DECLARATION FOR THE EXPLANATION OF SIGNIFICANT DIFFERENCES SAVAGE MUNICIPAL WATER SUPPLY WELL SUPERFUND SITE
December 19, 1996

Site Name and Location

Savage Municipal Water Supply Well Superfund Site
OK Tool Source Area, Operable Unit 1
Milford, New Hampshire

Identification of Lead and Support Agencies

Lead Agency: **US Environmental Protection Agency**

Support Agency: **NH Department of Environmental Services**
(Lead Agency for Design designated in Cooperative Agreement dated September 26, 1994)

Statement of Purpose

This decision document sets forth the basis for the determination to issue the attached Explanation of Significant Differences (ESD) for the Savage Municipal Water Supply Well Superfund Site (OK Tool Source Area portion) in Milford, New Hampshire.

Statutory Basis for Issuance of the ESD

Under Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)[1] if the US Environmental Protection Agency (EPA) determines that the remedial action being undertaken at a site differs significantly from the Record of Decision (ROD) for that site, EPA shall publish an explanation of the significant differences between the remedial action being undertaken and the remedial action set forth in the ROD and the reasons such changes are being made. EPA policy and regulations[2] indicate that an ESD, rather than a ROD amendment, is appropriate where the changes being made to the remedy are significant but do not fundamentally alter the overall remedy with respect to scope, performance, or cost. After review of the proposed changes to the remedy, EPA has determined that the adjustments to the ROD provided in the ESD are significant but do not fundamentally alter the overall remedy for the Site with respect to scope, performance, or cost. Therefore, this ESD is being issued properly.

In accordance with Section 300.435(c) of the NCP, this ESD and supporting documentation will become part of the Administrative Record which is available for public review at both the EPA Region I Records Center in Boston, Massachusetts, and the Wadleigh Memorial Library in Milford, New Hampshire.

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[1] 42 U.S.C. §9617(c).

[2] See 40 CFR 300.435(c) (National Contingency Plan, § 300.435(c)); EPA Office of Solid Waste and Emergency Response Directive 9355.3-02.

Background

On September 27, 1991, EPA issued a Record of Decision (ROD) selecting a remedy for the cleanup of the Savage Municipal Water Supply Well Superfund Site. The ROD identified two portions of the contaminated plume that needed to be remediated; the two portions were referred to as the concentrated plume and the extended plume. Since issuance of the ROD, the remedy has been divided into two operable units based upon the portions of the plume identifed in 1991. The portion of the plume where the levels of groundwater contamination are the highest is now Operable Unit 1 (OU 1), the OK Tool Source Area (OKTSA). The OKTSA, defined in detail in the Consent Decree, includes all of the OK Tool property and additional properties to the east, north and west of the OK Tool Property. Operable Unit 2 (OU 2) is the Extended Plume. It includes both the remaining portion of the concentrated plume and the dissolved plume; it extends eastward approximately one mile in length and is about 2500 feet in width.

The current document only addresses remediation of the fund lead portion of the site which is the OK Tool Source Area. New information obtained during the design studies, a better understanding of the nature of the contamination, and site restrictions revealed during the design studies all support the need to address changed conditions. However, the original goal of remediating the aquifer has not changed.

Remedy selected in 1991 ROD

The 1991 ROD remedy encompassed the entire site and included six extraction wells (pumping a total of 1100 gpm) and three treatment plants utilizing two treatment technologies. The two treatment technologies were ultraviolet oxidation (UV/ oxidation) and air stripping with carbon adsorption. The ROD made provision for decisions to be made during design for discharge of treated groundwater and for studies to determine the best method to control the concentrated plume.

More specifically, the 1991 ROD described the remedy for the area now known as the OKTSA to be one extraction well pumping at an estimated rate of 250 gpm; groundwater treatment using UV/oxidation; and discharge to either surface water or groundwater to be decided during design. The 1991 ROD considered the placement of a barrier wall to control the volume of water to be pumped.

Changes to the 1991 remedy

The changes to the remedy described in this document apply only to the remediation of the OKTSA. The changes include the acquisition of property upon which the treatment plant will be built; the addition of a slurry wall; the addition of three extraction wells (bringing the total to four); the reduction of the pumping rate to 70 gpm; the construction of a soil vapor extraction system with air sparging; and the treatment of groundwater by air stripping with carbon adsorption. Treated groundwater will be discharged to the ground using two injection wells and a recharge pit.

Overview of the ESD

Evaluations using data developed during pre-design indicate that tetrachloroethylene is present in the subsurface as a dense, non-aqueous phase liquid (DNAPL). The presence of DNAPL makes the extraction of groundwater contamination more complex than does the presence of dissolved phase contaminants alone. DNAPLs are not readily removed by the pump and treat methods called for in the ROD. While hydrodynamic capture could prohibit further migration of contamination from the source area, it would not effectively remove DNAPL mass or dissolved contaminant concentrations in a reasonable time frame.

Therefore EPA and the NHDES have concluded that a physical barrier (the proposed slurry wall) in combination with more aggressive contaminant removal technologies is the preferred technical solution as well as being a more cost effective method of managing the plume. The slurry wall will enclose the area containing the DNAPL and the highest dissolved phase contaminant concentration area thereby prohibiting continued contaminant migration to the downgradient extended plume area. In addition the slurry wall will reduce the total volume of groundwater needing treatment over time.

Soil Vapor Extraction with air sparging has been chosen to remove the near surface contamination sources within the slurry wall. In the 1991 ROD, the treatment technology for the groundwater pumped from the OK Tool area was UV/oxidation. This technology has been changed to air stripping with carbon adsorption. This changed treatment scenario will combine the air streams from two types of contaminant removal technologies -- air stripping of groundwater and SVE of soil -- to one type of treatment technology -- carbon adsorption.

Predesign evaluations indicate that the OK Tool property is not suitable for the location of the treatment plant called for in the ROD. The OK Tool property is almost entirely within the 100-year floodplain. Furthermore, the proposed remedial action (including construction of the slurry wall, soil vapor extraction system, and groundwater extraction and injection wells) will occupy nearly all the OK Tool property. As a result, there will not be sufficient space for the location of the treatment plant on that same property. Therefore, the remedy is being modified due to the physical limitations posed by site conditions to include the acquisition of an adjacent 0.78 acre property upon which the treatment facility will be located.

The Conceptual Remediation Design Report[3] compared several pump and treat alternatives with several slurry wall/pump and treat alternatives. All of the different alternatives used air stripping with carbon adsorption. The estimated cost (present worth analysis over a 30 year period of operation) of the slurry wall/SVE/air stripping alternative is $ 8.2 million. The estimated cost of a pump and treat/SVE/ air stripping alternative without a slurry wall is $ 9.7 million. The changes proposed here result in a cost effective remedy with greater certainty of meeting the clean up goals established

[3]CDM Inc., March, 1996, revised June, 1996.

in the ROD and the requirements defined in the Consent Decree governing the mixed work site.

Declaration

For the foregoing reasons, by my signature below, I approve the issuance of an Explanation of Significant Differences for the Savage Municipal Water Supply Well Superfund Site in Milford, New Hampshire, and the changes stated therein.

12/9/96
Date

Linda M. Murphy, Director
Office of Site Remediation & Restoration
USEPA, Region I

12-9-96
Date

Robert W. Varney, Commissioner
Department of Environmental Services
State of New Hampshire

EXPLANATION OF SIGNIFICANT DIFFERENCES
SAVAGE MUNICIPAL WATER SUPPLY WELL SUPERFUND SITE

I. Introduction

A. Site Name and Location

Site Name: **Savage Municipal Water Supply Well**
OK Tool Source Area

Site Location: **Town of Milford, New Hampshire**

B. Lead and Support Agencies

Lead Agency: **US Environmental Protection Agency**

Support Agency: **NH Department of Environmental Services**
(Lead Agency for Design designated in Cooperative Agreement dated September 26, 1994)

C. Legal Authority

Under Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),[1] Section 300.435(c) of the National Contingency Plan (NCP),[2] and U.S. Environmental Protection Agency (EPA) guidance,[3] if EPA determines that differences in the remedial action significantly change but do not fundamentally alter the remedy selected in the Record of Decision (ROD) with regard to scope, performance, or cost, EPA shall publish an explanation of the significant differences (ESD) between the remedial action being undertaken and the remedial action set forth in the ROD as well as the reasons such changes are being made.

D. Summary of Circumstances Necessitating this Explanation of Significant Differences

The Consent Decree[4] governing the performance of remedial work at the Site resulted in a division of work between the government agencies (EPA and New Hampshire Department of Environmental Services, NHDES) and the Performing Parties (Hitchiner Manufacturing Company and Hendrix Wire and Cable

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[1]42 U.S.C. Section 9617(c).

[2]40 C.F.R. 300.435(c).

[3]Office of Solid Waste and Emergency Response {OSWER} Directive 9355.3-02.

[4]United States of America and State of New Hampshire v. Conductron Corporation d/b/a Hendrix Wire &Cable, et al., Civil Action No. 94-174-JD, June 27, 1994 (New Hampshire District Court).

Company). The terms of the Consent Decree did not change the original goal of restoring the aquifer to drinking water quality. The agreed upon division of work is shown on the attached map (See Figure 1) which delineates the OK Tool Source Area (OKTSA) and the Extended Plume. The remedial work in the OKTSA is being funded by the federal and state governments in accordance with the Hazardous Waste Superfund Program. The remedial work in the Extended Plume is being funded by the Performing Parties. The Consent Decree and the attached Statement of Work (SOW) created a mixed work site where long-term successful remediation in the Extended Plume Area is dependent upon successful remediation efforts in the OKTSA. The SOW allows the Performing Parties to stop remediation efforts after 30 years if contamination from the OKTSA is the reason that the Performing Parties are unable to attain the ROD cleanup goals.

The presence of dense, non-aqueous phase liquid (DNAPL) at the OKTSA changes assumptions about the duration of remediation and the ability of current technology to achieve cleanup levels in that area. DNAPL has proven to be difficult to remediate and experience has shown that timeframes for cleanups may be very long or impossible to predict with any certainty. The presence of DNAPL in the subsurface was contemplated during the development of the ROD. Predesign studies evaluated that possibility and clearly have indicated that DNAPL is present at several locations in the subsurface. The ROD also provided for the consideration of structural or hydrogeologic barriers to speed or to redirect the contaminant movement and thus speed the cleanup. Groundwater modeling shows that significant volumes of clean water enter the OKTSA from the Souhegan River. Therefore the ESD proposes the addition of a barrier wall which will significantly reduce the mobility of contaminants, is permanent, reduces the volume of groundwater to be pumped and improves the long-term effectiveness of the remedial action.

Ultraviolet oxidation (UV/oxidation) and air stripping with carbon adsorption had been selected in the 1991 remedy for groundwater treatment. The treatment for the OK Tool portion of the Site was UV/oxidation. As a result of finding DNAPL at several locations and depths under and near the OK Tool building during the design investigations, soil vapor extraction (SVE) with air sparging and carbon adsorption has been chosen as the best technology for removing those source contaminants. Because it is not efficient to use two different treatment technologies, it has also been decided that air stripping and carbon adsorption will replace UV/oxidation as the technology for remediating the groundwater. As a result of that decision, the contaminated air streams from the air stripping unit and the SVE system can be combined and treated by a single carbon adsorption unit.

Predesign evaluations indicate that the property owned by the OK Tool Company is not suitable for the location of the treatment plant called for in the ROD. The OK Tool property is almost entirely within the 100-year floodplain. Furthermore, the proposed remedial action (including construction of the slurry wall, soil vapor extraction system, and groundwater extraction and injection wells) will be located on the OK Tool property. As a result, there will not be sufficient space for the location of the treatment plant on that same property. Therefore, as a result of site limitations, the remedy is being modified to include the acquisition of an adjacent 0.78 acre property upon which the treatment facility will be located. The parcel to be acquired is outside the 100-year flood plain and adjacent to Route 101A which will provide additional access during the remedial action.

E. Availability of Documents

This Explanation of Significant Differences (ESD) and supporting documentation shall become part of the Administrative Record for the Site. The ESD, supporting documentation for the ESD, and the Administrative Record are available to the public at the EPA Records Center on weekdays from 10:00 a.m. to 1:00 p.m. and from 2:00 p.m. to 5:00 p.m. and at Wadleigh Memorial Library.

US Environmental Protection Agency
Records Center
90 Canal Street
Boston, MA 02114
(617) 573-5729

Wadleigh Memorial Library
49 Nashua Street
Milford, NH 03055
(603) 673-2408

Please call for hours at the library

II. Summary of Site History, Contamination Problems, and Selected Remedy

A. Site History and Contamination Problems

The Site is in the western portion of the Town of Milford, New Hampshire near the intersection of Route 101 and Elm Street (Route 101A). The Site extends over a mile to the east of this intersection. Much of the Site lies between the Souhegan River to the north, and Elm Street to the south. The contamination impacts a 6000-foot long by 2500-foot wide area of a major aquifer named the Milford-Souhegan Aquifer. Discovery of the contamination and evaluation of the site began in 1983.

In February, 1983, NHDES detected five volatile organic compounds (VOCs) in the Savage Municipal Water Supply Well. Because of the risk to the community drinking the well water, the well was closed. The Site was placed on the National Priority List (NPL) on September 1, 1984.

Remedial Investigation and Feasibility Study reports were completed in June, . 1991. Two groundwater plumes were defined and their sources identified. One plume was mainly contaminated with tetrachloroethylene (PCE) and its degradation products, while the second was mainly contaminated with 111, trichloroethane (TCA) and its degradation products. The PCE plume emanated from the OK Tool facility while the TCA plume came from the Hitchiner and Hendrix facilities. The two plumes came together downgradient of the sources. The source of contaminants was determined to be the handling and disposal of hazardous materials and hazardous waste at the OK Tool, Hitchiner, and Hendrix manufacturing facilities.

The Record of Decision (ROD) was signed on September 27, 1991. The ROD remedy selected for the OKTSA (identified in the ROD as part of the Concentrated Plume Area) was to contain and treat the contaminated groundwater and, if present, the DNAPL source area. The remedy specified for the Concentrated Plume Area used multiple extraction wells pumping at an estimated 400 gallons per minute (gpm) and two treatment technologies, UV/oxidation and air stripping and carbon adsorption. The remedy for the remainder of the site, now identified as the Extended Plume Area or Operable Unit 2, specified multiple extraction wells pumping at 700 gpm and groundwater treatment consisting of metals removal and UV/oxidation.

Negotiations after the ROD was issued resulted in two consent decrees. The first was entered on June 27, 1994, and required the Performing Parties to perform the work in the Extended Plume Area. The Extended Plume is all areas of the Savage Site other than the OKTSA. The second consent decree was entered on December 8, 1994, and was a cash out for the parties connected to the OK Tool Company. As a result of the cash out, the remediation in the OKTSA is being funded by the federal and state governments. The Site is now designated as a mixed work site.

Through the terms of a Cooperative Agreement with EPA in 1994, the State of New Hampshire accepted the lead for the Remedial Design and Remedial Action at the OK Tool Source Area. Vertical profiling was conducted by EPA and identified areas of DNAPL accumulation. Meanwhile, NHDES procured the services of a design engineer under a contract.

Predesign studies developed several scenarios for site remediation including pumping at different rates, a partially-encircling barrier wall, and a completely-encircling barrier wall. Groundwater modeling indicated that hydraulic

containment of contamination in the OKTSA required a minimum pumping of 150 gallons per minute. However, actual design of a system would be for 250 gpm due to uncertainty of the modeling and a conservative approach to increase the probability of success. Much of the groundwater pumped would be groundwater recharge coming from the Souhegan River. By comparison, using a completely-encircling barrier wall the pumping rate will be reduced to 20 gallons per minute within the wall (the rate is dependent on the contribution from bedrock groundwater) while successfully containing the contamination. Based on the performance requirements of the CD, groundwater modeling suggested that the location of additional extraction wells to remove dissolved contamination outside the barrier wall would be appropriate to meet the remediation goals of the OKTSA. Such additional extraction wells will prevent significant offsite migration of contaminants from the OKTSA to the Extended Plume Area and will help achieve remediation at this mixed work site.

B. Summary of the Selected Remedy

The selected 1991 ROD remedy is intended to restore the groundwater in the aquifer to drinking water quality. The remedy has the following five components: extraction and treatment of the groundwater in the concentrated plume; extraction and treatment of groundwater in a portion of the extended plume; natural attenuation; environmental monitoring; and institutional controls. The 1991 ROD also contemplated containment and the removal of DNAPL if present. This ESD only affects the remedy in the OK Tool portion of the concentrated plume area. The following quotations from the ROD provide the salient information concerning the extraction and treatment of the concentrated plume:

> A groundwater extraction and treatment system will be installed near the OK Tool and Hitchiner plants to capture and treat the groundwater from the concentrated plume. The wells will be located to extract an estimated 400 gallons per minute of the heavily contaminated groundwater to prevent movement of those contaminants into remaining portions of the aquifer. The groundwater will be treated by two separate treatment processes. Ultraviolet oxidation will be used to treat water from the OK Tool well. Air stripping will be used to treat water from the Hitchiner well.
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> The removal of metals from the groundwater is dependent upon both the determination of discharge limitations and the treatment process design requirements. If the discharged treated water is used for groundwater recharge (which may include recharge to the Hitchiner-Hendrix discharge stream because the stream recharges the aquifer), MCLs will be the proper ARAR to be met and discharge limitations will be set appropriately.

If the water is discharged to a surface water body which does not recharge the groundwater, the discharge must meet the NPDES discharge requirements (which may be based on Ambient Water Quality Criteria if aquatic life is affected) and the appropriately set discharge limitations. If the treatment processes require metals to be removed for treatment efficiency, the discharge limitations described above still apply. The two treatment trains are necessary due to the relative locations of the wells and the nature of the contaminants identified at each location.

The well locations and pumping rates for all extraction points are subject to change during design studies. Additional changes may also be needed in the remediation phase based on field data obtained during system operation.

Ultraviolet (UV) oxidation is a technology that has proven to be effective in destroying chlorinated solvent contaminants of the kind found to be predominant within the plume, e.g. PCE. Volatile organic contaminants dissolved in groundwater are brought into contact with a proportional amount of hydrogen peroxide solution in the presence of ultraviolet radiation. The ultraviolet radiation breaks the hydrogen peroxide solution into hydroxyl radicals while simultaneously exciting the bond structure of the organics so that they become susceptible to oxidation. The end products of the reaction are carbon dioxide, water and a chloride ion.

Air stripping with metals pretreatment coupled with vapor phase carbon treatment is the treatment process for the contamination at Hitchiner due to the presence of 1,1,1-TCA. Air stripping is more efficient and thus more cost effective than ultraviolet oxidation in treating saturated organics such as 1,1,1-TCA which is located at the Hitchiner facility. In this process, contaminated groundwater is passed through a packed column countercurrent to an air flow which volatilizes the compounds from the liquid stream. The contaminant laden air stream is then treated using carbon to remove the contaminants. The carbon is regenerated off site and the contaminant is destroyed during that process.

The investigation of the concentrated plume suggests the presence of DNAPLs. Even if DNAPLs are determined to be present, this remedy will initially contain that portion of the plume where DNAPLs are found so that the remainder of the contaminated aquifer can be restored to beneficial use. EPA will periodically review advances in groundwater cleanup technology to determine if new techniques have been developed to effectively remediate

DNAPL conditions. Consistent with CERCLA and the NCP, EPA will determine whether any modifications to the remedy are appropriate.[5]

In addition, studies will be conducted to determine whether the remedy will result in a lowering of the water table at the Site. A lowered water table could have a negative effect on agricultural land use or on environmentally-sensitive areas within the Site. Similarly, both the specific location for the discharge of treated water and the method of discharge for the treated water will be examined during the design phase for other possible negative impacts on either wetlands or areas currently being used for agriculture. If the design studies indicate that negative impacts may occur in those areas or if negative impacts do occur in those areas after the cleanup has begun, appropriate mitigation efforts will be made. The use of groundwater recharge or structural or hydrogeologic barriers may also be considered to speed or to redirect the contaminant movement and thus to speed the clean-up.

Chemical data from the concentrated plume area suggest that DNAPLs may be present in the overburden aquifer. Studies to further investigate that possibility will be undertaken in the remedial design stage. If DNAPLs are determined to be present, the remedy initially would be to contain that portion of the plume so that the remainder of the contaminated aquifer can be restored to beneficial use.[6]

In summary the ROD contemplated that several decisions concerning the remedy would be delayed until the design provided better information. The ROD did not anticipate the establishment of a mixed work site where the governments assume responsibility for performing part of the remedy.

III. Description of Significant Differences

The remedy at the Site has been divided into two operable units (OU) since the signing of the 1991 ROD. This document addresses only OU 1, the OK Tool Source Area. The OKTSA is part of the concentrated plume. The remaining part of the concentrated plume and the extended plume is OU 2; the work in OU 2 is the responsibility of the performing parties. As a result of the mixed work settlement, the governments will be performing the remedy in the OKTSA. In addition the physical limitations posed by site conditions and the nature of the contamination support the need to alter the remedy.

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[5]Record of Decision, Savage Municipal Water Supply Well Superfund Site, September 27, 1991, p. 53.

[6]Ibid., p. 56.

The remedy selected by the 1991 ROD was not based on the presence of DNAPL at the OK Tool Source Area. The ROD noted that if DNAPL were present, the selected remedy would address the problem. But the ROD also required further studies to determine if DNAPL were in fact present. Predesign studies have since shown that DNAPL is present. The remedy changes address DNAPL.

The 1991 ROD required design studies to consider methods of hydrodynamic control or structural or hydrogeologic barriers for speeding the cleanup or directing the contaminant plume. The language in the ROD indicates both an intention to remediate DNAPL and a willingness to use methods other than pumping to prevent the migration of contaminants from the site.

During remedial design, groundwater modeling has shown that significant quantities of clean groundwater recharge from the Souhegan River will be captured by the pump and treat system envisioned in the ROD, unless a barrier wall is constructed to stop this flow. Uncertainty about the length of time it will take to complete the remedy using pumping for hydraulic containment supported the evaluation of a slurry wall to reduce overall program costs. In addition, the dependance of the Extended Plume cleanup on the successful remediation in the OKTSA places greater importance on selecting a technology that is more certain to control the contamination in the OKTSA. Therefore, after consultation between EPA and NHDES, it has been concluded that a barrier wall will provide long-term control of the DNAPL area within the OK Tool Source Area with greater certainty and at lower costs projected over a 30-year period. In the event that the DNAPL cannot be removed completely within that 30-year period, construction of a barrier wall will also result in lower long term O&M costs.

The presence of DNAPL at the OK Tool Source Area complicates the performance of any remedy at the Site. Therefore, the governments have considered different treatment technologies which are more appropriate to the site conditions revealed during the design investigation. The location of DNAPL at relatively shallow depths in the OKTSA suggests the use of soil vapor extraction with air sparging wells as an effective treatment technology within the slurry wall. The pumping of groundwater for such shallow contamination is not appropriate since some of the contamination will be above the level of groundwater within the slurry wall. The contaminated air from the SVE system will be treated using activated carbon and then discharged to the atmosphere. EPA policy supports the choice of this technology as the preferred presumptive remedy for VOCs in soils.[7]

The remedy continues to use the pumping of groundwater where appropriate. Groundwater will be removed at the rate of 20 gpm from the lower depths of the area within the slurry wall using two extraction wells. There will also be two extraction wells

[7]User's Guide to the VOCs in Soils Presumptive Remedy, OSWER Directive No. 9335.0-63FS.

located outside the slurry wall to capture dissolved contamination that is between the slurry wall and the boundary of the OKTSA. The wells outside the wall will pump at a removal rate of 50 gpm. The contaminated groundwater from all four wells will be treated using air stripping and the resulting contaminated air will be treated using activated carbon. The clean air will be discharged to the atmosphere. See Figure 2 for a plan of the components described for the remedy in the OKTSA.

The ROD selected UV/oxidation as the treatment technology for the groundwater to be pumped from the OK Tool portion of the concentrated plume, now delineated as the OKTSA. This selection was made because that technology was more cost effective than air stripping. At the time it was believed that metals pretreatment was necessary for air stripping to work. However, experience at other similar Superfund Sites in New Hampshire and sampling data during the design phase indicate that pretreatment for metals will not be necessary. Since the ROD called for UV/oxidation, keeping that treatment technology would mean that two types of technology would be used for treating contamination on site: SVE with carbon for the soils and UV/oxidation for the groundwater. A common sense decision was made to change the groundwater treatment to air stripping so that the air stream from both the soils and groundwater could be treated by a single treatment technology, carbon adsorption.

The carbon contaminated from treating air from both removal technologies will be regenerated on site using low pressure steam stripping to remove the contamination from the carbon and concentrate it in a liquid form. The concentrated contamination in liquid form will be shipped offsite to an approved facility for treatment, destruction or recycling.

The ROD did not anticipate the need to acquire any property to perform the remedy. The proposed remedy calls for the acquisition of a 0.78 acre parcel adjacent to the OK Tool Company property. The treatment facility will be built upon that newly acquired parcel. Design studies have indicated that the OK Tool property is no longer the best site for the location of a treatment facility. First of all, most of the OK Tool property is in the 100-year floodplain which increases the cost of construction. Secondly, the proposed remedial action (including construction of the slurry wall, soil vapor extraction system, and groundwater extraction and injection wells) will be located on the OK Tool property. As a result, there will not be sufficient space for the location of the treatment facility on that same property. This modification is due to physical limitations posed by site conditions.

The ESD describes technology changes that will better enable the selected remedy to control the OKTSA portion of the concentrated plume and allow the cleanup of the extended plume. Containment of the concentrated plume was one of the goals of the 1991 ROD. The proposed changes were prompted by new information including site limitations which were revealed during the pre-design and design studies. The following paragraphs address how those proposed changes affect statutory and regulatory evaluations made in the ROD upon which the choice of remedy was based.

The NCP articulates nine criteria to be used in evaluating different remedy alternatives. The 1991 ROD includes a detailed analysis based on those nine criteria of several different alternatives as well as the reasons why the chosen remedy was selected. As the following analysis indicates, the proposed technology change has no significant impact on the evaluation of the chosen remedy using the nine criteria.

Overall Protection of Human Health and the Environment

The remedy continues to provide protectiveness through capture and treatment of the contaminated groundwater and institutional controls restricting the use of contaminated groundwater. The slurry wall will reduce the volume of groundwater to be extracted and treated and will provide more certainty of remediation when used with groundwater extraction and treatment.

Compliance with ARARs

The remedy continues to meet ARARs, including chemical-specific, action-specific, and location-specific ARARs. The technology change to air stripping and an SVE system with carbon adsorption for the treatment of both air streams will meet ARARs for discharge to the atmosphere. The technology change will not affect the ability of the remedy to meet the cleanup standards proposed in the ROD. In addition, the technology change will also meet the performance requirements for the OK Tool Source Area placed on the government by the Consent Decree.

The estimated timeframe for cleanup established in the ROD was 15 to 85 years. The remedy is expected to meet ARARs outside the slurry wall within 10 years. The slurry wall will control the subsurface sources and allow long-term management of potential migration into the Extended Plume. Due to DNAPL being present within the slurry wall, no accurate prediction can be made regarding cleanup time for sources within the slurry wall. As specified in the 1991 ROD, the governments will continue to explore different technologies which may be appropriate for use in remediating the OKTSA.

Long Term Effectiveness and Permanence

The technology change will not affect the ability of the remedy to provide for capture and treatment of the OKTSA portion of the concentrated plume. The slurry wall provides more certainty that a reduction in the mobility of contamination will occur. The use of SVE with air sparging is a proven technology that will permanently remove the contamination from the soil. SVE is a proven technology and is recommended as a presumptive remedy for removal of VOCs in soil. The air sparging is an SVE enhancement which is consistent with the ROD to apply technologies which will improve the remedy or reduce cost or time of cleanup.

Reduction of toxicity, mobility, or volume through treatment

The slurry wall will improve the certainty of a reduction in mobility of contamination to the remaining aquifer. The use of air stripping and SVE with carbon regenerated on-site rather than UV/oxidation will mean that the contamination will be concentrated on-site and shipped to an approved facility for treatment, destruction or recycling. The capture of contaminated groundwater outside the slurry wall will continue to reduce the mobility and volume of contamination moving to the extended plume.

Short Term Effectiveness

There will be a change in the short term effectiveness of the remedy. There will be greater chance for the creation of dust during the demolition of the buildings. The asbestos within the buildings has been identified in the design and will be removed in accordance with Federal and State regulations governing asbestos removal and will be disposed of in an approved facility. The increase in dust from the demolition will be lessened by construction techniques. The demolition of the buildings is expected to be done in less than two months. The Site Health and Safety Plan will address the monitoring and worker procedures to be followed for the demolition of the buildings.

The change to a slurry wall means that different construction techniques will be used. he construction will remove contaminated soil from the aquifer that will be handled in an appropriate manner. Some of the material will be used to make the slurry wall material. Some of the contamination will volatilize from the soils when exposed to the atmosphere, however this is expected to be a minimal amount. Construction procedures such as covering the soils or misting with water will minimize the creation of dust from any stockpiled soil. The potential exposure from these operations is expected to be low. The Site Health and Safety Plan will address the monitoring requirements and worker safety procedures to be followed during this phase of the construction. The construction of the slurry wall is expected to be done in approximately five months.

There are no adverse impacts expected to any of the agricultural or wetland areas of the site by the remedy in the OKTSA.

Implementability

The proposed technology changes have no effect on the implementability of the remedy.

Cost

The mixed work settlement prompted a need to reexamine the design concept of the ROD. The technology identified in the ROD has changed as a result of both new information about the nature of the contamination gathered during the design and the

division of work based on the Consent Decree. The basic design concept of controlling the contamination so as to facilitate the cleanup of the aquifer did not change.

A Conceptual Design Report prepared for the NHDES in 1996 compared several alternatives. A comparison of costs is difficult because the ROD does not include the SVE technology to remove the newly found contamination in the shallow depth of the OKTSA. The alternative developed in the Conceptual Design Report most similar to the ROD remedy is pump and treat with air stripping of the groundwater, SVE/air sparging, and combining the two air streams for treatment with carbon; the alternative does not include a slurry wall. The estimated 30 year present worth cost for that alternative is $9.7 million. The estimated 30 year present worth cost of the proposed remedy as described above but with a slurry wall and reduced groundwater pumping is $8.2 million. The slurry wall will reduce the volume of water to be pumped which lowers the long term operation and maintenance costs associated with the continued remediation of the groundwater contamination. The estimated annual operation and maintenance cost savings due to installment of a slurry wall is $150,000.

State Acceptance

The NH Department of Environmental Services has determined that the ESD and proposed changes are acceptable.

Community Acceptance

The NHDES held a public meeting on November 19, 1996 at the Milford Town Hall. There were 22 people in attendance. A site history was given and the final design was described in detail. Several questions were asked about the construction techniques to be used, the schedule of construction, the technologies to be used for treating the water and the cost of the remedy. All questions were answered satisfactorily. The community appears to be satisfied with the design and is supportive of the remedial action.

In summary, it is apparent from reviewing the above mentioned criteria that the proposed changes described in this ESD will protect human health and the environment, will comply with all applicable or relevant and appropriate Federal and State requirements, and will provide for a long-term and permanent remedy for the Site to a similar or greater degree than the remedy for the OK Tool Source Area outlined in the 1991 ROD. It will pose somewhat greater short-term construction-related risks than the remedy contained in the ROD, which will be addressed in the Remedial Action Health and Safety Plan. The proposed changes to the remedy will increase construction costs, but will reduce Operation and Maintenance costs, especially if operations continue beyond 30 years.

IV. State Agency Comments

Under a Cooperative Agreement with EPA, the State of New Hampshire Department of Environmental Services has become the lead agency for the design of the remedy for the OKTSA. The NHDES has generated the information and developed the modifications to the design that are described here and that support the changes to the 1991 ROD remedy.

V. Statutory Determination

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA and NHDES believe that the 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 a permanent solution to the maximum extent practicable for this site.

VI. Public Information

This ESD and its accompanying supporting information is available for public review at the locations and times listed in Section I above.

The NH Department of Environmental Services held a public meeting to provide information and answer any questions on the final design in the Auditorium of the Milford, NH Town Hall on November 19, 1996. Comments received are discussed in the Community Acceptance paragraph above.

Savage Well Site

Volatile Organic Compounds in Groundwater

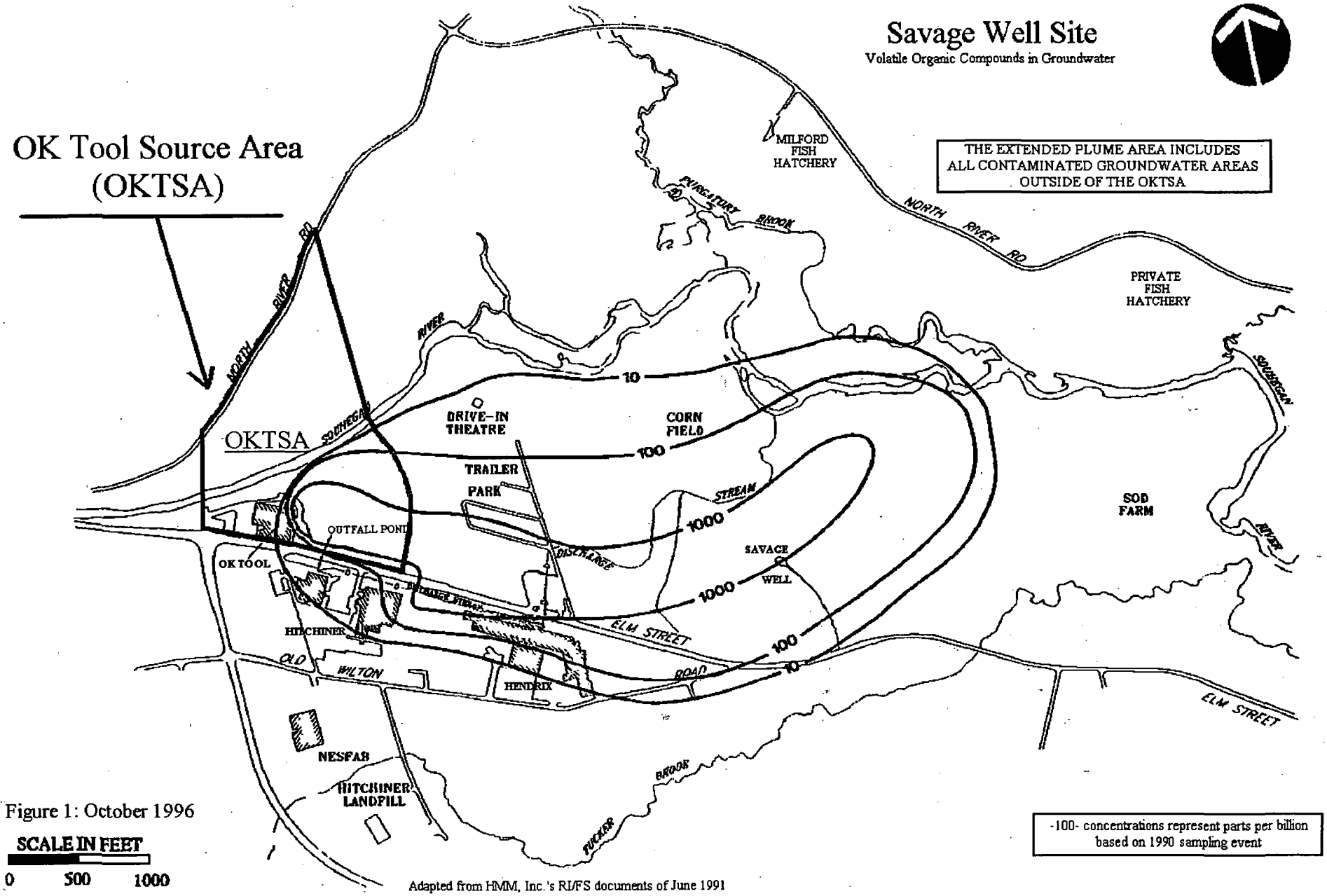
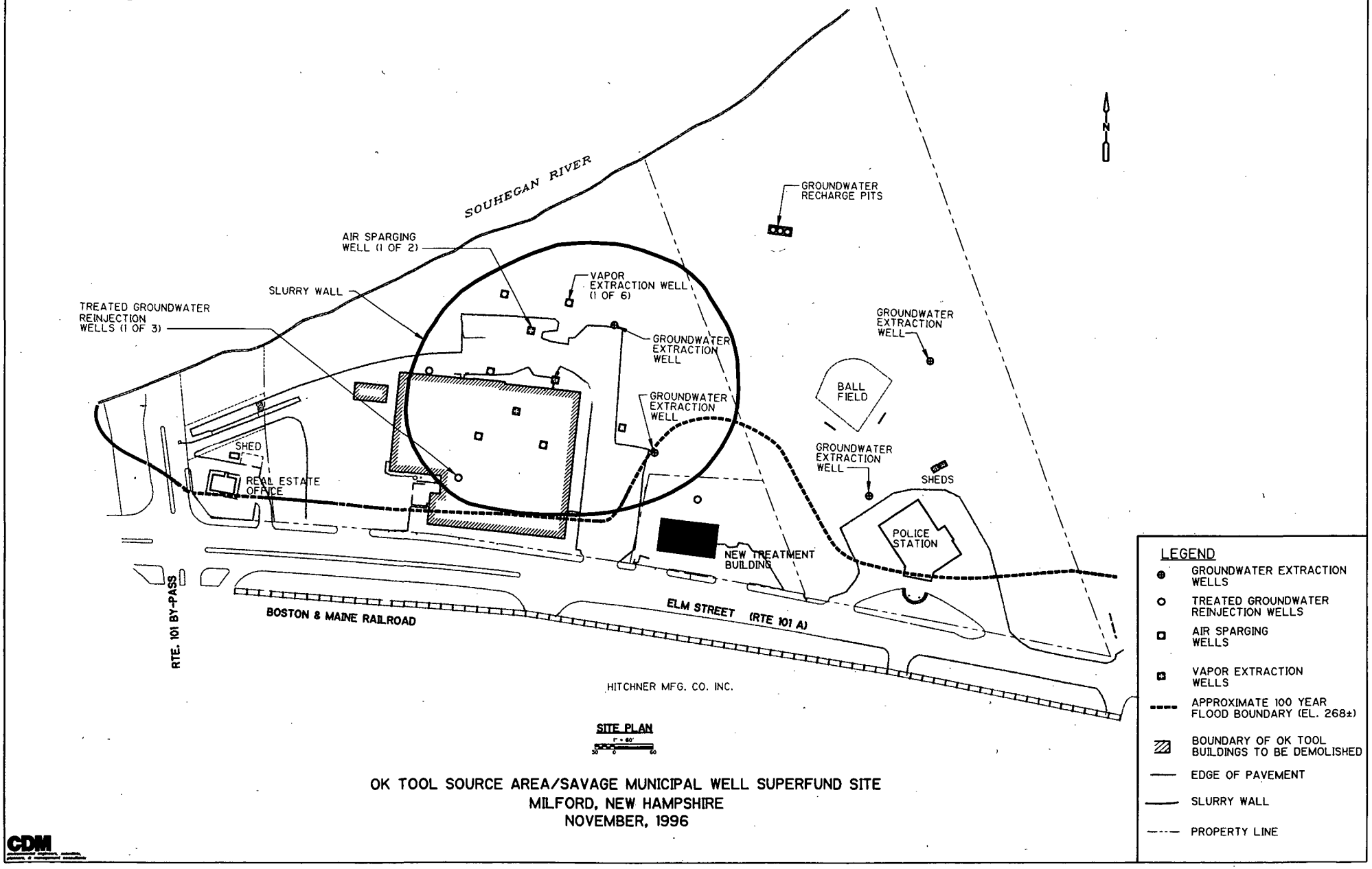


Figure 1: October 1996

Adapted from HMM, Inc.'s RI/FS documents of June 1991



SITE PLAN

OK TOOL SOURCE AREA/SAVAGE MUNICIPAL WELL SUPERFUND SITE
MILFORD, NEW HAMPSHIRE
NOVEMBER, 1996

CDM

Figure 2