DECLARATION FOR THE

SECOND EXPLANATION OF SIGNIFICANT DIFFERENCES

STAMINA MILLS SUPERFUND SITE, NORTH SMITHFIELD, RI

September 2007

SITE NAME & LOCATION

Stamina Mills Superfund Site, North Smithfield, Rhode Island

IDENTIFICATION OF LEAD & SUPPORT AGENCIES

Lead Agency: United States Environmental Protection Agency (EPA)

Support Agency: Rhode Island Department of Environmental Management (RIDEM)

STATEMENT OF PURPOSE

This decision document sets forth the basis for the determination to issue the attached Second Explanation of Significant Differences (2007 ESD) for the Stamina Mills Superfund Site (the Site) located in North Smithfield, Rhode Island. This 2007 ESD focuses on clarifying the institutional control requirements set forth in remedy selected in the September 28, 1990 Record of Decision (1990 ROD) and incorporates into the selected remedy the recommendation in the first five-year review report performed at the Site in 2005 (2005 five-year review) to conduct an investigation into potential pathways for vapor intrusion.

STATUTORY BASIS FOR ISSUANCE OF THE ESD

Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), requires that, if the remedial action being undertaken at a site differs significantly from the Record of Decision for that site, EPA shall publish an Explanation of Significant Differences setting forth the differences between the remedial action being undertaken and the remedial action set forth in the Record of Decision and the reasons for the changes to the remedial action. Section 300.435(c)(2)(i) of the National Contingency Plan (NCP), and EPA guidance (Office of Solid Waste and Emergency Response (OSWER) Directive 9200.1-23P, July 1999), indicate that an Explanation of Significant Differences, rather than a Record of Decision amendment, is appropriate where the adjustments being made to the Record of Decision are significant but do not fundamentally alter the remedy with respect to scope, performance or cost. EPA has determined that the adjustments to the 1990 ROD provided in this 2007 ESD are significant but do not fundamentally alter the overall remedy for the Site with respect to scope, performance, or cost. Therefore, this 2007 ESD is being properly issued.

In accordance with Section 117(d) of CERCLA and Section 300.825(a)(2) of the NCP, this 2007 ESD will become part of the Administrative Record for the Site, and will be available for public review at both the EPA Region 1 Record Center in Boston, Massachusetts 02114 and the North Smithfield Public Library, 20 Main Street, Slatersville, Rhode Island 02876.

BACKGROUND

The 1990 ROD selected a remedial action for remediating the contaminated medium at the Site. In summary, the remedy as originally described in the 1990 ROD consisted of the following:

Source Control Components

- Soils in the trichloroethylene (TCE) spill area are to be remediated using in-situ vacuum extraction. This will be accomplished through the installation of a number of shallow wells from which air containing TCE and other volatile organic compounds (VOCs) will be withdrawn from the soils. The withdrawn air will be treated using activated carbon filters prior to being discharged to the atmosphere.

- Approximately 550 cubic yards of a mixture of landfill wastes and sediments from within the 100-year floodplain of the Branch River will be excavated and consolidated under a new RCRA multi-layer cap to be installed over the existing landfill at the Site. A leachate collection system will be installed to handle the generation of any leachate.

- The location of the on-site septic tank will be confirmed and its contents sampled and then disposed of.

- Institutional controls in the form of deed restrictions will be used at the Site to regulate land use.

Management of Migration Components

- Active restoration of the contaminated groundwater aquifer will take place with the goal of restoring it to drinking water quality as rapidly as possible. EPA estimated in the 1990 ROD that the time frame for groundwater restoration would be 10 to 15 years. Extraction of groundwater will take place through the installation of on-site bedrock wells. Extracted groundwater will be treated using an innovative ultraviolet light and hydrogen peroxide (UV/hydrogen peroxide) technology.

- Entrances and exits to the raceways which were used to transport water to mill buildings will be sealed with impermeable barriers. Sections of the raceways which have not been collapsed will be collapsed and backfilled.

- Long-term environmental monitoring of the groundwater and the Branch River will be conducted to ensure the effectiveness of the remedy.

Other Miscellaneous Components

- Demolition and removal of partially standing buildings at the Site including a deteriorating smokestack.

- Grading and vegetation of the Site at the conclusion of the remedial activities.

On June 27, 2000, EPA issued the first ESD (2000 ESD) to modify two aspects of the remedy: 1) The method for treating contaminated groundwater was changed from UV/hydrogen peroxide technology to

air stripping as the primary means of treating groundwater and activated carbon as the primary means of treating VOCs found in the vapors produced by the soil vacuum extraction system and the air stripper; and 2) The method of addressing the landfill changed from consolidation of landfill wastes and construction of a RCRA C cap to excavation of the landfill wastes and offsite disposal at a properly licensed facility.

All of the above components of the remedy have been completed or are underway. In 2005 EPA conducted a five-year review of the remedy and found that all systems are operating effectively. However, contaminant concentration levels in groundwater, while decreasing offsite, still remain above drinking water standards.

OVERVIEW OF THIS SECOND ESD

Clarification of Institutional Controls

Based on information and data generated since the issuance of the 1990 ROD, as well as in the subsequent 2000 ESD, the 2005 five-year review, and as a result of recent real estate transactions at the Site, EPA has determined it necessary to clarify the required institutional controls that are necessary to maintain the protectiveness of the remedy. The selected remedy in the 1990 ROD required institutional controls in the form of deed restrictions regulating land use at the Site and noted that these controls would be implemented by the Site owner pursuant to a Partial Consent Decree already lodged with the Court. However, neither the 1990 ROD nor the Consent Decree specified the land use controls needed on the Site. In addition, although the 1990 ROD includes a discussion of the risk associated with groundwater, including the negative impacts on Site contaminants caused by offsite groundwater pumping, the 1990 ROD does not specify the need for controls on the use of groundwater on and offsite. Subsequent to the 1990 ROD, ownership of the Site property changed and institutional controls on land use were never implemented. In addition, the 2000 ESD was issued to, among other things, modify the landfill portion of the remedy which resulted in eliminating the need for institutional controls to prevent harm to the landfill cap but heightened the need for onsite groundwater controls since waste was now removed from this area of the Site making groundwater potentially available as drinking water.

This 2007 ESD clarifies the continued need for land use controls both on and off the Site to ensure that the remedy remains protective. Specifically, because groundwater is still contaminated above drinking water levels both on and offsite, there remains a need to control the use and pumping of groundwater both on and offsite. Institutional controls that would prohibit both on and offsite use of groundwater, as well as prohibit the installation of new groundwater wells, will prevent ingestion of contaminated water by offsite property owners and future onsite property owners. Restrictions on the pumping of any existing offsite groundwater wells will also prevent drawing the contaminated groundwater plume northward from the Site. In addition, controls are needed on the Site to prohibit any disturbance of the various treatment systems and their infrastructure located on the Site, to prohibit the excavation of soils in the areas currently being treated, to allow excavation of soils in other areas of the Site only with the prior approval of EPA, and to grant to EPA, the Rhode Island Department of Environmental Management, and Kayser-Roth Corporation (the party that is implementing EPA's remedy under a unilateral order) the right to enter onto the Site to conduct the response action, implement the operation and maintenance, and implement further remedial action if EPA determines that such action is necessary. Finally, although a Town ordinance currently prohibits installation of new groundwater wells and prohibits well pumping activity within a delineated area around the Site, surveying and decommissioning of any remaining active wells within the Stamina Mills Groundwater Remediation District (as delineated in the ordinance) is required to ensure remedy protectiveness. Should the Town ordinance be revoked or otherwise become ineffective

as determined by EPA, some other form of institutional control, such as deed restrictions, will be necessary to ensure protectiveness.

Vapor Intrusion

Since the 1990 ROD was issued, EPA has become concerned that vapor intrusion may be a potential exposure route for VOCs from groundwater at many Superfund sites and has issued a guidance for evaluating vapor intrusion. As part of the 2005 five year review, using EPA's Office of Solid Waste and Emergency Response Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Draft Vapor Intrusion Guidance), November 2002, EPA530-D-02-004, EPA performed a screening level evaluation of potential vapor intrusion exposures to determine potential impacts at the Site and in the surrounding community. Based on these findings, EPA determined that a more focused Site-specific assessment is appropriate for this Site. (See Appendix L of the 2005 five-year review report.) This Site-specific assessment will be conducted consistent with EPA's Draft Vapor Intrusion Guidance. Should this Site-specific assessment indicate that vapor intrusion does pose or potentially poses a threat to human health or the environment, a further decision document will be issued by EPA.

Applicable or Relevant and Appropriate Regulations (ARARs)

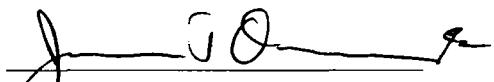
Consistent with these modifications to the selected remedy, EPA has identified one new applicable regulation and one new guidance that are now incorporated into the selected remedy:

For decommissioning of active wells – Rhode Island Department of Environmental Management, Office of Water Resources, Rules and Regulations for Groundwater Quality, Appendix 1: Construction Standards and Abandonment Procedures for Monitoring Wells, Piezometers and Other Subsurface Borings (May 15, 2006); and

For site-specific assessment of vapor intrusion – EPA Office of Solid Waste and Emergency Response Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Draft Vapor Intrusion Guidance), November 2002, EPA530-D-02-004.

Declaration

For the foregoing reasons, by my signature below, I approve the issuance of an Explanation of Significant Differences for the Stamina Mills Superfund Site in North Smithfield, Rhode Island, and the changes stated therein.



9-27-07

James T. Owens III, Director
Office of Site Remediation and Restoration

Date

Stamina Mills Superfund Site

Second Explanation of Significant Differences

September 2007

Prepared by EPA Region 1

TABLE OF CONTENTS

SECOND EXPLANATION OF SIGNIFICANT DIFFERENCES

Stamina Mills Superfund Site
North Smithfield, Rhode Island

September 26, 2007

I. INTRODUCTION

This document constitutes the second Explanation of Significant Differences (2007 ESD) with respect to the remedial actions as specified in the Record of Decision for the Stamina Mills Superfund Site (the Site) signed by the Regional Administrator on September 28, 1990 (1990 ROD), as modified by the first Explanation of Significant Differences dated June 2000 (2000 ESD), and those now planned under this 2007 ESD. It also documents the conditions that gave rise to the need for this 2007 ESD.

A. SITE NAME & LOCATION

Site Name: Stamina Mills Superfund Site

Site Location: North Smithfield, Rhode Island

Stamina Mills Superfund Site

B. LEAD & SUPPORT AGENCIES

Lead Agency: United States Environmental Protection Agency (EPA)

- *Contact: Byron Mah, EPA Remedial Project Manager, (617) 918-1249*

Support Agency: Rhode Island Department of Environmental Management (RIDEM)

- *Contact: Louis Maccarone, RIDEM Project Manager, (401) 222 -2797 x7142*

C. LEGAL AUTHORITY FOR ESD

Under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9617(c), Section 300.435(c) of the National Contingency Plan (NCP), 40 C.F.R. 300.435(c)(2)(i), and U.S. Environmental Protection Agency (EPA) guidance (Office of Solid Waste and Emergency Response [OSWER] Directive 9200.1-23P), if the EPA determines that differences in the remedial action significantly change but do not fundamentally alter the remedy selected in the Record of Decision, with respect to scope, performance, or cost, the EPA shall publish an Explanation of Significant Differences between the remedial action being undertaken and the remedial action set forth in the Record of Decision and the reasons such changes are being made. Because the clarifications stated herein to the remedy selected in the 1990 ROD do not fundamentally alter the overall remedy with respect to scope, performance or cost, the issuance of this 2007 ESD is appropriate in this case.

D. SUMMARY OF CIRCUMSTANCES NECESSITATING THIS ESD

This 2007 ESD is being issued to clarify the institutional controls portion of the selected remedy and to incorporate a recommendation for a Site-specific assessment for vapor intrusion made in the 2005 five year review.

Institutional Controls

The groundwater aquifer at and surrounding the Site is federally classified as a drinking water aquifer, except those areas where waste has been left in place. Groundwater flow, under natural conditions, general flows from north to south, with recharge in the upland areas north of the Site. Hydrogeologic investigations performed during the remedial investigation showed that pumping individual bedrock groundwater supply wells, including the Forestdale Water Association Well (FWAW), a community well located approximately 800 feet north of the Site, temporarily reversed the regional hydraulic gradient in such a way that the groundwater flow beneath the Site was directed north toward residential areas. This resulted in the groundwater TCE plume from the Site being drawn offsite into the northern residential area. Following installation of a municipal water main, cessation of pumping of offsite groundwater wells, and decommissioning of some offsite groundwater wells, decreasing concentrations of TCE have been noted in the groundwater in these offsite residential areas. Subsequent groundwater sampling events have confirmed that once offsite pumping ceases, the natural groundwater gradient reestablishes itself and TCE concentrations begin to decrease through natural flushing of the plume in the residential area. (See Appendix A for figures 3-3 and 6-2 from the 2005 five-year review showing the decreasing TCE concentrations in the groundwater plume between 1992 and 2004.)

The 1990 ROD required that institutional controls be put in place on the Site to regulate land use, but it did not specifically identify the institutional controls that would be required for

management of migration or source control or whether any offsite controls were required. Further, the 1990 ROD referenced an obligation of the Site owner to put land use controls in place pursuant to a Partial Consent Decree that had been lodged with the Court; however, the Partial Consent Decree also did not specifically identify the necessary institutional controls. Subsequent to entry of the Partial Consent Decree, the Site property ownership changed and institutional controls were never implemented. Further, the decision to excavate the landfill rather than cap the landfill, as documented in the 2000 ESD, eliminated the need for land use controls to protect the cap and made the groundwater beneath the landfill potentially available as a drinking water source since the landfill waste has been removed.

In September 2004, because the Town had previously instituted a moratorium on water line hookups for reasons unrelated to the Site contamination, a property owner near the Site began installing a private drinking water well which, if completed, would likely have drawn contamination from the Site.

As evidenced by the 2005 five-year review report, the physical components of the remedy are completed and operational; however, groundwater contaminant concentrations continue to exceed safe drinking water standards both on and offsite. Institutional controls that prohibit both on and offsite use of groundwater, prohibit the installation of new groundwater wells, and prohibit the pumping of any existing groundwater wells, except for remediation purposes, are needed in order to protect the management of migration portion of the remedy.

The Town of North Smithfield passed An Ordinance of the Town Council Regarding Groundwater Wells Near Stamina Mill Site, Town of North Smithfield, May 2006, (the ordinance) restricting the installation of new groundwater wells and the pumping of existing wells, except those necessary for monitoring purposes, in the Stamina Mills Groundwater Remediation District. The ordinance also includes a list of well owners that may be impacted or that may impact Site contaminants should their wells be reactivated. (See a copy of the ordinance at Appendix B.) This ordinance, as long as it remains in place, will prevent the use of groundwater and will prevent the drawing of contamination offsite. Individual deed restrictions on the affected properties would also ensure these prohibitions remain until the aquifer is returned to drinking water levels in accordance with the 1990 ROD. Should the Town ordinance be revoked or otherwise become ineffective as determined by EPA, some other form of institutional control, such as deed restrictions, will be necessary to ensure protectiveness.

In addition, to ensure that offsite pumping does not occur, a survey will be conducted to identify active wells located in the Stamina Mills Groundwater Remediation District that were not previously decommissioned when the municipal water line was installed or thereafter. All active wells will be decommissioned to prevent pumping in accordance with Rhode Island Department of Environmental Management, Office of Water Resources, Rules and Regulations for Groundwater Quality, Appendix 1: Construction Standards and Abandonment Procedures for Monitoring Wells, Piezometers and Other Subsurface Borings (May 15, 2006), except those wells identified by EPA for use in the Site long-term groundwater monitoring program. These wells shall be disconnected from all residential pumping and plumbing infrastructure and shall be left accessible for monitoring purposes.

Land use controls are also necessary on the Site property to protect the various treatment systems, associated infrastructure, prohibit soil excavation except under certain conditions, and to allow EPA, RIDEM and agents of these entities access to the Site to conduct the response action,

operate and maintain the remedy and perform additional response actions if EPA determines such action is necessary.

Vapor Intrusion

Since the 1990 ROD was issued, EPA and multiple states have recognized that vapor intrusion may be a potential exposure route for VOCs from groundwater and have issued guidances for evaluating vapor intrusion. As part of the 2005 five-year review, using EPA's Office of Solid Waste and Emergency Response Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Draft Vapor Intrusion Guidance) November 2002, EPA530-D-02-004, EPA performed a screening level evaluation of potential vapor intrusion to determine potential impacts to the Site and surrounding community. Findings from these screening evaluations concluded, among other things, that VOCs, including TCE, are present on and offsite in the groundwater, that the groundwater plume extends under residences offsite and that certain conditions regarding groundwater in the overburden and bedrock were unknown. Based on these finding, EPA determined that a more focused Site-specific assessment is appropriate for this Site. (See Appendix L of the 2005 five-year review report.) Should this Site-specific evaluation indicate that vapor intrusion does pose or potentially poses a threat to human health or the environment, a further decision document will be issued by EPA. The Site-specific assessment will be conducted consistent with EPA's vapor intrusion guidance. The Responsible Party has submitted to EPA for review a work plan for a Site-specific assessment for vapor intrusion.

E. AVAILIBILITY OF DOCUMENTS

This 2007 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 following locations and may be reviewed at the times listed:

U.S. Environmental Protection Agency
Records Center
1 Congress Street
Boston, MA 02114
(617) 918-1440

Business Hours
Monday-Friday: 9:00 am - 5:00 pm; (closed first Friday of every month and federal holidays)

North Smithfield Public Library
20 Main Street (PO Box 950)
Slatersville, RI 02876
401-767-2780

Business Hours
Tuesday, Friday, Saturday: 10:00 am – 5:00 pm
Monday, Wednesday, Thursday: 10:00 am – 8:00 pm

II. SUMMARY OF SITE HISTORY, CONTAMINATION PROBLEMS AND THE SELECTED REMEDY

A. SITE HISTORY

The Site, a former textile weaving and finishing mill, was developed in the early 1800s. Currently it is abandoned except for remediation equipment and an old mill building along School Street.

General Site Description and Historical Summary

The Stamina Mills Site is bounded to the south by the Branch River and several industrial and commercial facilities. Properties to the north and east are primarily residential, with some commercial usage. A dam immediately south of the Site forms the Forestdale Pond and the Site's southern boundary. This dam provided hydro-mechanical power for the textile mill operations. As part of the manufacturing process, various chemicals were used at the Site. These included detergents and solvents to clean wool; acids, bases and dyes to color fabrics; pesticides and solvents for moth proofing; and plasticizers to coat fabrics. A map of the Site is included in Appendix C.

Between 1930 and 1938 the eastern portion of the mill (Mill Building No. 2) was destroyed by fire. A portion of the burned-out building footprint was used as an onsite landfill for process wastes until approximately 1968, when it was made into a parking area. In March of 1969, a solvent scouring system was installed at the mill. The scouring system used TCE to remove oil and dirt from newly-woven fabric. Shortly after the system was installed, an unknown quantity of TCE was spilled during the filling of an above-ground storage tank. The mill did not attempt to clean up the spill and some of the TCE infiltrated into the soil and entered the groundwater. The mill continued operating the scouring system until the mill closed in 1975. The remaining portion of the mill was destroyed by fire in October 1977, leaving behind rubble, piles of debris, and the remains of the buildings foundation (including a deteriorating smokestack). The Site has remained vacant since the fire.

In 1979 TCE was detected offsite in the FWAW, approximately 800 feet north of the Site. The sampling was then expanded by the Rhode Island Department of Health (RIDOH) to include an additional 51 private residential wells in the nearby vicinity of the Site. As a result, RIDOH found elevated levels of TCE in 18 of these wells and advised area residents to boil water used for drinking and cooking.

In 1981 the State of Rhode Island Water Resources Board and the Town of North Smithfield financed the construction of a municipal water main to serve the residential area north of the Site that had been affected or had the potential to be affected by contamination from the Site. Between 1981 and 1984, only seven of the approximately 50 affected or potentially affected residences had been connected to the municipal water supply, reportedly because of the costs associated with connecting to the water main.

B. RESPONSE HISTORY

With the placement of the Site on the final National Priorities List in September 1983, the Site became eligible for Federal funding. During November 1984, EPA initiated a removal action to extend the existing water line as well as fund the residents' costs for connecting to the municipal water supply. In July 1988, EPA initiated a second removal action at the Site which dealt with

two deteriorating underground storage tanks. The contents of both tanks were removed and then treated and disposed of off-site. In August 1990 EPA initiated a third removal action to remove the contents of an above-ground acid storage tank. The contents were treated and disposed of off-site. In September 1990, EPA issued the ROD for the Site.

After several years of litigation EPA issued a Unilateral Administrative Order to a Responsible Party, Kayser-Roth, the parent corporation of Stamina Mills, in 1991 to perform the overall Site remedy as described in the ROD. In 1992 Kayser-Roth initiated Site preparation and predesign activities that included demolition of the remains of the old mill buildings, debris recycling and/or removal, raceway sealing activities and Site regrading. Some demolition materials, debris, and Site soils were used as fill during regrading prior to the addition of topsoil and seeding. A 6-foot-high gated fence is currently present along School Street to prevent unauthorized access; the property is not fenced along the Branch River or Forestdale Pond. Quarterly groundwater monitoring was initiated at the Site in November 1992.

From 1994 through 1999, the Responsible Party conducted testing of innovative technologies (UV/hydrogen peroxide and photocatalytic oxidation) to treat groundwater. These technologies were ultimately found not to be as effective as originally anticipated and, in 1999, the Responsible Party proposed to use air stripping as the primary means of treating groundwater and activated carbon as the primary means of treating VOCs found in the vapors from the soil vacuum extraction system and the air stripper. The construction of these changes was completed and the treatment system became operational on May 30, 2000.

In addition, in 1998, attempts to stabilize and cap the onsite landfill on the eastern portion of the Site proved hazardous to both Site workers and the adjacent Branch River. As a result, the Responsible Party proposed an alternate landfill remedy which was approved by USEPA and RIDEM. Landfill excavation and grading activities began in November 1998 and were completed in October 1999.

EPA issued the first ESD in June 2000 to document both of the above-noted modifications to the 1990 ROD.

Active soil and groundwater remediation is ongoing at the two central acres of the Site. A groundwater extraction (GWE) system, soil vapor extraction (SVE) system, and a multi-phase extraction (MPE) system, above- and below-ground manifolds, and a treatment building housing both groundwater and vapor treatment systems (GWTS, VTS) are present onsite.

C. CONTAMINATION PROBLEMS AND SITE RISKS

A two-phase remedial investigation (RI) was conducted from 1986 to 1988 to determine the nature and extent of contamination in soil, groundwater, surface water, and sediment. Relevant findings are summarized below; a complete description is presented in Section V of the ROD.

Soil - Soil samples collected during the RI from the area impacted by the 1969 TCE spill exhibited TCE concentrations up to 430,000 µg/kg. The spill area extended from the northeast corner of the former Mill Building No. 1 east to the base of the landfill, and then south to the Branch River. TCE contamination extended into the landfill directly above the water table near one of the raceways and a nearby sewer line trench, and was assumed to be characterized by preferential migration through these more permeable zones.

Other compounds detected in Site soil included lower concentrations of semi-volatile organic compounds (SVOCs), inorganic compounds, and pesticides (particularly dieldrin).

Groundwater - Bedrock groundwater beneath the former TCE spill area exhibited TCE concentrations of up to 850,000 µg/L. Shallow groundwater, primarily associated with seasonal intrusion of bedrock groundwater into the overburden material, was also contaminated. Natural gradients, as well as the presence of the two raceways and the sewer line trench, were assumed to cause migration of impacted groundwater toward the Branch River. As noted earlier, a TCE-contaminated groundwater plume extends northwest from the Site into the residential neighborhood north of School Street and was historically influenced by offsite pumping. Other compounds detected in Site groundwater included lower concentrations of SVOCs, inorganic compounds, and pesticides (particularly dieldrin).

Primary Health Threats

The baseline risk assessment conducted during the RI calculated both carcinogenic and non-carcinogenic effects of Site contaminants under various current and future use scenarios. Because the Site was and continues to be vacant, fenced, and is not being used as a drinking water supply, there is no current risk from onsite groundwater. A conservative assumption that the Site would be developed for residential use sometime in the future resulted in a determination that Site groundwater poses a future risk, mainly from TCE, if it were used for drinking water. Other Site risks included a current risk from contact with contaminated soil and indirectly through the consumption of fish from the Branch River.

Another assumption was made that the offsite residences and buildings that were connected to the waterline as a result of EPA's removal action would not use the groundwater beneath their lots and therefore there was no current risk found from drinking offsite groundwater in the risk assessment. However, TCE concentrations in offsite groundwater continue to exceed the safe drinking water maximum contamination level (MCL).

As noted in the 2005 five year review, while the MCL for TCE has remained at 5 µg/L, the toxicity data for TCE were being evaluated by EPA with the likely conclusion being that TCE is more toxic than previously believed. As a result, risk calculations based on TCE concentrations would likely result in higher estimates than those quantified during the RI/FS for the Site. Using more recent data on TCE concentrations from sampling events conducted from March 2002 though June 2004, a risk assessment for use of groundwater as drinking water from wells located south of Main Street was calculated using a peer-reviewed California EPA oral cancer slope factor of 1.3E-2 $(mg/kg\text{-}d)^{-1}$ and using the more conservative end of the draft EPA oral cancer slope factor of 4.0E-1 $(mg/kg\text{-}day)^{-1}$. This updated risk assessment confirms that the use of onsite groundwater as a drinking water source continues to exceed EPA's acceptable risk range. A copy of the updated risk assessment is attached as Appendix D.

D. SUMMARY OF SELECTED REMEDY

The 1990 ROD selected a remedial action for remediating each contaminated medium at the Site. In summary, the remedy consisted of the following:

Source Control Components

- Soils in the TCE spill area are to be remediated using in-situ vacuum extraction. This will be accomplished through the installation of a number of shallow wells from which

air containing TCE and other VOCs will be withdrawn from the soils. The withdrawn air will be treated using activated carbon filters prior to being discharged to the atmosphere.

- Approximately 550 cubic yards of a mixture of landfill wastes and sediments from within the 100-year floodplain of the Branch River will be excavated and consolidated under a new RCRA multi-layer cap to be installed over the existing landfill at the Site. A leachate collection system will be installed to handle the generation of any leachate.

- The location of the on-site septic tank will be confirmed and its contents sampled and then disposed of.

- Institutional controls in the form of deed restrictions will be used at the Site to regulate land use.

Management of Migration Components

- Active restoration of the contaminated groundwater aquifer will take place with the goal of restoring it to drinking water quality as rapidly as possible. EPA estimated in the ROD that the time frame for groundwater restoration would be 10 to 15 years. Extraction of groundwater will take place through the installation of on-site bedrock wells. Extracted groundwater will be treated using the innovative ultraviolet light and hydrogen peroxide (UV/hydrogen peroxide) technology.

- Entrances and exits to the raceways which were used to transport water to mill buildings will be sealed with impermeable barriers. Sections of the raceways which have not been collapsed will be collapsed and backfilled.

- Long-term environmental monitoring of the groundwater and Branch River will be conducted to ensure the effectiveness of the remedy.

Other Miscellaneous Components

- Demolition and removal of partially standing buildings at the Site including a deteriorating smokestack.

- Grading and vegetation of the Site at the conclusion of the remedial activities.

EPA issued the 2000 ESD to modify two aspects of the remedy: 1) The method for treating contaminated groundwater was changed from UV/hydrogen peroxide technology to air stripping as the primary means of treating groundwater and activated carbon as the primary means of treating VOCs found in the vapors produced by the soil vacuum extraction system and the air stripper; and 2) The method of addressing the landfill changed from consolidation of landfill wastes and construction of a RCRA C cap to excavation of the landfill wastes and offsite disposal at a properly licensed facility.

Five-Year Review

The Site's first five-year review was completed in 2005. The review found that although the overall offsite groundwater plume is decreasing in concentration and size, Site contaminants still persist at

levels above drinking water MCLs in both on and offsite groundwater. The review also identified the need for institutional controls to protect the remedy and its existing components as well as to protect the public from further expansion of the groundwater plume. The review also identified the need to further evaluate the vapor intrusion pathway.

III. BASIS FOR THE DOCUMENT

A. Basis for Change: Institutional Controls

Neither the 1990 ROD, nor the Partial Consent Decree referenced in the ROD, sufficiently described the land use controls needed onsite to protect the various treatment systems and their associated infrastructure, to prohibit soil excavation, to prohibit groundwater use, and to provide for access needs. Further, the June 2000 ESD eliminated the need for certain Site controls when the method for addressing the landfill changed to excavation rather than capping. The ROD also did not specify that offsite controls on the installation of new groundwater wells or the pumping of existing wells was required to protect against drawing contamination offsite. The Town of North Smithfield voluntarily passed an ordinance in 2006 prohibiting the installation of new groundwater wells and prohibiting well pumping activity within a delineated area around the Site which will protect against the use of groundwater and offsite pumping as long as the ordinance remains in effect; however, without this ESD to specifically require that such restrictions are needed, the selected remedy may not continue to be protective of human health and the environment. In addition, a survey of offsite active groundwater wells is necessary to determine the location of wells that were not decommissioned since the municipal water line was installed. To prevent offsite pumping, these wells, except those used for Site long-term groundwater monitoring purposes need to be decommissioned in accordance with state regulations. Those wells identified as monitoring wells must be modified for use only as monitoring wells.

B. Basis for Change: Vapor Intrusion

Subsequent to issuing the 1990 ROD, EPA identified vapor intrusion as a potential exposure pathway for VOCs. In November 2002 EPA issued a Draft Vapor Intrusion Guidance for evaluating the presence of this potential pathway. During the 2005 five-year review, EPA performed an initial screening evaluation for the potential for vapor intrusion at the Site. The results indicated that a more focused Site-specific assessment be performed to further evaluate potential vapor intrusion pathways based on Site conditions. This ESD will incorporate this evaluation into the selected remedy.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES

The modifications to the remedy are summarized below.

A. Institutional Controls

The selected remedy in the ROD includes institutional controls in the form of deed restrictions that will be used at the Site to regulate land use. The institutional controls would be focused on preventing the disturbance of the physical integrity of the remedy's components. EPA had proposed, in a Partial Consent Decree that was lodged in federal court, institutional controls with the then current owner to protect the remedy. However, neither the 1990 ROD nor the Partial Consent Decree specified the on-site controls nor specified the need for offsite controls to prohibit the installation of new groundwater wells or the pumping of existing groundwater wells.

In addition, pursuant to the 2000 ESD, the Site landfill was excavated, eliminating the need for land use controls to protect the integrity of the cap.

The remedy as modified by this 2007 ESD now requires that deed restrictions be implemented on the Site that will prohibit the use of groundwater, prohibit any disturbance of the treatment system and its associated infrastructure, prohibit the excavation of soils in the areas currently being treated, allow excavation of soils in other areas only with the prior approval of EPA, and grant to EPA, RIDEM and Kayser-Roth Corporation (the party that is implementing EPA's remedy under a unilateral order) the right to enter onto the Site to conduct the response action, implement the operation and maintenance, and implement further remedial action if EPA determines that such action is necessary. In addition, the remedy now incorporates the need for institutional controls offsite to prevent the installation of new wells and the pumping of existing groundwater wells. The Town ordinance currently in effect provides protection from these activities; however, if the ordinance were revoked for any reason, the protectiveness of the remedy could be jeopardized. Deed restrictions on identified offsite properties would ensure remedy protectiveness. Should the Town ordinance be revoked or otherwise become ineffective as determined by EPA, some other form of institutional control, such as deed restrictions, will be necessary to ensure protectiveness.

In addition, to ensure that offsite pumping does not occur, a survey will be conducted to identify active wells located in Stamina Mills Groundwater Remediation District that were not previously decommissioned when the municipal water line was installed or thereafter. All active wells will be decommissioned to prevent pumping in accordance with Rhode Island Department of Environmental Management, Office of Water Resources, Rules and Regulations for Groundwater Quality, Appendix 1: Construction Standards and Abandonment Procedures for Monitoring Wells, Piezometers and Other Subsurface Borings (May 15, 2006), except those wells identified by EPA for use in the Site long-term groundwater monitoring program. Those wells shall be disconnected from all residential pumping and plumbing infrastructure and shall be left accessible for monitoring purposes.

B. Vapor Intrusion

TCE concentrations in groundwater exceed the screening levels described in EPA's Draft Vapor Intrusion Guidance. As a result, a Site-specific investigation into potential pathways for vapor intrusion is warranted both on and offsite. As recommended by the 2005 five year review, EPA incorporates the need for a Site-specific assessment to evaluation potential vapor intrusion pathways into the selected remedy. This assessment will be conducted consistent with EPA's Draft Vapor Intrusion Guidance. The Responsible Party has already submitted to EPA for review a work plan for this Site-specific assessment.

C. Summary of Costs

The implementation of the institutional controls will not have a significant impact on the costs associated with the Site. The vapor intrusion investigation will also have minimal impacts to the Site costs. However, if a response action is warranted, additional cost impacts may be incurred.

V. SUPPORT AGENCY COMMENTS

The Rhode Island Department of Environmental Management, Office of Waste Management, has participated with the EPA in reviewing the modifications to the remedy described herein and concurs with the approach adopted by EPA. (See Appendix E).

VI. STATUTORY DETERMINATIONS

EPA believes that the modified remedy remains protective of human health and the environment, complies with all Federal and State requirements that are applicable or relevant and appropriate to this remedial action, meets the remedial action objectives specified in the 1990 ROD, and is cost-effective.

VII. PUBLIC PARTICIPATION COMPLIANCE

In accordance with Section 117(d) of CERCLA and Section 300.825(a) of the NCP, this 2007 ESD and supporting documentation shall become part of the Administrative Record for the Site which is available for public review at the locations and times listed in Section I(E) above. A public notice, which summarizes the modifications to the remedy as set forth in the 2007 ESD shall be published in a local newspaper of general circulation following the signing of this 2007 ESD.

Appendix A - Figure 3-3 from 2005 Five-Year Review showing decreasing TCE concentrations in gw plume 1992

LEGEND

- ROUND I WELLS
- ROUND II WELLS
- RAILROAD
- WATER FRONT
- 100 — CONTAMINANT ISOCON
- NS — NOT SAMPLED
- NI — NOT INSTALLED

ALL UNITS MICROGRAMS PER LITER (µg/L)

NOTE:
ROUND 2 WELLS WILL BE ADDED TO THE MONITORING PROGRAM ONCE IT HAS BEEN DETERMINED THAT CLEANUP STANDARDS HAVE BEEN ATTAINED AT ROUND 1 OFFSITE MONITORING WELLS.

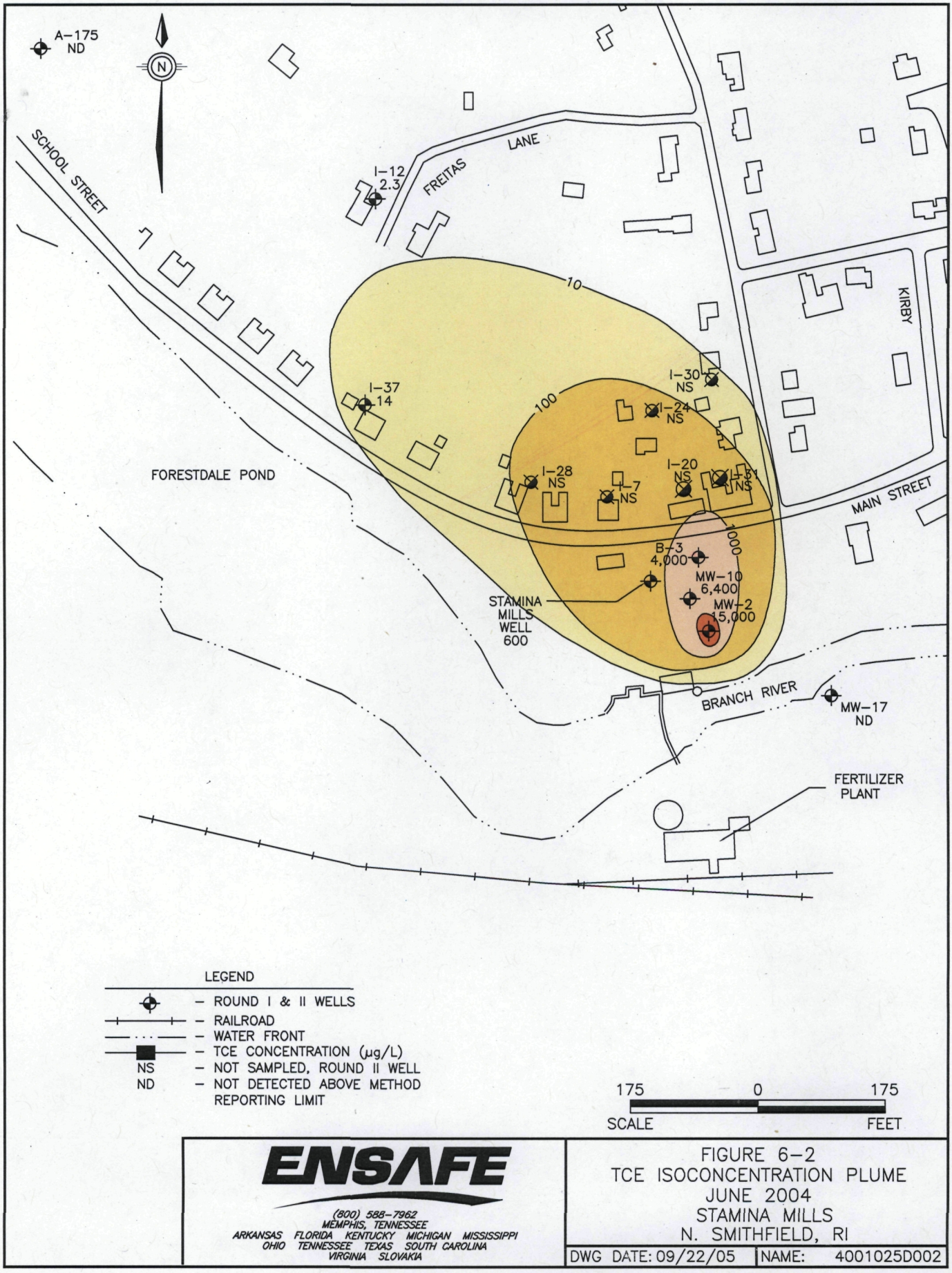
175 0 175
SCALE FEET

ENSAFE
(800) 588-7992
MEMPHIS, TENNESSEE
ARKANSAS FLORIDA KENTUCKY MICHIGAN MISSISSIPPI OHIO TENNESSEE TEXAS SOUTH CAROLINA VIRGINIA SLOVAKIA

FIGURE 3-3
TCE PLUME - NOVEMBER 1992
STAMINA MILLS
N. SMITHFIELD, RI

DWG DATE: 06/20/05 | NAME: 4001023W018

Appendix A - Figure 6-2 from 2005 Five-Year Review showing decreasing TCE concentration in gw plume 2004



ENSAFE

(800) 588-7962
MEMPHIS, TENNESSEE
ARKANSAS FLORIDA KENTUCKY MICHIGAN MISSISSIPPI
OHIO TENNESSEE TEXAS SOUTH CAROLINA
VIRGINIA SLOVAKIA

FIGURE 6-2
TCE ISOCONCENTRATION PLUME
JUNE 2004
STAMINA MILLS
N. SMITHFIELD, RI

DWG DATE: 09/22/05 | NAME: 4001025D002

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
THE TOWN OF NORTH SMITHFIELD

AN ORDINANCE OF THE TOWN COUNCIL
REGARDING GROUNWATER WELLS NEAR STAMINA MILL SITE

It is ordained by the Town Council of the Town of North Smithfield as follows:

That the Code of Ordinances shall be amended to add **Chapter 8, Article V**, to read as follows:

SECTION 1. Legislative Findings and Purpose

It is here declared that the public health and safety requires the cessation of well construction and well pumping activity within an area here defined as the Stamina Mill Remediation District. The scope of this district has been delineated by the United States Environmental Protection Agency as that area, due to groundwater patterns and proximity to the Stamina Mill Superfund site on School Street in Forestdale, North Smithfield, whose well pumping activities have the potential capacity to draw contaminants from the groundwater affected by the site. Furthermore, each lot in the delineated area has, for many years, been connected to a primary public water supply.

SECTION 2. No person shall install, construct or connect a groundwater well in any location within the Stamina Mill Groundwater Remediation District as defined on the attached maps, and attached schedule of included lots.

SECTION 3. No person shall use, pump from or in any way operate a groundwater well in any location within the Stamina Mill Groundwater Remediation District as defined on the attached map, and attached schedule of included lots.

SECTION 4. The Building Inspector is authorized to enforce the provisions of this chapter and to institute such proceedings, including proceedings to enjoin the above prohibited activities within the Stamina Mills Groundwater Remediation District, as necessary to effectuate the requirements of this chapter.

SECTION 5. Any person, firm, corporation or other entity who knowingly violates Sections 2 or 3 hereof shall be subject to a fine of not less than two hundred and fifty dollars ($250.00), nor more than five hundred dollars ($500.00). Each and every violation of this ordinance, and each and every day the violation continues or is repeated, shall constitute a separate offense. All such fines shall inure to the benefit of the town.

SECTION 6. The Building Inspector shall give copies of any violations issued pursuant to Section 4 or 5 above to (a) the Project Manager of the Stamina Mill Superfund Site, Office of Waste Management, Rhode Island Department of Environmental Management (RIDEM), 235 Promenade St., Providence, RI 02908, and (b) the Remedial Project Manager for the Stamina Mills Superfund Site, US Environmental Protection Agency (EPA) 1 Congress St., Suite 1100, Boston, MA 02114-2023, and shall provide written notice to the above of the repeal or modification of this ordinance or of any judicial decision that repeals or modifies this ordinance. The Building Inspector shall also

provide to RIDEM and EPA an annual report on September 1 of the number and nature of violations in the prior year ending June 30. The Building Inspector may consult with and coordinate with RIDEM and EPA concerning the management of this ordinance.

SECTION 7. This ordinance shall not apply to any investigative monitoring well installed by or at the request or order of any federal, state, or local governmental authority.

SECTION 8. The Town Administrator shall request from the EPA, following the next EPA five-year review, and no later than January 1, 2011 substantiation of the continued necessity of this ordinance.

SECTION 9. This ordinance shall take effect on the date of passage in accordance with the Town Charter. There are two (2) attachments to the ordinance. One is a revised map of what the ordinance will include as well as a list with the involved lots affected by the ordinance.

Approved in form: _____
Mark C. Hadden, Town Solicitor

Received by Town Clerk: Debra A. Todd Date: April 19, 2006
Debra A. Todd

Posted Date: April 19, 2006

First Reading: May 1, 2006

Second Reading: May 15, 2006

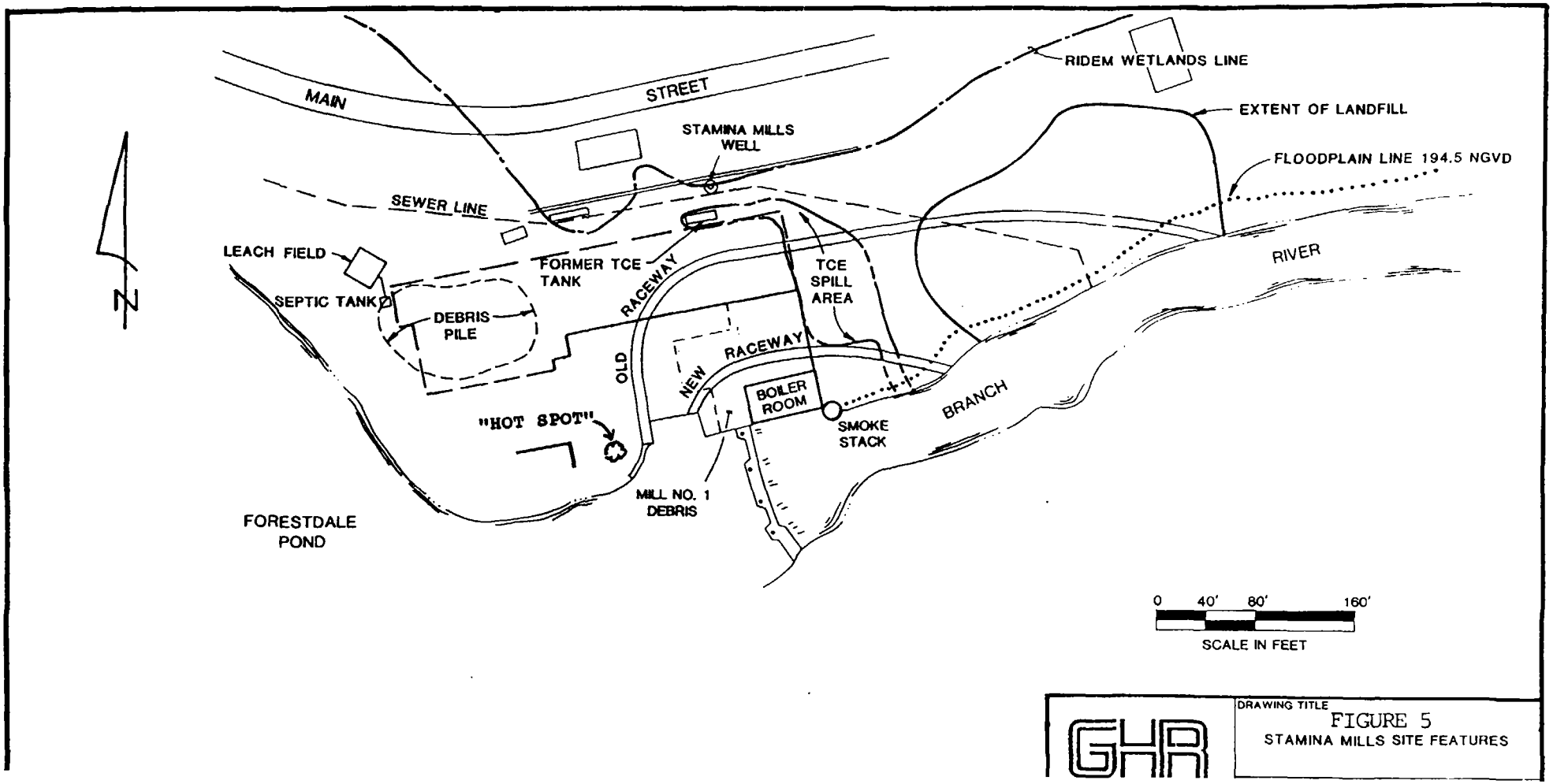
Flaherty yes Thibault yes Yazbak yes Zwolenski yes Lovett recused

Approved by Town Administrator: _____
Robert B. Lowe

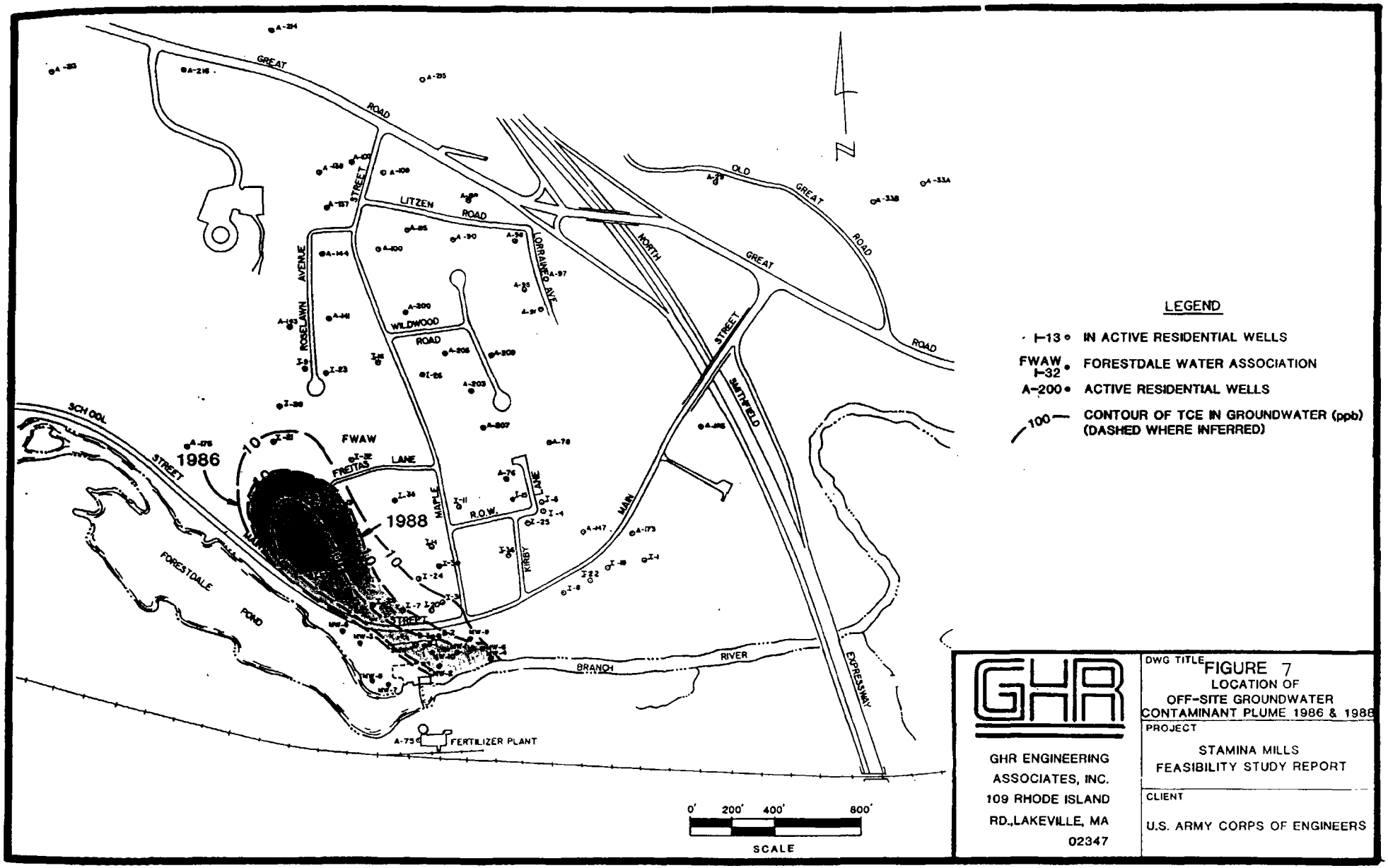

FORESTDALE POND
PARKING
MAPLE STREET
VICTORY HIGHWAY
SCHOOL STREET
BROOK STREET
BRANCH RIVER
LEGEND
WELL LOCATIONS
INCLUDE IN ORDINANCE
SOURCE: STAMINA MILLS REMEDIAL INVESTIGATION
100 0 100
SCALE FEET
ENSAFE

PLAT-LOT	LOCATION	Well ID	HOUSE NUMBER	RATIONALE
005-136	MAPLE AVE	I-30	53	Current/previous contamination generally > 10 ug/L
005-137	MAPLE AVE		55	Current/previous contamination generally > 10 ug/L
005-269	MAPLE AVE	I-14	51	Current/previous contamination generally > 10 ug/L
005-135	MAPLE AVE			Current/previous contamination generally > 10 ug/L
005-134	MAPLE AVE	I-33	47	Current/previous contamination generally > 10 ug/L
005-132	MAPLE AVE	I-32		Current/previous contamination generally > 10 ug/L
005-133	MAPLE AVE		43	Current/previous contamination generally > 10 ug/L
005-435	SCHOOL ST	I-31	134	Current/previous contamination generally > 10 ug/L
005-138	SCHOOL ST	I-20	130	Current/previous contamination generally > 10 ug/L
005-139	SCHOOL ST	I-24	128	Current/previous contamination generally > 10 ug/L
005-140	SCHOOL ST	I-7	126	Current/previous contamination generally > 10 ug/L
005-141	SCHOOL ST		124	Current/previous contamination generally > 10 ug/L
005-142	SCHOOL ST	I-28	122	Current/previous contamination generally > 10 ug/L
005-143	SCHOOL ST		120	Current/previous contamination generally > 10 ug/L
005-144	SCHOOL ST		118	Current/previous contamination generally > 10 ug/L
005-145	SCHOOL ST	I-37	116	Current/previous contamination generally > 10 ug/L
005-146	SCHOOL ST		114	Current/previous contamination generally > 10 ug/L
005-147	SCHOOL ST		112	Current/previous contamination generally > 10 ug/L
005-148	SCHOOL ST	A-152	110	Current/previous contamination generally > 10 ug/L
005-149	SCHOOL ST		108	Current/previous contamination generally > 10 ug/L
005-150	SCHOOL ST		104	Current/previous contamination generally > 10 ug/L
005-151	SCHOOL ST			Current/previous contamination generally > 10 ug/L
005-170	SCHOOL ST		100	Current/previous contamination generally > 10 ug/L
005-284	FREITAS LANE	I-13	16	Current/previous contamination generally > 10 ug/L
005-285	FREITAS LANE	I-12	20	Current/previous contamination generally > 10 ug/L
005-277	FREITAS LANE	I-21	19	Current/previous contamination generally > 10 ug/L
005-393	FREITAS LANE	I-34	10	Current/previous contamination generally > 10 ug/L
005-022	FREITAS LANE	I-35		Current/previous contamination generally > 10 ug/L
005-288	SCHOOL ST	I-1	191	Potential pumping influence
005-160	SCHOOL ST		189	Potential pumping influence
005-159	SCHOOL ST	I-17	187	Potential pumping influence
005-158	SCHOOL ST	I-22	183	Potential pumping influence
005-157	SCHOOL ST	I-3	181	Potential pumping influence
005-156	SCHOOL ST	I-8	179	Potential pumping influence
005-155	SCHOOL ST	I-38	177	Potential pumping influence
005-154	SCHOOL ST	I-18	175	Potential pumping influence
005-153	SCHOOL ST		173	Potential pumping influence
005-035	SCHOOL ST	A-167	162	Potential pumping influence
005-257	SCHOOL ST		152	Potential pumping influence
005-346	SCHOOL ST			Potential pumping influence
005-168	SCHOOL ST			Potential pumping influence
005-249	SCHOOL ST			Potential pumping influence
005-130	SCHOOL ST			Potential pumping influence
005-330	KIRBY LANE	I-5	15	Potential pumping influence
005-331	KIRBY LANE	I-6	19	Potential pumping influence
005-332	KIRBY LANE			Potential pumping influence
005-328	KIRBY LANE	I-10	9	Potential pumping influence
005-329	KIRBY LANE	I-25	11	Potential pumping influence
005-368	KIRBY LANE			Potential pumping influence
005-344	KIRBY LANE			Potential pumping influence
005-345	KIRBY LANE	I-36	8	Potential pumping influence
005-309	KIRBY LANE	I-15	14	Potential pumping influence
005-342	KIRBY LANE			Potential pumping influence
005-034	MAPLE AVE		62	Potential pumping influence
005-282	MAPLE AVE	I-11	50	Potential pumping influence
005-286	MAPLE AVE	I-43	46	Potential pumping influence
005-178	MAPLE AVE	I-44	44	Potential pumping influence
005-252	MAPLE AVE	I-45	42	Potential pumping influence
005-243	MAPLE AVE			Potential pumping influence
005-316	MAPLE AVE		32	Potential pumping influence
005-315	MAPLE AVE	I-26	30	Potential pumping influence
005-259	MAPLE AVE	I-27	60	Potential pumping influence
005-265	MAPLE AVE	I-41	58	Potential pumping influence
005-264	MAPLE AVE			Potential pumping influence
005-437	MAPLE AVE	I-42	54	Potential pumping influence
005-199	MAPLE AVE	I-16	29	Potential pumping influence
005-186	MAPLE AVE		31	Potential pumping influence
005-209	MAPLE AVE	I-39	33	Potential pumping influence
005-231	MAPLE AVE	I-40	37	Potential pumping influence
005-230	ROSELAWN AVE	I-23	16	Potential pumping influence
005-412	ROSELAWN AVE	I-2	18	Potential pumping influence
005-409	ROSELAWN AVE	I-19	23	Potential pumping influence
005-446	ROSELAWN AVE	I-9	21	Potential pumping influence
005-289	INDUSTRIAL DRIVE	A-75	120	Potential pumping influence

Appendix C - Map of Site (1 of 2)



Appendix C - Map of Site (2 of 2)



GHR ENGINEERING ASSOCIATES, INC.
109 RHODE ISLAND RD., LAKEVILLE, MA 02347

DWG TITLE
FIGURE 7
LOCATION OF OFF-SITE GROUNDWATER CONTAMINANT PLUME 1986 & 1988

PROJECT
STAMINA MILLS FEASIBILITY STUDY REPORT

CLIENT
U.S. ARMY CORPS OF ENGINEERS

Memorandum

Date: September 12, 2007

From: Chau Vu, Human Health Risk Assessor, Technical Support & Site Assessment

To: Byron Mah, RPM, NH & RI Superfund Section

Subj: Updated Risk Assessment for 2007 ESD – Stamina Mills Site

Groundwater data from the onsite groundwater extraction wells located south of Main Street (i.e., Stamina Mills Well or SMW, MW-2, MW-10, and B-3) as reported in the 2006 Annual Summary Report for the Stamina Mills Superfund Site (Ensafe, 2007) are used to calculate risks from drinking water for a resident. Since these monitoring data are available in multiple seasonal rounds (4 rounds of samples for each well in March 2002, December 2002, September 2003, and June 2004), the average TCE concentration is calculated for each well to account for the seasonal differences of concentrations. Of these average concentrations from the four onsite wells, the highest average concentration will be used as the exposure point concentration for groundwater for the whole onsite area. This exposure point concentration will be used to calculate risks for a resident consuming groundwater under the reasonable maximum exposure scenario. This approach is consistent with EPA Region 1's policy when there is more than one round of groundwater data to take into consideration the seasonal differences (USEPA, 1994).

Table 1 shows TCE concentrations in mg/L (ppm) of the onsite monitoring groundwater extraction wells. The average concentration of 68 mg/L from MW-2 is the highest average concentration and will be used in risk calculation.

Table 1
TCE concentrations in groundwater (mg/L)

Well	SMW	MW-2	MW-10	B-3
Mar. 2002 conc.	3.1	60	14	4.9
Dec. 2002 conc.	2.5	27	15	3.6
Sep. 2003 conc.	4.3	170	0.79	1.1
Jun. 2004 conc.	0.6	15	6.4	4
Average conc.	2.6	68	9.0	3.4

The following equation is used to calculate daily intake of consuming groundwater:

$$CDI = \frac{CW \times IR \times ABS \times EF \times ED}{BW \times AT}$$ (USEPA, 1989)

where: CDI = chronic daily intake averaged over 70 years (mg/kg-day)

CW = highest average TCE concentration in groundwater, site specific (mg/L)
IR = ingestion rate, for adult resident (2 L/day) (USEPA, 1994)
ABS = absorption factor (1 unitless)
EF = exposure frequency (350 days/year) (USEPA, 1994)
ED = exposure duration (30 years) (USEPA, 1994)
BW = body weight (70 kg) (USEPA, 1994)
AT = averaging time (365days/yr x 70yrs = 25,550 days)
Applying these parameters to the equation above, CDI = 0.8 mg/kg-day

Excess lifetime cancer risk is calculated for the sum of young child and adult resident as the total resident cancer risk from drinking TCE-contaminated groundwater. The resulting cancer risk value represents the upper-bound probability that an individual could develop cancer over their lifetime due to ingestion of TCE-contaminated groundwater.

The following equation is used to calculate cancer risk:

Cancer Risk = CDI x CSF (USEPA, 1989)

where: CSF = oral cancer slope factor for TCE
The peer-reviewed California EPA oral CSF value of 1.3E-2 $(mg/kg\text{-}d)^{-1}$ and the more conservative end of the draft range EPA oral CSF of 4.0E-1 $(mg/kg\text{-}day)^{-1}$ are used along with the calculated CDI value to calculate risks as presented in Table 2.

Table 2
Cancer risk results from consuming TCE-contaminated groundwater

Highest average GW concentration (mg/L) (Ensafe, 2007)	CDI (mg/kg-d)	CalEPA CSF $(mg/kg\text{-}d)^{-1}$ (CalEPA, 1999)	Cancer risk using CalEPA CSF (no unit)	Draft high-end EPA CSF $(mg/kg\text{-}d)^{-1}$ (USEPA, 2001)	Cancer risk using draft high-end EPA CSF (no unit)
68	0.8	1.3E-2	1.0E-2	4.0E-1	3.2E-1

According to EPA's National Oil and Hazardous Substances Pollution Contingency Plan (USEPA, 1990), the acceptable risk range for Superfund cleanups is 10E-4 to 10E-6. It is EPA's preference, all things being equal, to select remedies that are at the more protective end of the risk range. Therefore, EPA uses 10E-6 risk level as a point of departure for developing preliminary remedial goals. The calculated cancer risks of 1.0E-2 and 3.2E-1, using both CalEPA CSF and the draft high-end EPA CSF, respectively, exceed the high end of EPA's acceptable risk range. Therefore, it is unacceptable to consume groundwater from onsite wells under residential scenario.

References

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (CalEPA OEHHA). 1999. *Public Health Goal for Trichloroethylene in drinking water.* February 1999.

Ensafe Inc. 2007. *2006 Annual summary report.* Stamina Mills Superfund Site, North Smithfield, RI. May 2007.

U.S. Environmental Protection Agency (USEPA). 1989. *Risk assessment guidance for Superfund.* Volume I: Human health evaluation manual. Part A. Interim Final. EPA/540/1-89/002. December 1989.

U.S. Environmental Protection Agency (USEPA). 1990. *National oil and hazardous substances pollution contingency plan; final rule.* Part II. March 1990.

U.S. Environmental Protection Agency (USEPA). 1994. *Risk updates, no. 2.* USEPA Region I. August 1994.

U.S. Environmental Protection Agency (USEPA). 2001. *Trichloroethylene health risk assessment: synthesis and characterization.* Office of Research and Development. Washington, D.C. August 2001.

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

September 27, 2007

Mr. James T. Owens, Director
USEPA – New England, Region 1
Office of Site Remediation and Restoration
1 Congress Street – Suite 1100
Boston, MA 02114-2023

RE: Stamina Mills Superfund Site, North Smithfield, Rhode Island

Dear Mr. Jasinski:

The Office of Waste Management has conducted a review of the *Draft Explanation of Significant Differences* (ESD), dated September 2007, for the Stamina Mills Superfund Site located in North Smithfield, Rhode Island. As a result of this review, only the following recommendation is offered.

As part of the Five-Year Review process, it would be prudent to survey residences within the Stamina Mill Groundwater Remediation District, similarly to the survey suggested by this ESD. This periodic survey gives some further certainty of the maintenance of the appropriate institutional controls, so a reasonable effort is made to ensure permanency of the remedy.

With the consideration and incorporation of this concern, the Department is in favor of proceeding within the framework of this ESD.

If you have any questions please feel free to contact Matthew DeStefano of my staff at (401) 222-2797, extension 7141.

Sincerely,

Terrence D. Gray, Assistant Director of Air, Waste and Compliance
Dept. of Environmental Management

cc: L. Hellested, RIDEM OWM
M. DeStefano, RIDEM OWM ✓
L. Maccarone, RIDEM OWM
L. Brill, USEPA OSRR
M. Jasinski, USEPA OSRR
B. Mah, USEPA OSRR