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Office of
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September 1985

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Superfund Record of Decision:

American Creosote, FL

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

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16. ABSTRACT

The American Creosote Works, Inc. (ACW) site occupies approximately 12 acres in a moderately dense, commercial and residential district of Pensacola, Florida. Wood-preserving operations were carried out at the ACW site from 1902 until December, 1981. Prior to 1950, creosote was exclusively used to treat poles. Use of pentachlorophenol (PCP) started in 1950 and steadily increased in the later years of the ACW operations. During its operations, liquid process wastes were discharged into the two unlined, onsite surface impoundments. Prior to 1970, waste waters in these ponds were allowed to overflow through a spillway and follow a drainage course into Bayou Chico and Pensacola Bay. In subsequent years, waste waters were periodically drawn off the ponds and discharged into designated "spillage areas" on site. Additional discharges occurred during periods of heavy rainfall and flooding, when the ponds overflowed the containment dikes. Data gathered during the RI indicate that major contaminants in the ground water are aromatic hydrocarbons common to creosote, such as, polycyclic aromatic hydrocarbons (PAHs) and benzene, ethylbenzene, toluene, and xylene. In addition, onsite soil samples show that the areas where wood-preserving operations were carried out are contaminated with PAHs.

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Record of Decision American Creosote, FL Contaminated Media: gw, sediments, sludge, soil Key contaminants: PAHs, benzene; ethylbenzene, toluene, xylene		

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ABSTRACT Continued

The selected remedial action for this site includes excavation of all contaminated soils and sludges, both on and offsite, with consolidation and onsite disposal in a landfill that meets RCRA standards. Total capital cost for the selected remedial alternative is estimated to be $5,678,000 with annual O&M costs approximately $50,000 for years 1-5 and $19,000 for years 6-30. At a later date the Agency will consider a second operable unit which will involve the selection of an alternative for the Management of Migration of contaminants in the ground water at the site. Operable units I and II will be the basis for the site's remedial design.

RECORD OF DECISION
Remedial Alternative Selection
Operable Unit I

SITE: American Creosote Works Inc., Pensacola, Florida
NPL CERCLA Site

Documents Reviewed

I am basing my decision upon the following documents describing the analysis of cost-effectiveness and feasibility of remedial alternatives for the American Creosote Works Inc., Pensacola, Florida.

- Remedial Action Master Plan
- Remedial Investigation Report, Volumes I and II
- Feasibility Study, Volumes I and II, with addendum
- Responsiveness Summary to Public Meeting and Recommendations
- Summary of Remedial Alternative Selection

Description of Selected Alternative

After a thorough review of all options, I have determined that alternative number 2, as detailed in the Feasibility Study and described below, is the appropriate remedy for Source Control Measures at the site. This alternative will be identified as Operable Unit I of the remedy and will result in:

- Contaminated soils being excavated from areas off the site to be managed with contaminated soils and sludges from areas on the site.

- The consolidated contaminated soils will then be managed on the site consistent with RCRA standards.

- The State of Florida will evaluate whether use of other alternatives is possible for portions of the contaminated material presently onsite. These alternatives would be implemented through use of the State Fund or a combination of the State Fund and CERCLA. The State's intent is to complete this activity within 30 days from the receipt of available environmental information.

Future Actions

At a later date, Operable Unit II will be required which will constitute the Agency's official selection of an alternative for the Management Of Migration of contaminants in the groundwater at this site. Operable Units I and II will then form the basis for the entire site's Remedial Design.

Declarations

Consistant with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the National Contingency Plan (40 CFR Part 300), I have determined that excavation and consolidation of contaminated soils and sludges for placement in a landfill constructed on the American Creosote Works Site in Florida, is a cost-effective remedy and provides adequate protection of public health, welfare, and the environment. Based on available information, the remedial action does not adversely affect any floodplain or wetland areas.

I have further determined that the State of Florida has an independent Fund and may choose to handle portions of the contaminated material through other than land disposal onsite. The Remedial Design will incorporate State Funded and additional CERCLA activities as agreed to within a Cooperative Agreement or Contract in order to proceed.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

SEP 30 1985

DATE

Jack E. Ravan

Jack E. Ravan
Regional Administrator
EPA Region IV

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

SITE LOCATION AND DESCRIPTION

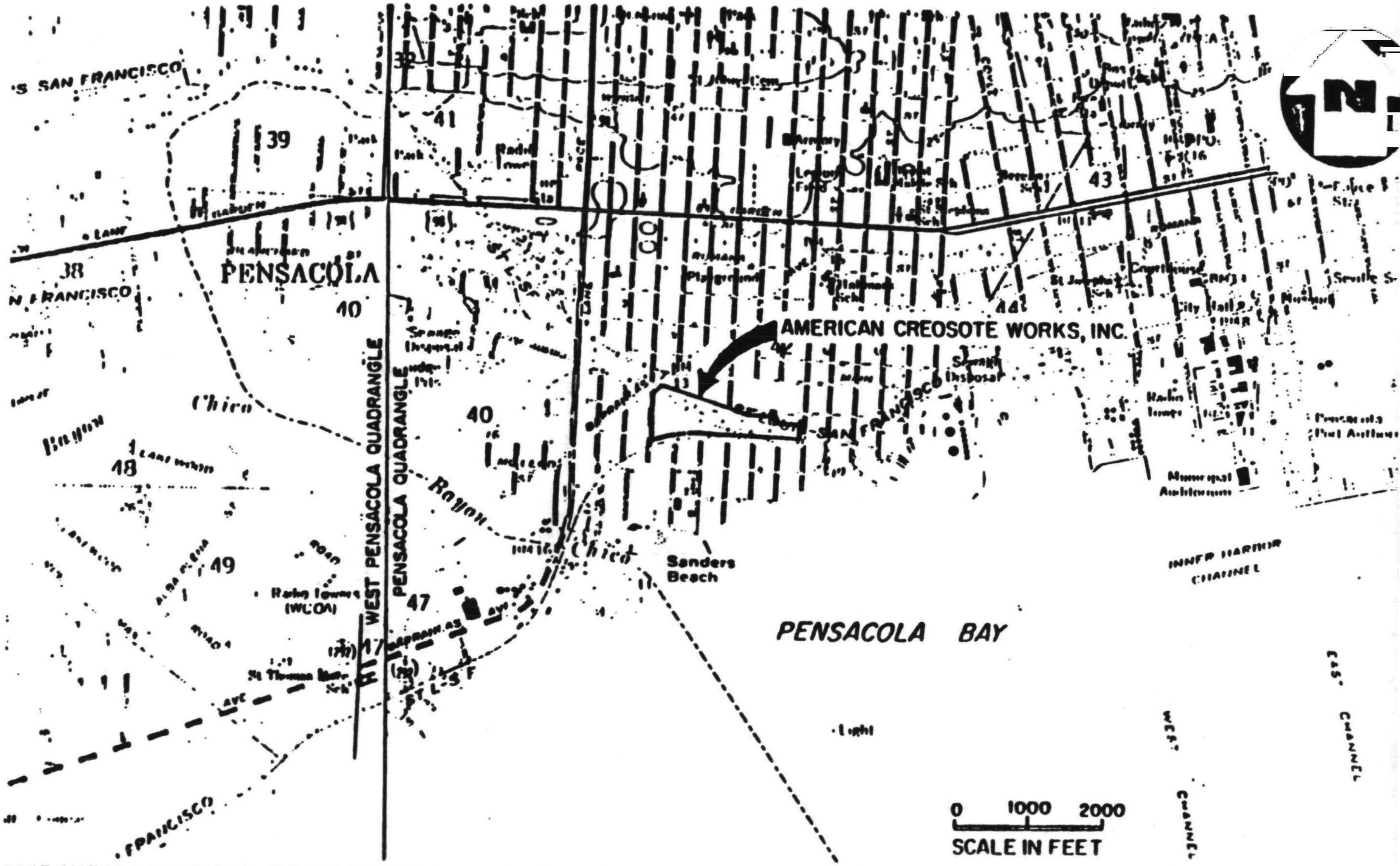
The American Creosote Works, Inc., (ACW) Site occupies approximately 12 acres in a moderately dense, commercial and residential district of Pensacola, Florida. The site is located about one mile southwest of the intersection of Garden and Palafox Streets in downtown Pensacola and is approximately 600 yards north of Pensacola Bay and Bayou Chico. Immediately north of the Site is a lumber company, an auto body shop, an appliance sales and repair shop and a wire storage area. Residential neighborhoods are immediately adjacent to the Site on the east and south and a yacht sales shop is southwest of the Site. The residential population within a one mile radius was approximately 5,000 persons in 1970. The approximate population in the area of the site was 1,056 in 1970. A total of 404 dwellings units were present in this same area in 1970. Figure 1 shows the general location of the ACW Site.

The more pertinent features of the site are shown on Figure 2. The site is about 2,100 feet long, east to west, and an average of 390 feet wide, north to south. Primary access to the plant is off Pine Street at its intersection with "J" Street. A railroad spur line of the Burlington Northern Railroad traverses the plant west to east. The majority of site buildings, process tanks, and equipment was situated near the center of the site in an area designated as the main plant area. A few small work sheds, miscellaneous equipment and debris lie about the remainder of the site.

Four surface impoundments were located in the western portion of the site. The Main and Overflow Ponds, located adjacent to "L" Street, were used for disposal of process wastes and are 1.8 and 0.9 acres in size, respectively. During former plant operations, liquid wastes periodically overflowed and were "drawn-off" from the two larger impoundments and allowed to accumulate in the smaller Railroad Impoundment, 0.3 acres, and Holding Pond, 0.1 acre, or were spread on the ground in "spillage areas."

SITE HISTORY

Wood-preserving operations were carried out at the ACW Site from 1902 until December, 1981. Prior to 1950, creosote was exclusively used to treat poles. Use of pentachlorophenol (PCP) started in 1950 and steadily increased in the later years of the ACW operations. During its years of operation, liquid process wastes were discharged into the two unlined, onsite surface impoundments. Prior to about 1970, wastewaters in these ponds were allowed to overflow through a spillway and follow a drainage course into Bayou Chico and Pensacola Bay. In subsequent years, wastewater were periodically drawn off the ponds and discharged to designated "spillage areas" on site. Additional discharges occurred during periods of heavy rainfall and flooding, when the ponds overflowed the containment dikes.



BASE MAP IS A PORTION OF THE U.S.G.S. PENSACOLA, FL QUADRANGLE (7.5 MINUTE SERIES, 1970, CONTOUR INTERVAL 5') AND A PORTION OF THE WEST PEN-SACOLA, FL-AL QUADRANGLE (7.5 MINUTE SERIES, 1970, CONTOUR INTERVAL 5').

FIGURE 1

LOCATION MAP

AMERICAN CREOSOTE WORKS SITE, PENSACOLA, FL

SCALE: 1"=2000

A Halliburton Company

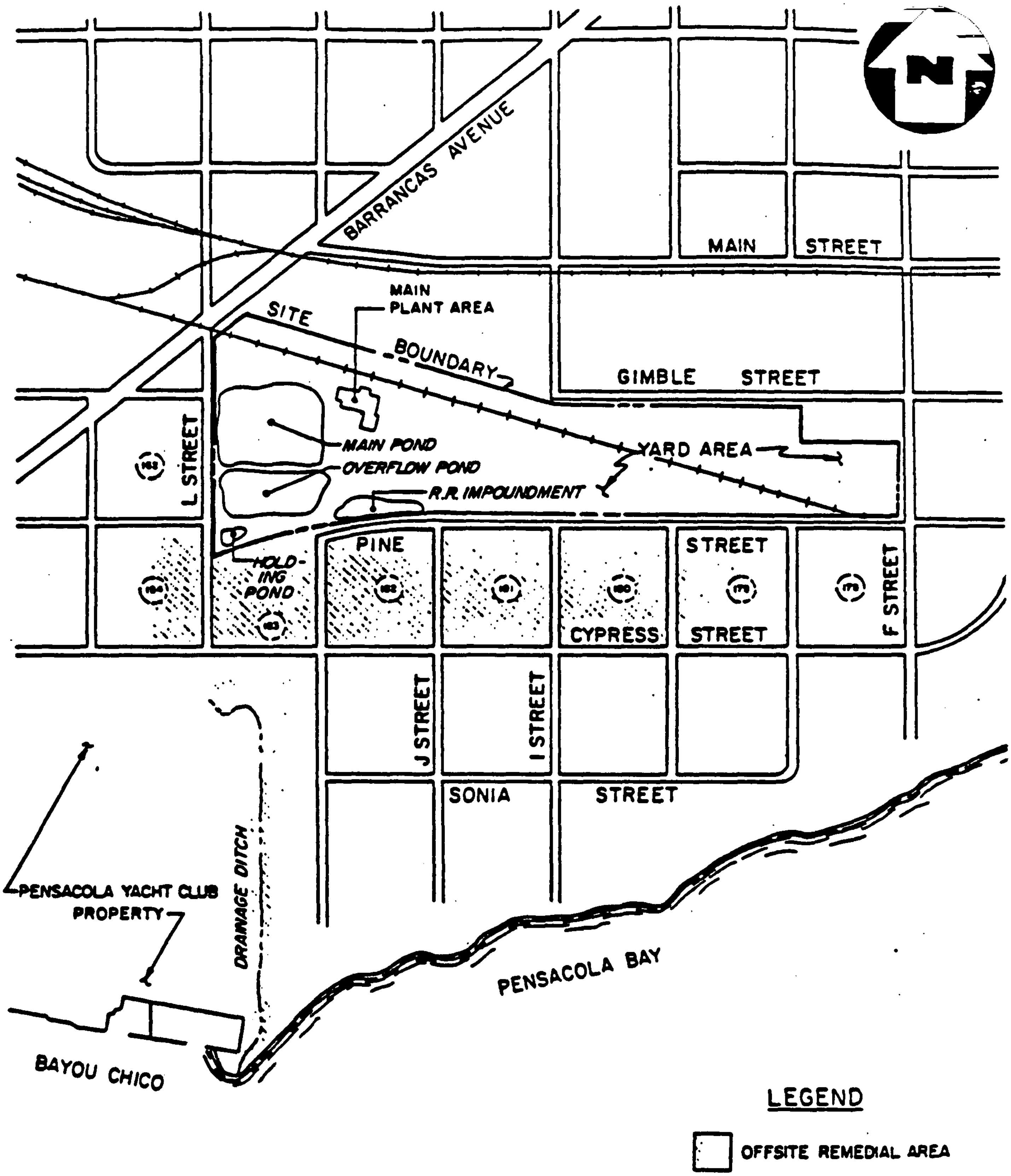


FIGURE 2

GENERAL ARRANGEMENT
AMERICAN CREOSOTE WORKS, INC., SITE, PENSACOLA, FL
NOT TO SCALE

NUS CORPORATION
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In March, 1980, considerable quantities of "oily/asphaltic/creosotic material" were found by the City of Pensacola in the groundwater near the intersection of "L" and Cypress Streets. In July 1981, the U.S. Geological Survey installed nine groundwater monitoring wells in the vicinity of the ACW Site. Samples taken from those wells revealed that a contaminant plume was moving in a southerly direction toward Pensacola Bay. In February 1983, the Site Screening Section conducted a Superfund investigation. The investigation included sampling and analyses of onsite soils, wastewater sludges, sediment in the area drainage ditches and existing onsite and offsite monitoring wells. Concurrent with this investigation, the USGS initiated a site and laboratory research study.

Because of the threat posed to human health and the environment by frequent overflows from the waste ponds, EPA, Region IV, Emergency Response and Control Section performed an immediate cleanup during September to October 1983. The immediate cleanup work included dewatering the two large lagoons (Main and Overflow Ponds), with the water being treated via coagulation, sedimentation and filtration with subsequent discharge to the City of Pensacola sewer system. The sludge in the lagoon was then solidified with lime and fly ash. A temporary clay cap was placed over the solidified material. The Florida Department of Environmental Regulation (FDER) also assisted during the cleanup. In January 1984, a remedial investigation and feasibility study under CERCLA was initiated by EPA's contractor.

SITE GEOMORPHOLOGY

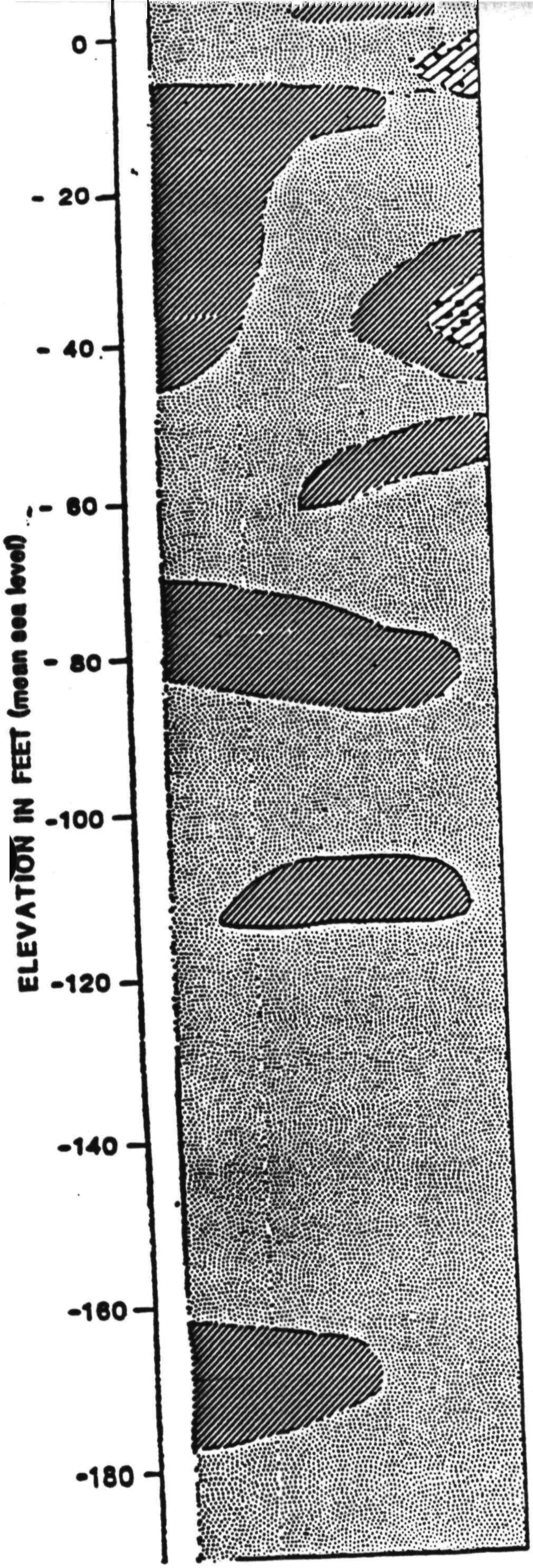
The ACW Site is located in the Gulf Coastal Lowlands of western Florida. The Site is nearly flat, with elevations ranging between 12 to 14 feet above sea level. The land slopes gently southward at about 25 feet per mile toward the Pensacola Bay.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates the boundaries and elevations of the 100-year floodplain. Based on the FIRM, the 100-year floodplain is not located within the ACW Site area and will not be affected by removal or source control types of actions at the site.

Local Geology

The water-bearing zone underlying the ACW Site area is composed primarily of sand with many interbedded layers and lenses of clay and sandy clay. These clay layers and lenses range from less than an inch to approximately 38 feet in thickness. Based on characteristics of the sands in these areas, the water-bearing zone can be stratigraphically divided into two areas.

The sand in the upper 25 feet of sediment varies in grain size from fine to coarse and in density from loose to dense. These variation in grain size and density are important, since these are a factor in the seepage rate of water through the sediment. Figure 3 presents a generalized stratigraphic column.



SAND (SP-SM) - white to dark brown, loose to very dense, moist to saturated, with trace to some silt

CLAYEY SAND (SC) - dark gray to light brown (some red and purple), loose, dry to saturated, some silty sand

CLAY (CH) - white to blue-gray (same red, brown and purple), medium stiff to hard, dry to moist

Figure 3

GENERALIZED STRATIGRAPHIC COLUMN

American Creosote Works
Pensacola, Florida

There are two massive clay formations in the water-bearing zone in the area of investigation. One clay layer is directly under the ACW ponds. This clay layer appears to be continuous under the ACW pond area, although it does pinch out south of the site. South of the site, a second massive clay layer underlies the Pensacola Yacht Club property and extends south to the Pensacola Bay. This second clay pinches out before reaching the ACW Site. The results of a ground pentrating radar survey have shown many channel deposits in the site area.

Surface Water

The dominant body of water in the ACW site area is Pensacola Bay. During rainfall events, most runoff from the site passes through the street and storm drains to the bay.

There is a small drainage ditch on the Pensacola Yacht Club (PYC) property directly south of the ACW surface impoundments. The drainage ditch begins approximately 200 feet south of Cypress Street and extends to the bay. Although the drainage ditch is fed by some runoff from the land surface during rain, most recharge of the ditch is from the groundwater. The bottom of the ditch is below the top of the groundwater table.

The Pensacola Bay exerts a tidal effect on the drainage ditch. During high tides, water flows into the ditch, flowing north from the bay. When the tide recedes, water flows south to the bay from the ditch, creating a 'washing' effect, where the contaminants that have collected in the ditch are washed to the bay.

Hydrogeology

In southern Escambia County, practically all the fresh groundwater is obtained from the sand-and-gravel aquifer. The aquifer is recharged by local rainfall. Because of the sandy nature of the aquifer and overlying soils, infiltration rates are relatively high. Annual recharge is 0 to 10 inches per year.

The direction of groundwater flow is to the south with discharge to Pensacola Bay. There are no public water supply wells in the immediate vicinity of the ACW site. The closest well field belongs to the City of Pensacola, located approximately a mile north of the site. The cone of influence of these well does not reach the ACW Site, and are not effected by the contamination from the ACW Site.

Surface Water Drainage

Drainage at the Site is not well developed. Most drainage in the area is by overland sheet flow through the streets and into storm drains south of the site to Pensacola Bay and by way of the drainage ditch on the Pensacola Yacht Club property.

Ecology

The ACW Site is located in the Pensacola urbanized area. Vegetation around the site consists mostly of cultivated grasses, trees and shrubs. Trees in the surrounding area are largely oaks, while no mature trees are present on the site. Vegetation on the site is mixture of grasses and other herbs. Wildlife in the area is typically urban with rodents, squirrels, racoons and opossums occasionally entering the site, as well as urban birds species.

Some shore birds from adjacent marine and freshwater habitats sometimes frequent the site. Pensacola Bay and Bayou Chico represent critical environmental systems downgradient from the ACW Site. The ecosystem in these water bodies has been stressed in the past due to pollution of these water caused by industrial, municipal and storm water discharges.

NATURE AND EXTENT OF CONTAMINATION

Table 1 summarizes the chemical data gathered during the RI and presents the concentration ranges of the most frequently occurring contaminants.

Waste Conditions

Liquid and sludges samples taken from the onsite surface impoundments during an EPA investigation in February, 1983, revealed the presence of 1,1,2,2-tetrachloroethane, chlorobenzene, ethylbenzene, xylene, styrene, pentachlorophenol, and 1,1,1-trichlorophenol in the aqueous phase and PAHs associated with wood preserving creosote processes in the sludges. Various metal were also identified, including aluminum, arsenic, copper, iron, manganese, and zinc.

A study conducted by the Environmental Response Team in June, 1983, determined the creosote distribution in the main and overflow ponds by obtaining sludge cores and visually observing such characteristics as sludge thickness, total column height and other physical characteristics. The volume of sludge determined from this study was approximated at 107,300 cubic feet for both ponds.

The water depth noted in the two ponds during this investigation was about 4 feet with a water surface about 2 feet above the surrounding grade. Tests indicated that the contaminated sludge is in direct and constant contact with the shallow groundwater table.

The sludges in the ponds were de-watered and then mixed with lime and fly ash and a temporary clay cap was placed over the solidified material left on site. As a result of the immediate cleanup, the pond areas contain 40,000 cubic yards of material consisting of a mixture of sludge, fly ash and lime, and 24,122 cubic yards of clay used for capping.

TABLE 1

RANGE AND FREQUENCY OF CHEMICAL CONTAMINANTS
IN VARIOUS MEDIA
AMERICAN CREOSOTE WORKS, INC., SITE
ALL CONCENTRATIONS IN mg/kg (SOILS) AND µg/l (WATER)

Contaminant	Soils Concentration Range and No. of Observations	Groundwater Concentration Range and No. of Observations	Sediment Concentration Range and No. of Observations
Polycyclic Aromatic Hydrocarbons (PAHs)			
benzo(a)anthracene	8.8-870 (16)		7,300 (1)
benzo(a)pyrene	8.7-140 (10)		
benzo(b)fluoranthene	9.2-480 (17)		8,300 (1)
benzo(k)fluroanthene	7.9-8.7 (2)		
chrysene	5.6-750 (19)		
anthracene	7.2-1,600 (17)	6,400-430,000*(2)	
benzo(ghi)perylene	5.4-20 (5)		
fluorene	7.1-1,800 (13)	50-140,000* (13)	5,700 (1)
phenanthrene	5.7-29,000 (21)	30-1,300 (10)	20,000 (1)
dibenzo(a,h)anthracene	7.8-91 (2)		
indeno(1,2,3-cd)pyrene	6.1-210 (5)		
pyrene	7.2-9,000 (29)	2,200 (1)	15,000 (1)
Other Acid and Base/Neutral Organics			
acenaphthene	7.3-6,900 (12)	40-140,000* (12)	
fluoranthene	8.1-10,000 (30)	60-2,700 (3)	18,000 (1)
naphthalene	74-1,100 (7)	35-580,000* (17)	
dibenzofuran	58-880 (8)	45-660 (6)	
2-methylnaphthalene	39-540 (7)	35-3,680 (8)	
pentachlorophenol	7.2-2,500 (10)		
Volatile Organics			
benzene	0.04-0.13 (3)	6-150 (15)	
ethylbenzene	0.03-0.26 (5)	15-110 (15)	
toluene	0.01-0.22 (7)	5-150 (15)	
acetone	0.08 (1)	400-2,700 (8)	
o-xylene	0.01-0.35 (10)	5-240 (16)	
Pesticides			
beta-BHC		+0.66-0.9 (5)	
endosulfan		++0.47 (2)	

\+ One reported concentration @ 230*

++ Same sample as above 12 µg/l

* May be in error due to nonrepresentive data

() Frequency of chemical found.

Groundwater Contamination

Data gathered during the RI indicate that groundwater contamination extends to an approximate depth of 60 feet below the ground surface and at least 900 feet south of the site. The data show that major contaminants in the groundwater are aromatic hydrocarbons common to creosote, such as, polycyclic aromatic hydrocarbons (PAHs) and benzene, ethylbenzene, toluene, and xylene (BTX). Other contaminants that have been identified include methylphenol, carbazoles, pyridenes, quinolenes, styrene, acetone, naphthalene, and a few pesticides.

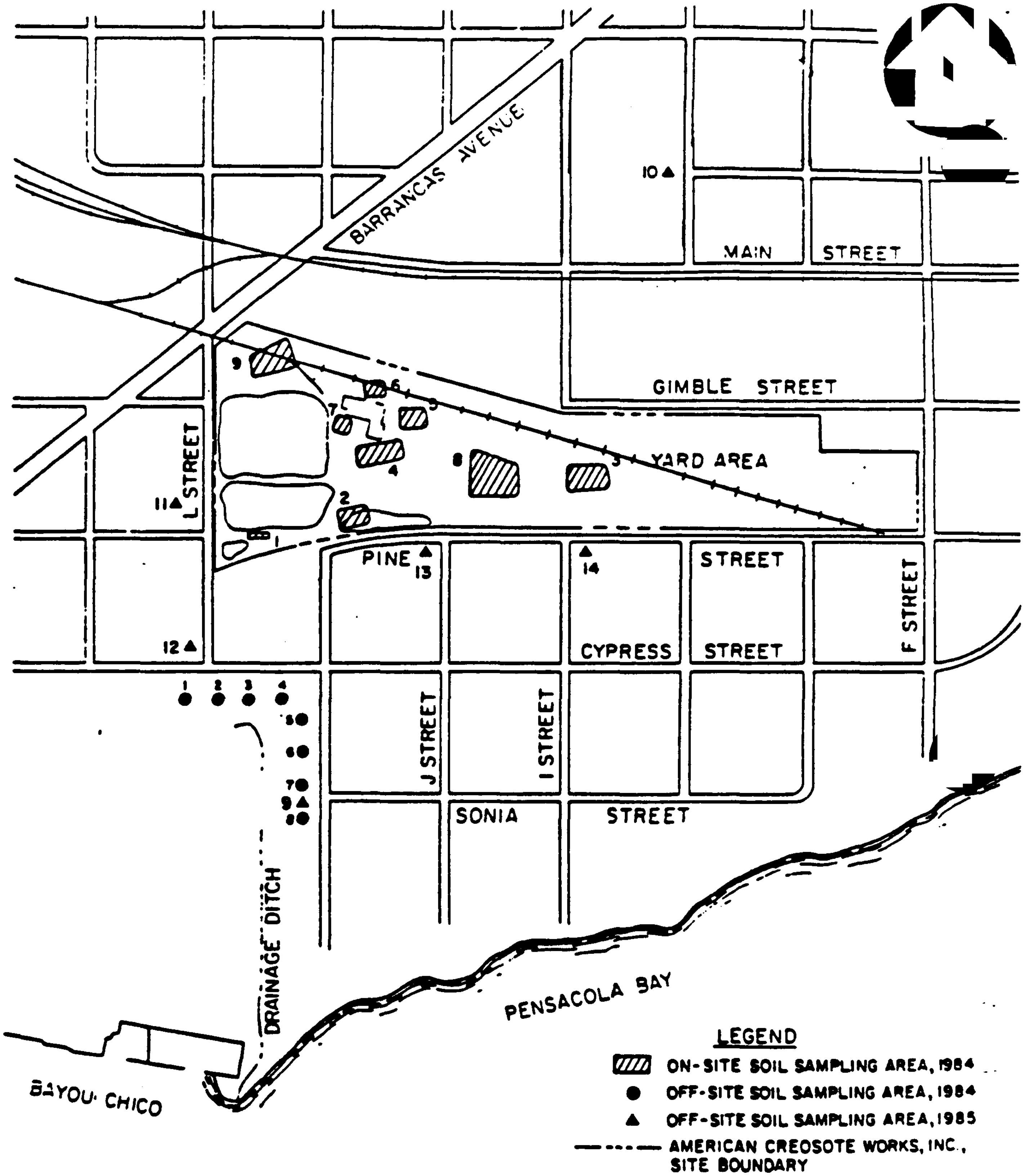
The data indicate the groundwater contamination is greatest south of and immediately adjacent to the former surface impoundments. The data also indicate the contamination generally decreases with depth at each monitoring well cluster and that contamination generally decreases downgradi ent of the site. At a depth of 20 feet contamination decreases as the groundwater moves south of the site toward the bay, this is further verified at the 60 foot depth. Contaminant reduction is most probably a combination of adsorption on soil and sediments and removal by mixing with surface water. The drainage ditch area south of the site receives most of its recharge from the ground water. Hence, contaminated groundwater may be moving rapidly toward the bay as surface runoff. The effect of surface water runoff is enhanced by tidal backwash, which 'washes' the ditch area.

Soil Contamination

Onsite soil samples show that the areas where wood-preserving operations were carried out are contaminated with PAHs. The data show that the primary soil contaminants are the higher molecular weight PAH species, anthracene, benzo(a)anthracene, chrysene, fluoranthene, benzo(a)fluoranthene, fluorene, phenathrene, pyrene, and benzo(a)pyrene. Lower aqueous solubility and higher affinity for adsorption on soil is to be expected for these compounds.

The analytical data also show two different patterns of soil contamination in the ACW soil samples. Samples taken in areas 1,2,3,8 and 9 show a generally decreasing degree of contamination with depth and a total base/neutral fraction content of less than 500 mg/kg in all samples, while samples taken from areas 4,5,6 and 7 show a less distinct variation of contaminant concentration with depth and a much higher total concentration of organics. Figure 4 illustrates the locations of these areas.

Offsite soil samples show that various PAHs, similar to those found in the onsite soil samples were identified in the area representing the northeast corner of the PYC. Based on the available data, it appears that soil contamination on the PYC property is limited. Based on additional offsite soil samples, collected in January 1985, it appears that there is soil contamination on city blocks 179 throught 184 and block 162, immediately south and west of the ACW Site.



All other sampling locations are discussed in the RI Report.

FIGURE 4

APPROXIMATE LOCATION OF SOIL SAMPLING AREAS
AMERICAN CREOSOTE WORKS, INC., SITE, PENSACOLA, FL
NOT TO SCALE

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Surface Water and Sediment Contamination

The data show very little contamination in the surface water of the drainage ditch. A possible explanation for this could be the effect of dilution from other surface water contributions and the tidal washing effect. The low levels of contaminants in the drainage ditch would not pose a threat to human health and the environment. The high chloride content in certain samples taken in the drainage ditch indicated the presence of seawater.

Sediment data from the drainage ditch area show the presence of the PAHs and volatile components previously identified in the monitoring well samples. The high oil and grease content of samples collected also shows the attraction of creosote oil to the sediment matrix. No contamination was found in the sediment samples take at the Pensacola Bay.

PUBLIC HEALTH AND ENVIRONMENTAL RISK EVALUATION

Environmental data show that most contaminated materials are surface soils, subsurface soils and the sludge present in the bottom of the main and overflow ponds. The major pathway for the migration of contaminants is via leaching by infiltrating, precipitation or groundwater inflow, followed by transport with groundwater.

Contaminated sediment transport is also possible via surface water runoff. This would be confined to the drainage ditch running to Pensacola Bay. Transport of the types of contaminants found in the groundwater under the ACW Site may present the potential for short-term bioaccumulation in the marine biota. Because environmental pollutants resulting from other sources could just as easily be the contaminant source, it would be difficult to differentiate among the potential sources of PAHs in marine, fish and invertebrates in the bay.

In summary, on the basis of present contaminant distribution, the most signignificant transport is through the movement of contaminants from the former sludge lagoons through and with groundwater to Pensacola Bay. A minor transport mechanism is the physical transport of contaminanted sediments in storm runoff, also moving toward the bay via the drainage ditch. Although air transport is not likely, another minor transport mechanism could be through soils dust mobilized during remedial implementation.

A process was developed to select the compounds that most represent the overall site hazard. The criteria included, significant health consequences, the frequency of occurrence and magnitude of the contaminants, data validation, the availability of standards and known toxic and/or carcinogenic properties, and the relationship of the compound to the site. Table 2 presents the critical contaminants used for the risk assessment.

TABLE 2

CRITICAL CONTAMINANTS
FOR ASSESSMENT OF RISK

•PAHs

- benzo(a)anthracene — soils, sediment and groundwater
- benzo(a)pyrene ——— in soils, and sediments
- anthracene ———— in soils and groundwater
- fluorene ————— most frequently detected in groundwater
- phenanthrene ——— in soils and groundwater
- pyrene —————— most frequently found in soils and groundwater

•Other Acid/Base/Neutral Fraction Organic Contaminants

- acenaphthene ——— in groundwater
- fluoranthene ——— in soils
- naphthalene ———— in water
- dibenzofuran ——— in groundwater
- 2-methylnaphthalene - in groundwater
- pentachlorophenol — in soils

•Volatile Organics

- benzene ————— in groundwater
- ethylbenzene ——— in groundwater
- toluene ————— in soil and groundwater
- o-xylene ————— in groundwater

Potential human receptors include consumers of marine fish and shellfish, in which some of the contaminates may accumulate on a short-term basis. Potentially, the site could be a contributor of these contaminants, but not necessarily the sole source or most significant contributor. Remedial cleanup personnel may be exposed, if they have direct contact with contaminated sludges, or contaminated dusts. Local residents who may come into repeated contact with contaminated soils and sediment may be exposed. Other potential receptors may be childern ingesting contaminated groundwater through lawn-watering and other casual use of the residential wells.

Potential environmental receptor include the groundwater, as related to quality and limitation on its use for all purposes. Ambient air may be a receptor in the context of aesthetic factors. Another potential receptor includes the marine flora and fauna as well as the Pensacola Bay where limitations on its recreational use may be imposed. Terrestial flora and fauna may be a receptor.

ENFORCEMENT SUMMARY

The earliest documented incident of a release of any type from the ACW plant occurred in the summer of 1978, when a spill of liquids flowed onto a nearby street and then onto the property of a yacht sales company. A flood in March, 1979, resulted in a similar spill. This incident resulted in increased regulatory attention to ACW by the Florida Department of Environmental Regulation (FDER).

ACW filed an incomplete application with the FDER in May 1980, for the construction of an industrial wastewater treatment system. The FDER issued a Notice of Violation (NOV) and orders for corrective action to ACW in January, 1981. This enforcement action included an order to cease operations until a permit was issued. In addition, ACW was to submit a restoration plan, install a groundwater well monitoring system, and remove contaminated soils. In January 1981, the FDER completed a responsible party search, a title search, and a financial assessment for the site. The FDER issued a consent order in March 24, 1981, incorporating the NOV requirements and allowing ACW to continue operations. The Order included schedules for completing construction of the wastewater treatment system and for meeting the other NOV requirements.

Throughout 1981 and 1982, the FDER encountered difficulty with ACW's compliance efforts. In March, 1982, ACW announced that it was going out of business. In April 1982, the FDER filed a Petition for Enforcement and Agency Action and a Complaint for Permanent Injunction and Civil Penalties as a result of ACW's failure to make progress toward compliance. One month later, in May 1982, ACW, Inc., of Florida, filed for reorganizational bankruptcy court. The FDER prepared motions opposing the removal and the stay of its case against American Creosote as well as proof of claim and a motion for default.

In the summer of 1981, the information required for the Hazard Rank Scoring (Mitre ranking) of the site was collected by Ecology and Environment, Inc., an EPA contractor. The site was ranked on September 24, 1981, and was proposed for the Natioanl Priorities List (NPL) in October, 1981. It scored 58.41 points out of 100 possible points and now ranks 50th amongst 538 total NPL sites nationwide. In September 1983, the main and overflow ponds were found to be within 1 to 2 inches of overflowing. EPA initiated an immediate removal action. EPA's cost for the immediate removal to stabilize the site was approximately $730,000

In 1984 the bankruptcy court presented a final court stipulation for the approval of the litigants. The ACW site would be sold after cleanup and the proceeds would be divided amongst the FDER, the EPA, and the financial organization holding the corporation's assets, i.e., Saving Life Insurance Company (as of July 1985, the court stipulation had not been signed by the litigants in the bankruptcy proceeding).

In March 1985, the Burlington Northern Railroad was sent a notice letter requesting that they perform certain tasks on-site. Specifically, they were to remove, utilizing an EPA-approved work plan, railroad spur lines which exist over an area of known contamination. Communications with Burlington Northern representatives since then indicate that the railroad is amenable to completing the assigned tasks within the time frame specified.

ALTERNATIVE EVALUATION

A list of all alternatives considered are given in Table 3. Onsite alternatives that comply with other environmental laws are listed in Table 4. Each of the remedial alternatives has passed technology screening on the basis of public health and environmental concerns. Each alternative was evaluated in terms of the extent to which the alternative remediates or minimizes the potential health hazards and environmental impacts as identified in the RI Report, Section 7. and the potential public health impacts as a result of implementation of the alternative

The remedial alternatives developed were placed into one of the following categories:

1) Alternatives specifying offsite storage, destruction treatment or secure disposal of hazardous substance at a facility approved under RCRA. Such a facility must also be in compliance with all other applicable EPA standards (e.g., Clean Water Act, Clean Air Act, Toxic Substance Control Act).
2) Alternatives that attain all applicable or relevent Federal public health or environmental standards, guidance or advisories.
3) Alternatives that exceed all applicable or relevent Federal public health or environmental standards, guidance and advisories.
4) Alternatives that meet the CERCLA goals of preventing or minimizing present of future migration of hazardous substances, but do not attain the app-

TABLE 3

GENERAL RESPONSE ACTIONS & ASSOCIATED
REMEDIAL TECHNOLOGIES
AMERICAN CREOSOTE WORKS, INC., SITE

General Response Action	Technologies
No Action	Site Monitoring (surface disturbance, monitoring wells, surface discharges)
Pumping	Groundwater pumping; dredging (sediments in drainage ditch)
Containment	Capping; groundwater containment barrier walls
Diversion	Grading; construction of surface water drainage ditches and berms
Removal	Excavation and handling of sludges, soils, and sediments; and removal of railroad tracks, stored drums, and debris
Onsite Treatment	Incineration; biological, physical, and chemical treatment
Offsite Treatment	Incineration; biological, chemical, and physical treatment
Onsite Storage	Temporary storage structures
Onsite Disposal	Landfills; surface impoundments; land application
Offsite Disposal	Landfills; surface impoundments; land application

TABLE 4

CATEGORIES OF REMEDIAL ALTERNATIVE COMPONENTS
DEVELOPED FOR THE AMERICAN CREOSOTE WORKS, INC., SITE

Remedial Alternative Components (Table 2-2)	EPA CATEGORIES: 1. Offsite Measures	2. Attains Standards	3. Exceeds Standards	4. Meets CERCLA Goals But Does Not Attain Standards	5. No Action
1. Excavate and backfill select locations.	Offsite disposal in RCRA Landfill.	Onsite disposal in RCRA Landfill.	Not Applicable	Not Applicable	Not Applicable
2. Recover groundwater excavate, and backfill.	Same as Alternative Component No. 1.	Onsite, as Alternative No. 2, and groundwater treatment. a) Pretreatment to required standards for POTW discharge. b) Treat to NPDES/Water Quality Standards for discharge. c) Treatment to other state standards for reinjection.	Treatment of ground-water to drinking water standards and discharge off site.	Groundwater treatment levels do not meet all various treatment standards.	Not Applicable
3. Recover groundwater.	Offsite disposal a) to a POTW. b) to surface waters. c) with or without treatment.	Same as Alternative Component No. 2 above.	Not Applicable	Same as Alternative Component No. 2 above.	Not Applicable
4. No Action, with or without monitoring.					Applicable to no action, but does not meet CERCLA goals for public health.

licable or relevent standards. This category may include an alternative that closely approaches the level of protection provided by the applicable or relevent standards.

5) No action.

All the alternative listed in Table 5 are assumed to include long-term site monitoring and inspection to verify cleanup levels and maintain the remedial aciton reliability.

Some of the alternatives, notably those involving groundwater treatment, could fit into multiple categories by modifying the treatment process.

A two-phase process has been used to select the most appropriate remedial alternatives. First, an initial screening of feasible technologies was used to eliminate infeasible, inappropriate or environmentally unacceptable technologies. This screening includes technical concerns, institutional performance and cost criteria. Second, techonologies that pass the screening are evaluated individually or combined to form definitive remedial alternatives.

Site data and waste characteristics were reviewed with respect to each technology to identify the technical criteria. Table 6-A shows limitations of certain technologies because of the physical limitation of the site characteristics. Table 6-B will limit certain technologies because of the limitation of the waste characteristics. Other technical criteria considered was the reliability and performance of the technology, and the implementability or how easily the technology could be constructed, operated and maintained.

Remedial technologies must comply with institutional criteria from federal, state and local standards wherever applicable to the design, construction and operation of each technology. Some considerations include but are not limited to the following; a) Resource Conservation and Recovery Act (RCRA), b) National Pollutant Discharge Elimination System (NPDES), c) State and Federal Department of Transporation regulations on the handling/shipping and manifesting of hazardous waste, d) Local zoning and construction permits and e) Local permits issued by publicly owned treatment works (POTW).

Technologies that are an order of magnitude or greater in cost than other alternatives are screened out if the increased cost offers no greater reliability or if the increased cost provides no greater environmental or public health benefit. This cost screening is intended to reduce the number of technologies that are excessively costly but does not replace the detailed cost analysis for the alternatives remaining after the initial screening. A list of remedial alternatives remaining following the screening procedures are given in Table 7 and Table 8 list the remedial alternatives. A total description of each remedial alternative is given in the Feasibility Study Report.

COMMUNITY RELATIONS

Three fact sheets have been issued to keep the public informed about the progress of the remedial investigation and the development of the feasibility

TABLE 5

TECHNOLOGY SCREENING
REMEDIAL ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC., SITE

Source Control

1. Capping of select areas.

2. Excavation of contaminated onsite soils and sludge and excavation of contaminated offsite soils and sediments.

3. Surface water run-on/runoff controls at the site.

4. Clearing and grubbing of the site:

   - Remove railroad tracks complete, including ties, except the main-line within the railroad right-of-way, which may be temporarily removed at select locations and restored to facilitate excavation of contaminated soil.

   - Remove trash and debris, including abandoned equipment and foundations.

   - Remove stored onsite drums.

   - Remove fuel tanks and service utility lines.

Options to 2, 3, and 4, above:

a) Dispose of excavated material at offsite RCRA landfill.

b) Dispose of excavated material at onsite RCRA landfill.

Management of Migration

5. Recover contaminated groundwater--collect drill soils and mud.

6. Clean and flush existing storm sewers.

Options for 5 and 6, above:

a) Treat groundwater on site and discharge treated water to the bay.

b) Pretreat groundwater on site and discharge to a publicly owned treatment works (POTW).

TABLE 5
TECHNOLOGY SCREENING
REMEDIAL ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC., SITE
PAGE TWO

d) Same options as listed for 2, 3, and 4 for Source Control.

e) Collection and disposal of sediments and waters from storm sewers on site or off site.

No Action

7. No action.

8. No action with monitoring (including drum removal).

TABLE 6-A

Site Limiting Characteristics	Technologies Eliminated from Considersaton
Existing land use (zoned residential/light commerical)	Incineration; land application
Depth of contaminated ground-water plume (approx. 60-80 ft.)	Subsurface collection drains
Site configuration	Land application
Depth to bedrock	Groundwater barriers
Site area	Land application

TABLE 6-B

Waste Limiting Characteristics	Technologies Eliminated from Consideration
Chemical Composition (PAHs, metals)	Pumping and discharging to surface water or WWTP without treatment
Treatability	Chemical treatment with the exception of oxidation
Current condition of sludge	In-situ treatment
Low BTU content	Incineration
Biodegradability	Biological treatment by itself
Volatility	Air or steam stripping

TABLE 7

REMEDIAL ALTERNATIVES FOR EVALUATION
AMERICAN CREOSOTE WORKS, INC., SITE

1. Total Excavation with Offsite Disposal

Total excavation, transportation, and disposal of all contaminated materials, and the backfill of excavations (see Table 3-2A). Dispose of approximately 83,000 cubic yards of excavated materials off site in a RCRA landfill.

Supportive items include clearing and grubbing, removal of railroad tracks, onsite drums, debris, grubbed material, buried fuel tanks, block shower building, office-laboratory building, and other abandoned utilities. Materials classified as hazardous will be transported and disposed off site in a RCRA landfill; non-hazardous materials will be disposed of locally in an approved landfill. Other items include grading, revegetation, and storm water management.

2. Total Excavation with Onsite Disposal

Total excavation and disposal of all contaminated materials in an onsite landfill. The quantities to be excavated and the quantities of various materials to be used for construction of an onsite landfill are shown in Table 3-2B.

Supportive items will be the same as described in Alternative No. 1, above; however, all materials except the onsite drums and railroad tracks will be disposed on site in the newly-constructed landfill. Onsite drums will be transported and disposed off site in a RCRA landfill, while the railroad tracks (rails only) will be sold as salvage.

Other Tables mentioned are presented in the Draft FS Report.

TABLE 7
REMEDIAL ALTERNATIVES FOR EVALUATION
AMERICAN CREOSOTE WORKS, INC., SITE
PAGE TWO

3. Partial Excavation with Offsite Disposal

   Selective excavation, transportation, and disposal of grossly-contaminated sludges, onsite soils, and offsite sediments, in an offsite RCRA landfill. Excavation and backfill quantities are as shown in Table 3-2C.

   Supportive items will include fencing around site, storm water management, and backfilling contaminated city blocks with topsoil, reseeding, and revegetation.

4. Partial Excavation with Onsite Disposal

   Selective excavation and disposal of grossly-contaminated sludges, onsite soils, and offsite sediments in an onsite landfill. The quantities to be excavated and the quantities of various materials to be used for construction of an onsite landfill are shown in Table 3-2D.

   Supportive items will be the same as those described for Alternative No. 3, above.

5. Alternative No. 1 (as listed previously), Plus Groundwater Recovery

   Supportive items would include the following treatment options:

   a. Pretreat groundwater on site and discharge off site to POTW.
   b. Treat groundwater on site and discharge off site into surface water body.

Other Tables mentioned are presented in the Draft FS Report.

TABLE 7 .
REMEDIAL ALTERNATIVES FOR EVALUATION
AMERICAN CREOSOTE WORKS, INC., SITE
PAGE THREE

6. Alternative No. 2 (as listed previously), Plus Groundwater Recovery

   Supportive items would include the same treatment options as listed under Alternative 5.a and 5.b.

7. Alternative No. 3 (as listed previously), Plus Groundwater Recovery

   Supportive items would include the same treatment options as listed under 5.a and 5.b.

8. Alternative No. 4 (as listed previously), Plus Groundwater Recovery

   Supportive items would include the same treatment options as listed under 5.a and 5.b.

9. No Action with Groundwater Plume Monitoring and Assessment

TABLE 8

SUMMARY OF REMEDIAL ALTERNATIVES
AMERICAN CREOSOTE WORKS, INC., SITE

Remedial Alternative (Table 3-1)	EPA Categories: 1. Offsite Measures	2. Attains Standards	3. Exceeds Standards	4. Meets CERCLA goals but does not attain Standards	5. No Action
1. Total Excavation with Offsite Disposal in a RCRA Landfill	Offsite Disposal at RCRA Landfill	NA	NA	By isolation of all waste sources and elimination of further groundwater contamination, will reduce future adverse impacts to human and environmental receptors with time	NA
2. Total Excavation with Onsite Disposal in a RCRA Landfill	NA	NA	NA	Same as Alternative No. 1 above	NA
3. Partial Excavation with Offsite Disposal in a RCRA Landfill	Offsite Disposal at RCRA Landfill	NA	NA	By isolation of major contaminant sources and reduction of further groundwater contamination, will reduce future adverse impacts to human and environmental receptors with time	NA
4. Partial Excavation with Onsite Disposal in a RCRA Landfill	NA	NA	NA	Same as Alternative No. 3 above	NA

TABLE 8
SUMMARY OF REMEDIAL ALTERNATIVES
AMERICAN CREOSOTE WORKS, INC., SITE
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Remedial Alternative (Table 3-1)	EPA Categories: 1. Offsite Measures	2. Attains Standards	3. Exceeds Standards	4. Meets CERCLA goals but does not attain Standards	5. No Action
5. Total Excavation with Offsite Disposal Plus Groundwater Recovery	Offsite Disposal at RCRA Landfill	Offsite Disposal at RCRA Landfill	Onsite groundwater treatment scheme will exceed Federal Pre-treatment Standards for the POTW subalternative and will exceed FDER Water Quality Standards for the Bay Discharge Subalternative	NA	NA
6. Total Excavation with Onsite Disposal Plus Groundwater Recovery	NA	Onsite Disposal at RCRA Landfill	Same as in Alternative No. 5 above	NA	NA
7. Partial Excavation with Offsite Disposal Plus Groundwater Recovery	Offsite Disposal at RCRA Landfill	Offsite Disposal at RCRA Landfill	Same as in Alternative No. 5 above	NA	NA
8. Partial Excavation with Onsite Disposal Plus Groundwater Recovery	NA	Onsite Disposal at RCRA Landfill	Same as in Alternative No. 5 above	NA	NA
9. No Action	NA	NA	NA	NA	Applicable, but does not meet CERCLA goals for public health and environmental protection

study. The local press has been involved with the progress of the American Creososte Works operations beginning before the site became an interest of EPA or the National Priority List. A meeting was held at the Pensacola Yacht Club to inform the membership of the findings of the remedial investigation. The Yacht Club is very interested in the development of their property in the form of condominium or yachting slips. The portion of the Club's property that would lend itself to such development has been established as contaminated from the remedial investigation. A public meeting was held to inform the public and present the draft feasiblity study of alternatives and allow for public comment. A responsiveness summary outlining the results of the public comment is attached. Information repositories are established at the West Florida Regional Library, the Pensacola Junior College and the West Florida University. When approved, the record of decision will be mailed to these repositories.

RECOMMEND ALTERNATIVE

Section 300.68(j) of the National Contingency Plan (NCP) [47 FR 31180; July 16, 1983] states that the appropriate extent of remedy shall be determined by the lead agency's selection of a remedial alternative which the agency determines is cost-effective (i.e., the lowest cost alternative that is technically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare and the environment. In selecting a remedial alternative EPA considers all environmental laws that are applicable and relevant. Based on the evaluation of the cost effectiveness of each of the proposed alternatives, the comments recieved from the public, we recommend Alternative number 2 to be implemented at the American Creosote Works Superfund Site. This selected alternative will address all onsite surface and subsurface contamination problems identified in the Remedial Investigation Report.

The No-action alternative is an unacceptable solution to the problem at the ACW site. Even if the 317 drums of drilling waste are removed, the contaminated source remains in the environment without mitigation. Under the No-action alternative, contaminates would continue to migrate offsite and affect the quality of the groundwater. The No-action alternative would not be acceptable in meeting the objectives of mitigating or minimizing the threat to public health, welfare and the environment.

Those remedial alternatives that suggest offsite disposal of both the highly and lesser contaminated soil do not meet the criteria for cost-effectiveness. Generally, the cost related for transporting all or part of the hazardous materials to an approved Hazardous Waste Management Facility is cost-prohibitive. This eliminates remedial alternative numbers 1,3,5 and 7 from further consideration because of the excessive cost without any greater protection to human health or the environment.

Remedial alternatives 6 and 8 are eliminated from further consideration because these remedial alternatives address groundwater and the groundwater issue has been deferred until more groundwater data can be gathered.

The remaining remedial alternatives (2 and 4) suggest either excavation of both the highly and lesser contaminated soils or excavation of only the highly contaminated soils for disposal on the ACW property. Based on the quantitative risk assessment presented in the Feasibility Study Report, either excavation remedial alternative will meet the criteria for protection of human health and the environment. Table 10 presents the life-time Maximum Risk estimations for the contamination identified on the site. The estimations are based on a variety of "worst possible case" assumptions, all occurring at the same time. Each of the assumptions used in the Risk calculations are also presented in Table 10. In reality, the true carcinogenic risk will be essentially zero because a foot of clean soil will be backfilled after the excavation of the contaminated soils, thereby, eliminating all likely exposure. A health and safety plan should be developed for any construction activities in the area to insure proper maintenance of the one foot of clean fill.

It is EPA's position that all contaminated soils be excavated and disposed on the ACW property as a Source Control Measure in a landfill that meets RCRA standards. To achieve this will require implementation of remedial alternative number 2. Remedial alternative number 2 meets the criteria for protection of human health, protection of the environment and cost-effectiveness. Table 11 list the area to be excavated and the volumes for disposal and Figure 5 illustrates the locations to be addressed during the implementation of alternative number 2.

The design will include excavation of the:

1) highly contaminated soils onsite,
   - existing pond areas
   - old process areas

2) highly contaminated soils offsite,
   - drainage ditch area on the Yacht Club
   - a section of City Block number 184

3) lesser contaminated soils onsite,
   - old pole storage areas
   - cleaning and grubbing of the site
   - contents of the 317 drums of drilling waste

4) lesser contaminated soils offsite
   - City Block number 179 through 183 and Block number 162
   - Yacht Club property at the corner of Cypress and 'K' Street

Figure 6 illustrates cross-section of the landfill, while Figure 7 depicts an aerial view of the landfill.

TABLE 9
MAXIMUM RISK
Polynuclear Aromatic Hydrocarbons & Benzene
AMERICAN CREOSOTE WORKS INC., SITE

	Maximum Concentration (mg/kg)		Carcinogenic Risk	
Alternative	Total PAHs(1)	Benzene	Dermal(2) Exposure	Accidential(3) Ingestion
No-Action	800	0.13	$5.6x10^{-1}$	$2.3x10^{-1}$
Partial Excavation	138	0.13	$9.7x10^{-2}$	$4.1x10^{-2}$
Total Excavation	12.0	0.13	$8.4x10^{-2}$	$3.5x10^{-2}$

Note: (1) The concentrations tabulated are the summation of the maximum concentration of the compounds found.

(2) Dermal exposure risks were based on Table C-3 in the Draft FS.

(3) Accidential exposure risks were based on Table C-4 in the Draft FS.

Assumptions used in the estimation of the excess cancer risk associated with dermal contact are as follows:

(a) All carcinogenic PAH's used in the estimation of cancer risk have the same carcinogenic potency as benzo(a)pyrene.

(b) A receptor will be exposed to the maximum concentration of carcinogenic PAH's over a lifetime (70 years).

(c) Lifetime dermal soil accumulation is 110,000 grams (Schaum, 1984).

(d) 100% of the PAH's are absorbed through the skin.

(e) PAH's do not degrade in soil over time.

Additional assumptions used in the estimation of the excess cancer risk associated with accidental ingestion are as follows:

(a) Body weight of a child is 14 kilograms.

(b) Exposure duration is 365 days per year from ages 2-6, for a total of 1,830 days (Schaum, 1984).

(c) A receptor ingest 5 grams of soil per day.

TABLE 10

TABULATION OF EXCAVATION AND BACKFILL
(TOTAL EXCAVATION-ONSITE DISPOSAL)
AMERICAN CREOSOTE WORKS, INC., SITE

Description		Quantity for Disposal
1. Excavation from Existing Ponds		
Total – cap, sludge, kiln dust, and lime	50,500 cu yd	
Clay Cap (Salvage)	13,100 cu yd	
Net Quantity for Disposal		37,400 cu yd
2. Excavation of Contaminated Soils at Select Locations		
Onsite		
a. At 4.5 ft depth (sampling areas 4, 5, 6, and 7)		10,600 cu yd–
b. At 2.0 ft depth (sampling area 9)		1,100 cu yd
c. At 1.0 ft depth (sampling areas 1, 2, 3, and 8)		2,350 cu yd
d. Excavation for landfill	4,400 cu yd	
Offsite		
e. At 1.0 ft depth at Yacht Club property		3,500 cu yd
f. Contaminated sediments from "L" Street drainage outfall ditch on Yacht Club property		800 cu yd.
g. At 1.0 ft depth (offsite sampling areas 0-1, 0-2, 0-3, and 0-4 within City Blocks 179 through 184 and Block 162)		20,000 cu yd
3. Clearing and grubbing 9.0 acres at 0.5 ft depth		7,250 cu yd
Total Excavation, General	17,500 cu yd	
Total Excavation of Contaminated Materials for Disposal . . .		83,000 cu yd

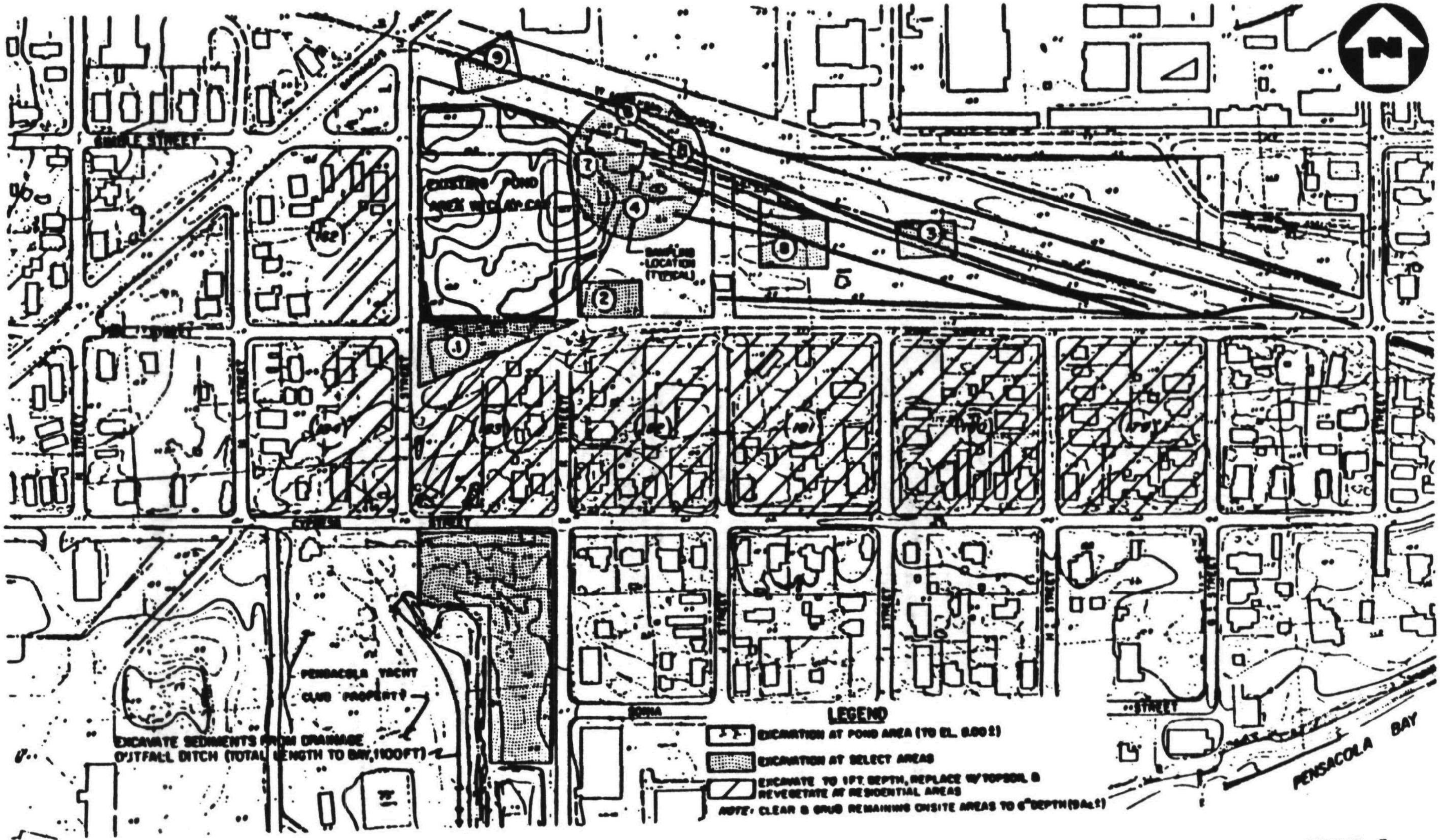

FIGURE 5

SELECTED LOCATIONS FOR EXCAVATION OF CONTAMINATED SOIL, SLUDGE AND SEDIMENT (TOTAL EXCAVATION) AMERICAN CREOSOTE WORKS, INC. SITE, PENSACOLA, FL

SCALE IN FEET

NL CORPORATION
A Halliburton Company

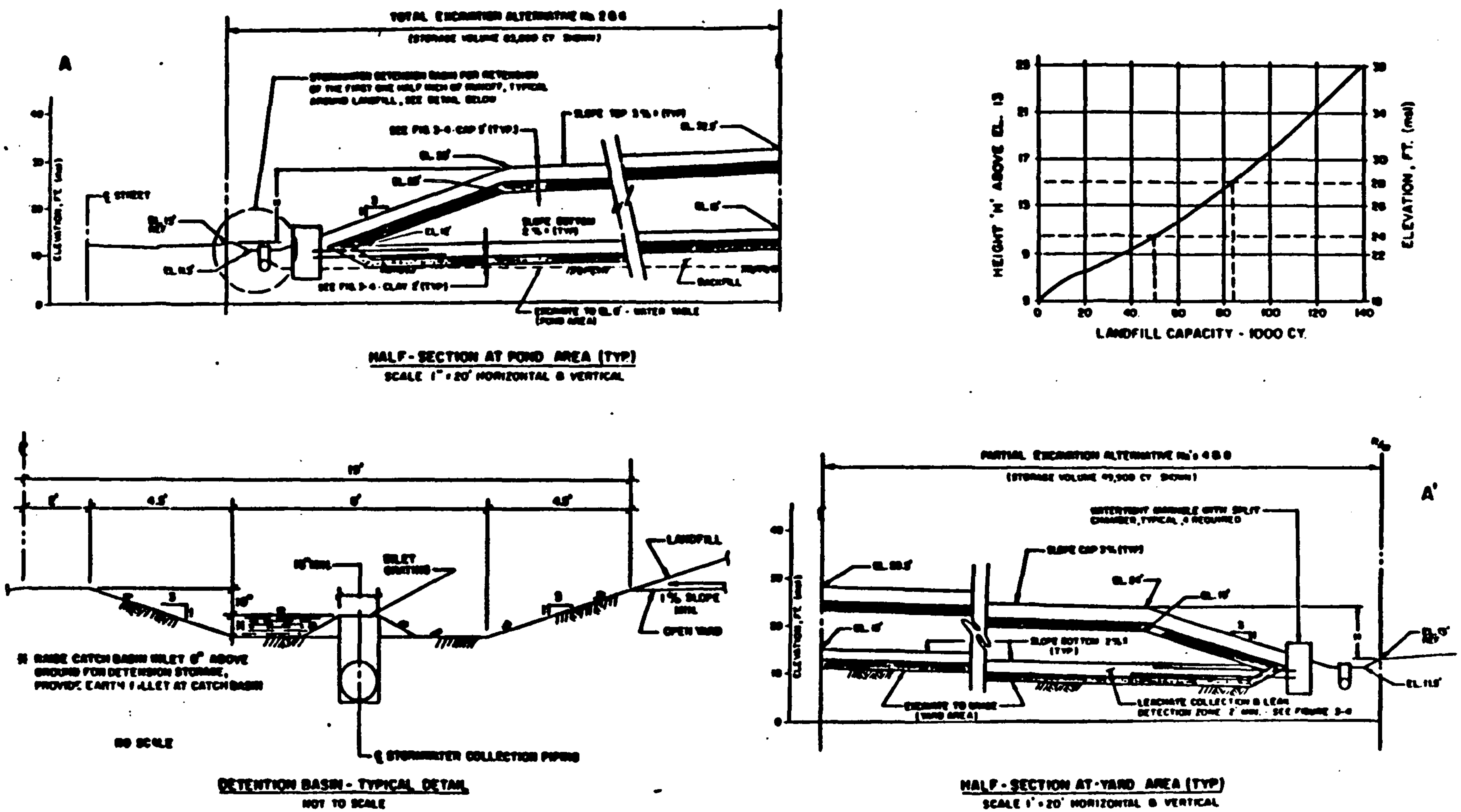

FIGURE 6

ONSITE LANDFILL-TYPICAL SECTION A-A'
AMERICAN CREOSOTE WORKS INC. SITE, PENSACOLA, FL
SCALE AS SHOWN

NUS CORPORATION
A Halliburton Company

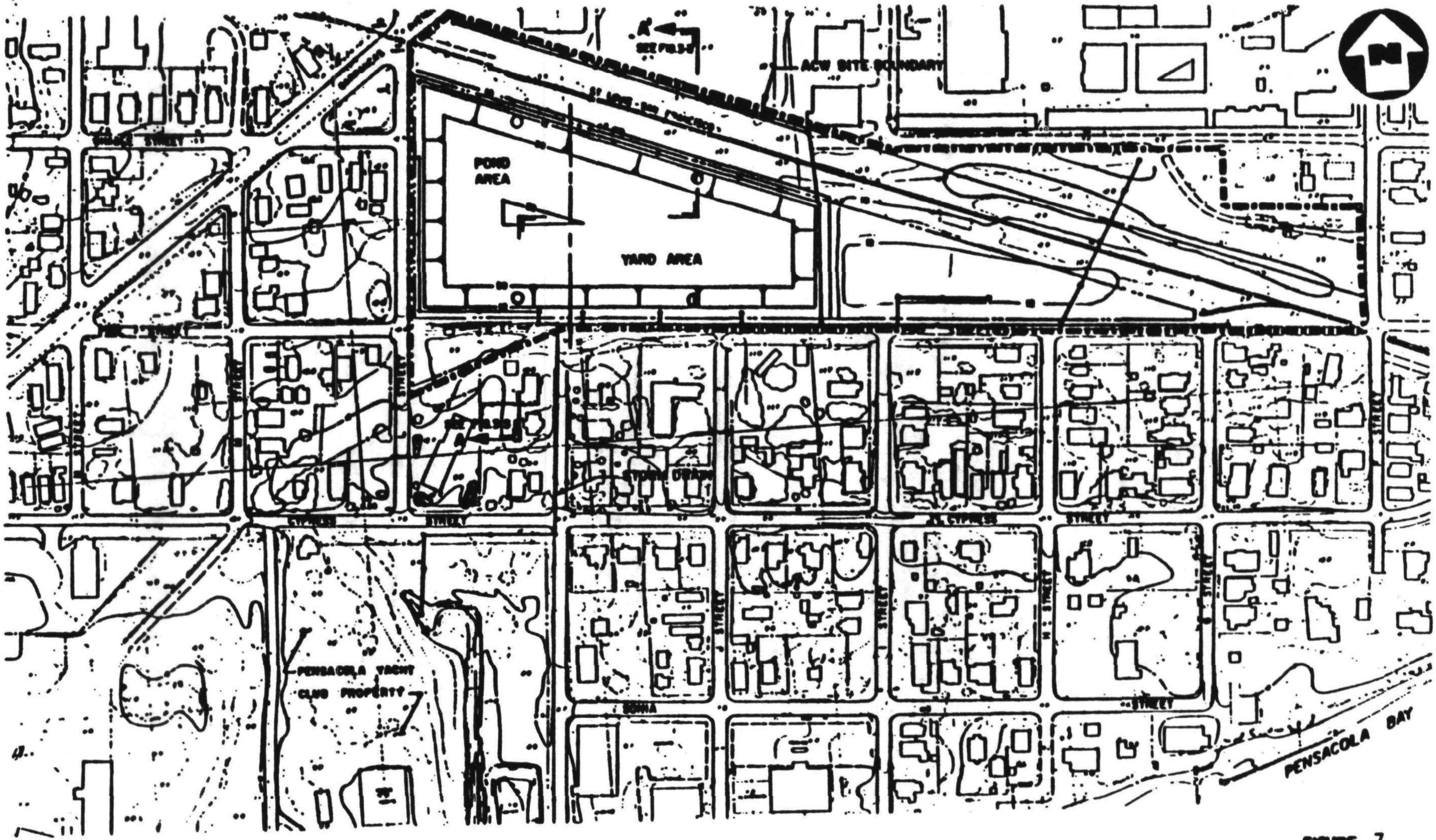

FIGURE 7

ONSITE LANDFILL

AMERICAN CREOSOTE WORKS INC. SITE, PENSACOLA, FL

SCALE IN FEET

NL CORPORATION

A Halliburton Company

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

Alternative 2 will result in a disposal site being constructed on the ACW property to RCRA design standards. While some contaminated soils will remain, the potential for any health risk are well below the established acute toxicity or the probability of injury from short-term exposure due to the relatively low observed concentration for the critical contaminants. The selected alternative will not effect any floodplaines and the wetlands area. We do not anticipate any conflict with other environmental laws. Table 8 summarizes the evaluation of alternatives with respect to other environmental concerns. Remediation for the groundwater is being deferred until more information is gathered.

OPERATION AND MAINTENANCE (O&M)

A Post-Closure and Monitoring Plan is required under RCRA. The Plan provides for the procedures, frequencies and technical considerations of such activities necessary to preserve the integrity of a capped disposal facility. The estimated Annual Cost associated with Operation and Maintenance are presented in Table 12, Alternative number 2. Operation and Maintenance cost are available for Fund monies for a period of one year and the O&M cost following one year are a responsibility of the State.

SCHEDULE

The Corps of Engineer will advertise for firms to conduct the remedial design. Review and selection of a contractor is scheduled for March 1986 with remedial design completed by June 1987. Construction should proceed immediately thereafter and should be completed by July 1988.

FUTURE ACTIONS

At a later date Operable Unit II will be required which will constitute the Agency's official selection of an alternative for the Management Of Migration of contaminants in the groundwater at this site. Operable Units I and II will then form the basis for the entire site's Remedial Design.

TABLE 11

REMEDIAL ACTION ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC., SITE

Alternative	Components	Costs ($1,000) Capital	Annual O & M yr. 1-5	Annual O & M yr. 6-30	Public Health Considerations	Environmental Considerations	Technical Considerations
Alternative No. 1	Total Excavation with offsite disposal; clearing and grubbing: drums, debris, tracks, other miscellaneous removal; grading, revegetation, and stormwater management	$21,337 $33,077	45 45	14 14	Minimal short term exposure of workers and nearby residents via inhalation or dermal contact with contaminated materials. Does not address residual groundwater contamination impacting local receptors through inhalation, dermal contract or casual ingestion	Surface water runoff control measures and proper construction practices will minimize potential adverse environmental impacts	Uncertainty regarding endpoint for cleanup
Alternative No. 2	Total excavation with onsite disposal; Drum disposal offsite; tracks sold as salvage; clearing and grubbing; site preparation and stormwater management	$ 5,878 $ 5,687	50 50	19 19	Same as in Alternative No. 1. In addition, impacts on local receptors during construction of the onsite landfill will be minimal. Short-term exposure to nearby residents due to temporary stockpiling of contaminated materials during site preparation for construction of onsite landfill	Same as Alternative No. 1	Same as Alternative No. 1

TABLE 11.
REMEDIAL ACTION ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC., SITE
PAGE TWO

Alternative	Components	Costs ($1,000) Capital	Annual O & M yr. 1-5	Annual O & M yr. 6-30	Public Health Considerations	Environmental Considerations	Technical Considerations
Alternative No. 3	Partial Excavation with offsite disposal; fencing;	$13,030	45	14	Same as for Alternative No. 1, however, risks to onsite and offsite receptors lower due to selective versus total excavation for Alternative No. 1. Residual risks is greater, as this alternative does not address all sources of contamination. Does not address groundwater contamination and its potential impacts on local receptors.	Same as Alternative No. 1	Same as Alternative No. 1
	backfilling city blocks; grading and stormwater management	$20,044	45	14		Environment impacts would depend on contaminant attenuation and the concentration at the point of exposure.	
Alternative No. 4	Partial Excavation with onsite disposal;	$ 4,678	50	19	Same as for Alternative No. 1, however, risks during implementation less due to reduced quantities. Residual risks greater than No. 1 since partial excavation does not address all sources of contamination. Does not address the impact of contaminated groundwater.	Same as Alternative No. 1	Same as Alternative No. 1
	fencing; backfilling city blocks; grading and stormwater management	$ 4,685	50	19		Environmental impacts would depend on contaminant attentuation and the concentration at the point of exposure	

TABLE 11
REMEDIAL ACTION ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC. SITE
PAGE THREE

Alternative	Components	Costs ($1,000) Capital	Annual O & M yr. 1-5	Annual O & M yr. 6-30	Public Health Considerations	Environmental Considerations	Technical Considerations
Alternative No. 5	Total excavation with offsite disposal plus groundwater recovery. Same supportive items as Alternative No. 1 plus pretreat groundwater onsite and discharge to POTW, or treat onsite and discharge to the bay.	$23,104/ 34,844	728	15	For excavation and offsite disposal, same as in No. 1; groundwater treatment would pose minimal hazards to operators and local residents. Treated discharge to POTW or the bay will not have any adverse impacts if effluent meets pretreatment standards or water quality standards	Same as Alternative No. 1 No adverse environmental impacts on the bay expected because the designed effluent concentrations of the critical contaminants are below the acute and chronic water quality criteria for the protection of salt-water aquatic life.	Same as Alternative No. 1 Operation and maintenance of the onsite treatment plant critical with respect to effluent quality and its potential impact on the POTW or the Bay.
		$23,882/ 35,622	377	15			
		$23,279/ 35,019	845	19			
		$24,049/ 35,789	420	19			
Alternative No. 6	Total excavation with onsite disposal plus groundwater recovery some supportive items as Alternative No. 2 plus pretreat groundwater onsite and discharge to POTW or treat onsite and discharge to the bay.	$7,445/ 7,454	733	20	Same as Alternative No. 2 for the excavation and onsite disposal component Same as Alternative No. 5 for the groundwater recovery and treatment component	Same as Alternative No. 2 for the excavation component Same as Alternative No. 5 for the groundwater recovery and treatment component	Same as Alternative No. 2 for the excavation component Same as Alternative No. 5 for the groundwater recovery and treatment component
		$8,223/ 8,232	382	20			
		$7,620/ 7,629	850	24			
		$8,390/ 8,399	425	24			

TABLE 11
REMEDIAL ACTION ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC., SITE
PAGE FOUR

Alternative	Components	Costs ($1,000) Capital	Annual O & M yr. 1-5	Annual O & M yr. 6-30	Public Health Considerations	Environmental Considerations	Technical Considerations
Alternative No. 7	Partial Excavation with Offsite Disposal plus Groundwater Recovery. Same supportive items as Alternative No. 3 plus pretreat groundwater onsite and discharge to POTW or treat onsite and discharge to the bay	$14,797/ 21,811	728	15	Same as Alternative No. 3 for the excavation component	Same as Alternative No. 3 for the excavation component	Same as Alternative No. 3 for the excavation component
		$15,579/ 22,589	377	15	Same as Alternative No. 5 for the groundwater recovery and treatment component	Same as Alternative No. 5 for the groundwater recovery and treatment component	Same as Alternative No. 5 for the groundwater recovery and treatment component
		$14,972/ 21,986	845	19			
		$15,742/ 22,756	420	19			
Alternative No. 8	Partial Excavation with Onsite Disposal plus Groundwater Recovery. Same supportive items as Alternative No. 4 plus pretreat groundwater onsite and discharge to POTW or treat onsite and discharge to the bay.	$6,443/ 6,452	733	20	Same as Alternative No. 4 for the excavation component	Same as Alternative No. 4 for the excavation component	Same as Alternative No. 4 for the excavation component
		$7,221/ 7,230	382	20	Same as Alternative No. 5 for the groundwater recovery and treatment component	Same as Alternative No. 5 for the groundwater recovery and treatment component	Same as Alternative No. 5 for the groundwater recovery and treatment component
		$6,618/ 6,627	850	24			
		$7,388/ 7,397	425	24			

TABLE 11
REMEDIAL ACTION ALTERNATIVES SUMMARY
AMERICAN CREOSOTE WORKS, INC., SITE
PAGE FIVE

Alternative	Components	Costs ($1,000) Capital	Annual O & M yr. 1-5	Annual O & M yr. 6-30	Public Health Considerations	Environmental Considerations	Technical Considerations
Alternative No. 9	No Action with Groundwater Plume Monitoring and Assessment with Drum Disposal Offsite	46 55	41 41	10 10	Dermal absorption of site contaminants would not have acute toxic impacts.	Consumption of contaminated groundwater by terrestial animals may have some long-term consequences	None
					Casual ingestion of groundwater could have chronic toxicity effects since maximum observed concentrations in groundwater for naphthalene and fluoranthene will exceed the Acceptable Daily Intakes (ADI's)	Contaminant levels expected to reach the bay would not impose limitations on its recreational use	
					Incidential oral exposure or dermal contact with PCP-contaminated soils could have chronic toxicity impacts	Bioaccumulative effects of PAHs on marine biota are of a short duration thus biomagnification up the food chain is not expected	

RESPONSIVENESS SUMMARY FOR THE
AMERICAN CREOSOTE WORKS, INC. NPL SITE
PENSACOLA, FLORIDA

BASED ON COMMENTS FROM THE
PUBLIC MEETING OF
AUGUST 15, 1985

TOPIC: **HEALTH CONSIDERATIONS**

Issue: Who is the chemist here? What is your definition of an aromatic hydrocarbon? Is that a creosote or a phenol?

Discussion: That is essentially associated with creosote.

Issue: People have lived near the site, worked there, and played near there. No case studies (health problems) have been found and now you're telling me that the contaminants are going to kill me. I'm asking you, is it the phenol or the creosote?

Discussion: Are you asking which one is more toxic?

Issue: Pentachlorophenol is the more dangerous of the two substances, isn't it?

Discussion: I believe so, yes. That's the position we've taken so far.

Issue: What is an aromatic hydrocarbon?

Discussion: The polynuclear aromatic hydrocarbons we are talking about are the major components of creosote. The chemical contaminants associated with creosote are polynuclear aromatic hydrocarbons. Some examples of polynuclear aromatic hydrocarbons include naphthalene, anthracene, and fluoranthene, just to name a few.

Issue: These are components of creosote?

Discussion: Yes, these are components of creosote. The pentachlorophenol is an acid-fraction and is not part of creosote. As I understand the history of the site, most of the processes involved creosote at this plant. After 1951, they also started using pentachlorophenol as a wood-treating chemical.

Issue: How many people have died from these hazardous wastes? How many case studies (health problems) have been documented? There's no evidence of cancer, and if there is, I want to know about it because I grew up there. I played on that property. You spent $15,000 for a clay cap--one that is poorly packed--and there isn't a problem. I don't think that's saving money; that's a waste.

Discussion: Just because no people have died does not mean that there is not a problem. We adopt a "Chicken Little" syndrome at these sites; that is, we treat them as if there is a problem and remediate them before a bigger problem occurs.

Issue: Are health department representatives here tonight?

Discussion: They are not here. However, they were invited.

TOPIC: REMEDIAL TECHNOLOGIES

Issue: There are basic chemical processes that were used at the plant. Creosote is being destroyed by bacteria in the ground and has been for over the last 80 years. Is the bacteria in the soil destroying the pentachlorophenol? I understand there is one kind that is destroying the creosote.

Discussion: We don't know of one. If there is any process with bacteria that is biodegrading the creosote, it is not evident from the data we have collected.

Issue: I read this in the (Pensacola) News Journal.

Discussion: I'm not aware of that. I think you're talking about the process of biodegradation of this particular compound. There is some indication that aerobic bacteria, that is, bacteria which need air in order to live and work on the contaminants--will biodegrade certain coal-tar derivatives, such as polynuclear aromatic hydrocarbons. However, when you get away from air and start going down into the ground, you get into anaerobic conditions. There have been no demonstrations that I know of that anaerobic bacteria will work on these particular contaminants under the ground.

Issue: There is a news release saying that there's a new technique of pumping oxygen into the ground for these bacteria.

Discussion: We are aware that there are some new technologies on the leading edge that could possibly be used. However, none have been proven to date.

Issue: If this aerobic bacteria destroys this material, why not till up the ground and bring it to the surface and let the bacteria destroy it? Or, why don't you introduce more bacteria that would work on the polynuclear aromatic hydrocarbons?

Discussion: We have looked at this technology. The reason we screened out this technology is again the same reason we screened out incineration, i.e., we have pockets of contamination mixed in with earth and soil and fly ash and lime. And even if you bring it up to the surface and mix this stuff, you are going to have partial treatment of these contaminants. If you had homogeneous wastes and if it were localized, biodegradation could very well work. But we would have to really isolate the wastes from the soil itself in order for us to aerobically treat this stuff. We felt that the technologies currently on the market are not proven for this particular site in its present condition. There have been some attempts in other areas to use biodegradation on sites of this nature that are contaminated with creosote. Part of the problem with biodegradation is that you have many factors to manage that could influence the way the bugs are going to attack the material. The weather, the amount of rainfall, temperature--these all have to be controlled very carefully in order for this to work. Biodegradation is not what we consider to be a proven technology.

Issue: Have you thought of deep well disposal, pumping the stuff underground?

Discussion: That compounds the problem somewhat, because, as you can well understand, it is very difficult to fathom or delineate what happens to a waste stream when you pump it underground under pressure. We have many horror shows in the regions where permitted injection wells have contaminated local water supplies because of improper installation of the well or because of the inability to determine what the substance is like, which might have prevented it from getting into the water supply. I think we would be compounding our problem.

Issue: I want to know why you dismissed incineration as an alternative when your other regions are promoting it as a method of destroying dioxin.

Discussion: We are basically looking at materials that are inert. We're looking at materials that have a low BTU content. When the immediate removal occurred on the pond area, they mixed the sludge with fly ash and lime, which are essentially inert materials. The costs for both onsite and offsite incineration are therefore considerably higher than some of the other alternatives we are looking at. Offsite incineration costs would be more than the total cost of the offsite disposal alternative that we are discussing. Also, we evaluated capacities of existing permitted incinerators. It will take 7 to 10 years to burn this material, and if you use an offsite facility, you must store this material someplace in any case. With onsite facilities there would be an incinerator in the middle of downtown Pensacola, surrounded by a residential area. It would have to meet air pollution standards. There would also be residues left over after incineration since we would be burning a lot of inert material. We would have to dispose of the ash after we burn the wastes. Since there is a lot of inert material, the high costs involved, which are 5 to 10 times greater than some of the other alternatives proposed, were the main reasons why we screened out incineration as a viable alternative.

Issue: Were you comparing this to the dioxin incineration in Missouri, at the Verona Site?

Discussion: I don't know what quantities were involved at that site. I'm not familiar with that site.

Issue: What about putting the contaminated material under concrete or asphalt with a shopping center over it?

Discussion: There are many materials that are evaluated as materials for liners, which are designed to contain wastes of one kind or another. We have found that when it comes to containing organic wastes, organic materials cannot contact the liner. For example, asphalt would be out because creosote would go right through it.

TOPIC: ADMINISTRATIVE ISSUES

Issue: What is the purpose of this meeting? We've identified the problem. What is next? Where do you see this going?

Discussion: The purpose of this meeting is to inform the public of the findings of the Feasibility Study and to obtain input from you, the citizens, concerning the recommended alternatives. The public comment period closes in 3 weeks, and you may send your letters to me or to Beverly Mosely. Our addresses are listed in the Fact Sheet. We will use your comments in guiding us in our decision. Once an alternative has been chosen, a Record of Decision will be written. The next step is design and construction of the alternative.

Issue: Which alternative have you decided on?

Discussion: No selection has yet been made. We will select the alternative after the public comment period and after we consult with the DER. The alternative we select will be cost-effective and technically sound.

Issue: You do not have a recommendation at this particular stage that you think is the best one?

Discussion: At this time, we are leaning towards partial excavation with onsite disposal and groundwater monitoring.

Issue: Are you asking what we think should be done? As a homeowner, I would like to see Alternative No. 9 implemented (No Action with groundwater plume monitoring and assessment).

Discussion: Thank you.

Issue: The Fact Sheet indicates that these reports are available at the libraries listed. Are all reports available for public review at these libraries?

Discussion: Yes. The Remedial Action Master Plan (RAMP), the Draft Remedial InvestigationReport (RI), and the Draft Feasibility Study Report (FS) are at the repositories. The Community Relations Plan is also available at those locations.

Issue: What is your proposal concerning the railroad? I bought all of the railroad property adjacent to my property.

Discussion: We are proposing, only for those alternatives containing total excavation, to remove the following: 360 feet of the main line in order to excavate contaminated soils (the line will then be replaced); about 6500 linear feet of tracks on the ACW property for site preparation, grading, and any other site activities; and 2500 feet of track on Pine Street south of the site for installation of the storm water collection system.

Issue: Based on comments I've heard so far, and as a taxpayer and an environmentalist, I would like you to go for the entire works. I think onsite disposal is not going to remedy the situation, because you will still have a block of land with contaminated sediments. The Yacht Club has plans for the redevelopment of the area and we could partially recover and use the land. Redevelopment of that land after it has been totally cleaned is much better. Superfund is a tax, right? Doesn't it [the money] come from a tax on the chemical companies?

Discussion: The future use of the land at and surrounding the American Creosote Site will have to be compatible with the remedy selected as well as all other local and State institutional restrictions.

Superfund cleanups are financed by a trust fund which will grow to $1.6 billion over a five-year period. The Fund can be used to provide both emergency and long-term cleanup of releases of hazardous substances and inactive waste sites. It is collected through taxes paid by manufacturers, producers and exporters and importers of oil and 42 chemical substances.

Issue: In the total excavation alternative, what provisions are made for the homeowners? Do you put us up in other houses or what?

Discussion: It is not EPA's policy to relocate people.

Issue: Are the people compensated or do the people just get a new yard in return?

Discussion: There are no provisions for compensation; however, the property would be restored to its original condition after excavation work is completed.

Issue: Did you check out Ashley for its pentachlorophenol? They were treating wood with pentachlorophenol before American Creosote knew what pentachlorophenol was.

Discussion: I'm not familiar with that site.

Issue: Back in 1981, when you first discovered this problem, why weren't the adjacent property owners notified of this problem? Wouldn't it have been proper to notify the people of the problem?

Discussion: That was the first time the site was discovered. There was not enough data to assess the nature and extent of the contamination and its potential impact on human health or the environment.

Issue: I have a ground well that is contaminated. Will I be reimbursed for it?

Discussion: At this point, we do not have plans for that.

Issue: How soon do you anticipate the most rapid action? How soon can you clean up the site?

Discusson: I would say next summer would be the earliest. But that hinges on the fact that money is available. Congress has not yet reauthorized the Superfund Bill.

Issue: As far as you hauling the stuff away in trucks--to another landfill or whatever--who is going to keep track of the trucks and assume responsibility for them? The State? EPA? Who is going to clean up this hazardous waste if these trucks jackknife or break down?

Discussion: You're saying that you don't want it trucked away?

Issue: I'm saying, "keep that snake in the box." I don't want it on the highways. Why move it 300 miles to Alabama? Florida ought to take care of its own problems.

Discussion: The problem here in Florida is that the groundwater table is very close to the surface. It's only about 3 feet underground. Therefore, land burial of hazardous waste in Florida is not feasible, as it would be buried right next to our groundwater. There are many demonstration projects going on for new alternative ways of treating wastes. We're hopeful that some of them will pan out and will be applicable. The potential in this program is that down the road, if there is a really unique alternative that comes to light that may be useful in treating a particular waste, then we could use it. Until such a treatment comes along, we have to act on what we have right now in the way of acceptable, proven technologies.

Issue: What about storing it over on some of Eglin's property? That's Federal Government property, and it would seem that they could spare a few inches over there on that bomb range.

Discussion: I think Eglin might have their own hazardous waste problems. The Department of Defense has some sites on our list, and I'm not sure that they would be receptive to that idea.

Issue: Did you cost out incineration and biodegradation in your report?

Discussion: We did not cost every technology under the book. If we did that, this report would cost a lot more than it did. But we looked at every single technology before we began the screening process and explained why we screened those technologies out, whether it was because of site characteristics, waste characteristics, or excessive costs as compared to other acceptable , proven technologies. In this particular area of hazardous waste cleanup, we are looking at proven track records on technologies. There are a lot of cleanup methods currently on the market. If you use one of them, and it doesn't work, then you have to go back and reinvent the wheel, so to speak.

Issue: Is there going to be money left over from Superfund to clean up this site?

Discussion: I think Superfund will be here for awhile. Judging by the number of sites we turn up annually, it [the problem] is growing and there will be a need for the Superfund to be around.

Issue: The way it was explained to me was that when Congress revised RCRA and made these regulations on hazardous waste, they intended it to be oversight. The intent of Congress is not to even have these wastes and to find alternatives such as incineration. If you have liabilities and take the material to Emille, and if they take it from you, than as a private company they are liable if the stuff leaks out of their landfill. Would you have to clean up Emille if you dispose of the material there?

Discussion: Emille has about a 600-foot clay layer and it will take 5800 years or so for the material to migrate, if it does. They are building the cells a lot smaller and are also being extra careful, utilizing sampling to a large extent in order to verify what is going into the landfall. The overall goal of the hazardous waste management program is to get out of the landfill business eventually and get more into reducing the amount of hazardous waste we produce and also move into the recycling and resource recovery aspects of hazardous waste.

Issue: Where does the local government fit in when we get further into the process with these alternatives? I'm with the City of Pensacola. You were talking about local permitting at one point.

Discussion: That's correct. Before we do anything, we would first have to take into consideration all of the requirements, whether they are local, State, or Federal, including environmental or engineering permits. The city has been contacted during the time of this study. The city engineer's office was contacted in order to determine things such as whether existing sewer lines would be adequate to convey the treated groundwater to the sewage treatment plant or whether existing storm sewers are adequate. The city and the county have been involved one way or another. We also involved the Escambia County Utilities Authority because we were talking about discharging groundwater into their system. Any affected parties have been kept abreast of our activities.

TOPIC: **LAND REDEVELOPMENT**

Issue: Under any of the alternatives considered, what potential is there for future development in the area? The Yacht Club is considering building boat slips. Would any of the alternatives permit future development or would they preclude this?

Discussion: Future development would depend on the alternative selected and also upon local permitting requirements, including compliance with local ordinances.

Issue: Would total excavation with offsite disposal permit more development in the area?

Discussion: Yes.

Issue: Is it correct that the land surrounding the disposal area could not be developed as much as it could if there were not onsite disposal?

Discussion: That is also true. The onsite landfill would essentially isolate that particular area from any development. The area around the site property could be developed regardless of onsite or offsite disposal.

Issue: If the onsite disposal alternative is selected and the land is recovered and revegetated, would you be able to use the area as a park or recreational area?

Discussion: As long as the use is consistent with the alternative selected in the remedial action that's taken, there is probably no reason why it couldn't be used for whatever the local permits would allow for the area.

TOPIC: **TECHNOLOGICAL CONCERNS**

Issue: When you talk about total excavation, does that mean the total removal of the houses?

Discussion: No, just the soil would be removed.

Issue: So how are you going to remove the soil from under the houses?

Discussion: We will not remove soil from underneath the houses. We will work around permanent structures such as driveways, houses, trees, and shrubs. And a lot of it will have to be done manually as opposed to using heavy equipment so as to disturb only those soils that are contaminated.

Issue: Could you report the depths of the excavations?

Discussion: For those areas where the contaminant concentrations increased with depth, we will excavate down to the water table, which is approximately 4 1/2 to 5 feet. In all other areas we will remove the top foot of contaminated soils.

Issue: Can you show me where the underground plume is now, where it is going, and how fast it is moving south?

Discussion: Based on the groundwater monitoring data, contaminants have been detected in the southernmost well to a depth of 60 feet. This well is approximately 900 feet south of the site. Based on the concentration of the contaminants found at this well, it can be surmised that the contaminants have migrated further south, close to the bay.

Issue: Is there a wall of clay preventing the groundwater from going into the bay?

Discussion: There are various thicknesses of clay underneath the pond area, but the most extensive clay is on the Yacht Club property. It starts at a depth of 20 feet, and it is about 20 to 30 feet thick. As the plume moves south of the site, this clay area divides the plume. Part of the plume goes above the clay area; part of it goes below it. The one that goes above the clay area eventually recharges the ditch and flows into the bay through the ditch itself, as surface water. There is water in the ditch and especially during dry times, what you're looking at is not rainwater--it's groundwater, recharged from that area.

Issue: So there's no wall between the ditch and the bay?

Discussion: No, there is no wall.

Issue: Is it already flowing into the bay?

Discussion: We do not have monitoring wells down to the bay level, but we have detected contamination in the southernmost wells.

Issue: Where is the 100-year flood plain in relation to the site?

Discussion: We are required to study that issue under Superfund statutes. The 100-year flood plain begins right where the site ends. The 100-year flood plain is at an elevation of 10 feet, and the average elevation of the site is 12 to 13 feet. When we refer to the ditch, we are in the 100-year flood plain because the elevation is under 10 feet. However, the site itself is not in the 100-year flood plain elevation.

Issue: Are the contamination levels measured in parts per million or parts per billion?

Discussion: In the soils, we measured in parts per million, or what we call miligrams per kilograms. In the groundwater, we measured contaminants such as napthalene and fluoranthene in parts per million. The rest of the contaminants in the groundwater were measured in parts per billion. Essentially, the one contaminant that we found in different media and at high levels was napthalene. In the soils, we detected napthalene at levels varying from 74 to 1100 parts per million. As far as groundwater is concerned, we did find very high levels of napthalene ranging between 35 and 580,000 parts per billion. So to answer your question, we have ranges of parts-per-million level in the soil and parts-per-billion level in the water.

Issue: You detected 580,000 parts per billion?

Discussion: Yes. However, this might not have been a representative sample. It is a questionable result because this one sample was an order of magnitude higher, compared to data for the same contaminant in other wells. What this tells us is that the data might be questionable for that particular sample, but we had to include it--with a qualifier that said that the number may not be representative.

Issue: How high above the ground would the onsite landfill be?

Discussion: About 15 to 19 feet, depending on whether you go with total or partial excavation.

Issue: With regard to the amount of material you have to remove, how does it compare to other projects? Do you have to remove a lot of material?

Discussion: The only other project that I can think of where we moved anywhere near the amount of dirt that we have to remove at this site consisted of half that amount, or about 40,000 cubic yards, which we moved to a specially constructed landfill in the State of North Carolina. So we are talking twice that amount of material for this site.

Issue: Would incineration completely clean up this area as well as total offsite removal?

Discussion: Yes, it would. You would have to do something with the residual ash that would contain heavy metals, and you might have to transport that material offsite if you decided not to have an onsite landfill.

Issue: If you had to pick a place to put hazardous waste, this would be one of the worst places because the groundwater is so close to the surface, right?

Discussion: That is correct. The remedies that we have basically proposed for leaving the waste on the site are to contain it and abate further migration of the waste from the site--in other words, to try to prevent it from spreading any further and to hold it in place.

Issue: But isn't there already contamination in the water table beneath the site?

Discussion: Yes, but that could be taken care of if you pick an alternative in which you are also treating the groundwater. If you consolidated all the excavated material and stored it in an onsite landfill, and at the same time put in wells and pumped out the contaminated groundwater and treated it, you would have essentially taken care of the problem.

Issue: What's the time period involved?

Discussion: Based on the data that we have evaluated, we are looking at a span of about 5 years.

Issue: Why don't you leave things as they are and just monitor the public health until a new technology is discovered to completely clean up the site?

Discussion: The No-Action alternative with monitoring is an alternative we are evaluating.

In addition to the oral comments received at the public meeting on August 15, 1985, the EPA also received one written comment from the Audubon Society.

Issue: Tolerance levels and specific effects on humans, plants, and animals were not given. In the report, there was not adequate information on bioaccumulation or the potential effects on humans who frequent Sanders Beach, where the underground plume emerges. Also, the possibility of chemicals at the site interacting with each other was not discussed in the study.

We feel that particular attention should be given to the onsite treatment of groundwater. Discharge of the groundwater into the Main Street Plant should occur only if there is assurance that this facility is capable of properly handling this treatment in a manner safe to the plant and the Bay where it discharges. We do not recommend onsite disposal.

Discussion: Since EPA has been involved with the American Creosote Site, EPA has made an effort to inform the residents, the local government and the State about the activities at the site.

Both chronic and acute toxic effects that may affect human health as well as the environment as a result of the contamination from the ACW Site have been presented in the Remedial Investigation Report and the Draft Feasibility Study.

Total excavation plus groundwater recovery is a proposed alternative that is under consideration for final remedial action. The groundwater discharge to the Escambia County Utility Authority Waste Water Treatment Plant (WWPT) is an item of concern, since the WWPT has not always been in compliance with their NPDES permit. An onsite disposal alternative which will result in the site being somewhat higher in elevation is possible. However, with revegetation and proper design the disposal area could blend in with the surrounding area. Our information indicates that the ACW property is not within a 100-year flood plain, and that an onsite disposal alternative would not of itself create an environmental or health hazard.