior Highlands Province in the region surrounding the site. Quaternary alluvium and terrace deposits occur locally along drainages in both provinces and are more common in the Coastal Plain Province. A generalized summary of the geologic formations surrounding the site is presented in Table 5-1. A map of the site geology is presented in Figure 5-2.

The contact between the Tertiary Age sediments and the Pennsylvanian Age rocks occurs along a regional trend of northeast to southwest and is present in the area of the site. On a local scale, the trend of the contact depends on the current erosional surface and the paleotopographic surface of the Atoka Formation. The strike of the Wilcox Group sediments and the Midway Formation tends toward the northeast/southwest. The dip of the sediments is low and oriented toward the southeast. The Midway Formation was deposited onto the irregular and weathered surface of the Atoka Formation, which was folded and fractured during the late stages of the Alleghenian orogeny. The Atoka Formation was later uplifted and weathered. In the area of the site, the strike of the beds in the

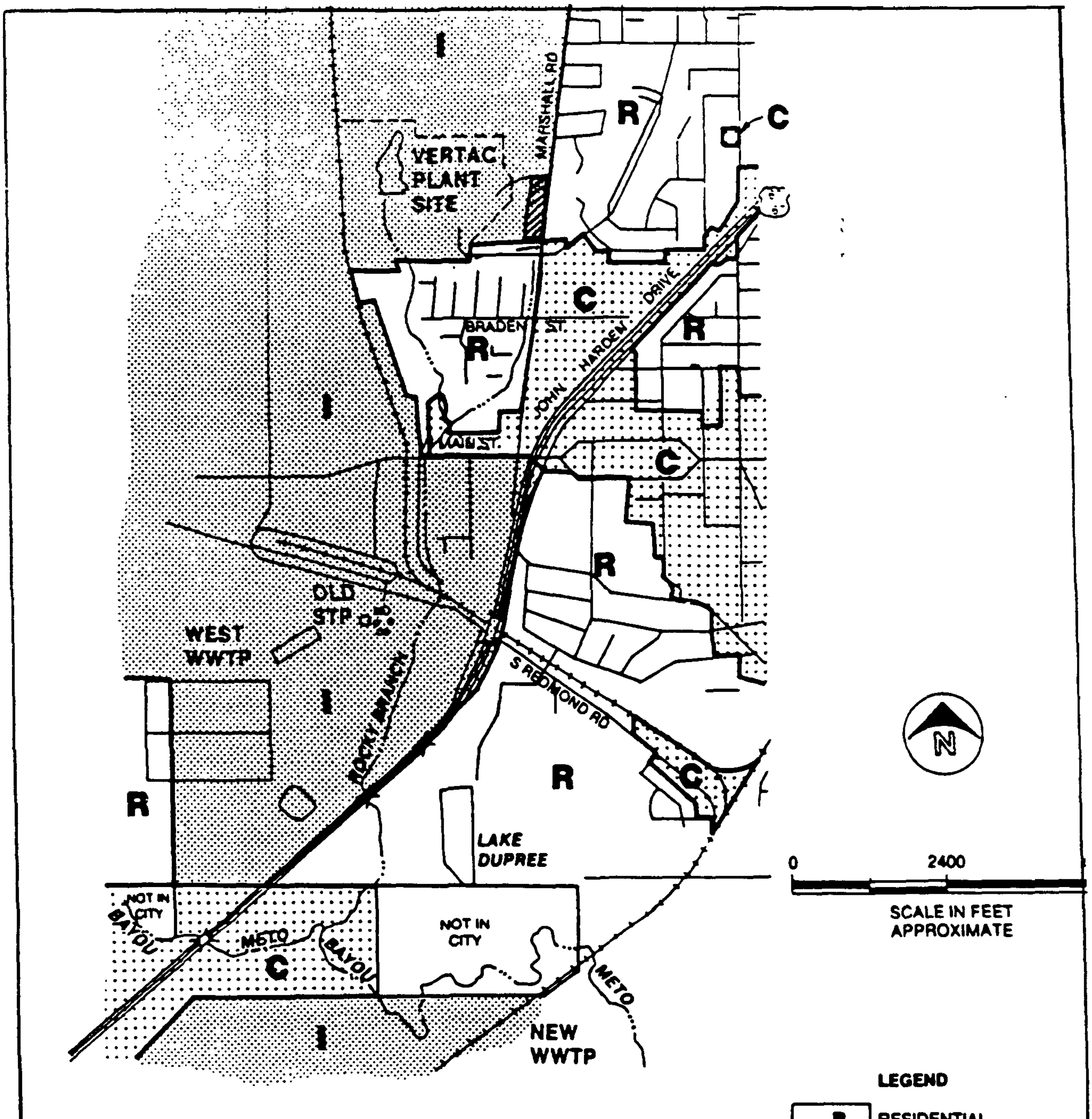

Figure 5-1

Land Use Zoning Map

Vertac Operable Unit 1

ERA	SYSTEM	SERIES	SUBDIVISION	THICKNESS (FEET)	LITHOLOGY	WATER SUPPLY
CENOZOIC	QUARTERNARY	HOLOCENE	ALLUVIUM	0-50	RED TO GRAY CLAY; OCCASIONALLY SILTY TO SANDY	GENERALLY NON-WATER BEARING; DOMESTIC SUPPLIES AVAILABLE FROM BASAL UNITS
		PLEISTOCENE	ALLUVIUM AND TERRACE DEPOSITS	0-156	BASAL SAND AND GRAVEL OVERLAIN BY FINE SAND, SILT AND CLAY	BASAL SANDS AND GRAVELS YIELD UP TO 2000 GPM; MOST IMPORTANT AQUIFER IN AREA
	TERTIARY	EOCENE	CLAIBORNE GROUP	0-700	WHITE TO LIGHT GRAY, FINE TO MEDIUM SAND; GRAY TO TAN CLAY AND SANDY CLAY	NOT WELL DEVELOPED
			WILCOX GROUP	0-800	SPECKLED LIGHT GRAY AND BLACK TO BROWN CLAY; LIGNITIC CLAY AND LIGNITIC FINE SAND	NOT WELL DEVELOPED
			TERTIARY UNDIFFERENTIATED NEAR FALL LINE	0-219	YELLOWISH TO REDDISH-BROWN MOTTLED/CLAYEY SAND AND SANDY CLAY; MOTTLED GRAY UNDER REDUCING CONDITIONS	CLEAN SAND BEDS YIELD DOMESTIC SUPPLIES
		PALEOCENE	MIDWAY FORMATION	0-500	DARK BLUE-GRAY TO BLACK NONCALCAREOUS TO VERY CALCAREOUS CLAY; OCCASIONAL THIN BEDS OF WHITE CLAY AND DENSE, FINE GRAINED SANDSTONE	GENERALLY NON-WATER BEARING
MESOZOIC	CRETACEOUS	UPPER CRETACEOUS	UNDIFFERENTIATED	0-500	LIGHT GRAY TO WHITE, CALCAREOUS, FOSSILIFEROUS, GLAUCONITIC SANDSTONE; OVERLAIN AND UNDERLAIN BY SANDY CLAY SHALE AND MARL	DEEPLY BURIED; SALINE WATER
PALEOZOIC	PENNSYLVANIAN	ATOKA	ATOKA FORMATION	500-1500	INTERBEDDED SHALE AND SANDSTONE; SANDSTONE TIGHTLY CEMENTED	WATER BEARING IN OUTCROP ONLY; DOMESTIC SUPPLIES UP TO 10 GPM

M327-4127

TABLE 5-1 SUMMARY OF SELECTED GEOLOGIC FORMATIONS AND WATER - YIELDING CHARACTERISTICS FOR REGION SURROUNDING VERTAC SITE

From Peer Consultants, 1990
Modified after Counts (1957)
Plebuch (1960)

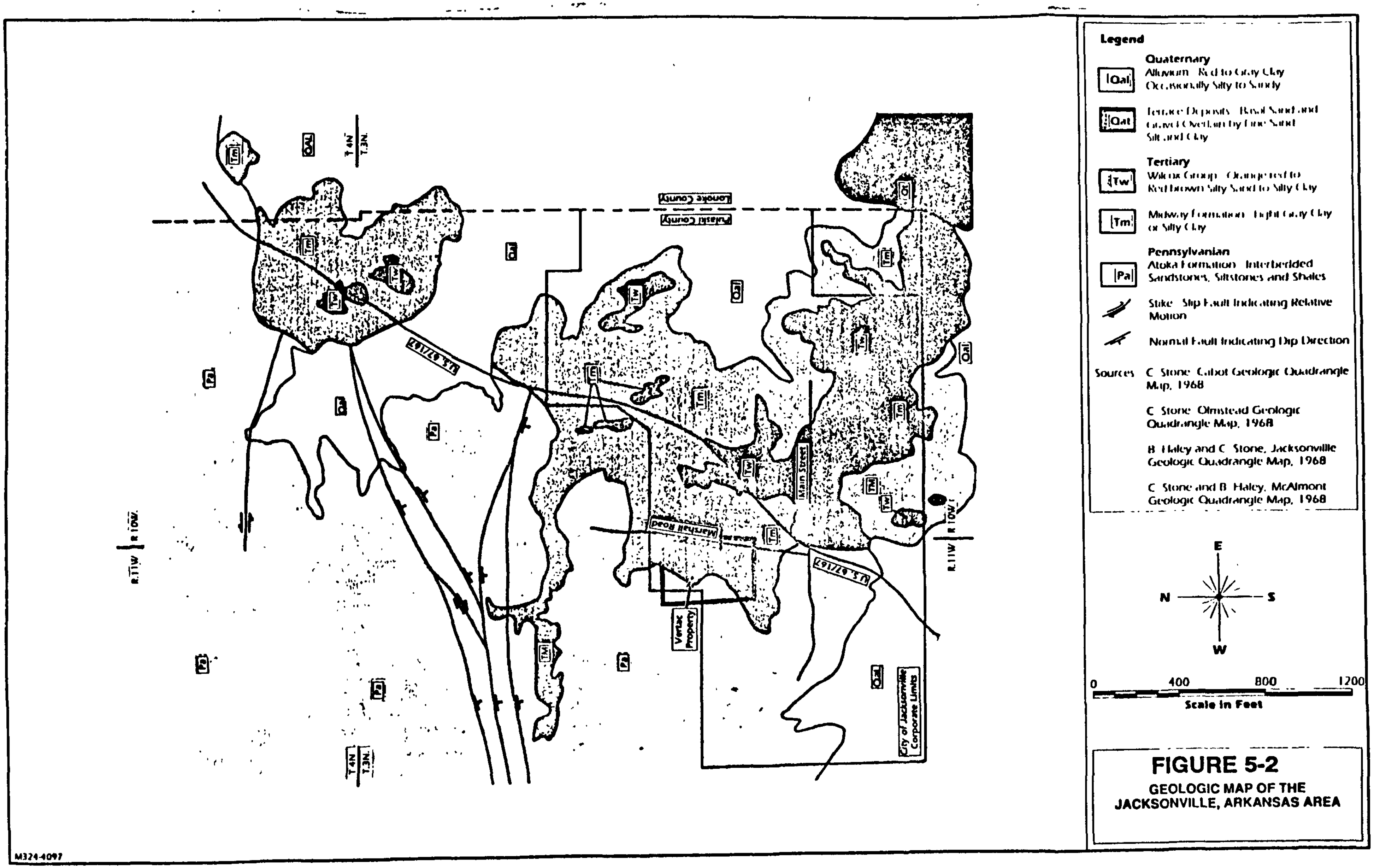

FIGURE 5-2
GEOLOGIC MAP OF THE JACKSONVILLE, ARKANSAS AREA

Atoka Formation trends N70^{0}W and dip is about 35^{0}NE. The Atoka Formation outcrops along Rocky Branch Creek on the western side of the site.

5.3 GROUND WATER

This ROD does not address the ground water contamination issues. Onsite Operable Unit 2 ROD, scheduled for December 1994, will address ground water contamination. Ground water investigation has indicated that contamination has not migrated to off-site areas. The City of Jacksonville does not use ground water as a source of drinking water, but receives water from Little Rock.

The ground water in the region surrounding the site occurs in both the overburden and the underlaying bedrock. The overburden and bedrock are generally not considered important sources of ground water supply near the site. Ground water supplies in the region are obtained from the unconsolidated sands and gravels in the Tertiary and younger Quaternary sediments. Most ground water is produced from wells completed in sands within the Wilcox Group and basal sands and gravels within the Pleistocene alluvium and terrace deposits. Yields from these deposits can range up to 2,000 gallons per minute. Ground water in the unconsolidated sediments is present in the primary intergranular pore space. Some domestic ground water supplies are obtained from Atoka Formation. Yields can range up to 10 gallons per minute. Ground water in the bedrock is present in the fractures and partings within the rock. A summary of the water-yielding characteristics is presented in Table 5-2.

The hydrogeology in the area of the site is influenced by the location of Rocky Branch Creek, the french drain, the central ditch, and the hydraulic characteristics of the overburden, weathered rock, and bedrock.

5.4 SURFACE WATER

This ROD does not address the surface contamination issues. Off-site ROD, issued in September 1990, addressed the surface water contamination problems and proposed a remedy.

There are two major drainageways in the area, Rocky Branch Creek and Bayou Meto. Minor drainageways are intermittent streams that flow into Rocky Branch Creek and Bayou Meto in the spring or during periods of heavy rainfall.

Rocky Branch originates near the northern boundary of Jacksonville and flows generally south, traversing the Vertac plant property along the west side. About two miles south of the plant it empties into Bayou Meto. Being a young stream, Rocky Branch is characterized by low sinuosity, low levels of suspended sediments, and a high bed-load potential. Channel deposits are predominantly silt and clay.

Bayou Meto begins in the Atoka Formation approximately one mile northwest of Jacksonville. About 130 miles southeast of Jacksonville, Bayou Meto empties into the Arkansas River.

5.5 REMEDIAL INVESTIGATION FINDINGS

Onsite Operable Unit I consists of the following above-ground materials:

- Contents and residues that are in process vessels.
- Miscellaneous containerized (drummed or bagged) materials that are currently stored onsite, including spent carbon, french drain oily leachate, shredded plant trash, shredded pallets, excavated soil, and other containerized disposables (this does not include those drummed wastes currently being incinerated).
- Process buildings and structures.
- Process equipment (i.e., storage tanks, reactors, piping, pumps, etc.).
- Materials used to construct, add to, and maintain the chemical processing units and buildings (i.e., asbestos siding and insulation, and PCBs in electrical equipment).

Contents of Process Vessels

During the process vessel inventory in 1989, a total of 270 vessels were found. Of the 270 vessels, 175 were empty (based on readings from a nonintrusive level detector). 95 process vessels that were not empty were categorized into vessels containing F-listed wastes (based on historical information and labels on vessels) (46), vessels containing non-F-listed wastes (31), vessels containing unknown wastes (6), and vessels in active use (12). The Resource Conservation and Recovery Act (RCRA) lists hazardous wastes fron non-specific sources (such as waste halogenated solvents, herbicides manufacturing wastes, etc.) as F-wastes. The process vessel inventory is presented in Appendix A of the Vertac Site Remedial Investigation and Focused Feasibility Study for Onsite Operable Unit 1.

F-Listed Vessel Contents

This category includes 2,4-D product and waste, 2,4,5-T products and waste, discarded raw materials like chlorophenols, toluene, etc. and spent alcohols. Out of the 46 vessels believed to contain F-listed wastes, 17 were sampled for physical and incinerability characteristics of the material contained within the vessels. The physical nature of the material varied greatly; vessels contained solids, tar, sludges, organic liquids, and aqueous liquids. Thirteen vessels contained more than one phase. The incinerability characteristics also varied widely; including BTU (measure of heating value), ash, and moisture content. Table 5-2 lists the ranges and median values of analytical results. Total volume of F-listed vessel contents was estimated at 104,700 gallons.

Non-F-Listed Vessel Contents

This category includes materials such as tetrachlorobenzene, caustic soda, hydrochloric acid, dimethyl amine, kerosene/fuel oil, etc. Of the 31 vessels believed to contain non-F-listed wastes, 9 vessels were sampled. These vessels contained material that was typically single phase. With the exception of one sample, the analytical data generally did not indicate the presence of trichlorophenol or 2,3,7,8-TCDD, which supports the initial characterization of the contents of these vessels as non-F-listed materials. Some of the material contained high values for BTU and chlorides. Table 5-3 is a summary of the analytical results for the non-F-listed vessels. Total volume of non-F-listed vessel contents was estimated at 69,400 gallons.

Unknown Vessel Contents

This category includes materials of unknown origin. Of the 6 vessels containing materials of unknown origin, only 5 were sampled (because the sixth vessel contained material similar to one of the vessel sampled). Three of the vessels contained weathered hydrocarbon residues, probably derived from petroleum, based on infrared (IR) scans performed on these samples. The physical nature of the materials varied greatly, including aqueous liquid, organic liquid, tar, and soil. 2,3,7,8-TCDD was detected in four of the seven samples analyzed. With the possible exception of one (2.4 ppb 2,3,7,8-TCDD), the vessel contents display chemical compositions that would support listing the contents with the non-F-listed category. The BTU and chloride values are similar to those of the other vessel contents. The analytical results are summarized in Table 5-4. Total volume of unknown vessel contents was estimated at 23,110 gallons.

Spent Carbon

Spent carbon (generated from treatment of aqueous phase of leachate collected in the french drains) drums inventoried totalled 502. The physical nature of the spent carbon was a solid, although a high moisture content was present. The analytical data showed that the spent carbon contained organic compounds, including toluene, di- and tri- chlorophenols, naphthalene, 2,4-D, and 2,4,5-T at concentrations over 1,000 ppm. The analytical data showed that the spent carbon is relatively homogeneous, even between the drummed and bulk carbon. The spent carbon has a high heating value, above

TABLE 5-2

F-LISTED PROCESS VESSEL CONTENTS ANALYTICAL SUMMARY

	CONCENTRATION RANGE (a)	MEDIAN VALUE (b)
METALS	mg/kg	mg/kg
Arsenic	ND - 130	19
Barium	ND - 82.8	0.44
Calcium	ND - 22200	17.2
Chromium	ND - 38.5	11.6
Lead	ND - 35.7	7.1
Magnesium	ND - 818	13
Potassium	ND - 221	47.5
Sodium	ND - 53400	1350
PHYSICAL PARAMETERS		
Ultimate Analysis (Wt %)		
-Carbon	0.41 - 73.4	62.4
-Hydrogen	0.46 - 5.97	4.18
-Oxygen	20.5 - 97.2	32.2
-Nitrogen	0.03 - 0.62	0.13
-Sulfur	ND - 0.13	0.06
Melting Point (F)	195 - 1865	204
Percent Ash (Wt %)	ND - 79.4	1.3
Percent Moisture (Wt %)	ND - 95	45
Heating Value (Btu/lb)	ND - 16000	6100
Total Chlorides (mg/kg)	1700 -420000	49000
-Inorganic Chlorides	200 - 52000	800
-Organic Chlorides	ND - 420000	158000

NOTES :

(a) Only those metals with detected concentrations greater than 1 mg/kg are included in this summary table.

(b) The median value for each analyte is determined using detected concentrations only.

VOLUME BREAKDOWN

VESSELS CONTAINING F-LISTED MATERIAL = 46

TOTAL F-LISTED PROCESS VESSEL CONTENTS = 104700 gal.
- -TOTAL LIQUIDS = 25400 gal
- -TOTAL SOLIDS = 30800 gal
- -TOTAL LIQ/SOL = 48500 gal

TABLE 5-3

NON-F-LISTED PROCESS VESSEL CONTENTS ANALYTICAL SUMMARY

	CONCENTRATION RANGE (a)	MEDIAN VALUE (b)
VOCs	mg/kg	mg/kg
Chloroform	ND - 41	0.24
Toluene	ND - 590	0.93
Ethylbenzene	ND - 40000	2
Xylenes	ND - 110000	4.7
BNAs	mg/kg	mg/kg
2,4-dichlorophenol	ND - 1000	7.5
1,2,4-trichlorobenzene	ND - 5600	5600
Naphthalene	ND - 360	130
2,4,6-trichlorophenol	ND - 5000	0.37
Pentachlorophenol	ND - 8700	8700
2-methylnaphthalene	ND - 1800	1800
Phenanthrene	ND - 560	560
Anthracene	ND - 560	560
Pyrene	ND - 200	200
Tetrachlorobenzene	NA (c)	610000
HERBICIDES	mg/kg	mg/kg
2,4-D	ND - 400	17
2,4,5-T	ND - 2.7	0.079
DIOXIN	ng/g	ng/g
2,3,7,8-TCDD	ND - 0.21	0.21
METALS	mg/kg	mg/kg
Arsenic	ND - 31.4	18.9
Barium	ND - 1.3	1.3
Calcium	ND - 75.1	24.7
Chromium	ND - 233	9.9
Magnesium	ND - 78.4	4.8
Potassium	ND - 439	138
Sodium	ND - 697000	78.5
PHYSICAL PARAMETERS		
Ultimate analysis (Wt %)		
-Carbon	0.52 - 78.3	5.36
-Hydrogen	2.14 - 10.1	5.1
-Oxygen	18.0 - 97.0	89.2
-Nitrogen	0.02 - 1.98	0.07
-Sulfur	ND - 0.53	0.04
Melting point (F)	321 - 685 (d)	321
Percent ash (Wt %)	ND - 14.9	0.3
Percent moisture (Wt %)	ND - 95	80
Heating value (Btu/lb)	ND - 18300	4500
Total chlorides (mg/kg)	ND - 660000	1400
-Inorganic chlorides	300 - 80000	300
-Organic chlorides	ND - 660000	1100

NOTES :

(a) With the exception of dioxin, only those chemical parameters with detected concentrations greater than 1 ppm are summarized above.

(b) Only detected concentrations are used when determining the median value.

(c) Only one sample was analyzed for tetrachlorobenzene.

(d) Values less than 32 F are not included.

VOLUME BREAKDOWN

VESSELS CONTAINING NON-F-LISTED MATERIAL = 31

TOTAL NON-F-LISTED PROCESS VESSEL CONTENTS = 69400 gal

- -TOTAL LIQUIDS = 53420 gal
- -TOTALSOLIDS = 5790 gal
- -TOTAL LIQ/SOL = 10190 gal

TABLE 5-4

UNKNOWN PROCESS VESSEL CONTENTS ANALYTICAL SUMMARY

	CONCENTRATION RANGE (a)	MEDIAN VALUE (b)
VOCs	mg/kg	mg/kg
Methylene chloride	ND - 1	1
Acetone	ND - 74	0.014
Chloroform	ND - 3.5	0.031
Tetrachloroethane	ND - 5.1	5.1
BNAs	mg/kg	mg/kg
Benzoic acid	ND - 3600	3600
PESTICIDES/PCBs	mg/kg	mg/kg
Dieldrin	ND - 1.5	0.017
4,4'-DDE	ND - 1.5	0.014
Endrin	ND - 4.1	4.1
4,4'-DDD	ND - 7.7	0.011
4,4'-DDT	ND - 12	0.12
HERBICIDES	mg/kg	mg/kg
2,4,5-T	ND - 9.1	9.1
DIOXIN	ng/g	ng/g
2,3,7,8-TCDD	ND - 2.4	0.51
METALS	mg/kg	mg/kg
Arsenic	ND - 26.3	22.9
Barium	ND - 28.7	13.2
Calcium	22.8 - 2560	353
Chromium	ND - 261	2.5
Magnesium	18 - 244	61.7
Potassium	ND - 215	161
Sodium	29.6 - 9810	62.8
PHYSICAL PARAMETERS		
Ultimate analysis (Wt %)		
-Carbon	1.43 - 81.3	58.3
-Hydrogen	0.79 - 4.62	2.96
-Oxygen	15.1 - 97.5	37.7
-Nitrogen	0.05 - 0.39	0.21
-Sulfur	ND - 0.83	0.25
Melting point (F)	192 - 1432 (c)	1400
Percent ash (Wt %)	ND - 85.3	12.1
Percent moisture (Wt %)	4 - 95	7
Heating value (Btu/lb)	ND - 14800	11200
Total chlorides (mg/kg)	ND - 470000	1400
-Inorganic chlorides	ND - 4600	400
-Organic chlorides	ND - 424000	1000

NOTES :

(a) With the exception of dioxin, only those chemical parameters with detected concentrations greater than 1 ppm are summarized above.

(b) Only detected concentrations are used when determining the median value.

(c) Values less than 32 F are not included.

VOLUME BREAKDOWN

VESSELS CONTAINING UNKNOWN MATERIALS = 5

TOTAL UNKNOWN PROCESS VESSEL CONTENTS = 23110 gal
-TOTAL LIQUIDS = 7870 gal
-TOTAL SOLIDS = 15240 gal

7,500 BTU/lb. The ash content varied between the bulk and drummed carbon samples. The bulk carbon exhibited a higher ash content, probably because solids removal (filtration) prior to carbon treatment did not take place until 1987, when spent carbon began to be stored in drums. Because the spent carbon generated prior to 1987 did not experience prefiltration, it is believed to contain higher grit and iron concentrations, thus having a higher ash content. Approximately 59,000 gallons of spent carbon (bulk and drummed) were inventoried. Analytical results are summarized in Table 5-5.

Containerized Materials/French Drain Oily Leachate

377 drums (55 gallons drums) were inventoried. The majority of these drums contained various materials resulting from the installation and maintenance of the french drain system for leachate collection and Remedial Investigation wastes (discarded tyvak suits, etc.). The sample (and duplicate sample) of the french drain oily leachate showed high levels of toluene (above 10 wt%), 2,3,7,8-TCDD, di- and tri-chlorophenols, and chlorophenoxyherbicides. Table 5-6 is a summary of analytical results for oily leachate.

Process Buildings

Figure 5-3 shows the locations of the buildings (administrative, manufacturing, warehouse, machine shop, etc.). These buildings were sampled for surface contamination (wipe samples) and contaminated dust. With the exception of the Dalapon boiler, all of the wipe samples from the interior and exterior surfaces of the process buildings showed 2,3,7,8-TCDD; the exterior levels were generally lower than the interior levels. The T-Product Storage Building and the Change House showed 2,3,7,8-TCDD concentrations an order of magnitude higher than the other onsite buildings sampled. Also, the Regina Paint Building is anticipated to be contaminated by 2,3,7,8-TCDD because of the many empty 2,4,5-T waste drums being stored inside the building. 2,3,7,8-TCDD was also found in all the dust samples that were taken inside the process buildings. Tables 5-7 and 5-8 present the summary of analytical results of wipe and dust samples.

An estimated 1,100 empty drums are within the Regina Paint Building. 2,3,7,8-TCDD was found in the wipe sample collected from a drum located near the door.

The volume of debris resulting from demolition of buildings is estimated at 13,680 cubic yards.

Process Equipment

Process equipment includes process vessels (tanks, reactors, etc.), piping, pumps, etc. 2,3,7,8-TCDD (from wipe samples) was generally

TABLE 5-5

SPENT CARBON ANALYTICAL SUMMARY

	CONCENTRATION RANGE (a)	MEDIAN VALUE (b)
VOCs	mg\kg	mg\kg
Methylene chloride	ND - 1.3	1.3
Acetone	ND - 2.3	2.3
1,1-dichloroethene	0.66 - 1	1
Chloroform	7.7 - 14	14
Benzene	1.7 - 2.8	2.8
Toluene	4100 - 5100	5100
Chlorobenzene	1 - 1.7	1.7
Xylenes	0.79 - 1.2	1.2
BNAs	mg\kg	mg\kg
Phenol	270 - 280	280
2-chlorophenol	930 - 960	960
1,4-dichlorobenzene	16 - 17	17
Benzyl alcohol	80 - 88	88
2-methylphenol	51 - 60	60
4-methylphenol	51 - 60	60
Benzoic acid	ND - 38	38
2,4-dichlorophenol	13000 - 150000	150000
1,2,4-trichlorobenzene	68 - 85	85
Naphthalene	1900 - 2000	2000
4-chloro-3-methylphenol	ND - 20	20
2,4,6-trichlorophenol	1500 - 1600	1600
2,4,5-trichlorophenol	4800 - 5500	5500
HERBICIDES	mg\kg	mg\kg
2,4-D	13000 - 140000	140000
2,4,5-TP	610 - 640	640
2,4,5-T	1900 - 2300	2300
DIOXIN	ng/g	ng/g
2,3,7,8-TCDD	1.9 - 2.6	2.6
METALS	mg/kg	mg/kg
Arsenic	ND - 23.9	23.9
Barium	3.8 - 92.5	5.2
Cadmium	ND - 1.1	1.1
Calcium	190 - 2140	436
Chromium	4.5 - 61.1	7.9
Lead	ND - 30.4	30.4
Magnesium	74.2 - 175	119
Potassium	ND - 537	333
Sodium	126 - 1970	162
PHYSICAL PARAMETERS		
Ultimate analysis (Wt %)		
-Carbon	60.6 - 64.8	64.3
-Hydrogen	3.12 - 4.23	4.06
-Oxygen	29.8 - 34.8	30.5
-Nitrogen	0.96 - 1.12	1.01
-Sulfur	0.01 - 0.08	0.04
Percent ash (Wt %)	3.5 - 28.9	4.7
Percent moisture (Wt %)	10 - 42	31
Heating value (Btu/lb)	7600 - 11400	7800
Total chlorides (mg/kg)	26000 - 70000	27000
-Inorganic chlorides	400 - 4000	600
-Organic chlorides	23600 - 69600	26400

NOTES :

(a) With the exception of dioxin, only those chemical parameters with detected concentrations greater than 1 ppm are summarized above.

(b) Only detected concentrations are used when determining the median value.

VOLUME BREAKDOWN (as of 06 October 1989

TOTAL QUANTITY OF SPENT CARBON = 59010 g

-BULK STORAGE = 21360 gal

-DRUM STORAGE = 37650 gal

TABLE 5-6

FRENCH DRAIN LEACHATE ANALYTICAL RESULTS

	HE-FD-DC1-OLD-01		HE-FD-DC1-OLD-02	
VOCs (a)	mg/kg		mg/kg	
Chloroform	8.8 J		5 J	
Trichloroethene	3.6		2.8 J	
Benzene	33 J		19 J	
Tetrachloroethene	45		27	
Toluene	100000		110000	
Chlorobenzene	84		52	
Ethylbenzene	190		110	
Xylenes	310		190	
BNAs	mg/kg		mg/kg	
2,4-dichlorophenol	22000		22000	
1,2,4-trichlorobenzene	8100 U		7100 J	
2,4,6-trichlorophenol	8100 U		9500	
2,4,5-trichlorophenol	40000 U		40000 J	
PESTICIDES/PCBs	ND		ND	
HERBICIDES	mg/kg		mg/kg	
2,4-D	6400		7200	
2,4,5-TP	1100		1400	
2,4,5-T	3300		4000	
DIOXIN	ng/g		ng/g	
2,3,7,8-TCDD	21		1200	
METALS (b)	mg/kg		mg/kg	
Barium	74.8 J		67.4 J	
Beryllium	0.26 J		0.26 J	
Calcium	524 J		281 J	
Chromium (c,d)	73.1 J		69.6 J	
Magnesium	37.2 J		43.2 J	
Potassium	305 J		522 J	
Sodium	536 J		521 J	
PHYSICAL PARAMETERS				
Ultimate analysis (Wt %)				
-Carbon	56.2		56.5	
-Hydrogen	4.03		3.98	
-Oxygen	39.5		39.2	
-Nitrogen	0.13		0.15	
-Sulfur	0.18		0.21	
Melting point (F)	NA		NA	
Percent ash (Wt %)	1.8		1.2	
Percent moisture (Wt %)	2 - 4	(e)	2 - 4	(e)
Heating value (Btu/lb)	10500		10800	
Total chlorides (mg/kg)	280000		290000	
-Inorganic chlorides	200		300	
-Organic chlorides	280000		290000	

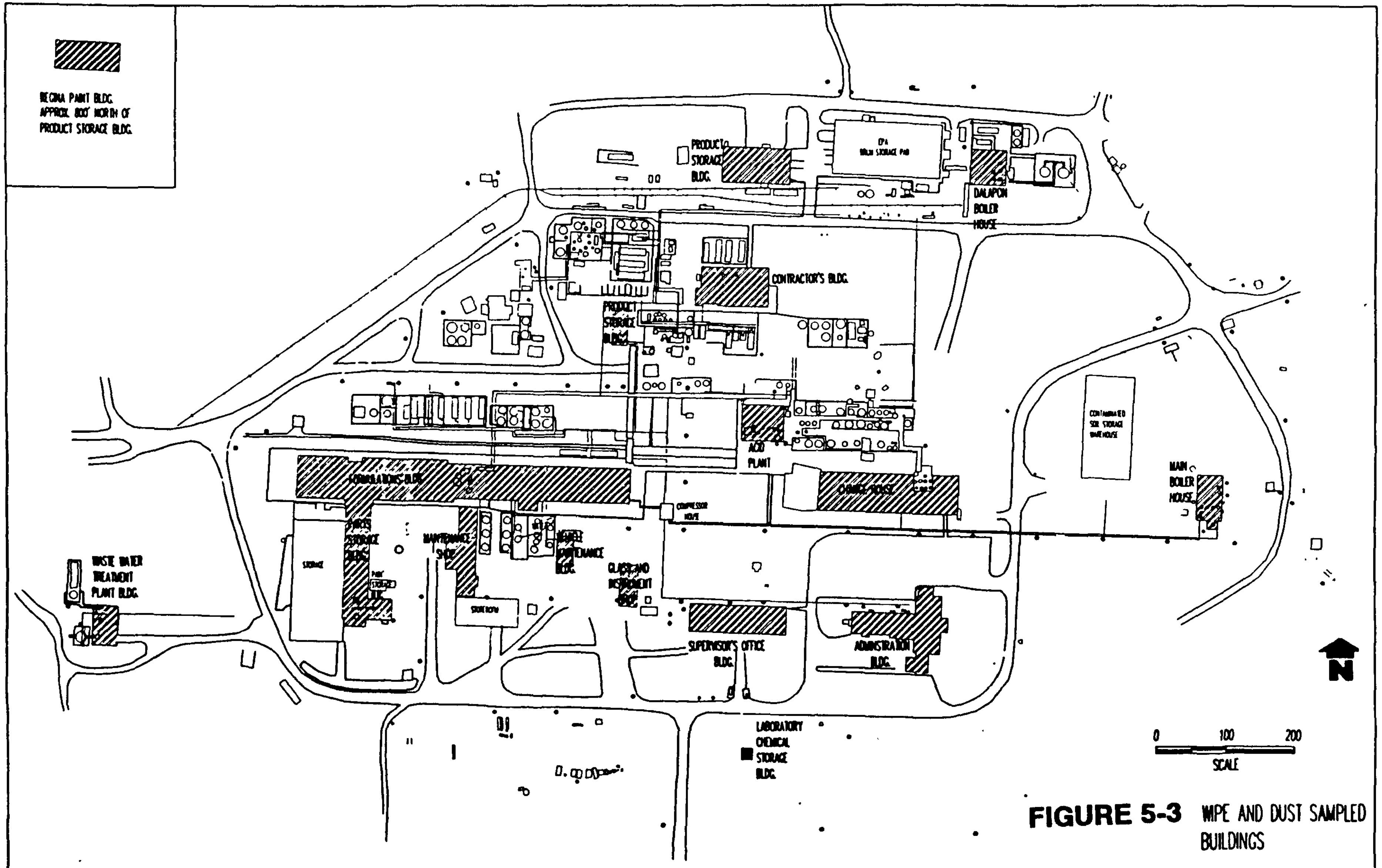

FIGURE 5-3 WIPE AND DUST SAMPLED BUILDINGS

TABLE 5-7

BUILDING WIPES ANALYTICAL SUMMARY

PROCESS BUILDING	2,3,7,8-TCDD RANGE (ng/sq m)	MEDIAN VALUE (a)
Dalapon boiler	ND - 2.1	0.3
Product storage	1.4 - 56	4.2
Contractors building	1.1 - 32	13.6
T-product storage	23 - 2360	480
Acid	13.8 - 260	62
Boiler house	37	37
Change house	1.3 - 1870	930
Formulations	3 - 31.5	12.5
Maintenance shop	3 - 62	35
Parts storage	4.1 - 430	76
Laboratory area	75	75
Wastewater treatment plant	9.8	9.8
Chemical storage	1.3 - 4	4
Regina paint (residue)	91 mg/kg	91 mg/kg
Regina paint (drum wipe)	121000	121000
Maintenance garage	28	28

NOTES :

(a) Only detected concentrations are used in determining the median value (no detection limits).

TABLE 5-8

BUILDING DUST ANALYTICAL RESULTS

SAMPLE ID	BUILDING	2,3,7,8-TCDD (ng/g)
HE-PB-009-VAC-01	Maintenance Shop	18
HE-PB-009-VAC-02	Maintenance Shop	18
HE-PB-010-VAC-01	Parts Storage	61 J (a)
HE-PB-011-VAC-01	Administration	88
HE-PB-013-VAC-01	Supervisors	12
HE-PB-014-VAC-01	Glass/Instrument Shop	29

NOTES:

(a) HE-PB-010-VAC-01 was spiked in the laboratory. The recovery was less than the QC limit in the spiked samples. Therefore the reported result for the unspiked sample was qualified as estimated.

J = Estimated value.

not detected on the exterior surface of the process vessels, and the levels on the interior surfaces varied, exceeding 100 ng/m^2 on one sample. The analytical data from the process vessel rinsate samples varied. Three of six of the samples showed low or nondetectable levels of toluene, chlorinated phenols, chlorophenoxyherbicides, and 2,3,7,8-TCDD, while the other three samples showed these compounds one or two orders of magnitude higher. 2,4-D was the only compound reported in all the samples. Tables 5-9 and 5-10 present the summary of wipe and rinsate samples analytical results.

The volume of debris resulting from demolition of process equipment is estimated at 10,080 cubic yards.

Asbestos Characterization

The asbestos characterization included the buildings, piping within the buildings, and the major outdoor pipe runs onsite. Of the 12 buildings surveyed, 11 buildings contained asbestos; the Dalapon boiler building did not. Most of pipe and fitting insulation sampled was found to contain asbestos. Siding shingles, roof shingles and floor tile samples also contained asbestos. The outdoor asbestos characterization focused on pipe runs and fittings in the major process areas. The general conclusion was that, while much of the outdoor insulation appeared to be fiberglass, asbestos was present in the pipe and fitting insulation throughout the central process area.

Containerized (bagged) Soils

Contaminated soils removed from residential yards and a drainage ditch onsite are bagged and stored onsite in a steel building. The analytical results for the bagged soils were within a consistent range for all the samples, indicating a general homogeneity. Chlorinated phenols, chlorinated benzenes, and chlorophenoxyherbicides were present at nondetectable to low levels. 2,3,7,8-TCDD was detected in all samples at levels ranging from 13 to 55 ppb. The bagged soils exhibited very low BTU values. Table 5-11 presents the soil analytical summary.

The total volume was estimated at 2770 cubic yards.

Shredded Trash and Pallets

After Vertac abandoned the site in 1987, EPA (under removal action) collected and shredded trash and pallets that were scattered throughout the plant. The shredded trash and pallets, placed in plastic bags, are stored on site under a tarpaulin cover. The analytical results for the shredded trash and pallet samples showed variability over several orders of magnitude. 2,3,7,8-TCDD was reported in all samples at levels ranging from 1.9 to 4100 ppb. The pallet samples generally showed higher levels of 2,3,7,8-TCDD

TABLE 5-9
PROCESS EQUIPMENT WIPES ANALYTICAL RESULTS

SAMPLE ID	PROCESS VESSEL	2,3,7,8-TCDD (ng)	2,3,7,8-TCDD (ng/sq m)
INTERIOR			
HE-PE-001-WPI-01	EPA-35	5.5	22.0
HE-PE-002-WPI-01 (a)	EPA-18	0.54 U	2.2 U
HE-PE-002-WPI-02 (a)	EPA-18	1.4 U	5.6 U
HE-PE-003-WPI-01 (a)	EPA-1	1 J	4.0 J
HE-PE-004-WPI-01 (a)	T-367	1.3 U	5.2 U
HE-PE-005-WPI-01 (a)	T-357	29	116.0
HE-PE-006-WPI-01 (a)	R-405	2.8 J	11.2 J
HE-PE-007-WPI-01 (a)	T-527	19 U	76.0 U
EXTERIOR			
HE-PE-001-WPE-01	EPA-31	0.34 U	1.4 U
HE-PE-002-WPE-01	T-503	0.23 U	0.9 U
HE-PE-003-WPE-01	T-432	0.41 U	1.6 U
HE-PE-004-WPE-01	T-139	0.97 U	3.9 U
HE-PE-005-WPE-01	R-404	0.36 U	1.4 U
HE-PE-006-WPE-01 (b)	T-316	1.8 U	7.2 U
HE-PE-007-WPE-01	T-201	0.62 U	2.5 U
HE-PE-007-WPE-02	T-201	0.8 U	3.2 U
HE-PE-008-WPE-01 (b)	R-362	26 J	104.0 J
HE-PE-009-WPE-01	EPA-16	0.84	3.4
HE-PE-010-WPE-01	EPA-26	0.6	2.4

TABLE 5-10

PROCESS VESSEL RINSATE ANALYTICAL SUMMARY

	CONCENTRATION RANGE	MEDIAN VALUE (a)
VOCs	ug/L	ug/L
Toluene	ND - 810	1.8
BNAs	ug/L	ug/L
2-chlorophenol	ND -57	8
2,4-dichlorophenol	ND -5700	6
2,4,6-trichlorophenol	ND - 1600	260
2,4,5-trichlorophenol	ND - 2100	1300
4-chlorophenol	ND - 280	13
2,6-dichlorophenol	ND - 530	80
2,3,6-trichlorophenol	ND - 43	43
HERBICIDES	ug/L	ug/L
2,4-D	3.3 - 49000	250
2,4,5-TP	ND - 2800	220
2,4,5-T	ND - 4700	2.1
DIOXIN	ng/L	ng/L
2,3,7,8-TCDD	ND - 86	0.51

NOTES :
(a) Only detected concentrations are used when determining the median value.

TABLE 5-11

CONTAINERIZED SOIL ANALYTICAL SUMMARY

	CONCENTRATION RANGE	MEDIAN VALUE (a)
CHLORINATED BENZENES/PHENOLS	mg/kg	mg/kg
2,4-dichlorophenol	ND - 0.39	0.21
2,4,5-trichlorophenol	ND - 0.41	0.18
Tetrachlorobenzene	ND - 5.6	2.5
HERBICIDES	mg/kg	mg/kg
2,4-D	0.25 - 5.1	0.46
2,4,5-TP	0.034 - 1.6	0.11
2,4,5-T	0.23 - 3.9	0.54
DIOXIN	ng/g	ng/g
2,3,7,8-TCDD	13 - 55	23
METALS	mg/kg	mg/kg
Antimony	ND - 14.4	5.8
Arsenic	1.8 - 3.6	2.4
Barium	47.5 - 64.7	55
Beryllium	0.22 - 0.95	0.46
Cadmium	ND - 1.2	0.77
Calcium	603 - 3490	997
Chromium	7.5 - 25.1	8.3
Copper	3.5 - 15.2	5.2
Lead	12 - 18.5	14.3
Magnesium	288 - 819	359
Nickel	2 - 6.1	4.4
Potassium	ND - 573	269
Selenium	ND - 0.31	0.21
Sodium	15.5 - 84.1	60.1
Zinc	17.6 - 35.8	21
PHYSICAL PARAMETERS		
Percent ash (Wt %)	76.9 - 82.6	80.9
Percent moisture (Wt %)	10 - 17	14

NOTES :
(a) Only detected concentrations are used when determining the median value.

VOLUME BREAKDOWN

TOTAL QUANTITY OF CONTAINERIZED SOIL = 2770 cubic yards while the trash samples generally showed higher levels of chlorophenoxyherbicides. Tables 5-12 and 5-13 present the shredded trash and pallets analytical summary.

The total volume of shredded trash and pallets is estimated at 2,240 cubic yards.

Electrical Equipment

PCBs were detected in five of the eleven transformers sampled. All five of those transformers are owned by Arkansas Power and Light Company (AP&L). Of those five, PCBs were detected above 50 ppm in four transformers, and above 500 ppm in one transformer. Table 5-14 presents transformer oil analytical summary.

The volume of PCB oil is estimated at 1 cubic yard.

6. SUMMARY OF SITE RISKS

The National Oil and Hazardous Substances Contingency Plan (NCP), promulgated on March 8, 1990, states that EPA expects to:

1. Use treatment to address the principal threats posed by a site, wherever practicable.

2. Use engineering controls, such as containment, for wastes that pose a relatively low long-term threat or where treatment is impracticable.

3. Use a combination of methods, as appropriate, to achieve protection of human health and the environment. In appropriate site situations, treatment of principal threats posed by a site, with priority placed on treating waste that is liquid, highly toxic or mobile, will be combined with engineering controls (such as containment) and institutional controls as appropriate, for treatment residuals and untreated waste.

4. Use institutional controls such as water use and deed restrictions to supplement engineering controls as appropriate for short-and long-term management to prevent or limit exposure to hazardous substances.

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. They include liquids (such as liquid waste contained in drums or tanks) and other highly mobile materials (such as surface soil containing high concentrations of contaminants of concern that are mobile due to wind entrainment, volatilization, or surface runoff) or materials having high concentrations of toxic compounds (such as buried drummed non-liquid wastes or soils containing significant

TABLE 5-12

SHREDDED TRASH ANALYTICAL SUMMARY

	CONCENTRATION RANGE	MEDIAN VALUE (a)
CHLORINATED BENZENES/PHENOLS	mg/kg	mg/kg
2-chlorophenol	ND - 5.8	3.8
2,4-dichlorophenol	ND - 25000	170
2,4,6-trichlorophenol	ND - 25000	67
2,4,5-trichlorophenol	ND - 21000	49
4-chlorophenol	ND - 11	11
2,6-dichlorophenol	ND - 150	14
Tetrachlorobenzene	60 - 100000	330
HERBICIDES	mg/kg	mg/kg
2,4-D	11 - 44000	6300
2,4,5-TP	ND - 75	18
2,4,5-T	2.8 - 6500	74
DIOXIN	ng/g	ng/g
2,3,7,8-TCDD	1.9 - 120	5.1
METALS	mg/kg	mg/kg
Antimony	ND - 27.3	5.8
Arsenic	ND - 0.64	0.41
Barium	3.3 - 68.6	55
Beryllium	ND - 0.31	0.19
Cadmium	ND - 1.4	0.77
Calcium	1030 - 37300	997
Chromium	3 - 31.5	8.3
Copper	5.4 - 103	12.1
Lead	1.6 - 58.1	14.3
Magnesium	89.9 - 3350	359
Nickel	1.9 - 28.2	4.4
Potassium	ND - 404	113
Sodium	369 - 4060	748
Zinc	21.1 - 418	32.5
PHYSICAL PARAMETERS		
Percent ash (Wt %)	1.1 - 49.6	5.5
Percent moisture (Wt %)	3 - 61	37
Heating value (Btu/lb)	ND - 10800	3200
Total chlorides (mg/kg)	ND - 30000	8800
-Inorganic chlorides	ND - 12000	600
-Organic chlorides	ND - 29800	7600

NOTES :
(a) Only detected concentrations are used when determining the median value.

VOLUME BREAKDOWN

TOTAL QUANTITY OF SHREDDED TRASH = 1150 cubic yards

TABLE 5-13

SHREDDED PALLETS ANALYTICAL SUMMARY

	CONCENTRATION RANGE	MEDIAN VALUE (a)
CHLORINATED BENZENES/PHENOLS	mg/kg	mg/kg
2-chlorophenol	ND - 45	4.9
2,4-dichlorophenol	ND - 1000	210
2,4,6-trichlorophenol	ND - 290	40
2,4,5-trichlorophenol	19 - 530	75
4-chlorophenol	ND - 85	5.4
2,6-dichlorophenol	ND - 160	27
2,3,6-trichlorophenol	ND - 24	9.4
Tetrachlorobenzene	12 - 170	27
HERBICIDES	mg/kg	mg/kg
2,4-D	ND - 2200	220
2,4,5-TP	ND - 65	29
2,4,5-T	ND - 580	45
DIOXIN	ng/g	ng/g
2,3,7,8-TCDD	2.5 - 4100	27
METALS	mg/kg	mg/kg
Antimony	ND - 5.3	3.7
Barium	1.9 - 21.2	5.2
Calcium	105 - 1010	453
Chromium	0.53 - 1.7	0.8
Copper	0.99 - 3.8	1.3
Lead	ND - 5.8	1.3
Magnesium	ND - 298	75.6
Nickel	ND - 1.9	1.2
Selenium	ND - 0.89	0.89
Silver	ND - 0.67	0.67
Sodium	23.7 - 2000	101
Zinc	6.6 - 20.1	9.9
PHYSICAL PARAMETERS		
Percent ash (Wt %)	0.3 - 3	0.6
Percent moisture (Wt %)	15 - 50	36
Heating value (Btu/lb)	4300 - 7700	4800
Total chlorides (mg/kg)	ND - 21000	6800
-Inorganic chlorides	ND - 700	700
-Organic chlorides	ND - 20300	6100

NOTES :
(a) Only detected concentrations are used when determining the median value.

VOLUME BREAKDOWN

TOTAL QUANTITY OF SHREDDED PALLETS = 1090 cubic yards

TABLE 5-14
TRANSFORMER OIL ANALYTICAL RESULTS

	TRANSFORMER OWNER	AROCLOR 1016 (mg/kg)	AROCLOR 1254 (mg/kg)	AROCLOR 1260 (mg/kg)
HE-EE-001-OLD-01	AP & L	120 U	240 U	560
HE-EE-001-OLD-02	AP & L	120 U	240 U	570
HE-EE-002-OLD-01	AP & L	60 U	120 U	360
HE-EE-003-OLD-01	AP & L	60 U	120 U	210
HE-EE-004-OLD-01	AP & L	74	10	48 U
HE-EE-005-OLD-01	AP & L	11 U	22 U	22 U
HE-EE-006-OLD-01	AP & L	12 U	24 U	6
HE-EE-007-OLD-01	AP & L	12 U	24 U	24 U
HE-EE-008-OLD-01	Vertac	11 U(a)	22 U(a)	22 U(a)
HE-EE-009-OLD-01	Vertac	11 U(a)	22 U(a)	22 U(a)
HE-EE-010-OLD-01	Vertac	11 U(a)	22 U(a)	22 U(a)
HE-EE-011-OLD-01	Vertac	11 U(a)	22 U(a)	22 U(a)

NOTES:
(a) Reanalyzed to obtain lower quantitation limits. Refer to Section 2.2.2 for method.

concentrations of highly toxic materials). No "threshold level" of toxicity/risk has been established to equate to "principal threat". However, where toxicity and mobility of source material combine to pose a potential risk of 10^{-3} or greater, generally treatment alternatives should be evaluated.

Low level threat wastes are those source materials that generally can be contained and that would present only a low risk in the event of release. They include source materials that exhibit low toxicity (soil with concentrations not greatly above reference dose levels or that present an excess cancer risk near the acceptable risk range), low mobility (such as surface soil containing contaminants that generally are relatively immobile in air or ground water) in the environment, or are near health based levels.

Some of Onsite Operable Unit 1 media, such as liquids, semi-liquids/solids, and sludges contained in process vessels, PCB oil in transformers, oily leachate stored in drums, spent carbon, and shredded trash/pallets, fit into the category of principal threat wastes and since treatment is practicable, they must be treated. The contaminants of concern in this category of wastes are dioxins, PCBs, herbicides (2,4-D and 2,4,5-T), chlorophenols, and tetrachlorobenzene. The debris resulting from the demolition of buildings, process equipment, miscellaneous drummed wastes (such as used tyvak suits, some RI wastes, etc.) are low level threat wastes and therefore should be contained using engineering controls. The primary contaminant of concern in these types of wastes is asbestos.

The baseline risk assessment is a four-step process. The first step, data collection and evaluation, identifies contaminants present in the environmental media -- soil, ground water, surface water, air, fish, etc. -- of the site. The second step, toxicity assessment, uses the results of years of research and testing of the effects of chemicals on the health of people and animals to decide which of the contaminants found on site might pose a health threat. The third step, exposure assessment, defines which pathways (e.g., using the ground water for drinking and showering or eating the fish) might bring the contaminants into contact with people. The final step, risk characterization, brings the information from the first three steps together to determine the potential severity of health threats from the site.

The baseline risk assessment provides the basis for taking action and indicates the exposure pathways that need to be addressed by the remedial action. It serves as the baseline indicating what risks could exist if no action were taken at the site. This section of the ROD reports the results of the risk assessment conducted for this operable unit.

Because this operable unit's media are contained in storage vessels, drums, plastic bags, etc., currently there is no exposure pathway for this operable unit's media to the public, and therefore a traditional baseline risk assessment is not feasible. A traditional baseline risk assessment will be performed for the site as part of Onsite Operable Unit 2, which includes surface soils and ground water. Human health and ecological risks associated with the surface water, off-site soils, and other contaminated off-site media were addressed in the Vertac Off-site Record of Decision, issued in September 1990.

Exposure to the public, however, could occur from a catastrophic release. Therefore, a reasonable maximum catastrophic release scenario was developed to assess the potential risk from such a release and to assess the need for remedial action. Because the no action alternative cannot ensure that the property could not be re-zoned for residential or commercial purposes, uncontrolled human contact with the Onsite Operable Unit I media is possible. Based on the 2,3,7,8-TCDD (dioxin) concentrations found in Onsite Operable Unit 1 media, human exposure to concentrations in excess of those considered acceptable (for example, the acceptable 2,3,7,8-TCDD concentration level for soils in residential or recreational areas is 1 ppb) could occur.

To evaluate potential risk from the Site, a scenario was considered whereby a catastrophic release of toxicants would occur from some of the more heavily contaminated Onsite Operable Unit I media. A fire scenario was selected for this purpose based on the available analytical data for Onsite Operable Unit I media. The scenario involves the burning of the trash and pallets that are stored under a black PVC tarp and within a bermed area at the west end of the Formulations Building. Shredded trash and pallets contain high concentrations of 2,3,7,8-TCDD, herbicides, chlorophenols, and tetrachlorobenzene. If a person (receptor) at the fence line inhaled the smoke for a 12-hour period, the calculated excess cancer risk from inhalation of 2,3,7,8-TCDD would be 1.9E-04 (1.9 excess cases in 10,000). Similarly, the risk posed by 2,4,6-trichlorophenol during this 12-hour period would be equivalent to 5.4E-11 (5.4 excess cases per 100 billion people). These risk calculations include only the inhalation pathway; risk resulting from deposition of contaminants on soils, in surface waters, or entry into the food chain were not evaluated as part of this particular scenario.

7. DESCRIPTION OF ALTERNATIVES

7.1 ALTERNATIVES

The alternatives for Onsite Operable Unit I include:

- Alternative 1: No action.
- Alternative 2: Onsite secure storage with onsite lined consolidation/containment unit.
- Alternative 3: Off-site incineration with onsite lined

consolidation/containment unit.

- Alternative 4: Onsite incineration with onsite lined consolidation/containment unit.
- Alternative 5: Onsite incineration with off-site disposal.

The majority of the alternatives present center around two remedial components: incineration and consolidation/containment.

ALTERNATIVE 1: NO ACTION

The no action alternative for Onsite Operable Unit I media at the Site provides a basis for comparing existing site conditions with those resulting from implementation of the other proposed alternatives. Under the no action alternative, no additional measures would be used to remediate contaminant sources. Access to the site would be prohibited only by the existing site fence. Therefore, public access would only be passively restricted. No institutional controls, facility maintenance, or monitoring would be implemented.

Implementing no remedial activities for the Onsite Operable Unit I media at the Site allows the existing contaminant sources to remain in place. The potential for exposure to contaminants is not reduced in this alternative.

There are no capital or operation and maintenance costs associated with this alternative.

ALTERNATIVE 2: ONSITE SECURE STORAGE WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT

The onsite secure storage alternative would involve interim storage that complies with standards for the more hazardous contents of process vessels and drums onsite. This storage would be an interim remedy that would be used until more cost-effective and efficient remedial technologies become available. The major components of this alternative include:

- Construction of a storage building capable of containing the process vessel contents and drummed onsite wastes (spent carbon, french drain oily leachate, and other containerized materials). PCB transformer oils and compacted Regina Paint Building drums would also be stored in this building.

- Construction of a permanent (long-term) above-ground, lined consolidation/containment unit, and packing of the asbestos-containing materials and the demolition debris into the unit.

- Abatement (removal and disposal) of friable asbestos-containing materials (ACM), including pipe insulation and possibly building shingles/tiles.

- Emptying the contents of the process vessels into compatible containers.

- Demolition of the buildings and process equipment (including emptied process vessels) in the central process area and the Regina Paint Building to the ground surface, with the exception of the bagged soil storage building and the bermed and tarped area containing bagged trash and pallets. These latter facilities would continue to function as interim storage units. The demolition debris and process equipment would be put into the consolidation/containment unit. The active water treatment plant would not be demolished.

- Periodic inspection of the container storage building and the consolidation/containment unit.

Figure 7-1 presents a possible location and the major components of Alternative 2.

Container Storage Building

The container storage building to be constructed onsite would be for interim secure storage of process vessel contents, spent carbon, french drain oily leachate, PCB transformer oil, and miscellaneous drummed wastes. To store these materials, a 400-ft x 100-ft facility has been conceptually designed. The conceptual design features are shown in Figure 7-2.

After the container storage building is operational, waste-containing drums being stored within the central process area, including contents transferred to compatible containers from vessels, would be transported to the container storage building. Empty drums within the Regina Paint Building would be crushed and overpacked in 85-gallon drums. Once all of the drums have been removed from the central process area, the process vessel contents would be recontainerized and stored. Because of the wide range of materials within the vessels, ranging from liquids (aqueous and organic) to crystalline solids and soils, numerous removal techniques would be required to collect the vessel contents, such as digging, shoveling, gravity draining, heating/slurrying, and pumping. Safe removal of vessel contents may be extremely difficult because of limited access and the mixed, multiphase material in some vessels. Once a vessel is emptied, the contents would be transferred to a new container for loading into the container storage building. Care would be taken to make sure that the contents are placed into compatible containers (i.e., stainless steel, polypropylene, or glass lined) because many of these materials are highly corrosive.

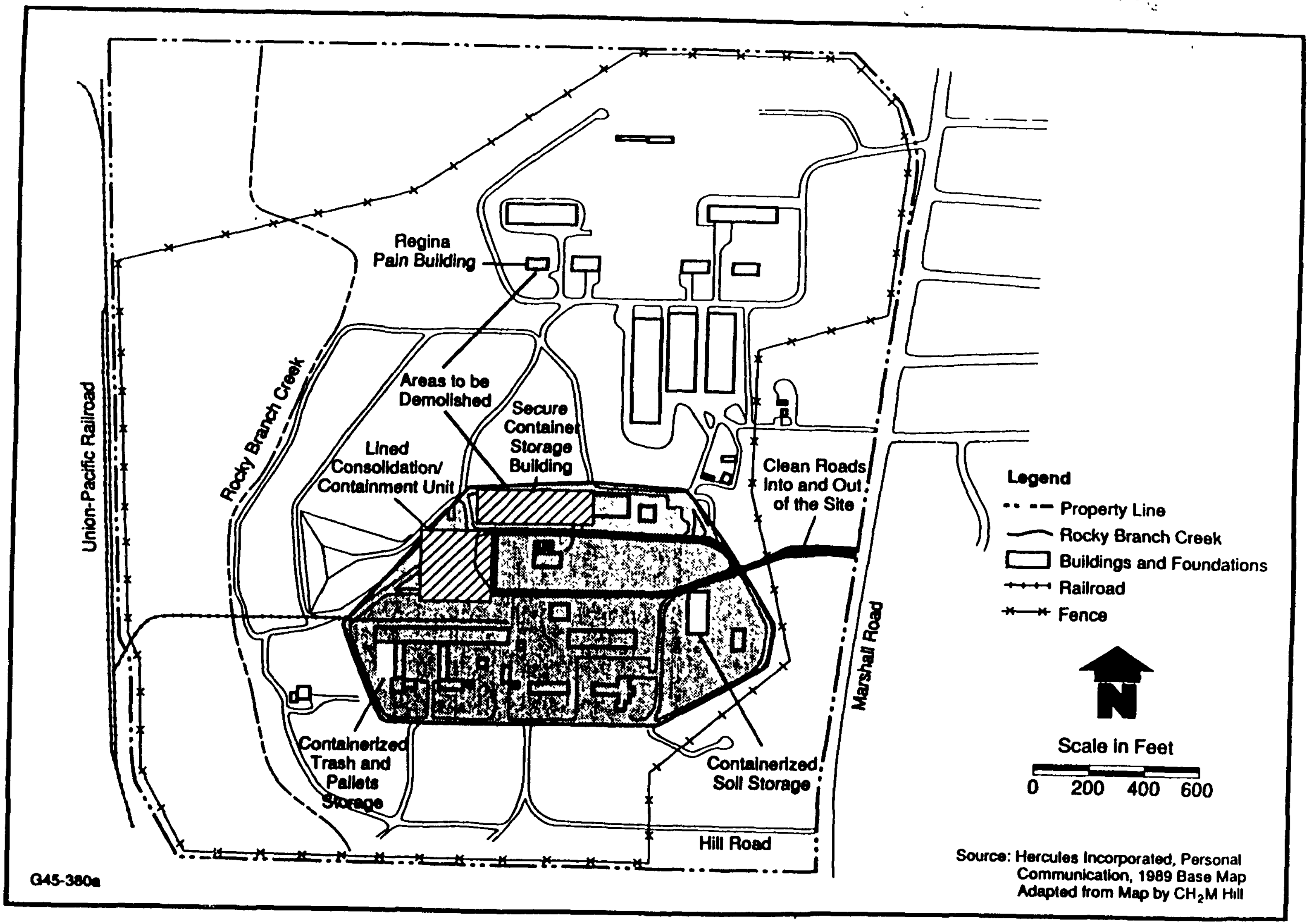

FIGURE 7-1 CONCEPTUAL LAYOUT OF ALTERNATIVE 2 - ONSITE SECURE STORAGE

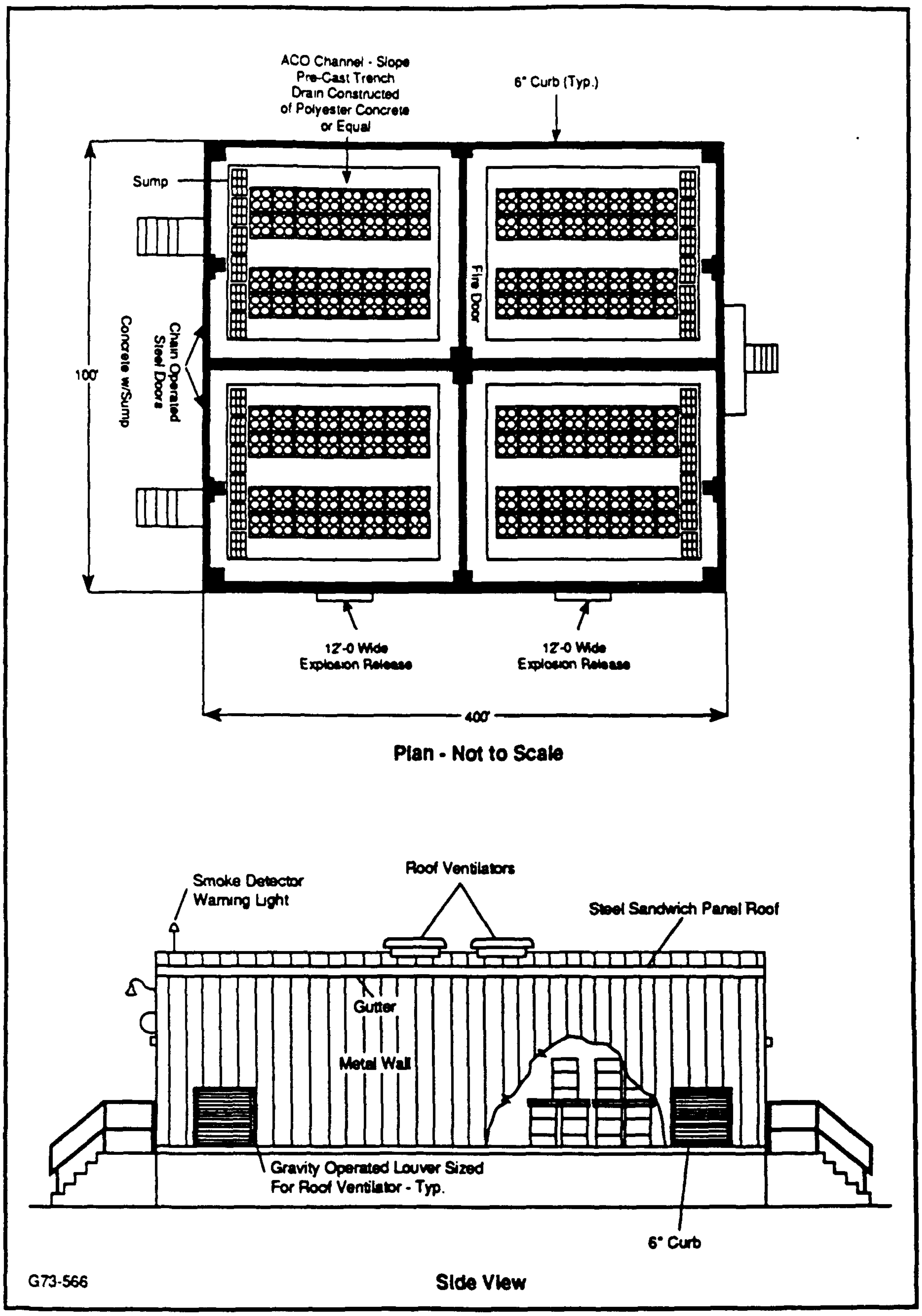

FIGURE 7-2 CONTAINER STORAGE BUILDING - CONCEPTUAL DESIGN

PCB transformer oils would also be collected in drums and stored in the container storage building. The transformers that do contain PCB-contaminated oils would be de-energized, drained, decontaminated (if possible), and refilled if they are planned to remain in use. After refilling, the transformer could be put back in service, if needed. The new contents would be checked after an equalization period to confirm the PCB concentration is less than 50 ppm.

The capacity of the storage building is approximately 4,000 drums (assuming 4 rows of 36 pallets per row, stacked 2-high, containing 4 drums each, per bay). The building consists of 4 bays.

Onsite Consolidation/Containment Unit

An above-ground, lined, consolidation/containment unit would be constructed and filled to provide long-term isolation of building materials, process equipment, and containerized soils, trash, and pallets. The lined consolidation/containment unit would be constructed onsite to contain approximately 30,000 cubic yards of site debris, including any asbestos-containing material. Two types of consolidation/containment units (single lined and double lined units) are proposed in Alternative 2.

Single Liner Unit

The first design scenario for the consolidation/containment unit would be a clay-lined/clay-capped unit similar to the vault constructed onsite in 1985. This unit has been conceptually designed as follows (Figure 7-3):

- The unit would be constructed entirely aboveground.

- To accommodate the 30,000 cubic yards of debris to be generated, the foot print of the unit would need to be approximately 300 ft x 300 ft. The foot print would rest upon a 5-foot clay base.

- The unit would be approximately 30 feet high, sloping upward at a maximum rate of 3:1.

- A leachate collection system would rest above the single clay liner and collect into a sump. The sump would be drained or pumped to the onsite treatment plant.

- Upon closure, a 3-foot thick clay cap would be placed over the unit. Venting of the unit through the clay cap would be necessary to release gases from the biodegradation of organic material, particularly wood. Emissions through the vents may require treatment. Top soil would be placed on the cap to promote vegetation and to keep the cap intact.

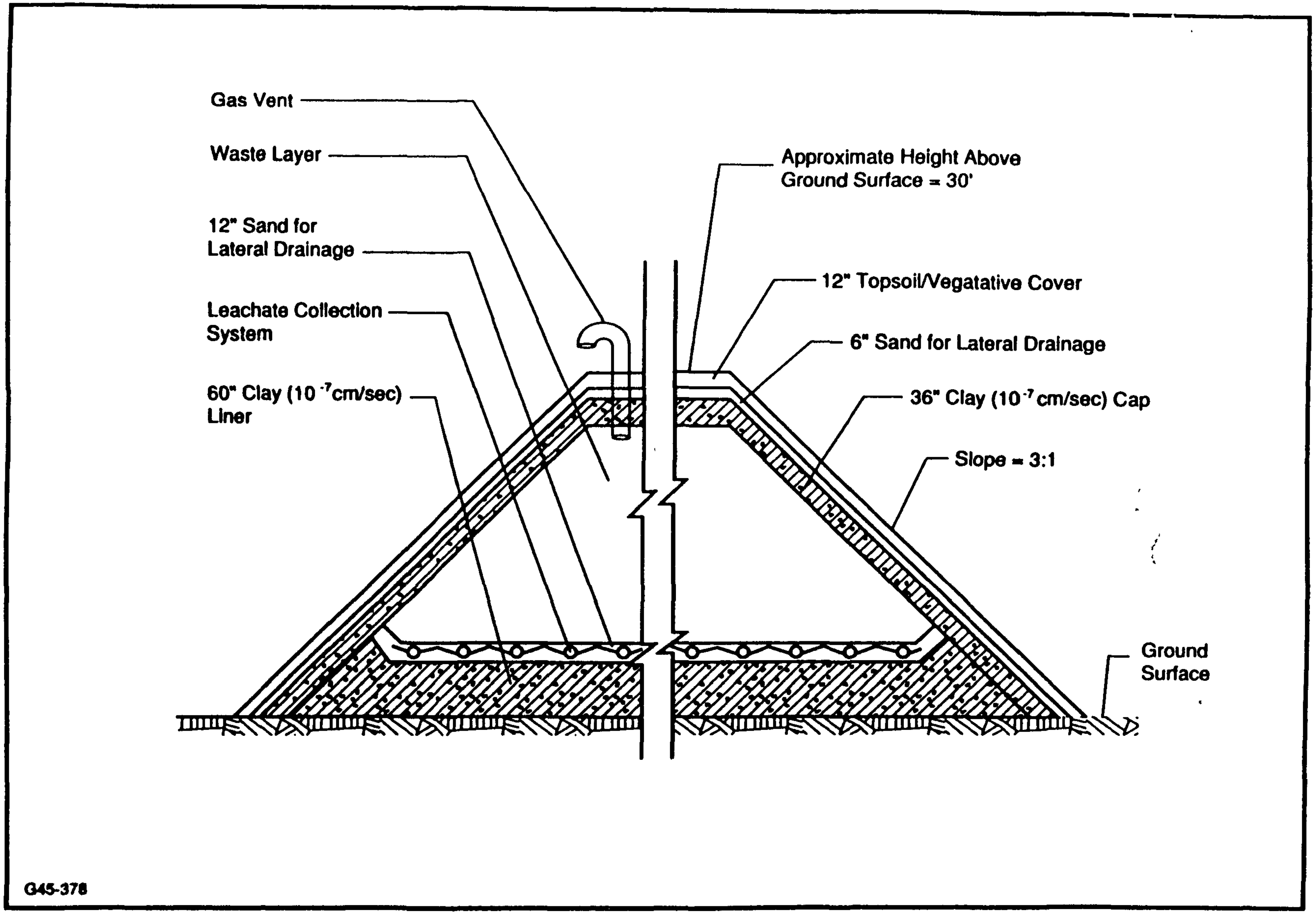

FIGURE 7-3 CLAY-LINED CONSOLIDATION/CONTAINMENT UNIT - CONCEPTUAL CROSS-SECTION

Double Liner Unit

The second design scenario for the consolidation/containment unit would be a double-liner system with leachate collection and detection systems. This unit would comply with RCRA design standards. The conceptual design of this unit is similar to the unit described above, with the following exceptions (Figure 7-4):

- The leachate collection liner system would consist of two liners, a leachate collection system, and a leachate detection system. The top liner would be a compatible, flexible membrane liner at least 60 mils thick (minimum requirement). The conceptual alternative for the consolidation/containment unit uses an 80-mil thick liner to provide a stronger, more puncture-resistant barrier. The bottom liner would be a composite made of a compatible, flexible membrane liner (80 mil) on top of 3 feet of clay.

- The leachate collection system would rest above the top liner and the leachate detection system would rest above the bottom liner.

Once constructed, the lined consolidation/containment unit would be able to accept the demolition debris.

Asbestos Abatement

Asbestos abatement (removal and disposal) would be performed as part of the demolition. Based on the current National Emission Standards for Hazardous Air Pollutants (NESHAPs) asbestos criteria, asbestos-containing materials (ACM) found onsite were present in friable and nonfriable forms. Friable asbestos was present in insulation on some piping and fittings, and as vessel and breaching insulation in the boiler house. Nonfriable asbestos was present in roofing and siding shingles and in floor tiles. Some asbestos-bearing insulation is present inside buildings. Additional onsite characterization may be required during remediation to delineate ACM, where uncertainty exists, unless it is determined that all of the insulation will be handled as ACM.

Demolition

Buildings, process equipment, and piping within the central process area would be demolished to ground surface (foundation level), with the exception of the building containing the bagged soil and the area containing bagged trash and pallets, and the water treatment plant. The materials would be wetted during demolition. Demolition would occur using conventional construction equipment. The Regina Paint Building outside the central process area would also be demolished and consolidated. The estimated volumes (after volume reduction) of the debris are as follows:

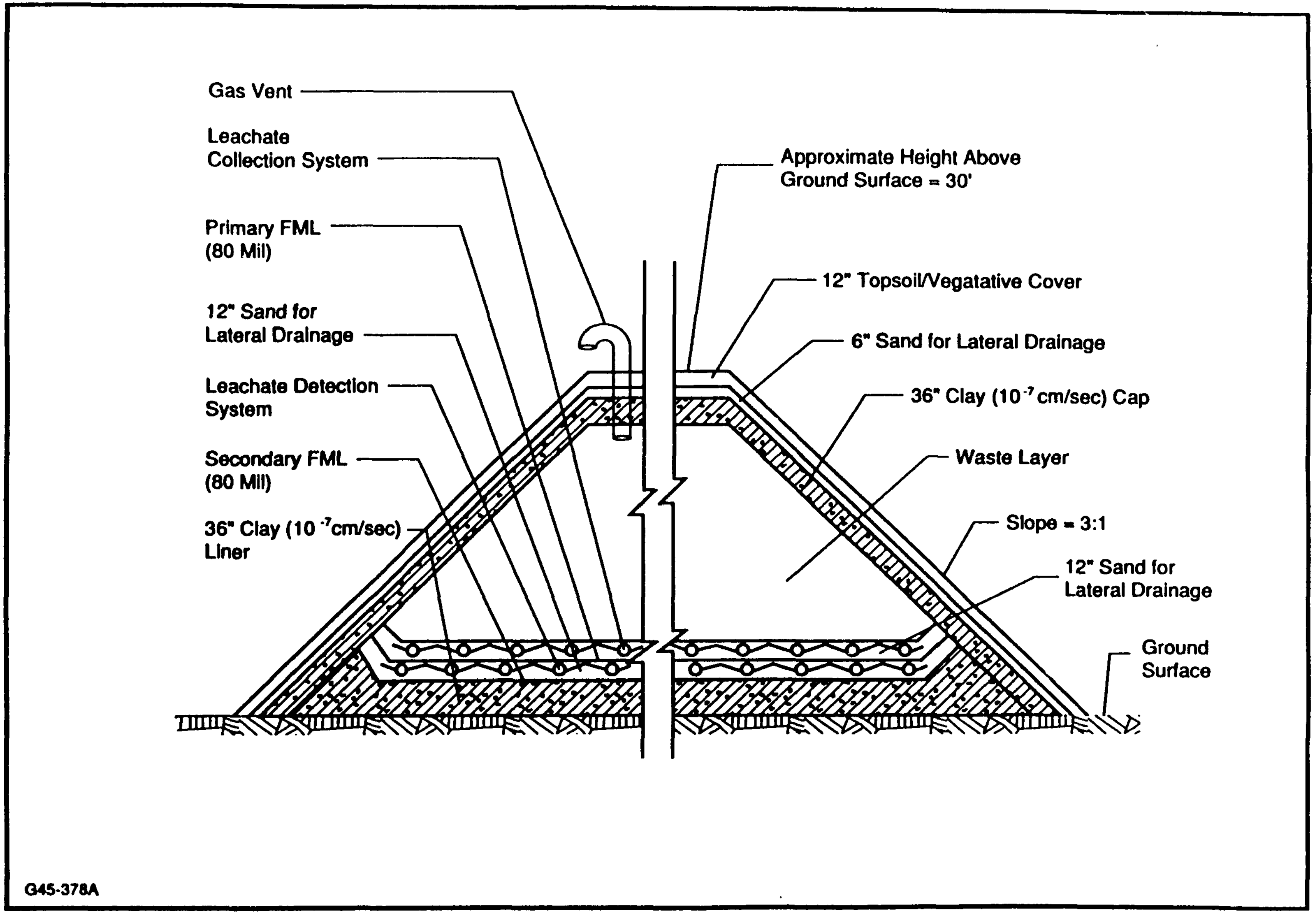

FIGURE 7-4 DOUBLE-LINED CONSOLIDATION/CONTAINMENT UNIT - CONCEPTUAL CROSS-SECTION

- Buildings and structures - 5,600 cubic yards
- Piping - 1,200 cubic yards.
- Process vessels/reactors - 7,700 cubic yards.
- Miscellaneous debris - 8,100 cubic yards.

The estimated total volume of debris generated from demolition activities for this alternative would be approximately 22,800 cubic yards. After demolition, the debris would go through a volume reduction step where materials would be further cut and crushed to increase the bulk density and minimize any long-term settlement in the consolidation/containment unit. Debris would then be hauled to the lined consolidation/containment unit for packing. Soils could be used to fill void spaces within the consolidation/containment unit and minimize settlement.

Pretreatment

Pretreatment of the building and equipment surfaces may be beneficial in reducing the amount of contaminants packed into the consolidation/containment unit and in reducing the amount of contaminated dust that could be generated during demolition. If implemented, pretreatment may include a scraping, dusting, wiping, and vacuuming steps for the buildings and/or a steam-cleaning step for the process equipment. A solvent rinse/wipe may also be used on a limited basis, if areas of visible staining are present. Pretreatment is not required to meet the risk-based target concentration levels for 2,3,7,8-TCDD (for industrial scenario), but may be useful in reducing potential cosolvents, where structural conditions permit. Decontamination may be performed to remove dust and particulates from exposed surfaces.

Steam cleaning may be used to decontaminate equipment with visible organic staining. Steam cleaning would be performed to remove dust and soluble organic compounds from visible surfaces. Those pieces of equipment exhibiting visible staining may be solvent-wiped if steam cleaning were unsuccessful in removing the staining.

Bagged Soils, Trash, and Pallets

The final component of Alternative 2 would be the continued storage of the bagged soils and the bagged trash and pallets. The bagged soil storage building was constructed in 1988 and is in good condition. Because onsite interim storage is the emphasis of this alternative, the bagged soils would remain in their current storage locations. The same rationale would hold true for the bags of trash and pallets that have been placed in a concrete bermed area and covered with a PVC tarp.

The total capital costs and operation and maintenance costs for this and alternatives 3, 4, and 5 are summarized in Table 7-1.

TABLE 7-1

OPERABLE UNIT 1 ALTERNATIVE COST SUMMARY

ALTERNATIVE COST	2	3A	3B	3C	4A	4B	4C	4D	4E	4F	5
Capital											
											1.8
Single lined unit	10.6	4.2	4.2	4.2	5.5	5.5	5.5	5.5	5.5	5.5	N/A
Double lined unit	11.0	4.5	4.5	4.5	5.9	5.9	5.9	5.9	5.9	5.9	N/A
O&M											
											167.4
Without pretreatment	9.2	20.1	47.8	37.7	15.6	31.6	25.6	21.4	21.3	15.3	N/A
With pretreatment	10.5	21.4	49.1	39.0	16.9	32.9	26.9	22.7	22.6	16.6	N/A
Total cost											
											169.2
Single lined unit											
Without pretreatment	19.9	24.2	51.9	41.9	21.1	37.1	31.1	26.9	26.8	20.8	N/A
With pretreatment	20.2	24.6	52.3	42.2	21.5	37.4	31.5	27.3	27.2	21.1	N/A
Double lined unit											
Without pretreatment	21.2	25.5	53.2	43.2	22.4	38.4	32.4	28.2	28.1	22.1	N/A
With pretreatment	21.5	25.9	53.6	43.5	22.8	38.7	32.8	28.6	28.5	22.4	N/A

Notes:
1. Costs are in million dollars
2. No costs are incurred for Alternative 1 - No Action
3. N/A - Not Applicable
4. Onsite incineration cost - $ 3,400/ton
5. Off-site incineration cost - $ 6,000/ton

EVALUATION OF ALTERNATIVE 3: Off-site INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT

This alternative would involve the transport of those wastes that could be considered a principal threat to an off-site incinerator permitted to treat dioxin-contaminated materials. Those materials (low level threat wastes) that could be consolidated would be packed in a lined consolidation/containment unit on site. The main components of this alternative include:

- Emptying of process vessels, bulk storage containers, PCB transformers, and re-containerizing the contents in containers suitable for transport to an off-site facility.

- Compaction of the metal drums located inside the Regina Paint Building and placement into 85-gallon overpack containers.

- Loading of the above materials, as well as the drummed materials (spent carbon, french drain oily leachate, and other containerized materials), for transport on semi-trailers to an off-site hazardous waste incineration facility.

- Construction of a permanent (long-term), above-ground, lined consolidation/containment unit onsite and packing of the asbestos-containing materials, and demolition debris, into the unit.

- Asbestos abatement of friable asbestos-containing materials, including pipe insulation and possibly building shingles/tiles.

- Demolition of the Central Process Area to the ground surface, with the exception of the active water treatment plant. The Regina Paint Building would also be demolished.

- Periodic inspection of the consolidation/containment unit.

- Shredded trash and pallets and containerized soils are evaluated as part of both the onsite consolidation/containment and the off-site incineration technologies.

  - Option A: The shredded trash and pallets and containerized soils would be packed into the consolidation/containment unit along with the demolition debris, and any asbestos-containing materials.

- Option B: The shredded trash and pallets and containerized soils would be loaded onto semi-trailers for transport to an off-site hazardous waste incineration facility.

- Option C: The shredded trash and pallets would be packed into the consolidation/containment unit and the containerized soils would be loaded onto semi-trailers for transport to an off-site hazardous waste incineration facility.

Figure 7-5 illustrates a possible layout of the onsite components within Alternative 3.

Materials to be transported to an off-site incinerator would be carefully containerized and loaded onto semi-trailers for transport to the incineration facility. Transportation distances are unknown at this time. The onsite media that are candidates for off-site incineration include:

- Vessel contents (approximately 900 tons, assuming 1,800 lbs/cubic yard).
- Spent carbon (approximately 140 tons, assuming 900 lbs/cubic yard).
- French drain oily leachate (approximately 15 tons, assuming 2,000 lbs/cubic yard).
- PCB transformer oils (approximately 1 ton, assuming 2,000 lbs/cubic yard).
- Drummed materials (approximately 165 tons, assuming 1,500 lbs/cubic yard).
- Trash (approximately 520 tons, assuming 900 lbs/cubic yard).
- Pallets (approximately 660 tons, assuming 1,200 lbs/cubic yard).
- Containerized soils (approximately 2,100 tons, assuming 1,500 lbs/cubic yard).

A maximum of approximately 4,500 tons of contaminated material would be transported off-site for treatment. Assuming a semitrailer can haul 15 tons per load, it would require 300 trips to transport the above materials to an off-site treatment facility (Option B). If the trash, pallets, and soils are to be packed into the lined consolidation/containment unit, only 1,220 tons of contaminated material would be transported off-site for treatment (Option A). This would require only 80 trips to the off-site treatment facility. If the trash and pallets are to be packed into the lined consolidation/containment unit, only 3,300 tons of contaminated material would be transported off-site for treatment (Option C). This would require 220 trips to the off-site treatment facility.

PCB transformer oils would also be collected in drums. The

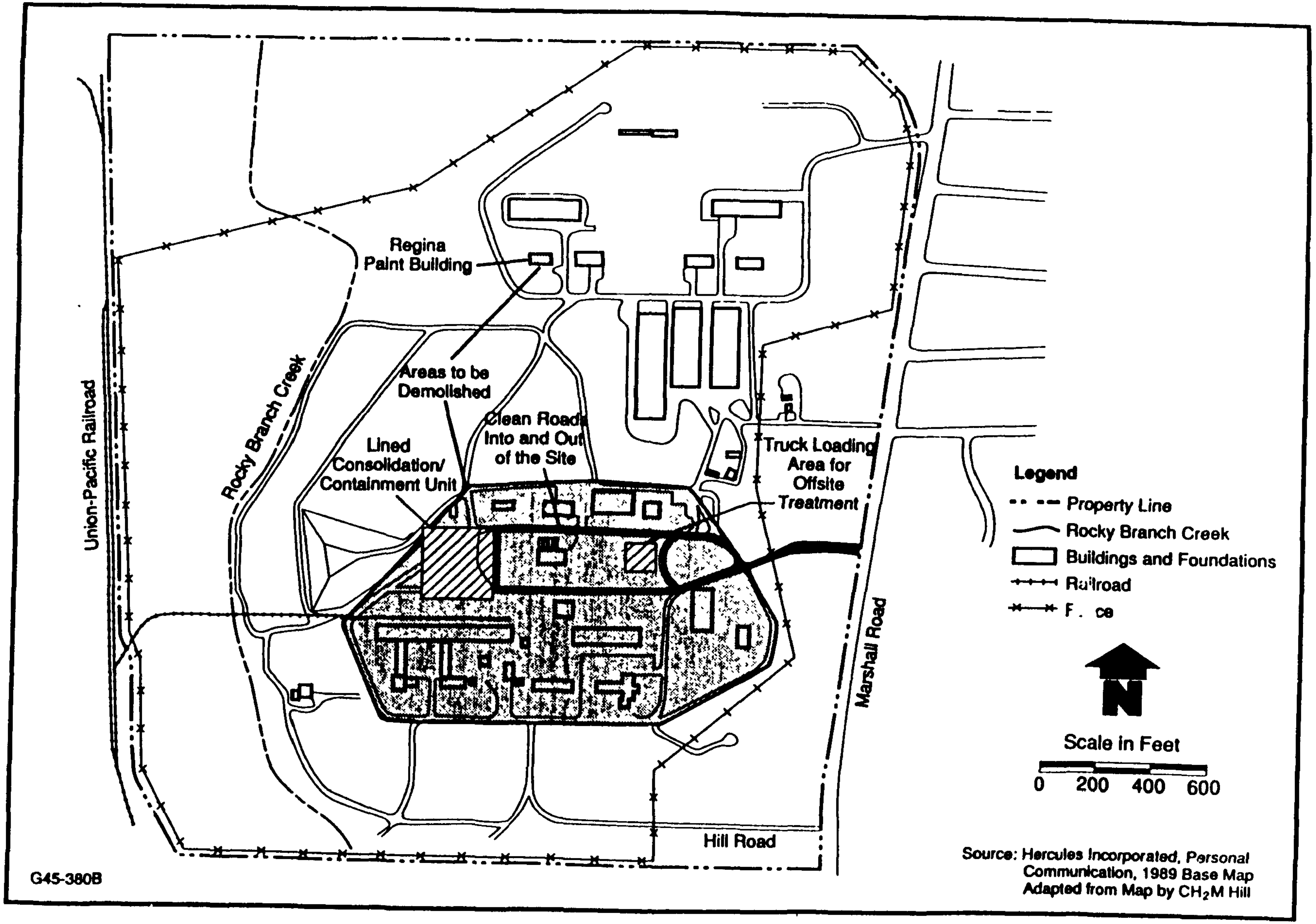

FIGURE 7-5 CONCEPTUAL LAYOUT OF ALTERNATIVE 3 - OFFSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT

transformers that contain PCB-contaminated oils would be de-energized, drained, and decontaminated.

The 1,100 empty metal drums currently being stored in the Regina Paint Building would be compacted and placed in 85-gallon overpack drums. Compaction would be performed under wet conditions using a drum crusher. It is assumed that 10 crushed 55-gallon metal drums could fit into one 85-gallon overpack drum. This activity would generate approximately 110 drums to be shipped for off-site treatment.

After wastes to be incinerated off-site have been removed, onsite remedial actions would begin. Before demolition/consolidation of buildings and equipment in the central process area, as well as the Regina Paint Building to the north, the lined consolidation/containment unit would be constructed onsite to contain approximately 30,000 cubic yards of site debris, including any asbestos-containing material and the containerized soils onsite. Two consolidation/containment unit scenarios are proposed for Alternative 3. The first scenario would be a single clay-lined/clay capped unit with leachate collection similar to the vault constructed earlier onsite. The second consolidation/containment unit scenario being considered would be a double-liner system with leachate collection and detection systems. This unit would closely resemble a RCRA-type facility. Both of these scenarios have been conceptually described under Alternative 2.

Once the consolidation/containment unit is constructed and operational, all asbestos abatement, demolition, packing, pretreatment, and monitoring/inspection activities would begin. These activities have been described in detail under Alternative 2.

EVALUATION OF ALTERNATIVE 4: ONSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT

This alternative would involve onsite incineration of some of the more hazardous materials (principal threats) and consolidation of the other materials (low level threats) in an onsite consolidation/containment unit. This alternative resembles Alternative 3 except that the incineration would be performed onsite instead of off-site. This alternative would comply with the CERCLA requirements for the treatment of principal threats (process vessel contents, spent carbon, french drain oily leachate, PCB oils, and shredded trash/pallets). The major components of this alternative are:

- Onsite incineration of the process vessel contents, spent carbon, french drain oily leachate, PCB transformer oils, shredded trash/pallets, Regina Paint Building drums (empty), and other containerized materials.

- Asbestos abatement for friable asbestos-containing materials. These materials would include pipe insulation and possibly building shingles/tiles.

- Demolition of the buildings and equipment in the central process area and the Regina Paint Building to the ground surface. This includes buildings, piping, debris, and process equipment, except for the water treatment plant.

- Construction of a permanent (long-term) aboveground lined consolidation/containment unit, and packing of the demolition debris, and asbestos-containing materials into the unit.

- Delisting of the incinerator residues and packing the solids (salts) and ash into the consolidation/containment unit.

- Periodic inspection of the consolidation/containment unit.

- Shredded trash and pallets and containerized soils are evaluated as part of both the onsite consolidation/containment and incineration technologies.

    - Option A: The shredded trash and pallets and containerized soils would be packed into the consolidation/containment unit along with the demolition debris and asbestos-containing materials.

    - Option B: The shredded trash and pallets and containerized soils would be incinerated onsite along with the other incinerable media.

    - Option C: The shredded trash and pallets would be packed into the consolidation/ containment unit and the containerized soils would be incinerated onsite.

    - Option D: The shredded trash and pallets would be incinerated onsite and the containerized soils would be packed into the consolidation/containment unit.

    - Option E: The shredded trash and pallets would be incinerated onsite and the containerized soils would be removed from this operable unit.

    - Option F: The shredded trash and pallets would be consolidated onsite and the containerized soils would be removed from this operable unit.

Figure 7-6 illustrates a possible layout of the components within Alternative 4.

In Alternative 4A, materials including the process vessel contents, spent carbon, french drain oily leachate, PCB transformer oils, and Regina Paint Building drums would be thermally treated in an onsite incinerator. In Alternative 4B, shredded trash and pallets and containerized soils would also be incinerated onsite. In Alternative 4C, the media in Alternative 4A plus the containerized soils would be incinerated onsite. Materials would be removed from the vessels and brought to the incinerator staging area in temporary storage containers (drums or other compatible containers). Materials that are already containerized (spent carbon, french drain oily leachate, shredded trash, and shredded pallets) would also be brought to the staging area. The Regina Paint Building drums would be shredded or compacted using a drum compactor and brought to the incinerator staging area.

Buildings and equipment in the Central Process Area would be demolished. The bags of shredded trash and shredded pallets would be removed from their current location in preparation for packing into the consolidation/containment unit (Option A) or incineration (Option B). Asbestos abatement and construction of the consolidation/containment unit would occur during demolition. The bags of contaminated soil will be removed from their location in preparation for packing in the consolidation/containment unit.

The construction of the consolidation/containment unit would be the same as described in the above alternative. The design of the unit (single- or double-lined) would determine the need for pretreatment. If a single, clay-lined unit is chosen, pretreatment of the materials (buildings, process vessels, piping, and debris) prior to consolidation would proceed as described previously. The containerized soils would be consolidated with the other materials without any pretreatment.

<u>EVALUATION OF ALTERNATIVE 5: ONSITE INCINERATION WITH OFF-SITE DISPOSAL</u>

This alternative would involve incineration of all materials characterized during Onsite Operable Unit I and disposal of the delisted incineration residues in an off-site landfill. This alternative offers a permanent remedial solution for each media, although implementation and cost of this solution may be prohibitive. The major components of this alternative are:

- Asbestos abatement of friable asbestos-containing materials. These materials would include pipe insulation and possibly building shingle/tiles.

- Demolition of the buildings and equipment in the central process area and the Regina Paint Building to the ground

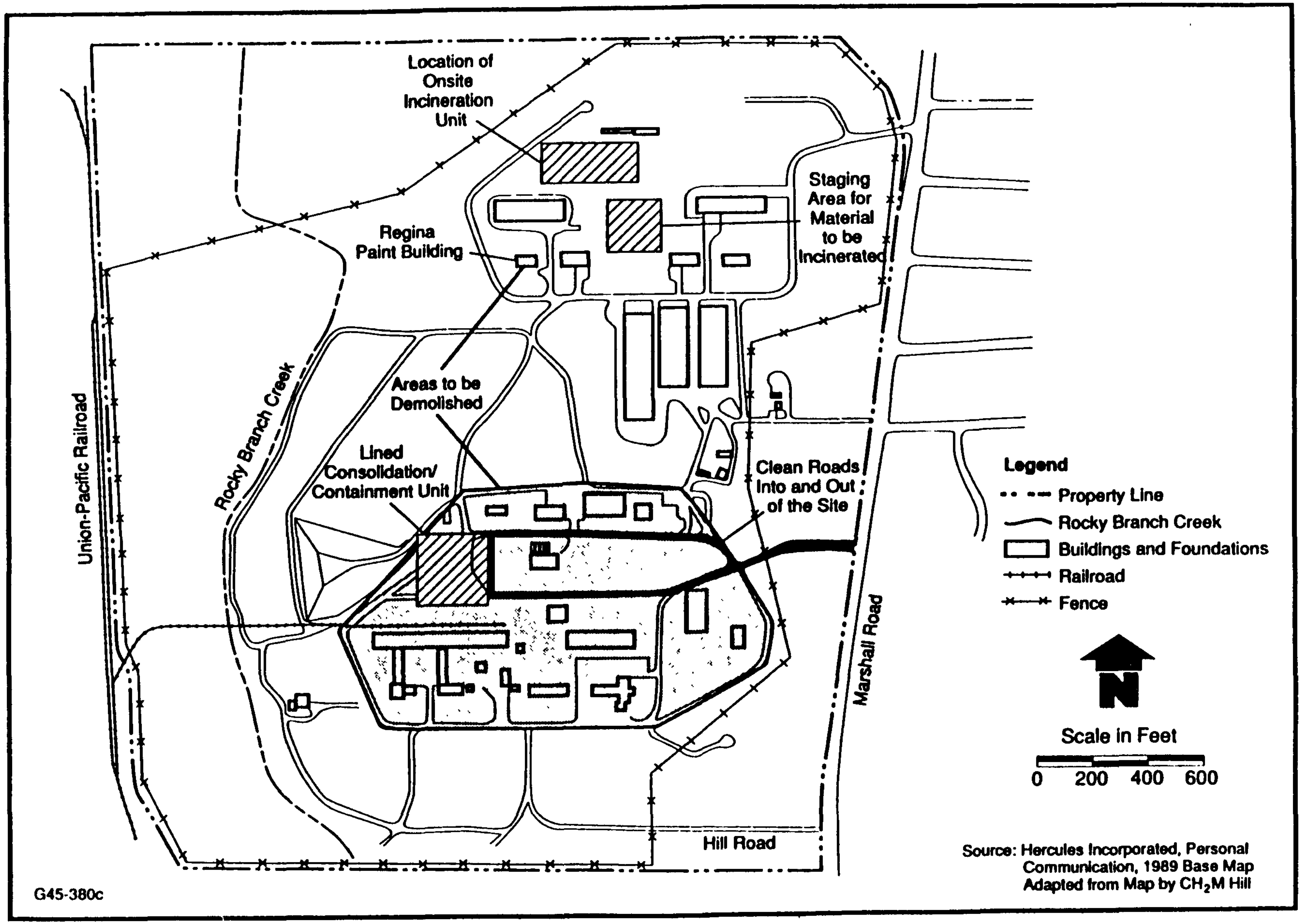

FIGURE 7-6 CONCEPTUAL LAYOUT OF ALTERNATIVE 4 - ONSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT

surface. This includes buildings, piping, debris, and process equipment, except the water treatment plant.

- Onsite incineration of Onsite Operable Unit I materials. This includes process vessel contents, french drain oily leachate, spent carbon, PCB transformer oils, shredded trash, shredded pallets, Regina Paint Building drums, non-asbestos-containing building materials, process equipment, process piping, containerized soils, other containerized materials, and debris.

- Delisting of incinerator residues and disposal of these residues in an off-site landfill.

Figure 7-7 illustrates a possible layout of the components within Alternative 5.

The building and equipment central process area and the Regina Paint Building would be demolished as described previously. The shredded trash, shredded pallets, and containerized soils would also be removed from their current storage locations to incineration. Asbestos-bearing materials would be removed prior to demolition for off-site disposal.

Materials will be brought to the incinerator staging area for mixing and/or size reduction. Process vessel contents would be removed from the vessels as described previously and brought to the incinerator staging area in temporary storage containers (drums or other compatible containers). Materials that are already containerized (spent carbon, french drain oily leachate, trash, pallets, and containerized soils) would also be brought to the staging area. The Regina Paint Building drums may be compacted using a drum compactor near the Regina Paint Building or brought to the staging area (for compaction or shredding). The incinerator ash and any other residue would be delisted and sent to an off-site landfill. Once delisting is complete, the incinerator residues would be able to be disposed at an off-site sanitary landfill.

7.2 ARARs

The Superfund Amendments and Reauthorization Act (SARA) of 1986 and the National Contingency Plan (NCP), revised March 8, 1990, provides that the development and evaluation of remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund) must include a comparison of alternative site responses to applicable or relevant and appropriate Federal and state environmental and public health requirements (ARARs).

Identification of ARARs must be done on a site-specific basis. The NCP and SARA do not provide across-the-board standards for determining whether a particular remedial action will produce an

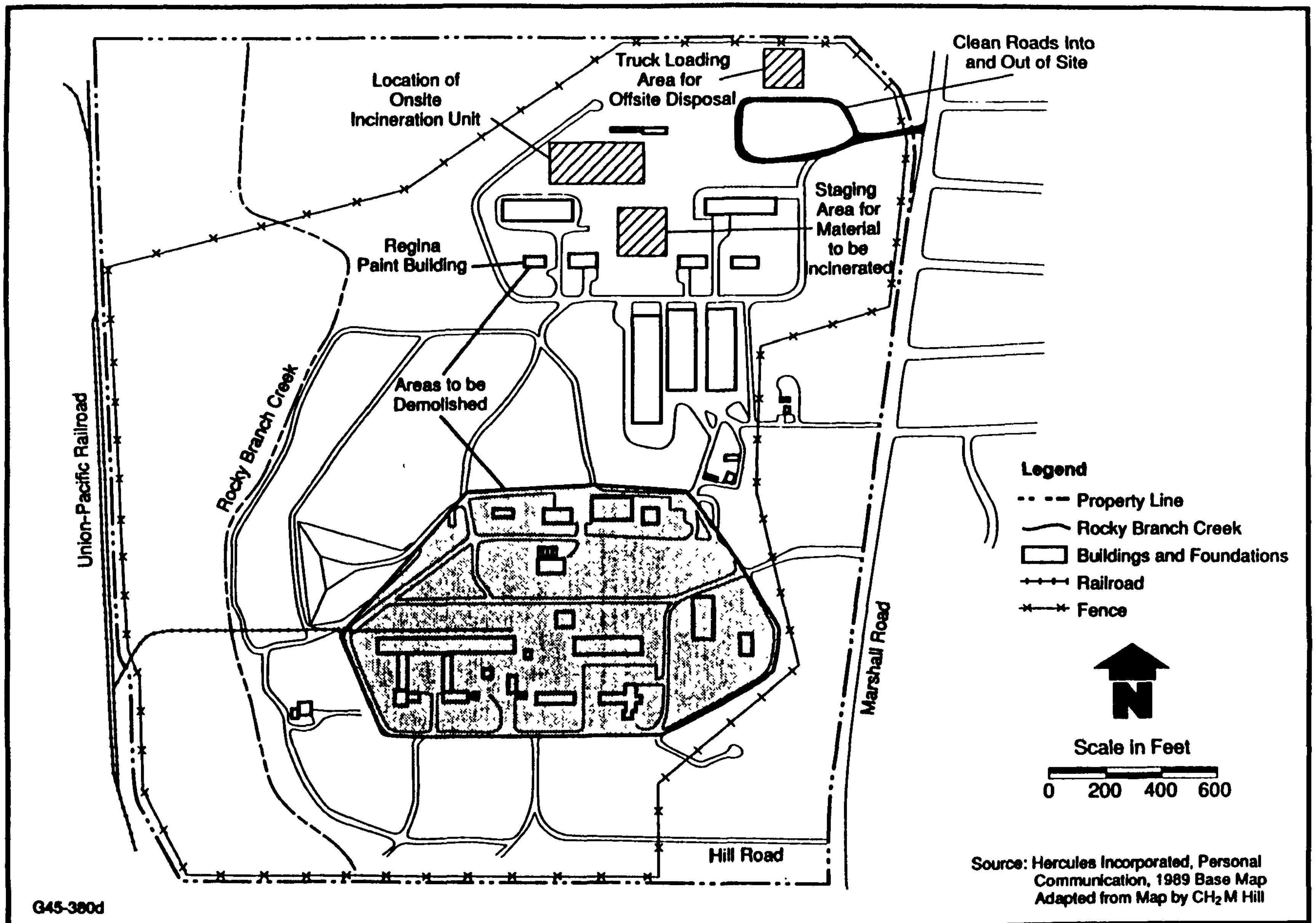

FIGURE 7-7 CONCEPTUAL LAYOUT OF ALTERNATIVE 5 - ONSITE INCINERATION WITH OFFSITE DISPOSAL

adequate remedy at a particular site. Rather, the process recognizes that each site will have unique characteristics that must be evaluated and compared to those applicable and relevant requirements that apply under the given circumstances. In accordance with the requirements of the NCP, the remedial action selected must meet all ARARs unless a waiver from specific requirements can be granted.

For remedial actions performed under SARA, permits for compliance with the Resource Conservation and Recovery Act (RCRA), National Pollutant Discharge Elimination System (NPDES), and Clean Air Act (CAA) regulations for onsite remedial actions are not required. However, CERCLA and SARA do require that the selected alternative meet relevant and appropriate regulatory standards or performance levels where possible, even though a permit is not required. Relevant and appropriate regulatory standards address problems or situations sufficiently similar to those encountered at a CERCLA-regulated site. Therefore, their use is well-suited to the particular site of concern. ARARs are defined as follows:

- Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting law, that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site.

- Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at a CERCLA site.

ARARs may be divided into the following categories:

- Chemical-specific requirements are health- or risk-based concentration limits or ranges in various environmental media for specific hazardous substances, pollutants, or contaminants. These limits may take the form of action levels or discharge levels.

- Location-specific requirements are restrictions on activities that are based on the characteristics of a site or its immediate environment. An example would be restrictions on wetlands development.

- Action-specific requirements are controls or restrictions on particular types of activities in related areas such as hazardous waste management or waste water treatment. An example would be RCRA incineration standards.

The chemical-specific, location-specific, and action-specific ARARs for Onsite Operable Unit I media at the site are listed in Table 7-2, and described in more detail in the remainder of this section.

FEDERAL ARARs

Resource Conservation and Recovery Act (RCRA)

RCRA requirements may be applicable to the Vertac site because some of the contaminated materials found at the Vertac site are considered RCRA-listed wastes. Regulations promulgated under RCRA generally provide the basis for identification and management of hazardous waste and establish technology-based requirements for active or proposed hazardous waste facilities. RCRA facility design standards may also be consulted if appropriate for wastes other than RCRA wastes containing significant hazardous constituents.

Chemical-Specific Requirements

Because of the range of chemicals detected at the site, including solvents, herbicides, and 2,3,7,8-TCDD, numerous chemical-specific requirements exist. According to 40 CFR § 261.31 (hazardous wastes from non-specific sources), some of the wastes, specifically the contents of the F-listed process vessels, would be given the hazardous waste numbers of F02X (F020, F022, F023, F026, or F027). These waste numbers are described and defined in 40 CFR § 261.31.

2,3,7,8-TCDD is produced as a byproduct during the manufacture of herbicides. These potentially dioxin-containing F-listed wastes are labeled "acutely hazardous wastes" (40CFR § § 261.30 (d) and 261.31).

Some of the other materials characterized during this operable unit investigation may also be characterized as listed or characteristic RCRA wastes. These wastes would be defined as follows:

- Materials that are F-listed, such as spent alcohols and solvents, but are not defined by the F-listed classifications previously described. These materials would be listed as F001-F005 wastes.

- Materials, such as the contents of the non F-listed tanks, may be listed, as defined in 40 CFR § 261.33, as discarded commercial chemical products, off-specification species, container residues, and spill residue thereof.

Table 7-2

Potential Operable Unit I ARARs for the Vertac Site

CHEMICAL-SPECIFIC

- Resource Conservation and Recovery Act (RCRA)
- Toxic Substances Control Act (TSCA)
- Safe Drinking Water Act (SDWA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Arkansas Water and Air Pollution Control Act
- Noncriteria Air Pollution Control Strategy

LOCATION-SPECIFIC

- Resource Conservation and Recovery Act (RCRA)
- Arkansas Hazardous Waste Management Code
- Arkansas Solid Waste Management Code

ACTION-SPECIFIC

- Resource Conservation and Recovery Act (RCRA)
- Toxic Substances Control Act (TSCA)
- Safe Drinking Water Act (SDWA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Arkansas Hazardous Waste Management Code
- Arkansas Solid Waste Management Code
- Arkansas Water and Air Pollution Control Act

TO-BE-CONSIDERED (TBC)

- City of Jacksonville Ordinances 604, 620, 684, and 877

- Materials considered RCRA characteristic wastes. RCRA characteristic wastes are defined in 40 CFR § 261 Subpart C as wastes displaying the characteristics of ignitability, corrosivity, reactivity, or toxicity.

- Residues from the treatment of a listed RCRA hazardous waste are themselves considered a RCRA hazardous waste unless delisted. Residues resulting from the incineration of the F02X materials would be considered F-028 wastes (40 CFR § 261.31).

The residues of materials in containers would be subject to the above criteria unless the container is empty (40 CFR § 261.7).

It is important to note that the definitions of the F023 and F026 listings apply to the wastes only. Therefore, a strict interpretation of these definitions indicates the vessel, or container, would not be a listed waste.

There are other materials that contain small concentrations of dioxin that would not be specifically listed as wastes under RCRA. Furthermore, some materials investigated may not be considered hazardous, but due to the nature and public awareness of the site, it is unlikely that an off-site facility would accept these materials.

Although some of the materials onsite may be defined as RCRA hazardous wastes, the regulations pertaining to the dioxin-containing F-listed wastes are more stringent than for the other wastes. For example, 99.9999 percent (six 9s) destruction removal efficiency (DRE) is required for incineration of these dioxin-containing wastes, while only 99.99 percent (four 9s) DRE is required for most other wastes. Regulatory requirements for the land disposal of these materials are also more stringent than for other wastes.

<u>Location-Specific Requirements</u>

Location-specific ARARs within RCRA may be applicable to the siting of any onsite treatment or storage alternative. RCRA states that any facility within a 100-year flood plain must be designed, constructed, operated, and maintained to prevent washout. Washout is described as "the movement of hazardous waste from the active portion of the facility as a result of flooding". RCRA also requires that the treatment, storage, or disposal of a hazardous waste must not be conducted within 200 feet of a fault that has had displacement within the Holocene time (40 CFR § 264.18).

<u>Action-Specific Requirements</u>

Because of the potential hazards associated with dioxins, action-specific ARARs related to the remediation of dioxin wastes are especially stringent. Action-specific ARARs are usually technology or activity-based requirements or limitations on actions taken with respect to hazardous wastes. These requirements may be triggered by the particular remedial action that is selected to accomplish the selected alternative. Because there is more than one alternative action for the Vertac site, many different requirements may be applicable.

Corrective Action Provisions

The revised corrective action-related regulations under subtitle C of RCRA (40 CFR § 260) became effective on April 19, 1993. The revised regulations introduces the concept of corrective action management units (CAMUs) and temporary units for remediation wastes to provide facilities with wider range of remediation alternatives, while assuring reliable, protective, and cost-effective remedies. The Vertac Superfund Site is widely contaminated and has been designated as and Area of Contamination (AOC), the equivalent of a CAMU. As such, contaminated debris amenable to consolidation/containment within the AOC may be pretreated and consolidated without incurring placement or triggering the applicability of Land Disposal Restrictions.

Incineration

Incineration of a RCRA hazardous waste is regulated under 40 CFR § 264 *Subpart O. These regulations* call for an analysis of the waste feed (40 CFR § 264.341), and for the disposal of all hazardous wastes and residues, including ash, scrubber water, and scrubber sludge (40 CFR § 264.351). In addition, the regulations set the following performance standards for incineration (40 CFR § 264.343); including:

- For dioxin containing wastes (F-02X), achieve a destruction and removal efficiency (DRE) of 99.9999 percent (six 9s) for each principal organic hazardous constituent (POHC) designated under 40 CFR § 264.342 in the permit. DRE for dioxins is demonstrated during a trial burn using a POHC more difficult to incinerate than dioxin.

- Reduce hydrogen chloride emissions to 1.8 kg/hr or 1 percent of the HCl in the stack gas before entering any pollution control device.

- Not release particulate matter in excess of 180 mg/dscm, corrected for the amount of oxygen in the stack gas.

The ability to meet these performance standards must be demonstrated during the trial burn period.

Furthermore, monitoring of various parameters during operation of the incinerator is required (40 CFR § 264.347). These operating parameters include:

- Combustion temperature.
- Waste feed rate.
- An indicator of combustion gas velocity.
- Carbon monoxide emissions.

Finally, fugitive emissions must be controlled (40 CFR § 264.345) either by:

- Keeping the combustion zone totally sealed.
- Or maintaining a combustion zone pressure lower than atmospheric pressure.

Land Disposal Restrictions

There are presently no regulations that specifically govern the destruction efficiency for non-thermal treatment of dioxin-containing wastes. A land disposal restriction (land ban) was enacted under RCRA effective on November 7, 1986 (40 CFR § 268.31). The land ban stipulates that no untreated dioxin-containing wastes (as defined in 40 CFR § 261.31) may be land disposed. Treatment standards for hazardous debris, effective on November 16, 1992 (40 CFR § 268.45), requires that hazardous debris must be treated prior to land disposal unless EPA determines under 40 CFR § 261.3(e)(2) that the debris is no longer contaminated with hazardous waste or the debris is treated to waste specific treatment standard provided in this subpart for the waste contaminating the debris. Land disposal restrictions are not applicable to onsite debris, e.g., equipment, buildings, or other materials, consolidated within the "area of contamination" (AOC). An AOC is defined as the areal extent of contiguous contamination. RCRA requires that the treatment of wastes that are subject to the ban on land disposal attain levels achievable by the best demonstrated available technology (BDAT). A treated material is required to have less than 1 ppb TCDD, as measured by the Toxicity Characteristic (TC) test, prior to disposal in a RCRA-permitted landfill.

The land disposal restrictions apply to the storage of certain hazardous wastes onsite. These restrictions prohibit the onsite storage of "banned" wastes for longer than 1 year unless the owner/operator can prove that the extended storage is solely for the purpose of accumulating enough waste for proper treatment.

Delisting

If the material (i.e., residues from incineration) can be delisted, it would no longer be considered a RCRA hazardous waste, the land ban would not apply, and the material could be placed in any permitted solid waste landfill. Metals content within the incinerator ash must also be considered before the ash could be placed into a solid waste landfill. Metals content within the ash would be measured by the TC test to determine if the ash would be considered a RCRA characteristic waste. After delisting, if the ash leachate concentrations are less than TC standards, treatment residues would be disposed in a solid waste landfill.

Hazardous Waste Landfills

Minimum technology requirements (MTR) are not applicable within an AOC, but may be relevant. Therefore, technical requirements for a consolidation unit may, but are not required to, consider relevant and appropriate certain design guidance (for covers/caps, drainage, liners, stability, etc.) pertaining to RCRA facilities. RCRA-specific requirements for a hazardous waste landfill are presented in 40 CFR § 264.300 (Subpart N), which could be considered relevant and appropriate to the consolidation unit. 40 CFR § 264.301 states that a RCRA landfill must have two or more liners that are designed, constructed, and installed to prevent migration of wastes out of the landfill to the adjacent soil or subsurface soil or ground water during the active life of the landfill.

Leachate collection systems are required above and between the liners that are designed, constructed, maintained, and operated to collect and remove any leachate from the landfill.

Furthermore, RCRA presents requirements for dioxin-containing wastes. In order to place dioxin-containing wastes into a landfill, the landfill must be operated in accordance with a management plan for these wastes that is approved by the Regional Administrator (40 CFR § 264.317). Approval of the management plan would be based on the following factors:

- The volume, physical, and chemical characteristics of the waste, including migration potential.
- The attenuative properties of the underlying and surrounding soils.
- The effectiveness of additional treatment, design, or monitoring requirements.

Finally, RCRA also presents monitoring, inspection, surveying, record-keeping, closure, and post-closure care requirements (40 CFR § § 264.303-264.310).

Container Storage

Because container storage in a storage facility is a potential alternative for the Vertac site, RCRA requirements pertaining to such a storage facility may be considered relevant and appropriate.

The container storage regulations under RCRA apply to owners and operators of hazardous waste facilities that store containers of hazardous waste.

According to these regulations, containers of RCRA hazardous waste must be:

- Maintained in good condition (40 CFR § 264.171).
- Compatible with hazardous waste to be stored (40 CFR § 264.172).
- Closed during storage (except to add or remove waste)(40 CFR § 264.173).

Container storage areas must be inspected weekly for deterioration (40 CFR § 264.174) and have a containment system that is designed and operated in accordance with 40 CFR § 264.175. In addition, containers of ignitable or reactive waste must be kept at least 50 feet from the property line (40 CFR § 264.176). Furthermore, incompatible materials must be kept separate and separated by a dike or other barrier (40 CFR § 264.177). Finally, at closure, hazardous waste and residues must be removed from the containment system and containers and liners must be decontaminated or removed (40 CFR § 264.178).

Storage of dioxin must be in accordance with 40 CFR § 268, Land Disposal Restrictions. When such storage occurs beyond 1 year, the owner/operator has the burden of proving that such storage is solely for the purpose of accumulating sufficient quantities to allow for proper recovery, treatment, and disposal (40 CFR § 268.50).

Toxic Substances Control Act (TSCA)

The Toxic Substances Contract Act (TSCA) regulates hazardous chemical substances and mixtures deemed to present an unreasonable risk to human health and the environment. The only identified substances at the Vertac site that may be regulated under TSCA are PCBs and asbestos. The asbestos regulations are identical to NESHAPs regulations and are outlined under the Clean Air Act.

The PCBs of concern at the site are within four active transformers located throughout the site. Under TSCA, as of October 1, 1990, the use of network PCB transformers with secondary voltages equal to or greater than 480 volts, including 480/227 volt systems, in or near commercial buildings is prohibited. Also, the use of any retrofilled PCB transformer is limited to use until October 1, 1990 (40 CFR § 761.30).

Regulations for the disposal of PCBs are also promulgated in 40 CFR § 761. In general, all PCBs of 500 ppm or greater must be disposed of by incineration in incinerators in compliance with the performance standards in 40 CFR § 761.70. PCB concentrations between 50 and 500 ppm may be disposed of by incineration, high-efficiency boiler, or in a chemical waste landfill. Empty transformers must be disposed of by incineration or chemical waste landfill provided the transformer has been rinsed with a solvent. Large PCB-containing capacitors (containing more than 3 lbs of dielectric fluid) must also be disposed of by incineration (40 CFR § 761.60). Storage of PCBs is also limited to 1 year (40 CFR § 761.65).

Clean Water Act (CWA)

The Clean Water Act (CWA) requirements may be applicable because incineration or pretreatment may generate fluids that need to be treated and discharged. The CWA applies to point-source direct discharges into navigable waters and indirect discharges to a publicly owned treatment works (POTW). In the case of indirect discharges to a POTW, the POTW sets forth pretreatment standards.

Clean Air Act (CAA)

Because asbestos was found in building and insulation materials onsite, remedial activities must be designed to comply with the NESHAPs regulations in the Clean Air Act (CAA). NESHAPs provides procedures for controlling asbestos emissions during demolition (40 CFR § 61.147) and during disposal (40 CFR § 61.156). Highlights of NESHAPs pertaining to asbestos (Subpart M) include:

- Discharge no visible emissions of asbestos particulate material to the outside air.

- Friable asbestos is to be removed or contained prior to or during demolition, unless unsafe structural conditions exist.

- When a facility component coated with friable asbestos is being taken out in sections, adequate wetting of the material must be performed before any cutting or disjoining occurs.

- An active, commercial waste disposal site is required to cover the asbestos waste daily with 6 inches of compacted nonasbestos-containing material.

- Proposed amendments to the NESHAPs (54FR912; January 10, 1989) indicate that non-friable asbestos that may be broken during demolition must also be removed prior to demolition, except where unsafe structural conditions exist.

Remedial technologies that could result in air emissions would have to be designed so that emissions meet Federal or state air-emission standards. Currently, NESHAPs regulations do not specifically address emissions from hazardous waste sites.

National Ambient Air Quality Standards (40 CFR Part 50) have also been developed for particular pollutants under the Clean Air Act. These standards are included in Table 7-3.

STATE ARARs

Arkansas Hazardous Waste Management Code

The Arkansas Hazardous Waste Management Act of 1979 and the Arkansas Resource Reclamation Act of 1979 are known together as the Arkansas Hazardous Waste Management Code (the "Code"). This Code resembles the Federal Hazardous Waste Management Regulations. These ARARs are discussed in Subsection 4.1. The Arkansas Hazardous Waste Management Code does contain siting criteria (Section 5) for a hazardous waste management facility. Such a facility may not be sited in the following areas:

- An active fault zone.
- A "regulatory floodway" as adopted by communities participating in the National Flood Program.
- A 100-year flood plain.
- A recharge zone of a sole source aquifer designated pursuant to the SDWA.
- Wetland areas that are inundated or saturated by surface water or ground water.

In addition, no permit shall be issued for a hazardous waste landfill facility or surface impoundment if such a facility is located in the following areas:

- Areas of high earthquake potential.
- Areas having a soil that would be classified as vertisol.
- Areas in which a stratum of limestone or similar rock of an average thickness of more than 1 meter lie within 30 meters of the base of the proposed liner system.
- Areas in which the liner bottom or in-place barrier soil is less than 10 feet above the historically high water table.
- Areas near a functioning private or public water supply that would constitute an unacceptable risk to the public health or safety.

TABLE 7-3

NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	STANDARD	AVERAGING PERIOD	REGULATORY STATUS (a)
Sulfur oxides	Primary	12-month arith. mean	80 ug/cu. m (0.03 ppm)
	Primary	24-hour average (b)	365 ug/cu. m (0.14 ppm)
	Secondary	2-hour average (b)	1300 ug/cu. m (0.5 ppm)
Particulate matter	Prim. & Sec.	Annual arith. mean	50 ug/cu. m
	Prim. & Sec.	24-hour average	150 ug/cu. m
Carbon monoxide	Prim. & Sec.	8-hour average	9 ppm (10 mg/cu. m) (c)
	Prim. & Sec.	1-hour average	35 ppm (40 mg/cu. m) (c)
Ozone	Primary	Max. daily 1-hour avg.	0.12 ppm (235 ug/cu. m) (d)
	Secondary	1-hour average	0.12 ppm (235 ug/cu. m) (d)
Nitrogen oxides	Prim. & Sec.	12-month arith. mean	100 ug/cu. m (0.05 ppm)
Lead	Prim. & Sec.	Quarterly mean	1.5 ug/ cu. m

NOTES:

(a) National short -term standards are not to be exceeded more than once in a calendar year.
(b) National standards are block averages rather than moving averages.
(c) National secondary standards for carbon monoxide have been dropped.
(d) Maximum daily 1-hour average: averaged over a 2-year period, the expected number of days above the standard must be less than or equal to one.

- Areas one-half mile from any occupied dwelling, church, school, hospital, or similarly occupied structure.

- Areas where the active portion of the facility is less than 200 feet from the facility's property line, and less than 300 feet from right-of-ways for roads and utilities.

Section 13 of the Code includes performance standards in addition to the provisions of 40 CFR 264, 265, and 270. Within Section 13, it states that when it is technically feasible, destruction of hazardous waste should be accomplished by incineration utilizing currently available technology. No acutely hazardous waste shall be disposed in landfills in the State of Arkansas.

Arkansas Solid Waste Management Code

Section I of Appendix A of the Arkansas Solid Waste Management Code pertains to friable asbestos material. The regulation states that asbestos material wastes shall be handled in accordance with NESHAPs Regulations in the removal, containerizing, storage, and transporting of materials. Additionally, Arkansas Class III and Class IV landfills (facilities for the disposal of inert nonputrescible and approved process wastes only) could not accept asbestos material wastes.

The State of Arkansas requires the following permitting and operational standards when planning/designing a solid waste landfill within the state:

- Testing - Geological characteristics would be required to indicate soil conditions, ground water elevation and movement, and subsurface characteristics.

- Equipment - Verification of proper equipment available to properly operate the landfill facility.

- Geologic Structure - The subsoil and lithological structure shall be such that there is reasonable assurance that leachate from the landfill will not contaminate the ground waters or surface waters of the state.

- Sedimentation and Surface Water Control - The surface contour of the area shall be such that surface runoff will not flow through/into the fill area.

- Water Table - Landfill operations will maintain a safe vertical distance between deposited refuse and the maximum seasonal water table elevation and shall include such measures necessary to prevent contamination of the ground water.

- Flooding - Sites subjected to flooding shall be avoided.

- Site Improvement - The following physical improvements shall be made before a landfill site is placed in operation.

  - The site shall be adequately fenced, with an entrance gate that can be locked and posted.

  - All weather operational roads shall be provided.

  - Arrangements shall be made for fire-protection services.

- Operation - All operations of the landfill shall be in accordance with the approved plans and the Arkansas Solid Waste Management Code.

Arkansas Water and Air Pollution Control Act

Arkansas air and water quality regulations resemble the national standards set forth by the U.S. EPA under the Clean Air and Clean Water Acts, but require preconstruction review by the state. In addition, Section 5 of the Arkansas Air Pollution Control Regulations outlines specific limitations for particulate emissions from new or modified sources. These limits are based solely on the amount of material being processed (lb/hr).

Arkansas Noncriteria Air Pollutants Control Strategy

ADPC&E has also implemented an evaluation of the emissions of proposed emission of noncriteria air pollutants from all sources in order to determine if a permit should be issued or if an existing source should be required to retrofit control equipment. The Noncriteria Air Pollutants Control Strategy (NAPCS) is based upon Threshold Limit Values (TLVs) for chemical substances adopted by the American Conference of Governmental Industrial Hygienists (ACGIH).

According to NAPCS, the predicted ambient air concentration of gases and vapors is considered acceptable if it is less than 1/100 of the ACGIH TLV. The ambient concentration is determined by using appropriate atmospheric dispersion models over a 24-hour average. The spacing between receptors used in the model is 100 meters (in the area of the highest concentration). The NAPCS may consider 8 and 24-hour averages, first highs, as well as annual averages for use in assessing risk.

TLVs have been established for the following contaminants of concern:

Compound	TLV
2,4-D	10 mg/m^3
2,4,5-T	10 mg/m^3
Toluene	375 mg/m^3
Phenol	19 mg/m^3

As stated in the NAPCS, when the substance emitted is a particulate compound and persistence in the environment is expected, the predicted annual average concentration is considered acceptable if it does not exceed the dosage mass of the LD_{50} (lethal dose for 50%) expression divided by 10,000.

TO-BE-CONSIDERED (TBCs)

City of Jacksonville Ordinances 604, 620, 684, and 877

Existing operations at the Vertac site involve the pretreatment of water collected in the french drain system and water collected in the surface water diversion ditch system. This treated water is then combined with sanitary waste water and discharged to the Jacksonville West Publicly Owned Treatment Works (POTW). POTW influent must meet pollutant limitations on metals, chlorinated phenols, chlorophenoxyherbicides, and 2,3,7,8-TCDD as outlined in City Ordinance 877. POTW effluent must meet secondary taste and odor standards before being discharged to Bayou Meto. Taste and odor standards for chlorophenols range from 0.1 ug/L (4-chlorophenol) to 2.0 ug/L (2,4,6-trichlorophenol).

8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The nine criteria for evaluation of an alternative are categorized into three groups: threshold criteria (overall protection of human health and environment and compliance with ARARs), primary balancing criteria (long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, and cost), and modifying criteria (state and community acceptance). The threshold criteria must be satisfied in order for an alternative to be eligible for selection. The primary balancing criteria are used to weigh major tradeoffs among alternatives. The modifying criteria are taken into account after public comment is received on the proposed plan.

8.1 THRESHOLD CRITERIA

Overall Protection of Human Health and Environment

This evaluation criterion involves consideration of the overall protection of human health and the environment. The overall assessment of protection draws on the assessments conducted for other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Evaluation of the overall protectiveness of an alternative focuses on whether a specific alternative achieves the remediation objectives and describes how risks posed through each potential exposure route addressed in the Focused Feasibility Study are eliminated, reduced, or controlled through treatment, engineering, or institutional controls. This evaluation also allows for consideration of whether an alternative poses any unacceptable short-term impacts.

All of the alternatives, except Alternative 1 (no action), provide adequate protection of human health and the environment. Alternatives 3 and 4 provide a high degree of overall protectiveness because the principal threats are destroyed through incineration, and low level threats are contained in a disposal vault that will isolate the low level threats from exposure pathways and ensure no migration from the unit. Alternative 5 provides a high degree of overall protectiveness by destruction of all organic pollutants by incineration. Alternative 2 provides protection by isolating hazardous material and keeping them out of exposure pathways. However, Alternative 2 is not a permanent solution and may eventually result in a release because some of the wastes are corrosive liquids.

An ambient air monitoring program will be implemented to help ensure overall protectiveness, including the short term effectiveness of waste handling and incineration that may result in fugitive emissions.

Compliance With ARARs

This criterion is used to determine how each alternative complies with applicable and relevant regulations that include chemical-specific, location-specific, and action-specific ARARs.

Alternatives 3, 4, and 5 will comply with all ARARs provided they are properly implemented. Alternatives 3, 4, and 5 require compliance with ARARs such as operating requirements for an incinerator and performance requirements during remedy implementation. Upon completion of the remedies, Alternatives 3, 4, and 5 will also comply with ARARs for treatment standards and for disposal of treatment residuals. Alternative 2 would not comply with RCRA storage ARARs if the material is stored for longer than 1 year; however, it is considered an interim remedy and could qualify for a waiver from ARARs. Alternative 1 would not comply with ARA[illegible] hazardous waste would be stored on site in a manner that does not meet storage requirements. Alternative 1 would not meet EPA policy of using 1 ppb of dioxin as an action level in areas of unrestricted public access and 20 ppb of dioxin as an action level in industrial areas.

8.2 PRIMARY BALANCING CRITERIA

Long-Term Effectiveness and Permanence

This evaluation criterion involves consideration of the long-term effectiveness and performance of the alternative once it has been implemented. The evaluation focuses on the presence of receptors, magnitude of the remaining risk from untreated waste or treatment residues, adequacy, and reliability of controls that are used to manage treatment residuals or untreated waste.

Alternative 2 was not designed as a permanent solution and would not be effective in the long-term because the materials of most concern remain onsite untreated. These materials contain liquid and corrosive wastes which present a high probability for release if left onsite indefinitely.

Alternatives 3 and 4 offer a high degree of long-term effectiveness and permanence. Both of these alternatives contain an incineration component and a consolidation/containment component. By incinerating principal threats (vessel and drum contents), the source of additional contamination is destroyed. The residuals of incineration, salt and ash, are dry, inert, and contain very low levels of contaminants. The onsite consolidation/containment unit would provide long-term effectiveness for the low level threats and asbestos containing materials. These wastes do not contain liquids or high concentrations of waste and can be contained without significant risk of migration.

Alternative 5 offers the highest degree of long-term effectiveness and permanence because all media of concern would be thermally treated to destroy contaminants. After treatment, materials would have to be delisted and permanently disposed off-site in a solid waste landfill. If residuals can not be delisted, disposal would need to be in a RCRA Subtitle C hazardous waste landfill, provided the treatment standards have been met.

Short-Term Effectiveness

This evaluation criterion involves consideration of the short-term effectiveness of the alternative during construction and implementation. The evaluation focuses on the protection of the community and the onsite personnel during implementation of remedial measures, potential environmental impacts, and the time required to achieve remedial response objectives.

Alternative 1 is anticipated to have the greatest short-term effectiveness since no action is required. Of the alternatives requiring action, Alternative 2 presents the least amount of risk to workers, the community, and the environment because Onsite Operable Unit I media are contained onsite with the least amount of effort. Some particulate emissions from construction/demolition activities are anticipated during implementation; however, dust-control methods would reduce this risk. Alternative 3 would involve all of the short-term risks of Alternative 2, plus the risks associated with transporting the more hazardous materials off-site. Alternative 4 also includes all of the risks of Alternative 2 plus the risks associated with onsite incineration. The short-term risk to the neighboring community associated with Alternative 5 centers around incinerating all media within this operable unit. This would entail a long-term incineration project, with risk associated with operation of the incinerator and materials handling for size reduction to facilitate feed of multiple materials to the incinerator.

Any of the Alternatives 2, 3, 4, and 5 will also require implementation of an ambient air monitoring program to detect and protect against the impact of fugitive emissions during remedy implementation. Ambient air monitoring and a site specific risk assessment performed as part of the ongoing incineration of drummed wastes at the Vertac Site indicate that onsite incineration can be performed in a manner that does not pose unacceptable risk to the community.

Reduction of Toxicity, Mobility, and Volume of Contaminants

Consideration of this evaluation criterion is a result of the statutory preference for selecting remedial actions that permanently and significantly reduce the toxicity, mobility, and volume of the contaminants and associated media.

The following factors are considered in this evaluation:

- The treatment process and materials.
- The amount of hazardous materials.
- The degree of reduction in toxicity, mobility, or volume.
- The degree to which treatment will be irreversible.
- The type and quantity of materials that remain after remediation.

Alternative 1 will not reduce toxicity, mobility or volume of the contaminants at the Site since no treatment or additional containment is performed.

Alternative 2 would reduce the mobility of the contaminants. However, this reduction would be through containment, not treatment. Mobility may not be permanently reduce with Alternative 2 since wastes are liquid and [illegible] eventually be released from the storage unit. Pretreatment would reduce toxicity of some of the media being consolidated/contained onsite.

Alternatives 3, 4, and 5 use thermal treatment to reduce the inherent hazards posed by the contaminants of concern at the site.

Alternatives 3 and 4 would reduce toxicity, mobility, and volumes for the principal threats. Pretreatment would reduce the toxicity of the low level threats being consolidated/contained onsite. Alternative 5 would achieve the greatest reductions in toxicity, mobility, and volume because all media would be incinerated. Incineration yields salt and ash as a treatment residue. However, the salt and ash occurs at a lower mass than the organic waste feed, is dry, not chemically reactive, and contains hazardous constituents at concentrations much lower than the waste incinerated.

Implementability

This criterion establishes the technical and administrative feasibility of implementing an alternative. Technical aspects evaluated for each alternative include: construction and operation activities, reliability of the technologies involved, ease of undertaking additional remedial action, and monitoring after completion of activities. Administrative concerns include establishing contact with appropriate agencies to implement remedial actions (e.g., obtaining permits for construction and operation of a treatment unit). Availability of materials and equipment needed is another factor that must be considered when evaluating implementability of an alternative.

Alternatives 2, 3, 4,and 5 all contain technologies that are proven and commercially available. Alternative 2 would be the easiest to implement because no treatment would take place. Alternative 3 would require locating an off-site facility permitted and willing to treat dioxin-containing wastes. Also, difficulties may arise in transporting the materials to the off-site facility. Alternatives 4 and 5 would be more difficult to implement compared to Alternative 2 because of facility requirements for the onsite incineration component. There is strong opposition to incineration among some members of the community that has resulted in several lawsuits attempting to halt incineration. This ongoing litigation will make onsite incineration more difficult to implement than Alternative 2.

Cost

A remedial program must be implemented and operated in a cost-effective manner and must mitigate the environmental and human health concerns at the Site. In considering the cost-effectiveness of the various alternatives, the following categories are evaluated:

- Capital Costs--These costs include expenditures for equipment, labor, and materials necessary to install remedial actions. Indirect costs may be incurred for engineering, financial, or other services not directly involved with installation of remedial alternatives, but necessary for completion of this activity.

- Operating and Maintenance Costs--These costs include post-construction expenditures incurred to ensure effective implementation of the alternative. Such costs may include, but are not limited to, operating labor, maintenance materials and labor, rental equipment, disposal of residues, and administrative, insurance, and licensing costs.

Cost is assumed to be the critical factor in deciding among alternatives that are in compliance with ARARs or that are better than risk-based health standards. Costs for Alternative 2 range from $ 19.9 to $ 21.5 million. Costs for Alternative 3 range from $ 24.2 to $ 53.6 million. Costs for Alternative 4 range from $ 20.8 to $ 38.7 million. Alternative 4F had the lowest total cost, at approximately $ 20.8 million. Alternative 5 had the highest total cost, at $ 169.2 million, due to the amount and type of materials incinerated.

It should be noted that costs associated with Alternatives 3, 4 and 5 assume that incineration residuals are delisted and disposed in the consolidation unit onsite or off-site as solid waste. Additional treatment at additional cost would be required if residuals cannot be delisted.

8.3 MODIFYING CRITERIA

State Acceptance

The State of Arkansas has commented on the proposed plan. The State is in general agreement with the proposed plan.

Community Acceptance

All comments received have been addressed in the responsiveness summary, which is attached to this Record of Decision.

Table 8-1 summarizes the evaluation of alternatives.

9. THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives using the nine evaluation criteria, consultation with the Arkansas Department of Pollution Control & Ecology, and public comments, the EPA has determined that Alternative 4, Option E (with the changes described below) is the most appropriate remedy for the Vertac site Onsite Operable Unit 1. The selected remedy uses treatment to address principal threats and consolidation/containment to address low level threats posed by this operable unit media. The treatment selected is incineration. Incineration is the best demonstrated available technology for

TABLE 8-1
INDIVIDUAL EVALUATION OF FINAL ALTERNATIVES

CRITERIA	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ONSITE SECURE STORAGE WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 3 OFFSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 4 ONSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 5 ONSITE INCINERATION WITH OFFSITE DISPOSAL
COMPLIANCE WITH ARARS					
	Very few ARARs are applicable to the media of concern. Of those that do apply, no action would not comply with any of them	Would meet RCRA containment requirements Would not meet TSCA requirements for treatment of PCBs Onsite secure storage beyond one year could be interpreted as a violation of the Land Ban.	Offsite incinerator would be RCRA-permitted to treat dioxin wastes Consolidation/containment unit would meet RCRA containment requirements Pre-treatment wastewaters would comply with POTW standards	Onsite incinerator would comply with RCRA performance standards for treating dioxin wastes Treatment residuals would be delisted and contained onsite Consolidation/containment unit would meet RCRA containment requirements Pre-treatment wastewaters would comply with POTW standards	Onsite incinerator would comply with RCRA performance standards for treating dioxin wastes Treatment residuals would be delisted and transported offsite to a solid waste landfill
SHORT-TERM EFFECTIVENESS					
	Risk to community not increased by remedy implementation No significant risk to workers Continued environmental impact from existing conditions	Increased risk to community due to dust/asbestos emissions from demolition, construction, spillage, and possible pre-treatment activities Workers would be required to wear protection against dermal contact and inhalation of dust/asbestos fibers Containment would minimze additional environmental impacts	Increased risk to community due to dust/asbestos emissions from demolition, construction, spillage, and possible pre-treatment activities Additional risk associated with transporting wastes offsite by truck Workers would be required to wear protection against dermal contact and inhalation of dust/asbestos fibers	Increased risk to community due to dust/asbestos emissions from demolition, construction, spillage, and possible pre-treatment activities Additional risks associated with the onsite incinerator Workers would be required to wear protection against dermal contact and inhalation of dust/asbestos fibers	Increased risk to community due to dust/asbestos emissions from demolition, construction, spillage, and possible pre-treatment activities Additional risks associated with the onsite incinerator Workers would be required to wear protection against dermal contact and inhalation of dust/asbestos fibers

TABLE 8-1 (CONT.)
INDIVIDUAL EVALUATION OF FINAL ALTERNATIVES

CRITERIA	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ONSITE SECURE STORAGE WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 3 OFFSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 4 ONSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 5 ONSITE INCINERATION WITH OFFSITE DISPOSAL
SHORT-TERM EFFECTIVENESS (CONT.)		Remedial activities would be complete in two years	Incineration/containment would minimze additional environmental impacts Remedial activities would be complete in four years	Incineration/containment would minimze additional environmental impacts Remedial activities would be complete in three years	Incineration/containment would minimze additional environmental impacts Remedial activities would be complete in five years
LONG TERM EFFECTIVENESS AND PERMANENCE	Risk will remain or increase as the plant continues to deteriorate Five-year review would be required to ensure adequate protection of human health and the environment is maintained	Container storage of the more hazardous wastes in a building onsite would not be considered a permanent solution The onsite consolidation/ containment unit would provide long-term effectiveness Five-year review would be required to ensure adequate protection of human health and the environment is maintained	Offsite incineration would be considered a permanent remedy The onsite consolidation/ containment unit would provide long-term effectiveness	Onsite incineration would be considered a permanent remedy Delisted treatment residues would remain onsite The onsite consilidation/ containment unit would provide long-term effectiveness	Onsite incineration of all media within Operable Unit I would be considered the most permanent remedy Delisted treatment residues would be transported to an offsite solid waste landfill
OVERALL PROTECTIVENESS	No significant reduction in risk	Not considered a permanent solution because the materials of most concern remain onsite untreated Engineered controls must minimize short-term risks associated with construction/destruction activities	Would provide overall protectiveness of human health and the environment Engineered controls must minimize short-term risks associated with construction/destruction activities and offsite transport of waste	Would provide overall protectiveness of human health and the environment Engineered controls must minimize short-term risks associated with construction/destruction and incineration activities	Would provide overall protectiveness of human health and the environment Engineered controls must minimize short-term risks associated with construction/destruction and incineration activities

TABLE 8-1 (CONT.)
INDIVIDUAL EVALUATION OF FINAL ALTERNATIVES

CRITERIA	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ONSITE SECURE STORAGE WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 3 OFFSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 4 ONSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 5 ONSITE INCINERATION WITH OFFSITE DISPOSAL
OVERALL PROTECTIVENESS (CONT.)					Considered to provide better long-term effectiveness because all media are incinerated
REDUCTION OF TOXICITY, MOBILITY OR VOLUME	None	Secure storage will reduce the mobility of the contaminants If pre-treatment is performed before consolidation/containment, the mobility of contamination would be reduced further	Offsite incineration would greatly reduce the toxicity, mobility and volume of all treated materials. Contaminants remaining in the ash after treatment would primarily be metals Onsite consolidation/containment would reduce the mobility of the contaminants If pre-treatment is performed before consolidation/containment, the mobility of contamination would be reduced further	Offsite incineration would greatly reduce the toxicity, mobility and volume of all treated materials. Contaminants remaining in the ash after treatment would primarily be metals Onsite consolidation/containment would reduce the mobility of the contaminants If pre-treatment is performed before consolidation/containment, the mobility of contamination would be reduced further	Onsite incineration of all media onsite would provide the greatest reductions in toxicity, mobility, and volume.
IMPLEMENTABILITY	None required	The technologies involved in implementing this alternative are all proven, and commercially available (i.e.,construction, demolition, asbestos abatement)	Implementation would only be possible if an offsite facility permitted to treat dioxin-containing wastes is located. Removing vessel contents would be a difficult task Transportation of the wastes offsite must also be arranged	The potential exists for an incinerator to already be operating onsite. This unit could be used to incinerate many of the wastes within Operable Unit I Removing vessel contents would be a difficult task	The potential exists for an incinerator to already be operating onsite. This unit could be used to incinerate all of the wastes within Operable Unit I Removing vessel contents would be a difficult task

TABLE 8-1 (CONT.)
INDIVIDUAL EVALUATION OF FINAL ALTERNATIVES

CRITERIA	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ONSITE SECURE STORAGE WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 3 OFFSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 4 ONSITE INCINERATION WITH ONSITE LINED CONSOLIDATION/CONTAINMENT UNIT	ALTERNATIVE 5 ONSITE INCINERATION WITH OFFSITE DISPOSAL
IMPLEMENTABILITY(CONT.)			The technologies involved in implementing the onsite portion of this alternative are all proven, and commercially available (i.e.,construction, demolition, asbestos abatement)	The technologies involved in implementing the remaining portion of this alternative are all proven, and commercially available (i.e.,construction, demolition, asbestos abatement)	An offsite solid waste landfill would be located to dispose of the delisted treatment residuals Significant materials feed difficulties; size reduction required
COST	REFER TO TABLE 7-1				

NOTES:
(a) Trash, pallets and containerized soils are packed into the consolidation/containment unit.
(b) Trash, pallets and containerized soils are incinerated.
(c) Trash and pallets are packed into the consolidation/containment unit; containerized soils are incinerated.
(d) Capital costs for incineration are reflected in the O&M costs.

dioxin wastes. Onsite incineration (except for non-F-listed wastes) was selected because of the CERCLA preference for onsite remedies and the current estimates indicate that off-site incineration would cost about $ 2000 more per ton of waste. Consolidation/containment of low level threat wastes will be within the area of contamination defined by the site boundaries. A RCRA subtitle C landfill will be constructed within the area of contamination. A RCRA subtitle C landfill is required to minimize the potential for migration of contaminants and to improve long-term effectiveness of the remedy. A subtitle C landfill is also required because some of the wastes to be consolidated and contained on site contain contaminant levels above the best demonstrated available technology treatment standards and the ground water table occurs at shallow depths. The selected remedy consists of the following:

1. **Contents and residues that are in process vessels** - This media is a principal threat and therefore shall be treated. The remedy shall be onsite incineration for F-listed wastes. Incineration shall be performed by an incinerator with 99.9999% destruction removal efficiency (DRE) based on trial burn results. Demonstrated non- F-listed wastes shall be transported to a RCRA permitted off-site facility for treatment/disposal (if feasible) and/or incinerated onsite. Demonstrated uncontaminated raw materials, such as caustic, kerosene/fuel oil, etc., shall be shipped off-site for recycle/reuse or treatment/disposal (if feasible) and/or incinerated onsite. This flexibility in treatment/disposal, recycle/reuse for demonstrated non-F-listed wastes and uncontaminated raw materials in an off-site permitted facility is built in to reduce remediation costs (since non-F-listed wastes can be incinerated in a commercial facility with 99.99% destruction removal efficiency). Both process knowledge and analytical confirmation that dioxin levels are below the detection limit shall be the performance standards to demonstrate that a particular waste or raw material is non-F-listed.

2. **Spent carbon** - This media is a principal threat and therefore shall be treated. The remedy shall be onsite incineration and/or onsite regeneration/reuse. Regenerated carbon shall be used solely in the onsite leachate collection/treatment system and shall not be shipped for off-site use.

3. **Containerized (drummed) wastes** - Onsite incineration of drummed french drain oily leachate, spent Butyl-T, recovery waste, 2,4-D drum wash waste, and used filters (from Phase 2 waste water treatment, french drain, and sumps), since these materials are principal threat wastes. Consolidation of drummed RI waste (such as used tyvek suits, discarded glassware, and trash) in an onsite RCRA Subtitle C landfill, since this waste poses a low level threat. A remedy for the containerized mud and sediments collected from manholes, drains, leaf filter, and drilling will be proposed during the Onsite Operable Unit 2 remedy selection process (reasoning for this deferment is provided under the remedy for bagged soils)

4. PCB oils in transformers - This material poses a principal threat and the TSCA regulations require incineration. Since the estimated quantity of PCB oil is small (1 cubic yard) and a trial burn is required for a PCB incinerator, this media shall be shipped to an off-site permitted facility for incineration.

5. Shredded pallets - This media is a principal threat waste because the sampling results indicate that this waste is contaminated with herbicides and dioxin (average concentration of 2,3,7,8-TCDD is about 549 ppb, with a range of 2.5 to 4100 ppb). Therefore, shredded pallets shall be incinerated onsite.

6. Shredded trash - This media poses a principal threat because of high concentrations of chlorophenols (25,000 ppm maximum), tetrachlorobenzene (100,000 ppm maximum), and herbicides (44,000 ppm 2,4-D maximum)present in this media. Therefore, this media shall be incinerated onsite.

7. Buildings - This media poses a low level threat after removal of friable asbestos. The buildings mainly contain porous media (such as asbestos siding, shingles, wood, sheetrock, etc.). For off-site Recycle/reuse of building materials, the building materials must be decontaminated using the treatment standards set forth in the hazardous debris rule (40 CFR § 268.45). This rule requires removal of at least 0.6 centimeters of surface layer and to further ensure removal of contaminants that may be absorbed to depths beyond 0.6 centimeters, the rule requires removal of virtually all staining that could be indicative of the presence of toxic contaminants. This decontamination process, if implemented, poses unacceptable short-term risks. Therefore, the buildings (except the bagged soil storage building, which will continue to store bagged soils, the supervisor's office building, which will continue to be used by the site maintenance personnel, and the waste water treatment plant building, which will continue to be used for treatment of leachate collection system water) shall be demolished and the debris shall be consolidated/contained in an onsite RCRA subtitle C landfill.

8. Process equipment (including drums in the Regina Paint Building)- After the removal of process vessel contents, this media poses a low level threat. Since this media is made up of mostly metal objects, it should be decontaminated and shipped off-site for recycle/reuse. Therefore, the process equipment shall be decontaminated utilizing treatment standards for hazardous debris (40 CFR § 268.45), to the maximum extent practicable, and shipped off site for recycle/reuse. The treatment standards for hazardous debris require the use of abrasive blasting, high pressure steam and water sprays, water/detergent washing, liquid phase solvent extraction, etc. to clean the surface so that residual staining is limited to no more than 5% of each square inch of the surface area. Debris resulting from demolition of equipment that cannot be decontaminated, utilizing the maximum extent practicable criteria (determined,in part, by integrity, degree of corrosion, safety considerations, etc.), shall be consolidated/contained in an onsite RCRA subtitle C landfill.

9. **Bagged Soils** - Since the bagged soils (excavated from residential yards and an onsite drainage ditch) are similar to onsite contaminated surface soils that will be addressed in the Onsite Operable Unit 2, remedy selection for this media is deferred. A remedy for these bagged soils will be selected, along with the onsite soils, during the remedy selection process for Onsite Operable Unit 2.

10. **Friable asbestos containing materials** - After removal from the buildings and process equipment following NESHAPs regulations, this media shall be consolidated/contained in an onsite RCRA Subtitle C landfill.

11. **Residues from decontamination activities** - Spent solvents generated from decontamination activities shall be incinerated on site. Waste water generated from decontamination activities shall be treated onsite and discharged to the Rocky Branch Creek.

12. **Onsite incinerator ash and salt** - EPA is in the process of developing and selecting a disposal option for the ash and salt generated by onsite incineration of 29,000 plus drums. Disposal of ash and salt that would be generated by onsite incineration of Onsite Operable Unit 1 media shall be consistent with the remedy to be selected for the ash and salt from the current onsite incinerator.

The remedy shall also require implementation of an ambient air monitoring program during remedial action to measure and protect against excessive fugitive emissions that may pose a threat to the community or the environment.

The estimated remedial cost for the selected remedy is $ 28.5 million. The annual O&M (inspection) cost is estimated at $ 15,000 per year. A better estimate of the annual O&M cost will be provided in the site O&M plan (developed during remedial design).

Since all the media addressed in this operable unit would be treated onsite, treated, reused, or disposed off-site, or consolidated in an onsite RCRA Subtitle C landfill, the ARARs (such as RCRA regulations for incinerators, landfills etc.) specify the performance standards and cleanup levels.

10. STATUTORY DETERMINATIONS

Under CERCLA section 121, EPA must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy protects human health and the environment through treatment of principal threat wastes (process vessel contents, spent activated carbon, shredded trash and pallets, PCB transformer oils, and miscellaneous drummed wastes), through containment of low level threat wastes (asbestos, debris resulting from the demolition of buildings and some equipment,etc.) in a RCRA Subtitle C landfill, and through decontamination and off-site recycle/reuse of process equipment to the maximum extent practicable.

Treatment of the highly contaminated wastes will eliminate the continued threat of exposure to the most toxic contaminants of concern (dioxins, chlorophenols, tetrachlorobenzene, herbicides such as 2,4-D and 2,4,5-T, toluene, and PCBs) via direct contact with or ingestion/inhalation of these wastes. Since the principal threat wastes are contained in tanks, plastic bags, etc., the exact risk to the public cannot be quantified. However, the cancer risk, from just one release scenario, assuming that trash/pallets would catch fire and a receptor at the fenceline would inhale smoke for a 12-hour period, is estimated at $2x10^{-4}$. By treating these principal threat wastes, the cancer risks from exposure will be reduced to less than $1x10^{-6}$. This level falls within the EPA's acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$.

Short-term threats associated with the selected remedy can be controlled by proper design and implementation. In addition, no adverse cross-media impacts are expected from implementation of the selected remedy.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy of incineration, decontamination and off-site recycle/reuse of process equipment, and consolidation/containment of this operable unit media will comply with all applicable or relevant and appropriate requirements (ARARs), if properly designed and implemented.. The ARARs for the selected remedy are presented below.

<u>Chemical Specific ARARs:</u>

RCRA

A. TSD able to accept material

TSCA

A. PCBs

CAA

A. Asbestos

B. NAAQS

Arkansas Water and Air Pollution Control Act

A. Particulate emissions from new or modified sources

Arkansas Noncriteria Air Pollutants Control Strategy

A. Ambient air criteria
   1. TLV/1000
   2. LD_{50}/10,000 for particulates

<u>Location Specific ARARs</u>

RCRA

A. Location stds. (40 CFR 264.18)
   1. Floodplains
   2. Seismic considerations

Arkansas Hazardous Management Code

A. Hazardous waste management facility siting stds.
   1. Fault zone
   2. Regulatory floodway
   3. Floodplain
   4. Recharge zone of sole source aquifer
   5. Wetland areas

B. Hazardous waste landfill siting stds.
   1. High earthquake potential
   2. Vertisol soil
   3. Limestone > 1 meter thick within 30 meter
   4. Bottom liner > 10 ft above historically high water table
   5. Near a functioning water supply that would pose an unacceptable risk
   6. Within 1/2 mile of occupied dwelling
   7. within 200 ft of facility boundary
   8. Within 300 ft of right-of-way

Arkansas Solid Waste Management Code

A. Solid waste landfill design/planning

1. Proper geologic conditions
2. Proper hydrogeologic conditions
3. Floodplains

<u>Action Specific ARARs</u>

RCRA

A. Incineration (40 CFR Subpart O)
   1. 99.9999 % DRE
   2. HCl emissions < 1.8 kg/hr
   3. Particulates emission < 180 tons/dscm
   4. Monitoring

B. Landfills (40 CFR 264 Subpart N)
   1. Construction stds.
   2. Operating and monitoring stds.
   3. Closure requirements
   4. Post-closure requirements

C. Land Disposal Restrictions (40 CFR § 268)
   1. Alternative treatment standards for hazardous debris

CWA

A. Treatment Standards and Effluent Limitations for Direct Discharge
B. Pretreatment Standards for Discharge to a POTW

TSCA (40 CFR 761)

A. Treatment/storage/disposal of PCBs

CAA

A. Demolition
   1. Asbestos release

B. Disposal requirements for asbestos

Arkansas Hazardous Waste Management Code

A. Destruction of hazardous wastes by incineration where feasible

B. No acutely hazardous wastes in landfills

Arkansas Solid Waste Management Code

A. Solid waste landfill design/planning
   1. Proper geologic conditions
   2. Availability of proper equipment

3. Sedimentation and surface water control
4. Site improvements (roads, fencing, etc.)
5. Operation in accordance with approved plan

Arkansas Water and Air Pollution Control Act

A. Preconstruction review

To Be Considered (TBCs)

City of Jacksonville Ordinances 604, 620, 854, 877

A. POTW influent limitations on metals, chlorinated phenols, chlorophenoxyherbicides and TCDD

B. Secondary taste and odor stds. for POTW effluent

Cost Effectiveness

EPA believes this remedy will eliminate the risks to human health at an estimated cost of $ 28.5 million. The selected remedy provides an overall effectiveness proportionate to its costs, such that it represents a reasonable value for the money that will be spent.

The selected remedy assures a much higher degree of certainty that the remedy will be effective in the long-term because of the significant reduction of the toxicity, mobility, and volume of the wastes achieved through treatment of wastes, recycle/reuse of process after decontamination, and consolidation and containment of debris resulting from demolition of buildings and some equipment in a RCRA Subtitle C landfill.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for this operable unit. Of those alternatives (alternatives 3,4, and 5) that are protective of human health and the environment and comply with ARARs, EPA has determined that this selected remedy provides the best balance of trade-offs in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, or volume achieved through treatment, short-term effectiveness, implementability, cost, while also considering the statutory preference for treatment as a principal element and considering state and community acceptance.

The selected remedy treats the principal threats posed by the highly contaminated wastes, achieving significant 2,3,7,8-TCDD, chlorophenols, tetrachlorobenzene, 2,4-D, 2,4,5-T, toluene, and

PCBs reductions. This remedy provides the most effective and implementable treatment of any of the alternatives considered. The selection of treatment of the highly contaminated wastes is consistent with program expectations that indicate that highly toxic and mobile wastes are principal threats and a priority for treatment and often necessary to ensure long-term effectiveness of a remedy.

Preference for Treatment as a Principal Element

By treating the process vessel contents, spent carbon, shredded trash and pallets, miscellaneous drummed wastes, and PCB oils, the selected remedy addresses the principal threats posed by the site through the use of treatment technologies. By utilizing treatment as a significant portion of the remedy, the statutory preference for remedies that employ treatment as a principal element is satisfied.

11. DOCUMENTATION OF SIGNIFICANT CHANGES

A proposed plan was released for public comment in February 1993. The proposed plan identified onsite incineration of vessel contents, spent activated carbon (with option for onsite regeneration and reuse), miscellaneous drummed wastes, shredded trash and pallets, and PCB oils, and onsite consolidation and containment of the debris resulting from demolition of buildings and equipment. EPA reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that provisions should be made for off-site treatment/disposal and recycle/reuse of some of the demonstrated non-F-listed vessel contents (non-F-listed wastes such as dalapon wastes, and uncontaminated raw materials such as hydrochloric acid, sodium hydroxide, kerosene/fuel oil, etc.) to reduce remediation costs, to decontaminate process equipment for off-site recycle/reuse to the maximum extent practicable, since recycle/reuse benefits the environment, and for consolidation and containment of some drummed (containerized) RI wastes (such as used personal protective clothing, trash, etc.) in the onsite RCRA Subtitle C landfill, since this type of waste poses a low level threat. These changes are a logical outcome of the discussion of EPA's goals for site remediation in the proposed plan.

RESPONSIVENESS SUMMARY

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