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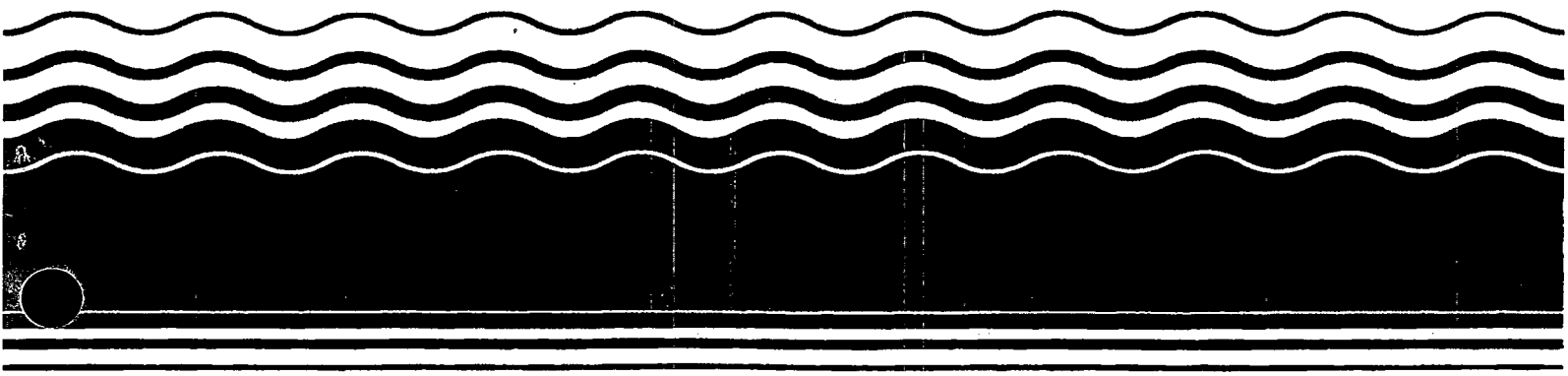
EPA541-R99-066
1999

EPA Superfund
Explanation of Significant Difference for the Record of Decision:

H & H Inc. Burn Pit Site
Farrington, VA
2/29/1999



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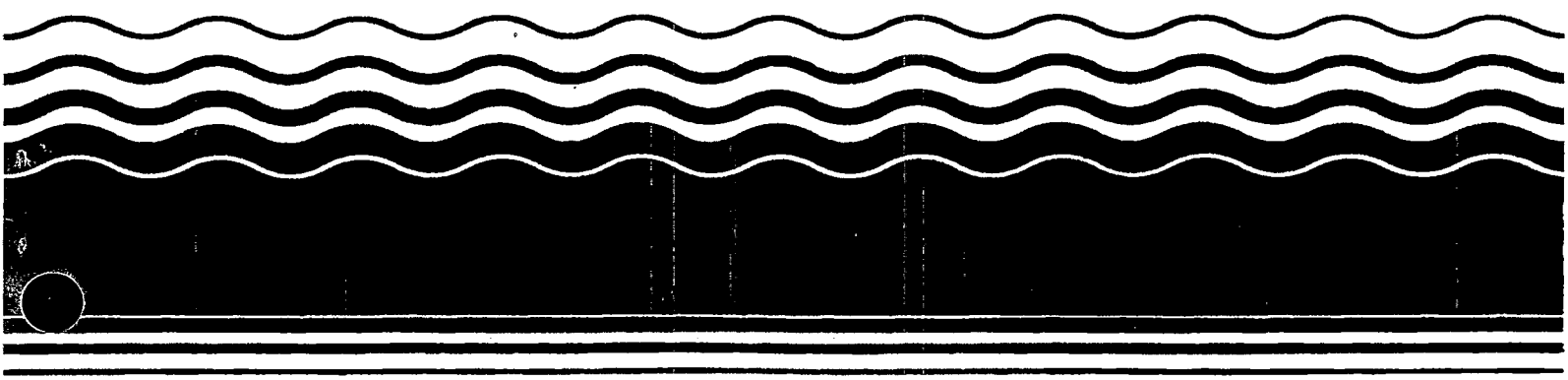


EXPLANATION OF SIGNIFICANT DIFFERENCES
HH Burn Pit Superfund Site
Hanover County, Virginia

I. INTRODUCTION

This Explanation of Significant Differences (ESD) is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9617(c), and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.435(c)(2)(i), which require the United States Environmental Protection Agency (EPA) to issue such a document where a remedial action will differ in any significant, but not fundamental, respect from that selected by EPA and described in the Record of Decision.

This ESD relates to remedial action selected by EPA for implementation at the HH Burn Pit Site in Hanover County, Virginia, in a Record of Decision issued on June 30, 1995 (ROD). The selected remedial action included, among other things, excavation and disposal of certain soils and sediments contaminated with polychlorinated biphenyls (PCBs) and extraction and treatment of contaminated groundwater using ultraviolet (UV) oxidation. Advances in the development of High Vacuum Extraction (HVE), an innovative technique for remediating groundwater and soil vapor, have occurred since the ROD was signed. In addition, PCBs have not been detected in Site groundwater since a Remedial Investigation (RI) sampling event on May 29, 1992. As long as PCBs remain absent from the groundwater, carbon adsorption is a feasible alternative to the ROD-selected UV oxidation. These developments, along with the success of an on-Site pilot study of the HVE technology, provide the basis for EPA's reconsideration of the remedy selected for the Site and its conclusion that HVE and carbon adsorption are a more appropriate way of treating groundwater at the Site than the previously selected conventional pumping and UV oxidation. This modification to the groundwater remediation component of the selected remedy does not alter the remaining components of the selected remedy. Therefore, the original performance standards for the groundwater in the 1995 ROD will still be met, but this ESD identifies a different technical means for their achievement.

This ESD has been prepared to provide the public with an explanation of the nature of the modification to the ground water component of the selected remedy set forth in the ROD and to summarize the information that supports this modification. EPA concludes that the remedy selected in the June 30, 1995 ROD, as modified by this ESD, will meet the objectives and performance standards of the ROD.

A copy of this ESD, together with information supporting the changes described herein, will be included in the Administrative Record for the Site. Public access to these documents is discussed in Section IV of this ESD.

II. SUMMARY OF THE SITE HISTORY, SITE CONDITIONS, AND SELECTED REMEDY

The HH Burn Pit Site ("Site") is located in Hanover County, Virginia, approximately 12 miles northwest of the City of Richmond on Staples Mill Road (Route 33) and 0.5 mile south of the small community of Farrington, Virginia (See Figure 1). The approximately 1-acre Site is located on a 73.5-acre parcel of land currently owned by T. Frank Flippo and Sons, a Virginia limited partnership formed on July 15, 1985.

The Site was used by Haskell Chemical Company for the disposal of solvents containing printing inks and paint manufacturing wastes between 1960 and 1976. These materials were collected in drums, transported to the Site by the Richmond-based Haskell Chemical Company and others, emptied into a shallow, unlined pit, and burned. The disposal and burn area is located in a clearing of a wooded area, approximately 260 feet in diameter, and surrounded by a 4-foot high berm.

The Virginia Department of Health, Division of Solid and Hazardous Waste (VA DSHW), the Commonwealth agency responsible for hazardous waste regulation at the time, initially managed investigation activities at the Site. There were a number of early response activities. Residential well sampling showed no evidence of contamination above background levels. In 1982, approximately 1,000 empty drums stored on-Site were crushed on-Site and transported to a hazardous waste disposal facility under the supervision of the VA DSHW. Stained soil, including the soil that lined the burn pit, was also reportedly removed from the Site at the same time. Additional VA DSHW activities included soil erosion and sediment controls, installation of two monitoring wells, groundwater sampling, and a health survey of nearby residents (inconclusive).

EPA's involvement at the Site began with a non-sampling preliminary assessment of the Site on March 16, 1983 and a Site Inspection (SI) in March 1984. The SI report was published in October 1985. The analytical data collected were used to evaluate the relative hazards posed by the Site using EPA's Hazard Ranking System (HRS). The Site scored 33.71 using the HRS, was proposed for inclusion on the National Priorities List (NPL) in January 1987, and finalized on the NPL in March 1989.

The Remedial Investigation and Feasibility Study (RI/FS) was conducted in two phases, with Phase I in 1988 and 1989, and Phase II in 1992. The Proposed Plan for the HH Burn Pit Site was issued on December 21, 1993.

EPA issued the Record of Decision (ROD) in June 1995. The selected remedy (Alternative E1) required that groundwater be extracted from the aquifer underlying the Site and treated using a combination of precipitation and sedimentation to remove metals and by ultraviolet (UV) oxidation to destroy organics. Excavation and off-Site disposal were required

for soils and sediments contaminated beyond the cleanup levels in Table 12 of the ROD. A monitoring program was to be implemented to verify the performance of the groundwater treatment system and detect any impacts to the tributary, surrounding wetlands, and the nearest residences downgradient of the Site.

Following issuance of the ROD, EPA and several companies associated with the Site (PRPs) negotiated a consent decree under which such companies agreed to implement the ROD. The consent decree became effective on November 5, 1997. In the Spring of 1997, these PRPs agreed to conduct, pursuant to a separate settlement, a removal action to dispose of approximately 250 drums of investigation-derived waste left on-Site at the conclusion of the RI.

Implementation of the remedial action has occurred in two phases--the first phase consists of soils and sediments and the second phase consists of groundwater. The PRPs completed excavation and off-Site disposal of all contaminated soils in August and September of 1998. Excavation and off-Site disposal of the contaminated sediments were completed by the PRPs in May of 1999, concluding the fieldwork portion of the soil/sediment cleanup. Now only the groundwater remains to be cleaned up.

During the Remedial Design, the PRPs investigated an alternative groundwater remediation technology known as High Vacuum Extraction (HVE). In February 1999, the PRPs submitted to the Agency a proposal to modify the groundwater component of the remedy. The PRP proposal presented the results of a successful HVE pilot test at the Site and suggested substituting HVE for the conventional groundwater pumping described in the ROD. The proposal additionally provided that carbon adsorption would replace the UV oxidation system as the treatment system for the organics. Precipitation and sedimentation to remove metals will continue to be a component of the treatment system. The PRPs indicated that these modifications to the groundwater remedy would achieve the groundwater remedial objectives while providing a faster and more cost-effective alternative to the groundwater pump and treat system selected in the 1995 ROD. EPA concurs with this conclusion.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES

A. Description of the Modification

The June 30, 1995 ROD provided that contaminated groundwater would be extracted and treated using precipitation and sedimentation to remove metals and ultraviolet (UV) oxidation to removal organic contaminants. EPA is modifying the groundwater component of the selected remedy set forth in the ROD to provide for the construction of an HVE system, including carbon adsorption, for removal and treatment of contaminated soil vapor and groundwater. Precipitation and sedimentation to remove metals will continue to be a component of the treatment system. UV oxidation will not be used to treat contaminated groundwater.

The HVE system will include a number of extraction wells piped to a single centrally-located extraction unit consisting of a high-vacuum extraction pump and an air/water separator. The air (soil vapor) and water will be treated as needed to meet discharge requirements. Separate carbon adsorption systems will treat the contaminated air and groundwater. The spent carbon filters will be properly disposed of off-Site, in accordance with CERCLA Section 121(d)(3) and Section X, paragraph 8 of the ROD. The air will be emitted to the atmosphere in the immediate vicinity of the treatment system, in compliance with the ROD, particularly Section X, paragraph 9. The treated groundwater will be discharged to surface water downgradient of the Site. The system will be monitored to ensure safe and efficient operation, and the discharged air and water will be monitored to ensure that all discharge and emission requirements are met.

The remedy selected in the June 30, 1995 ROD, as modified by this ESD, will meet the objectives and performance standards of the ROD.

B. Summary of Supporting Information and Data

HVE is being substituted for UV oxidation for treatment of contaminated groundwater because these modifications to the groundwater remedy will achieve the groundwater remedial objectives more quickly and cost-effectively than the groundwater pump and treat system selected in the 1995 ROD. The PRPs studied HVE extensively before proposing the technology for use at the HH Burn Pit Site. The results of the PRPs' study can be found in the Expedited Remediation Program and High Vacuum Extraction Pilot Study Report (June 1999) (included in the Administrative Record).

HVE is an enhanced pump-and-treat technology. Significant improvements are realized in the cost and speed of groundwater cleanup by using an HVE system in lieu of extraction and treatment with UV oxidation. By extracting and treating soil vapor and groundwater at the same time, the HVE system will be able to remove the contamination more rapidly than a system that removed and treated groundwater alone. In addition, cleanup costs will be reduced through this substitution. First, the replacement of treatment by UV oxidation with treatment by a less-expensive carbon adsorption system should result in direct capital cost savings. Second, the system should operate for a shorter period of time before reaching the cleanup requirements. This reduction in the time the system will operate should result in a savings in costs both in operation and maintenance of the treatment system and in costs associated with monitoring the groundwater cleanup.

Section 300.435(e)(9)(iii) of the NCP, 40 C.F.R. § 300.435(e)(9)(iii), identifies nine criteria to be used to evaluate remedial alternatives presented in the Feasibility Study (overall protection of human health and the environment; compliance with applicable and relevant and appropriate requirements (ARARs); long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost; state acceptance; and community acceptance). While consideration of these criteria is not required in this ESD, EPA has analyzed those criteria most likely affected by the remedy change described in this document as follows:

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The selected remedy, as modified by the changes identified in this ESD, is expected to comply with all chemical-specific, location-specific, and action-specific ARARs and To-Be-Considered Materials (TBCs) identified in the ROD. No new ARARs are triggered by the changes identified in this ESD.

Reduction of Toxicity, Mobility, or Volume through Treatment

Both HVE and conventional pump-and-treat provide reductions in toxicity, mobility, and volume through treatment. HVE compares favorably to the previously selected system because HVE removes a greater percentage of the contaminant mass than conventional pump-and-treat. This is due to HVE's higher removal efficiency and combined air/water removal. HVE compares unfavorably, however, in terms of reduction in volume. This is because HVE system's treatment component is carbon adsorption, a mass transfer technology, while the UV oxidation component of the traditional pump-and-treat system would destroy the contaminants.

Short-Term Effectiveness

HVE is expected to lower contaminant levels in the groundwater more effectively in the short term than conventional pump-and-treat because of HVE's higher removal efficiency and combined air/water removal.

Cost Effectiveness

The estimated capital cost for the UV oxidation system is $620,423. The estimated capital cost of the HVE groundwater remediation system is $166,500, a savings of $453,923. The ROD estimate (page 67) of the annual cost of O&M for the UV system is $234,500. The estimated O&M cost for the HVE system during the first year is $175,000. Costs are expected to decrease to approximately $145,000 per year during the second and third years of operation, then decrease again to approximately $115,000 per year for the remainder of the monitoring period. These decreases in cost reflect a reduction in the number of samples to be collected and analyzed. Over a nominal 30 year operational period (selected for cost comparison only -- this figure should not be taken as an estimate of actual system operational life), the total O&M cost of the UV oxidation system is approximately $3,510,000. O&M for the HVE system is estimated to cost $1,785,000, a savings of $1,725,000. Total (capital plus O&M) cost savings associated with this ESD are thus estimated to be $2,178,923. The figures used to estimate the capital and O&M costs of the HVE system were provided by its designers, Hatcher-Sayre, Inc.

Factors influencing the relative costs of the two systems include the following:

- Fewer extraction wells will be necessary to achieve containment of contaminated groundwater with the HVE system.

- Only one groundwater extraction pump is used in the HVE system. The original pump-and-treat system required numerous pumps.

- The HVE system will work more efficiently under conditions at the Site because it is not as sensitive to water table fluctuations, which are significant at the Site.

- Carbon adsorption is expected to be less costly than UV oxidation.

- Because HVE combines extraction and treatment in one process, and because it extracts contaminants from two phases (soil vapor and water) simultaneously, HVE will achieve the cleanup requirements in a shorter time, thereby lowering operation and maintenance costs. The shorter time of operation will also reduce monitoring costs.

State Acceptance

VDEQ has reviewed and commented on this Explanation of Significant Differences and concurs with this ESD.

IV. PUBLIC PARTICIPATION

This ESD and the information upon which it is based will be included in the Administrative Record file for this Site. The Administrative Record also includes the ROD and all documents that formed the basis for EPA's selection of the remedial action for the Site. The Administrative Record is available for public review at the locations listed below:

Pamunkey Regional Library
Ashland Branch
201 South Railroad Ave.
Ashland, VA 23005
(804) 798-4072

U.S. EPA Region III
6th Floor Public Reading Room
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3157

Questions and comments on EPA's action and requests to review the Administrative Record can be directed to:

Mr. Hilary Thornton
Remedial Project Manager
Mail Code: 3HS23
U.S. EPA, Region III
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3323

V. SUPPORT AGENCY REVIEW

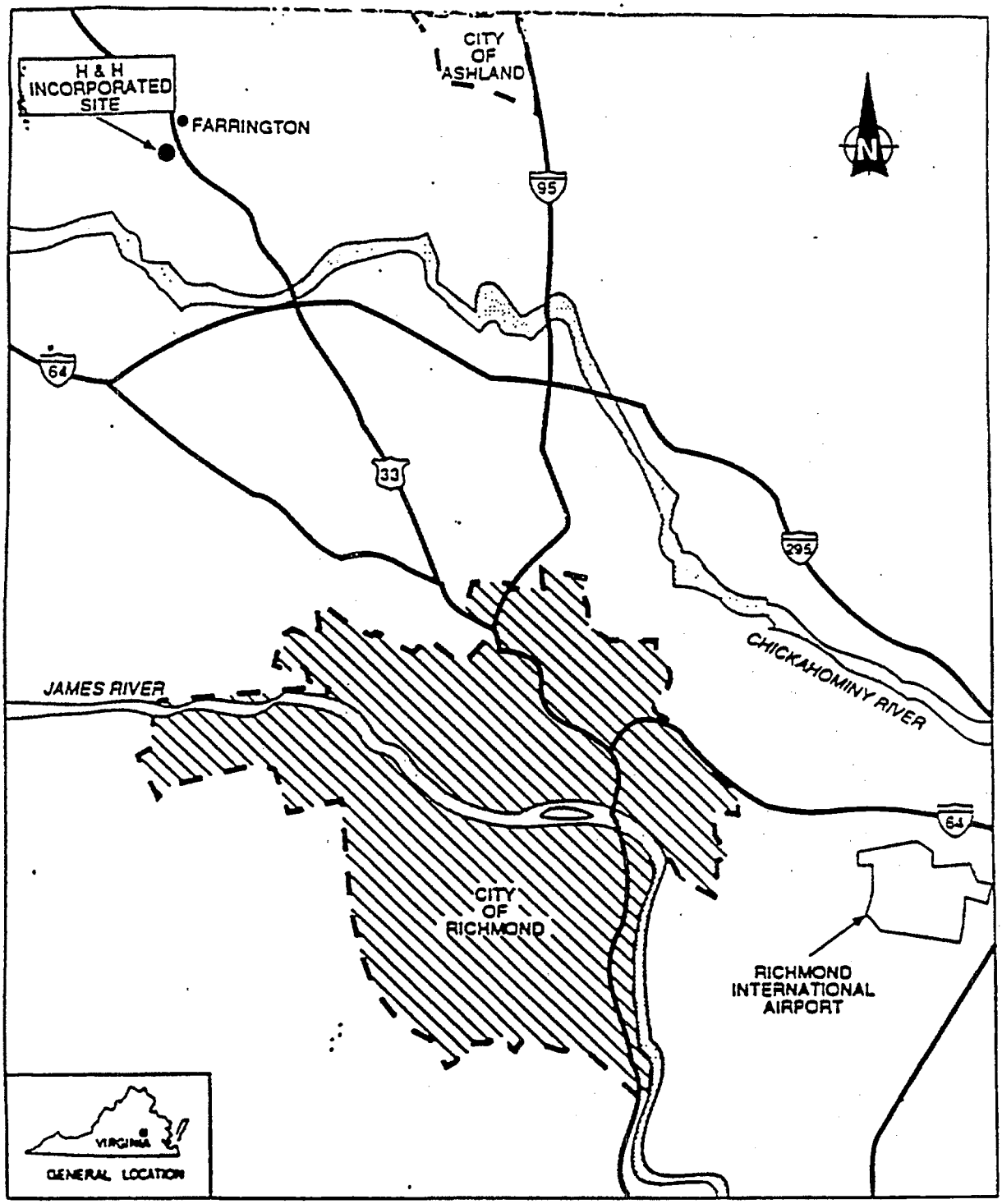
All of the above changes to the remedy have been coordinated with representatives of the Virginia Department of Environmental Quality. VDEQ concurs with the changes to the selected remedy as described in this ESD.

VI. AFFIRMATION OF STATUTORY DETERMINATION

Considering the new information that has been developed and the changes that have been made to the scope of the selected remedy, EPA and VDEQ believe that the revised remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost effective. In addition, the revised remedy utilizes treatment technologies that permanently and significantly reduce the toxicity, mobility, or volume of the hazardous substances to the maximum extent practicable for this Site.

Abraham Ferdas, Director
Hazardous Site Cleanup Division
EPA Region III

2/29/99
Date



SOURCE: Ecology and Environment, Inc. 1992

SCALE

0 2.5 5 Miles

Figure 1
H&H INCORPORATED
SITE LOCATION MAP

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