APPENDIX C

Site-Specific Data Collection Forms

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SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Pensacola, FL)
PHASE I/PHASE II ANALYSIS

Comments: Note that original decision to landfill wastes was overturned because the state did not concur. This analysis represents the amended FS/ROD.

TECHNOLOGY	FS NAME*	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Restrictions, Erosion Control, Monitoring	Y				
Capping						
Multi-Layer Cover System	RCRA	Y				
Fixation						
Solidification	Solidification/ Fixation (lime-based or portland cement)	Y				
On-Site Containment						
Long-Term On-Site Landfill	RCRA Landfill	Y				
Thermal Treatment						
On-site Incineration	Rotary Kiln	Y				Fluidized bed incinerator was rejected
Pyrolysis	Pyrolysis	N		Effectiveness not demonstrated at CERCLA sites		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Pensacola, FL)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME*	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Wet Air Oxidation	Wet Air Oxidation	N		Not effective on solid waste streams		
SHIRCO Infrared	Infrared Thermal Treatment	N				No reason provided
Thermal Desorption	Low Temperature Thermal Aeration	Y				
Biological Treatment						
In Situ Bioremediation	*In Situ* Bioremediation	Y				
Ex Situ Bioremediation	Solid Phase Bioremediation	Y				
Soil/Slurry Bioreactor	Slurry Phase Bioremediation	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Pensacola, FL)
PHASE III ANALYSIS

* This column is the actual technolog

y name referred to in the FS/ROD.

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Pensacola, FL)
PHASE III ANALYSIS (Continued)

Comments: OU #1 refers to 23,000 cubic yards of surface soils contaminated with PAHs, PCP, and dioxins; OU #@ refers to contaminated ground water and subsurface soils.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Multi-Layer Cover System	N			Doesn't reduce T or V				
Fixation								
Solidification	N			Doesn't reduce V				High cost
On-Site Containment								
Long-Term On-Site Landfill	N		Doesn't meet preference for treatment	Doesn't reduce T or V				
Thermal Treatment								

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Pensacola, FL)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
On-Site Incineration	N (no reason provided)							
Thermal Desorption	N (no reason provided)							
Biological Treatment								
In Situ bioremediation	N (however, ROD says treatability studies will be conducted)					Long time required for bacterial culture growth		
Ex Situ Bioremediation	Y							
Soil/Slurry Bioreactor	N (no reason provided; ROD also says treatability studies will be conducted)							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Jackson, TN)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include VOCs, PAHs, PCP, and dioxins.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Access	Y				
Capping						
Soil/Bentonite/Clay		Y				
Fixation						
Solidification		Y				
On-site Containment						
Long-Term On-Site Landfill	Vault	Y				
Thermal Treatment						
On-Site Incineration	Mobile Rotary Kiln	Y				
Off-Site Incineration		Y				For tank liquids and sludges

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Jackson, TN)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Biological Treatment						
In Situ Bioremediation		N		May not be effective because of the high contaminant concentrations which would be toxic to microorganisms	*In situ* pretreatment not feasible	
Chemical Treatment						
Solvent Extraction		Y				
Physical Treatment						
Soil Washing		Y				
Off-Site Options						
Off-Site RCRA Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Jackson, TN)
PHASE III ANALYSIS

Comments: Key contaminants include VOCs, PAHs, PCP and dioxins. Because of the high levels and extent of contamination, a permanent remedy was not selected in the FS. An interim alternative was developed to implement early action items that prepared the site for the final remedy while additional evaluations were performed during the Remedial Design (RD). A "*" indicates that technology was retained in the initial phase but a final decision was not made in the detailed screening.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Soil/Bentonite/Clay	N							
Fixation								
Solidification	N							
On-site Containment								
Long-Term On-site Landfill	N							
Thermal Treatment								
On-Site Incineration	N							
Off-Site Incineration	Y							
Chemical Treatment								
Solvent Extraction	N							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CREOSOTE WORKS (Jackson, TN)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Physical Treatment								
Soil Washing	N							
Off-Site Options								
Off-Site RCRA Facility	N							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE I/PHASE II ANALYSIS

Comments: In 1988, an incinerator was brought on the facility to incinerate the principle threat. The remedial action presented in the FS and ROD addresses the remaining low-level threats to human health and the environment. Key contaminants include PCP, CPAH, and dioxins.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Monitoring, Deed, and Fencing	Y				
Capping						
Asphalt/Concrete	Asphalt	Y				
Soil/Bentonite/Clay	Clay and Topsoil	Y				
Multi-Layer Cover System	Geomembrane and Topsoil	Y				
Fixation						
Solidification	*In Situ* Reagent/Cement	N			Not applicable because of excessive fine particles, wood chips present, and varied stratigraphy	
	Organophilic Clay	N		Unable to adequately immobilize contaminants and prevent leaching indefinitely		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Stabilization	*In Situ* Stabilization	N		Because the site soils are fine-grained deposits, *in situ* stabilization would exhibit a diminished effectiveness in immobilizing the contaminants. The debris and wood chips prevalent throughout the site would further degrade the effectiveness of this treatment.		
	Reagent Stabilization	N				Retained for stabilizing metal contaminated soil; not incorporated into detailed analysis alternative
On-Site Containment						
Temporary On-Site Storage Pile		Y				Test incinerated soil to assure that cleanup goals were met

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Thermal Treatment						
On-Site Incineration	Rotary Kiln and Fluidized Bed	Y				
Vitrification	*In Situ* Solidification Technology	N			Not applicable because of high soil water content, wood fragments in fill, and high water table	
SHIRCO Infrared		N	High costs		Still in the development phase which results in higher costs and lower processing rates	
Thermal Desorption	Thermal Desorption	N				Not incorporated into detailed analysis alternative
Biological Treatment						
Off-Site Landfarming		N		Lacks demonstrated and conclusive effectiveness for dioxins	Requires a large tract of land and long treatment periods	
Soil/Slurry Bioreactor	Slurry-Phase Bioremediation	N				Not incorporated into detailed analysis alternative

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Chemical Treatment						
Dechlorination	Base-Catalyzed Decomposition	N		In the early stages of development; has not been adequately demonstrated on PCP or dioxins, nor is it likely to have a significant destruction of PAHs		Water Technology
Solvent Extraction	Triethyl Amine (TEA) Solvent Extraction	Y				
	Critical Fluid Extraction	Y				
	In Situ Air/Steam Stripping	N		Not applicable to low permeability soils or organic contaminants with low Henry's constant; not effective in removing nonvolatiles or semivolatile contaminants from the soil		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Other	*In Situ* Vacuum Extraction	N		Not applicable in low permeability soils; application limited on organic contaminants with low Henry's constant		
Physical Treatment						
Soil Flushing		N		Expected difficulties and low removal rates of semivolatile compounds in low permeability soil	High partition coefficient makes removal difficult	
Soil Washing		N		Soil washing is most efficient on sandy, homogeneous soils; contaminated material is largely composed of fine grain soils (<.075 mm). Limited effectiveness in attaining the remediation goals for soils contaminated with dioxins.		
Off-Site Options						

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site RCRA Facility		Y				Includes off-site solidification

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE III ANALYSIS

Comments: Scenario 1 alternatives consist of actions to remediate the ACC facility are to a risk of $1x10^{-4}$ and the Chehalis Avenue are to a risk of $1x10^{-5}$. Scenario 2 alternatives consist of actions to remediate the ACC facility area and the Chehalis Avenue area to a risk of $1x10^{-5}$ and $1x10^{-6}$ respectively. Solvent extraction was selected as the treatment technology for Scenario 1. Because of the more stringent cleanup goals, incineration was selected as the treatment technology for Scenario 2. Containment options were retained in conjunction with other technologies.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Asphalt/Concrete	N				Not a permanent solution; may not provide long-term effectiveness as the cap deteriorates or contaminants migrate underneath the cap from flooding			
Soil/Bentonite/Clay	Y							
Multi-Layer Cover System	Y							
On-Site Containment								
Temporary On-Site Storage Pile	Y							
Thermal Treatment								
On-Site Incineration	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: AMERICAN CROSSARM (Chehalis, WA)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Biological Treatment								
In Situ Bioremediation	N				Not effective on dioxins or in low permeability soils; inadequate for soil in the vadose zone; not a well-proven technology			
Chemical Treatment								
Solvent Extraction	Y							
Off-Site Options								
Off-Site RCRA Facility	N (no reasons provided)							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include metals (lead), organics (dioxins, PAHs, PCPs), and VOCs (benzene). Technologies were evaluated based on applicability to oraganics or metals.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Deed	Y				
Capping						
Asphalt/Concrete	Concrete	N		Low long-term durability; susceptible to cracking	Requires removal of all structures	
Soil/Bentonite/Clay		N			Clay alone difficult to maintain	
Multi-Layer Cover System		Y				RCRA approved for some site areas
Fixation						
Solidification	*In Situ*	N		Not effective in meeting the primary clean-up criteria of reducing exposure to soil by direct contact, inhalation, or ingestion; site would still need capping		
Stabilization		Y				Appropriate for metal contamination
On-Site Containment						

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Closure-In-Place/On-Site Encapsulation		Y				
Temporary On-Site Storage Pile		Y				
Long-term On-Site Landfill		Y				
Thermal Treatment						
On-Site Incineration	Fluidized Bed	N			Site-specific (type of soils) operational concerns; difficult to keep the bed materials fluid	
	Rotary Kiln	N				May actually be retained for detailed analysis along with thermal desorption process - FS unclear
	Circulating Bed	N				Rotary kiln most representative

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site Incineration	Industrial Process Kilns	N	High costs		Volume of soil exceeds available incinerator capacity; none of the potential facilities could accept the hazardous waste material containing dioxins	
SHIRCO Infrared		N		Rotary kiln most representative		
Thermal Desorption	Thermal Desorption	Y				
Biological Treatment						
In Situ Bioremediation	Surface Bioremediation	Y				
Ex Situ Bioremediation	Surface Biotreatment	Y				
Soil/Slurry Bioreactor	Liquids/Solids Slurry	N		Surface biological treatment most representative		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Chemical Treatment						
Solvent Extraction		N	Costs twice as much as biotreatment processes		Innovative, untested alternative that requires very specialized equipment and personnel	
Physical Treatment						
Soil Flushing		N		Potential ground water contamination from flushing chemicals	Uncertain	
Soil Washing		N	Higher residual volumes than solvent extraction and therefore, higher costs			
Aeration/Soil Venting	*In Situ* Air/Steam Stripping	N	Higher costs than *in situ* surface bioremediation	Not effective for the shallow, relatively impermeable surface and subsurface soil and low VOC concentrations		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site Options						
Off-Site RCRA Facility	Hazardous Waste Landfill	Y				Chosen in detailed screening in conjunction with S/S; not applicable to soil with organics above BDAT levels
Off-Site Recycle/Reuse Facility	Reclamation	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS, CO
INTERIM ACTIONS

Comments: Key contaminants include metals (lead), organics (dioxins, PAHs, PCPs), and VOCs (benzene).

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Site Access	Y				
On-Site Containment						
Temporary On-Site Storage Pile		Y				Retained for further study
Thermal Treatment						
On-Site Incineration	Mobile Incinerator	Y				
Off-site Options						
Off-Site RCRA Facility		Y				For incineration of residual ash
Off-Site Recycle/Reuse Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE III ANALYSIS

Comments: Key contaminants include metals (lead), organics (dioxins, PAHs, PCPs), and VOCs (benzene). In June, 1988, EPA issued a ROD to address source control and the direct contact exposure pathway, recommending interim actions. A final remedy was selected in March, 1992.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Multi-Layer Cover System	Y							
Fixation								
Stabilization	Y							
On-Site Containment								
Closure-In-Place/On-Site Encapsulation	Y							
Temporary On-Site Storage Pile	Y							
Long-Term On-Site Landfill	N							Costs more than off-site RCRA

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Thermal Treatment								
Thermal Desorption	N					Potential for air emissions; greatest potential for exposure because ineffective treatment would result in potential off-site transport of hazardous contaminants	Not implementable because of large contaminated soil volumes; relatively complex process which requires specialized equipment and knowledge	Costs much higher than biotreat-ment
Biological Treatment								
In Situ Bioremediation	N	*In situ* bioremediation does not include an engineered containment structure and does not feasibly treat the subsurface soils			Lesser degree for similar reasons as overall protection; control of residual risk would be more dependant on institutional controls than reliable engineered controls			
Ex Situ Bioremediation	Y							
Off-Site Options								
Off-Site RCRA Facility	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BRODERICK WOOD PRODUCTS (Denver, CO)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Off-Site Reclamation/Recycling	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BROWN WOOD PRESERVING (Live Oak, FL)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include organics (creosote, PAHs). During the initial screening, *in situ* containment technologies were eliminated because of site specific constraints. The underlying concern for application of these technologies is that the majority of the hazardous materials are located within the lagoon. The possibility of a partial sinkhole collapse significantly impacts the use of these technologies at this site. A "*" indicates technology will be reconsidered as a selected remedy if the land treatment solution does not achieve the desired cleanup levels.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Ground-Water Monitoring	Y				
Fixation						
Solidification		N		Risk of the solidified material entering the Floridian Aquifer because of a sinkhole collapse	Risk of initiating a sinkhole collapse beneath the lagoon because of the increased stress of the pozzuolinic material and the addition of other contaminated soils	
Stabilization (precipitation, chelation, polymerization)		Y				sludge treatment
On-site Containment						
Closure-In-Place/On-Site Encapsulation	Vault	N			May not meet RCRA siting performance standards	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BROWN WOOD PRESERVING (Live Oak, FL)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Temporary On-Site Storage Pile		Y				Temporary storage of low-level contaminated soils until treatment demonstration tests are complete
Thermal Treatment						
On-Site Incineration	Mobile Rotary Kiln	N*			Requires time and preparation for transport; small site size may present some operational difficulties	
	Mobile Circulating Fluidized Bed	N			Least transportable of any of the incineration technologies	
Off-Site Incineration	Industrial Kiln	Y				
	Commercial Incinerator	N	High prohibitive disposal fees		Commercial disposal firms lack the capacity to store and process the volumes of contaminated soils and sludges at the site	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BROWN WOOD PRESERVING (Live Oak, FL)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Pyrolysis	HUBER Advanced Electric Reactor (4000-5000°F)	N			Manufacturer has not developed the technology past the pilot stage at this time; uncertainty as to time of commercial availability	
SHIRCO Infrared	On-Site Incineration (1600-1800°F)	Y				
Biological Treatment						
In Situ Bioremediation		N			Not technically feasible for highly concentrated contaminated soil	May be applicable to low level contaminated soils
Ex Situ Bioremediation		Y				
Soil/Slurry Bioreactor	Biological Batch Reactor	Y				For pre-treatment of the highly contaminated sludges
Chemical Treatment						

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BROWN WOOD PRESERVING (Live Oak, FL)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Solvent Extraction	Solvent Washing (a) B.E.S.T. Process (b) Critical Fluid Extraction System (c) PCB Soil Decontamination Process	N	High energy costs		Requires extensive research and development; need to find a way to recycle the oils recovered in the system; uncertain regulatory status	
Off-Site Options						
Off-Site RCRA Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BROWN WOOD PRESERVING (Live Oak, FL)
PHASE III ANALYSIS

Comments: Key contaminants include organics (creosote, PAHs). The detailed screening used nine slightly different criteria. A "*" indicates technology will be reconsidered as a selected remedy if the land treatment solution does not achieve the desired cleanup levels.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Fixation								
Stabilization	Y							
On-Site Containment								
Temporary On-Site Storage Pile	Y							
Thermal Treatment								
Off-Site Incineration	N*						Facility under consideration has been cited for non-compliance	High

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: BROWN WOOD PRESERVING (Live Oak, FL)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
SHIRCO Infrared	N*						Exposure to emissions; mobile incinerators not readily available and delays may result in attaining a unit; extensive construction requirements; requires test burn and meeting RCRA performance standards; low administrative feasibility	
Biological Treatment								
Ex Situ Bioremediation	Y							
Soil/Slurry Bioreactor	Y							
Off-Site Options								
Off-Site RCRA Facility	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: CAPE FEAR WOOD PRESERVING (Cumberland County, NC)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include VOCs (benzene), organics (PAHs), and metals (arsenic, chromium). The criteria of the initial screening were implementability, reliability/effectiveness, and previous experience. A high ground-water table at the site affected the technology selection process.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Access	Y				Deed and land use restrictions were considered in conjunction with surface capping which was screened out in the detailed analysis
Capping						
Soil/Bentonite/Clay		Y				
Fixation						
Solidification	*Ex Situ*	Y				
Stabilization		N		Precipitation may introduce additional pollutants into ground water; chelation is not a well-proven technology; polymerization has had limited application and possibly forms toxic by-products; may cause continued contaminant migration		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: CAPE FEAR WOOD PRESERVING (Cumberland County, NC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
On-Site Containment						
Closure-In-Place/On-Site Encapsulation		N	Not cost-effective in relation to capping		Landfilling below the site's 3 foot ground water table is not recommended	
Thermal Treatment						
On-Site Incineration		N	Not cost-effective relative to other on-site treatment technologies (e.g., thermal processing)		Potential for metal oxide emissions	
Off-Site Incineration		N	Given the quantity of soil, not cost-effective relative to on-site treatment		Considering the melting points of CCA metals, volatization would occur and produce toxic metal oxides which would be difficult to remove	
Vitrification		N	High energy costs	Not a well proven technology	Not well suited to the high ground water table; causes significant worker risk because of extremely high voltages during implementation	
Thermal Desorption	Low Thermal Desorption	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: CAPE FEAR WOOD PRESERVING (Cumberland County, NC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Biological Treatment						
In Situ Bioremediation		N		High metal concentrations could inhibit or prevent contaminant breakdown; in some cases, undesirable degradation by-products have been produced; cold winter temperatures will impede degradation process	Development of an effective "seed" population may be difficult; requires bench scale treatability or pilot testing; high ground-water table is not well suited for *in situ* biotreatment	
Soil/Slurry Bioreactor		N			Adequate space may not be available to set up the large reactors or numerous mobile units that are needed; requires long-term, intensive operation and maintenance	
Physical Treatment						
Soil Flushing		N		PAHs, a major soil contaminant at the site, are not highly water soluble	Given the shallow ground water table, implementation of an effective extraction system would be difficult	
Soil Washing		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: CAPE FEAR WOOD PRESERVING (Cumberland County, NC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Attenuation		N		No reduction in TMV; not a permanent solution	Attenuation is generally limited to the upper two feet of soil; because treatment depths of 3 to 10 feet have been estimated in the process area, attenuation is not well suited to site conditions	
Off-Site Options						
Off-Site RCRA Facility		Y				
Off-Site Sanitary Landfill	County Solid Waste Facility	N				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: CAPE FEAR WOOD PRESERVING (Cumberland County, NC)
PHASE III ANALYSIS

Comments: Key contaminants include VOCs (benzene), organics (PAHs), and metals (chromium, arsenic). The preferred alternative for soil remediation is soil washing. The alternate source control alternative, indicated by a "*", is a low thermal desorption process followed by either soil washing or a S/S process. The appropriate source control alternative will be based on the soil flushing (even though the ROD refers to soil washing) treatability study.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	N			Screened out in conjunction with capping				
Capping								
Soil/Bentonite/Clay	N			No reduction in mobility of contaminants below ground-water table; no reduction in toxicity or volume of all contaminants				
Fixation								
Solidification	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: CAPE FEAR WOOD PRESERVING (Cumberland County, NC)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Thermal Treatment								
Thermal Desorption	N*					Potential toxic gas emissions		
Physical Treatment								
Soil Washing	Y							
Off-Site Options								
Off-Site RCRA Facility	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: COLEMAN-EVANS WOOD PRESERVING (Duval County, FL)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include PCPs. Metals are present but below or within normal ranges. Initial screening was based on technical feasibility (implementability), public health and environmental protection (effectiveness), and cost. The 1986 ROD specified the remediation of approximately 9,000 cubic yards of contaminated soils and sediments, primarily by temporary, on-site incineration. Further studies determined that the amount of contaminated soil was actually 27,000 cubic yards. This significant volume increase and subsequently, significant cost increase resulted in an evaluation of other alternatives, selecting a technology train consisting of soil washing, bioremediation, and S/S in the AROD. Improvements and increased data about bioremediation and S/S made them more viable alternatives in the AROD. Initial screening stems from the 1986 ROD preliminary and final screenings.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Deed Site Access	Y				
Capping						
Unspecified	Vegetative Cover	Y				
Fixation						
Solidification		Y				
Stabilization		Y				
On-Site Containment						
Closure-In-Place/On-Site Encapsulation	Containment and encapsulation	N		No reduction in toxicity or volume of contaminants	Potential for liner failure	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: COLEMAN-EVANS WOOD PRESERVING (Duval County, FL)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Thermal Treatment						
On-Site Incineration	Mobile Unit	Y				
Off-Site Incineration		N	Significantly high hauling and disposal costs because the nearest facility is 600 miles from the site			
Thermal Desorptioni		N	Research and development expenditures offset energy savings; overall, more expensive than incineration			
Biological Treatment						
In Situ Bioremediation		N		Digestion of PCP by microorganisms has not proven to be effective; hot spots could remain untreated because of the toxicity of concentrated wood preserving wastes		
Ex Situ Bioremediation		N			Seasonal high water table level at site renders landfarming unsuitable	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: COLEMAN-EVANS WOOD PRESERVING (Duval County, FL)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site Landfarming		N	Extensive transport, handling, and monitoring costs; very expensive costs		Requires large off-site land area	
Chemical Treatment						
Solvent Extraction		N	Costs more than incineration			
Physical Treatment						
Soil Washing	Soil Washwater Pretreatment	Y				
Off-Site Options						
Off-Site RCRA Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: COLEMAN-EVANS WOOD PRESERVING (Duval County, FL)
PHASE III ANALYSIS

Comments: Key contaminants include PCPs. Metals are present but below or within normal ranges. Incineration was more effective in overall protection, long-term effectiveness, and implementability. Costs dictated selection of soil washing/biotreatment/S/S.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTA-BILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Unspecified	Y							
Fixation								
Solidification	Y							
Stabilization	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: COLEMAN-EVANS WOOD PRESERVING (Duval County, FL)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTA-BILITY	COST
Thermal Treatment								
On-Site Incineration	N							Incineration costs three times as much as soil washing/biotreatment/S/S; higher costs, resulting from increased amounts of known contaminated soils, provided the basis for reconsidering the selection of incineration in the 1986 ROD
Physical Treatment								
Soil Washing	Y							
Off-Site Options								
Off-Site RCRA Facility	N	Potential contamination at the new disposal site					Landfill may be unavailable	High transportation costs

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: COLEMAN-EVANS WOOD PRESERVING (Duval County, FL)
PHASE III ANALYSIS (Continued)