EXPLANATION OF SIGNIFICANT DIFFERENCE TO THE REMEDIAL ACTION CAPE FEAR WOOD PRESERVING SUPERFUND SITE FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA

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1.0 INTRODUCTION

This is the third Explanation of Significant Difference (ESD) to be prepared for the Cape Fear Wood Preserving Superfund Site (Cape Fear or Site). The first Cape Fear ESD was issued in September 1991 and the second one was disseminated in August 1995.

The function of an ESD is to relate to all parties of concern that the Environmental Protection Agency (EPA) is enacting a significant alteration to a component of a Superfund site Remedial Action (RA). The requirements of an ESD are specified in Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

Requirements of the original Cape Fear RA can be found in the June 1989 Record of Decision (ROD) which are summarized in Section 4.0 below. The necessity to modify the RA arose from information gathered since the completion of the 1991 Cape Fear Remedial Design (RD).

A copy of this ESD will be added to the Cape Fear Wood Preserving Superfund site Administrative Record and Information Repository. The Administrative Record and Information Repository can be found in the Cumberland County Public Library and in EPA's, Region IV Information Center. The public is encouraged to review both the Administrative Record and the Information Repository during normal working hours.

2.0 SITE LOCATION AND DESCRIPTION

The Cape Fear site is located on the western side of Fayetteville in Cumberland County, North Carolina. Primary access to the Site is directly off State Road 1403 (Reilly Road) approximately 1.6 miles north of the intersection of State Road 1403 and U.S. Highway 401 (Raeford Road). Of the approximately 41 acres comprising the Site, less than 10 acres were developed. The remainder of the Site is heavily wooded with coniferous trees with a small swampy area northeast of the developed area. The swampy area consists of a seasonally flooded wetland dominated by

rushes. The upland section of the Site is sandy and well-drained. No endangered flora and fauna species were found during a Site survey made in the Summer of 1990.

The terrain of the Cape Fear site is predominantly flat, with drainage provided by a swampy area on the northeast side of the Site and a man-made ditch to the southeast that extends southeastwardly to an impoundment that use to be diked. A variety of land uses exist around the Site. The properties to the north include an undisturbed pine forest, an abandoned concrete plant, and a few residential properties. To the east is a continuation of the undisturbed pine forest, and to the west is farmland used for growing crops and raising livestock as well as additional residences. To the south is another concrete plant as well as a subdivision named "Southgate". This subdivision is approximately a quarter of a mile south of the Site and houses approximately 1,000 people. Several potable wells are located within the boundaries of this subdivision that supply these homes with drinking water.

Buildings on the Cape Fear Site are abandoned and in various states of disrepair. Soils in and around the plant facility are contaminated with inorganic chemicals (predominately copper, chromium, and arsenic) and polycyclic aromatic hydrocarbons (PAHs or creosote). Some volatile organic chemicals (primarily benzene and toluene) are also present in the soils, but these volatile organics are not widespread nor present at significant in concentrations. In general, the most contaminated areas of the Site are in the process area, the northeast seasonal swamp, along the access road to the back storage area, the drainage ditch running south of the former process area, the impoundment area receiving runoff from this drainage ditch, the area adversely impacted when the impoundment's dike was breached, and the soil piles created by the excavation of the drainage ditches.

The Site is underlain by two aquifers which are separated by an aquitard. An aquitard is a geologic formation that permits some groundwater movement through it, but not in sufficient quantity to supply a well. Flow in the lower aquifer is generally southwestward while flow in the upper aquifer is radial, moving in all directions from the Site. Flow also occurs downward through the aquitard from the upper to the lower aquifer. Groundwater is contaminated by a variety of inorganic and organic chemicals. Elevated concentrations of benzene, carcinogenic PAHs, arsenic, and chromium were found in the upper aquifer, and arsenic in the lower aquifer.

3.0 SITE HISTORY

Operations at the Cape Fear Wood Preserving site commenced in 1953 and continued until 1983. Creosote-treated wood was

produced from 1953 until 1978 when demand for creosote-treated products declined. Wood was then treated by a wolmanizing process using salts containing sodium dichromate, copper sulfate, and arsenic pentoxide. This treatment process is known as the copper-chromium-arsenic (CCA) process.

In the summer of 1977, the State of North Carolina determined the Site was contaminated with constituents of coal tar and coal tar creosote and ordered the owner/operator to comply with North Carolina law. As a result, the owner/operator changed operations to limit further releases, installed a new potable water well for a neighbor west of the site, and removed 900 cubic yards of creosote-contaminated soil from the treatment yard and the drainage ditch that parallels the railroad. Between 1979 and 1980, a new closed-circuit CCA plant was installed and the old creosote and CCA facilities were decommissioned. The new CCA plant was regulated under the Resource Conservation and Recovery Act (RCRA) as a small generator until 1983, at which time the company went out of business.

The Site was proposed for the National Priorities List (NPL) in June 1986 and was finalized in July 1987 as site number 572. A Remedial Investigation (RI) and a Feasibility Study (FS) were completed in October 1988 and February 1989, respectively.

In the fall of 1988, reportedly with the sanction of a Cumberland County building/construction inspector, the new owner of the property retrenched the majority of the drainage ditch, dug several new drainage trenches and breached the diked pond. Both the drainage ditch and the sediments within the drainage ditch and the diked pond and the sediments within the diked pond were areas targeted for remediation.

4.0 RECORD OF DECISION

The June 1989 ROD mandated the following remedial activities:

REMEDIATION OF HAZARDOUS MATERIALS, TANKS AND PIPING

- -- Off-site disposal of sodium dicromate - copper sulfate - arsenic pentoxide (CCA) salt crystals, the solidified creosote and asbestos-containing pipe insulation. The CCA crystals and solidified creosote will be disposed of at a RCRA permitted landfill. The asbestos-containing pipe insulation will be disposed of at the Cumberland County Solid Waste Facility pursuant to the facilities specifications.

- -- The tanks and associated piping, above and below ground, will be emptied, flushed and cleaned, including triple

rinsing, to render the metal non-hazardous. The metal will then be cut and either sold to a local scrap metal dealer or disposed of at the Cumberland County Solid Waste Facility. For those tanks and/or piping that cannot be cleaned sufficiently to render them non-hazardous they will be transported to a RCRA permitted landfill for disposal.

-- The contents of the tanks and associated piping contains approximately 50,000 gallons of 3 percent CCA solution and 15,000 gallons of CCA contaminated wastewater. A buyer of the 50,000 gallons of 3 percent CCA solution will first be pursued. If no buyer can be found, then the 50,000 gallons of 3 percent (3%) CCA solution along with the 15,000 gallons of CCA contaminated wastewater will be treated on-site through the water treatment system set up for treating the pumped surface waters and extracted groundwater. All wastewater (i.e., cleaning equipment, etc.) generated by on-site activities will also be directed to the treatment system.

SOURCE CONTROL (Remediation of Contaminated Soils)

-- The preferred alternative for the remediation of contaminated soils/sediment is soil washing. The alternate source control alternative is a low thermal desorption process to remove the organic contaminants from the soil followed by either soil washing or a soil fixation/ solidification/stabilization process to address the inorganics. The decision as to which source control alternative will be implemented will be based on data generated by the soil washing treatability study to be conducted during the remedial design.

-- Contaminated soils/sediment will be excavated, treated and placed back in the excavation. All wastewater generated will either be reused or treated on-site. Following completion of on-site remedial activities, those areas disturbed will be revegetated

MIGRATION CONTROL (Remediation of Contaminated Groundwater)

-- Groundwater extraction will be accomplished through the use of well points in the upper (surficial) aquifer. Groundwater removal will be conducted in 10,000 square foot subareas at a time, until the entire contaminated surficial aquifer is addressed. The well points will be moved from one area to another for subsequential dewatering.

-- Due to local contamination of the lower aquifer, the lower aquifer will be pumped following remediation of the overlying upper aquifer in this area. This will prevent potential contaminant drawdown to deeper depths.

-- A water treatment system will be established on-site. The system's influent will include contents of the tanks and piping, all wastewater generated due to remedial actions implemented, pumped surface water, and extracted groundwater. The level and degree of treatment will depend on 1) the level of contaminants in the influent and 2) the ultimate discharge point of the treated water. There are two water discharge alternatives for the treated water. The optimal choice is the local sewer system. The other alternative is to discharge the effluent to a surface stream. The range of treatment for the contaminated water includes biological degradation, air stripping, filtration through activated carbon filters, and metal removal through flocculation, sedimentation and precipitation. The point of discharge and the degree of treatment will be determined in the Remedial Design stage. The effluents, including both discharged water and/or air, will meet all applicable and relevant or appropriate requirements (ARARs). [For details of the technologies mentioned above, please review the Feasibility Study which is in the Information Repository.]

5.0 REMEDIAL ACTION AND PREVIOUS EXPLANATIONS OF SIGNIFICANT DIFFERENCES

The Remedial Design (RD) was initiated following the signing of the ROD and was completed in September 1991. The design is performance based requiring the RA contractor to achieve the clean-up goals specified for each contaminant in the ROD.

The first ESD, issued in September 1991, precipitated from the findings of the two treatability studies conducted as part of the RD. This first ESD accomplished the following:

* selected soil washing over low thermal desorption as the primary remedial technology to address soil contamination at the Site;

* acknowledged the potential need to solidify some soil using a cement/ash mixture to address the elevated concentrations of the metals, arsenic and chromium;

* selected activated carbon adsorption as the primary treatment technology for treating groundwater;

* recognized the potential need for pretreatment of the contaminated water stream to remove suspended solids and oxidized iron prior to activated carbon filtration; and

* selected Bones Creek as the discharge point for the treated water.

Following the completion of the RD, the project became dormant as the State of North Carolina had difficulty in resolving its capacity assurance issue. The capacity assurance issue was rectified in the summer of 1994. The RA Work Assignment was issued in September 1994.

During discussion with EPA's RA contractor, it was agreed upon to divide the RA into four phases. A brief description of each phase follows:

PHASE I includes clearing and grubbing the Site; installation of an access control fence; emptying, flushing, cleaning, and disposing of nine tanks and associated piping; excavating and stockpiling contaminated soil for railroad relocation; treatment of contaminated water (surface water, storage tank liquids, rinse water, water from dewatering excavation, etc) by means of a temporary treatment facility; removal and off-site disposal of debris/hazardous waste material [copper-chromium-arsenic (CCA) crystals, solidified creosote] and asbestos-containing insulation; and transportation of debris/hazardous/asbestos waste material to a municipal landfill or Resource Conservation and Recovery Act (RCRA)-permitted hazardous waste landfill (as appropriate).

PHASE II includes temporarily relocating the existing railroad track and then restoring the railroad track following remediation of the underlying contaminated soils and removal of the spur.

PHASE III includes installation of the discharge pipeline; dismantle/demolition and disposal of building structures; excavation and treatment of contaminated soils; treatment and discharge of contaminated water; backfill and restoration of disturbed areas.

PHASE IV includes installation of groundwater extraction wells, monitoring wells, and piezometers; construction of groundwater treatment plant; operation and maintenance of groundwater treatment plant.

Phase I work began the week of July 25, 1995 and has been completed during the week of September 5, 1995 with the exception of disposing of the solidified creosote and sludge from the tanks. This material has been stored in roll-offs awaiting shipment to a RCRA-permitted hazardous waste facility for final disposal. The first stage of Phase II began the week of December 1, 1995 and was completed the week of February 12, 1996. Following the removal of the existing railroad track and the remediation of the underlying contaminated soils, the railroad track will be restored along its original route. This will signify the completion of Phase II.

The second ESD was required as it became necessary to discharge treated water during Phase I into the drainage ditch on the southeast side of the Site. Activities conducted during Phase I generated small amounts of contaminated water. Since the discharge pipeline would not be installed until Phase III, the contaminated water generated during Phase I was treated and discharged on-site. The water discharged on-site was treated to meet the substantive requirements of an National Pollutant Discharge Elimination System (NPDES) permit. In accordance to Section 300.400(e)(1) of the NCP an actual permit was not required. Section 300.400(e)(1) of the NCP states, "No federal, state, or local permits are required for on-site response actions conducted pursuant to CERCLA sections 104, 106, 120, 121, or 122."

6.0 DESCRIPTION/RATIONALE FOR THE THIRD EXPLANATION OF SIGNIFICANT DIFFERENCE

The following two factors warrant the issuance of this third ESD:

- the elimination of the biotreatment step from the soil remediation process

and

- to change the point of discharge of the treated water emanating from the Site from Bones Creek to the local publicly owned treatment works (POTW or sewer system) owned and operated by the Public Works Commission (PWC) of the City of Fayetteville.

The following paragraphs provide the rationale for the modification highlight in the first bullet above.

The 1989 ROD originally envisioned a two step soil remediation process to address the approximately 24,000 cubic yards (yds^3) of soils contaminated with PAHs and metals. The first step, soil washing is a volume reduction process. It separates the contaminated soils (predominantly the small, clay-like soil particles) from the bulk of the soil. The ROD anticipated the soil washing process would generate 19,200 yds^3 of clean, large, sand-like soil particles and 4,800 yds^3 of contaminated fines (slurry). This represents the recovery of 80 percent (by volume) of clean soil and the generation of 20 percent (by volume) of contaminated soil which requires further remediation.

The first ESD stipulated that the organics in the slurry would be biodegraded by microorganisms to innocuous by-products in an onsite bioreactor. If the metal concentrations in the

slurry prevent biodegradation to from occurring, then the metals were to be removed from the slurry prior to being introduced into the bioreactor. These efforts constitute the second step of the soil remediation process (i.e., treat the organics and metals in the slurry).

In July 1995, Requests for Procurement (RFP) and the accompanying Scope of Work (SOW) was disseminated to 41 potential bidders. The RFP and SOW called for implementing this two step soil remediation process. The Agency received only three bids in response to the RFP. Only two of these bids were determined to be technically responsive and capable of achieving the objectives stipulated in the RFP and SOW.

Both of the technically responsive bidders proposed a single step soil remediation process (i.e., soil washing) in which the resulting fines would contain both organics and metals. These potential bidders claimed that their soil washing procedure could reduce the volume of contaminated soil by greater than 96 percent or down to a volume of approximately 960 yds^3. Because both bidders could reduce the volume of contaminated material to less than 4 percent of the starting volume, they proposed either on-site solidification or off-site disposal for the contaminated residue generated by the soil washing process (i.e., the contaminated fines). Both bidders stated that it would be more cost effective to dispose of this small amount (960 yds^3) of contaminated fines using either on-site solidification or off-site disposal than it would be to separate the metals from the organics and bioremediate the organics. In addition, neither bidder was optimistic that the biotreatment could achieve the clean up goals specified for the organics in the ROD. Consequently, a one step soil washing approach provides the maximum value to the government.

The 1989 ROD estimated the present worth cost of remediating the soils at $11,000,000. The 1991 RD estimated the cost of remediating the soils at $5,700,000. The Independent Government Cost Estimate and RA engineering cost estimates are $6,814,000 and $5,990,000, respectively. The value of the bids proposed by the two potential subcontractors to perform the soil remediation was $5,000,000 and $5,100,000. As can be seen, the cost for the approaches proposed by the two bidders is lower than any of the previous cost estimates. Therefore, it is in the Agency's benefit to eliminate the biotreatment step of the soil remediation process as the process proposed by the subcontractor will accomplish the same degree of protection of human health and the environment as the original remedy described in the ROD.

The following rationale supports the change specified in the second bullet above.

Soil washing uses a large quantity of water. The majority of this water will be treated on-site and recycled. A small portion of this water will be discharged. In addressing the discharge of this water from the Site as well as the water that will be generated during Phase IV (groundwater pump and treat), the Agency had initially selected discharging this water to Bones Creek. This decision was documented in the first ESD. However, during the interim of issuing the first ESD in 1991 and 1995, when the Agency began preparations to start the Cape Fear RA, it was ascertained that the PWC of the City of Fayetteville had expanded it's sewer system. This expansion included the installation of a sewer trunk line on the eastern side Bones Creek running parallel and adjacent to the creek.

In accordance to the 1991 ESD, the Agency was planning of running a discharge pipeline from the Site to Bones Creek which is approximately 4,000 feet west of the Site. However, as stated in the 1989 ROD, the Agency prefers discharging an effluent from a Site to the local sewer system as this discharge option adds a second level of protection to public health and the environment by adding a second regiment of treatment to the wastewater generated on Site. Therefore, the Agency initiated discussions with the PWC about the possibility of tapping into the sewer line running along Bones Creek. During these discussions with the PWC, it became evident that the PWC would prefer the Agency to tap into the sewer line located at the intersection of Reilly Road and Cliffdale Road. This location is approximately 4,600 feet from the Site.

The estimated cost to install the 4,000 foot pipeline east towards Bones Creek is $82,400. The estimated cost to install the 4,600 foot pipeline north towards the intersection of Reilly Road and Cliffdale Road is $94,600. As the difference in cost is moderate, the Agency elected to conform to PWC's preference and will install the discharge pipeline north to tap into the sewer system at the intersection of Reilly Road and Cliffdale Road. The PWC has agreed to accept this wastestream and will establish the discharge parameters for the Site's effluent.

7.0 AFFIRMATION STATUTORY DETERMINATIONS

Neither the elimination of the bioremediation aspect of the soil remediation nor the change in the discharge of the treated water from the Site are fundamental alterations to the scope, performance, or cost of the Cape Fear remedy. These changes do not alter the performance standards. The Agency and the State of North Carolina Department of Environment, Health, and Natural Resources believe that the changes made to the selected remedy has not altered the protectiveness for human health and the

environment, compiles with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective.

8.0 PUBLIC PARTICIPATION ACTIVITIES

This ESD will be added to the Cape Fear Wood Preserving Superfund site Administrative Record. Copies of the Administrative Record are kept at:

Cumberland County Public Library & Information Center
300 Maiden Lane
Fayetteville, North Carolina 28301

and

Environmental Protection Agency
Region IV - Records Center
345 Courtland Street, N.E.
Atlanta, Georgia 30365.

These Records are available for public review during normal working hours.

Richard D. Green
Acting Director
Waste Management Division

5/31/96
Date