OLD SOUTHINGTON

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RECORD OF DECISION

OLD SOUTHINGTON LANDFILL SUPERFUND SITE
Southington, Connecticut

INTERIM REMEDIAL ACTION FOR LIMITED SOURCE CONTROL

SEPTEMBER 1994

D94-178
9/15/94

RECORD OF DECISION
OLD SOUTHINGTON LANDFILL

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STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected interim remedial action for limited source control for the Old Southington Landfill Superfund Site (Site), in Southington Connecticut. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The remedy selected in this document will prevent or reduce the threat to human health and the environment posed by the presence of the landfill through the implementation of a limited source control action. This decision is based upon the contents of the Administrative Record for this Site. A copy of the Administrative Record is available at the Southington Library, in Southington, Connecticut and at the United States Environmental Protection Agency's Office in Boston, MA.

The Connecticut Department of Environmental Protection concurs with the selected remedial action.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substance from this Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present a current or potential threat to human health and the environment.

DESCRIPTION OF SELECTED REMEDY

The selected remedy addresses in part remediation of the source of contamination at the Old Southington Landfill by eliminating or reducing the risks posed by he presence of the landfill at the Site. Subsequently, additional groundwater studies will be performed and a final remedy will be selected that will address groundwater contamination at and off-site. A Record Of Decision will be issued for the final groundwater remedy.

The major components of the selected remedy include:

- Removing all residential and commercial structures from the landfill and off-site relocation of all affected residents and businesses;

- Excavating and consolidating discrete semi-solid materials from semi-solid disposal area 1 (SSDA1) (including a two-foot buffer zone around these materials) to prevent wastes below the water table from further contaminating the groundwater;

- Constructing a low permeability cap over all of the landfill area to reduce the amount of water entering the site waste and implementing engineering controls to minimize erosion and manage surface water run-on and run-off.

- Installing a gas collection and, if necessary, treatment system to prevent landfill gas build-up under the cap and to collect the landfill gases;

- Implementing a monitoring plan to determine the long-term effectiveness of the cap on groundwater, surface water and sediment quality, and the effectiveness of the soil gas collection system;

- Developing and implementing institutional controls, which could include fencing, to ensure the integrity of the remedy by controlling future site use and access;

- Performing five year reviews.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the interim remedial action, and is cost-effective. This limited source control interim remedial action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy does not satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element because treatment of the entire landfill area is impracticable. The selected remedy will reduce mobility of contaminants through its containment features. Because this remedy will result in contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure, the interim remedial action will be reviewed to the extent required by law to assure that it continues to protect human health and the environment.

In addition, pursuant to this interim ROD, additional groundwater studies will be required and shall proceed concurrently with the implementation of this remedy. The purpose of these studies will be to define the boundary of the plume and determine if the plume is impacting any natural resource areas. Groundwater monitoring data collected from the interim remedy will be reviewed by the Agencies. This data, in conjunction with the results of the additional groundwater studies, will be used to evaluate groundwater remedial alternatives so that EPA, in consultation with CTDEP, will be able to determine an appropriate final remedy.

The following represents the selection of a remedial action by the United States Environmental Protection Agency, Region I, with concurrence of the Connecticut Department of Environmental Protection.

By: ____________________ Date: 9/22/94

Title: John P. DeVillars
Regional Administrator

RECORD OF DECISION
INTERIM REMEDIAL ACTION FOR
LIMITED SOURCE CONTROL

OLD SOUTHINGTON LANDFILL SUPERFUND SITE

I. SITE NAME, LOCATION, AND DESCRIPTION

The Old Southington Landfill Superfund Site (Site) is approximately 11 acres and is located in Southington, Connecticut, (see Figure 1). The Site abuts Old Turnpike Road to the west, Rejean Road to the north, Black Pond with associated wetlands to the east and northeast, and industries to the south (see Figure 2). The Site is located in a mixed industrial, commercial, and residential area. There are currently seven commercial and industrial buildings, and two residential homes on the Site. Two other homes were demolished and removed from the Site, one in July 1993 and the other in January 1994. An intermittent, unnamed stream flows westerly from Black Pond through a culvert, under the landfill and Old Turnpike Road and eventually discharges to a wetland west of the Site.

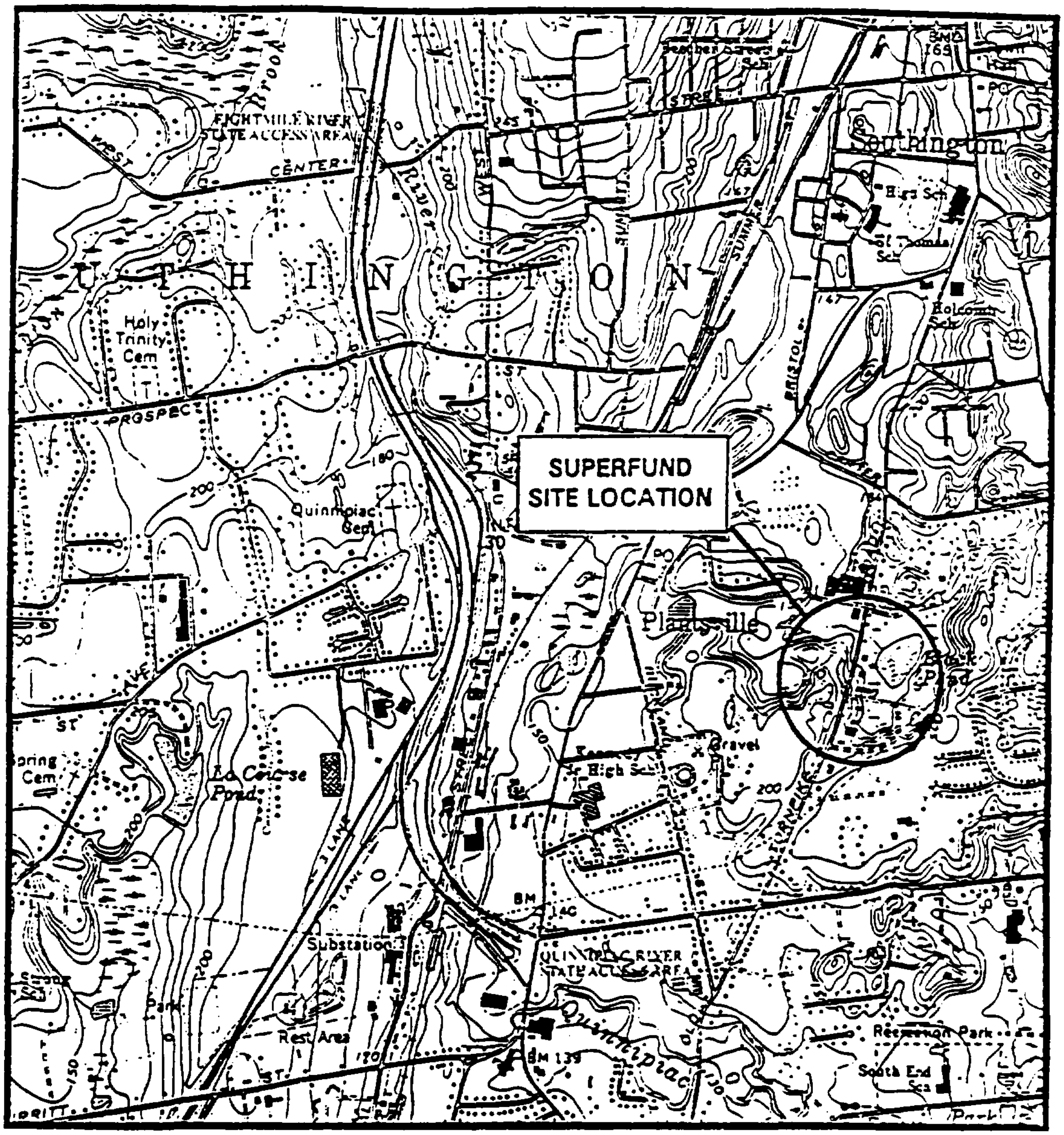
A more complete description of the Site can be found in the Remedial Investigation/Feasibility Study (RI/FS) Report Section 1.0. These documents are part of the Administrative Record which is available at the Southington Library site repository, and at the Environmental Protection Agency's Boston office.

II. SITE HISTORY & ENFORCEMENT ACTIVITIES

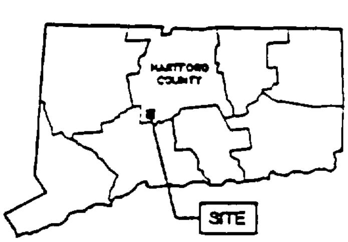
A. Land Use and Response History

There are currently two private residences located on the northern part of the Site. The Southern portion of the Site has five commercial businesses and one town facility. Four of these businesses have buildings located within the footprint of the landfill. They are: R.V. & Sons Welding, Northeast Machine, Southington Metal Fabricating Company (three structures), and Solomon Casket Company. The landfill encompasses part of the fifth business property, namely, Meriden Box, but the building is not located on the landfill. The Town of Southington owns and operates the Parks and Recreation Building. It too is located on the landfill.

The Old Southington Landfill operated as a municipal and industrial landfill between 1920 and 1967. During that period, mixed residential, commercial and industrial solid and liquid wastes were disposed of at the landfill. The northern, now residential, area of the landfill was used primarily for disposal and burning of municipal waste consisting primarily of wood and construction debris. The southern, now industrial, area received municipal, commercial and industrial wastes. Two areas in the southern portion of the landfill are known to have been used for



SOURCE: U.S.G.S. TOPOGRAPHIC MAP, SOUTHINGTON, CONNECTICUT QUADRANGLE, 7.5 MINUTE SERIES, PHOTOREVISED 1984.



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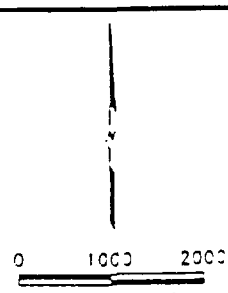
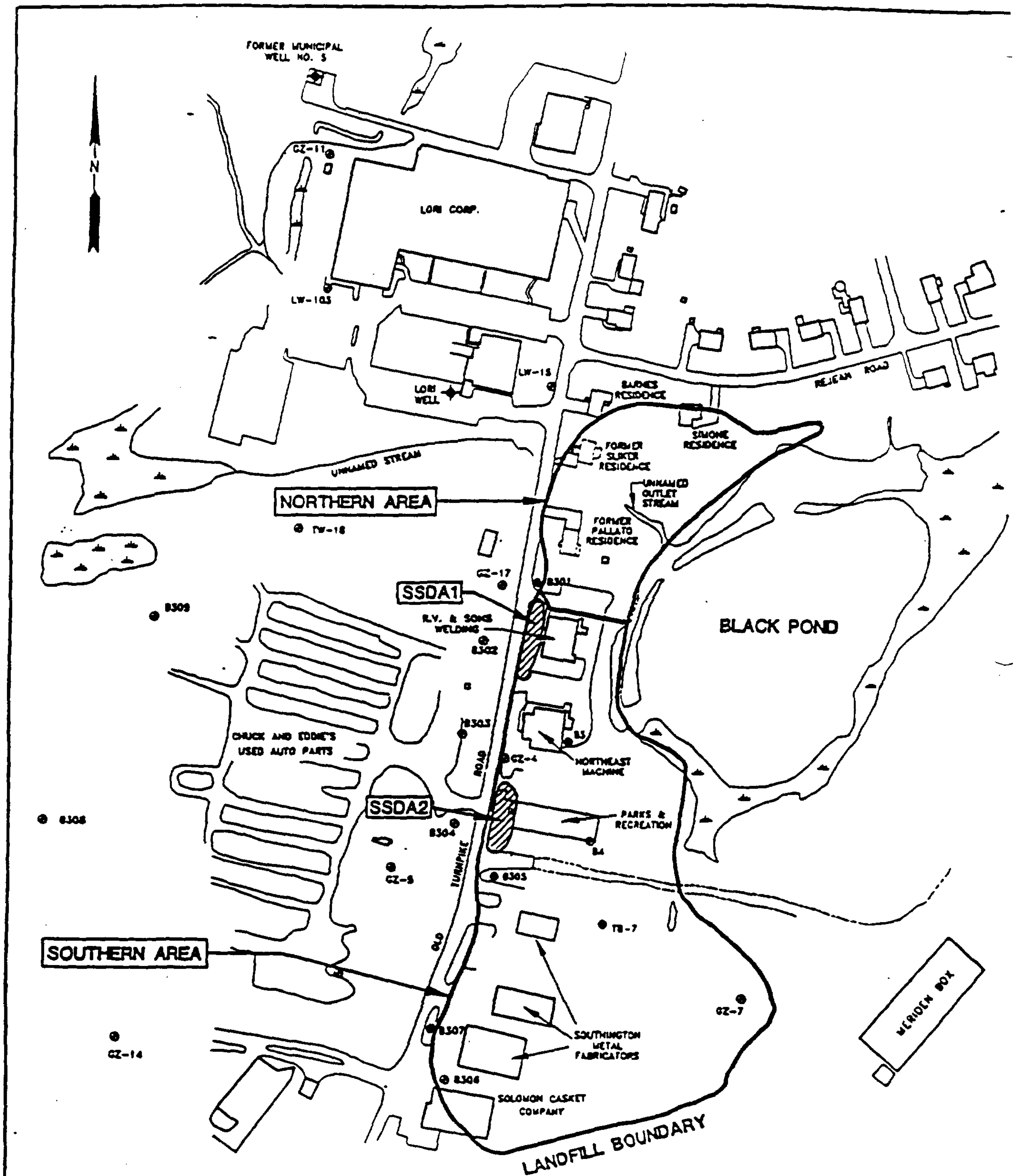


FIGURE 1

OLD SOUTHINGTON LANDFILL
SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

LOCATION MAP



LEGEND:

- ● TRIPLE MONITORING WELL CLUSTERS
- ⊕ SINGLE MONITORING WELL
- ▲ WETLANDS
- SSDA1 SEMI-SOLID DISPOSAL AREA

0 100 200 400
SCALE IN FEET

FIGURE 2

OLD SOUTHINGTON LANDFILL SUPERFUND SITE

DWG.EPA032

the disposal of aqueous, semi-solid and semi-liquid wastes. These areas, namely Semi-Solid Disposal Area 1 (SSDA1) and Semi-Solid Disposal Area 2 (SSDA2), are located just east of Old Turnpike Road as shown on Figure 2.

In 1967, the Town of Southington (Town) closed the landfill and placed an approximately 2 foot thick soil cover over the Site. In 1971, municipal Well No. 5 was installed approximately 700 feet northwest of the Site. From the early 1970s to the 1980s, the landfill property was subdivided, and developed into residential, industrial and commercial properties. In 1979, Well No. 5 was deactivated due to exceedence of water supply guidelines, including 1,1,1-trichloroethane by the Connecticut Department of Public Health and Addiction Services (CT DPHAS), (formerly called the Connecticut Department of Health Services). Well No. 5 was decommissioned and municipal water was supplied to the local community from another source.

Several preliminary investigations were performed by the U.S. Environmental Protection Agency (EPA) and the Connecticut Department of Environmental Protection (CT DEP) in 1980. Groundwater samples from two monitoring wells installed between the Site and Well No. 5 contained chlorinated volatile organic compounds (VOCs). Soil samples from a manhole excavation on land that had once been part of the landfill showed the presence of chlorinated and non-chlorinated VOCs. In 1984, the Site was formally listed on the National Priorities Lists (NPL).

A more detailed description of the Site history and previous investigations can be found in the Remedial Investigation Report Section 1.3.3.

B. Enforcement History

State Enforcement Activities

The Connecticut Health Department sampled Southington Production Well No. 5 on several occasions between December of 1978 and March of 1979. Sampling indicated that Well No. 5 was contaminated with hazardous chlorinated organic compounds, including trichloroethylene and 1,1,1-trichloroethane. As a result of this contamination, Well No. 5 was closed in August of 1979.

On November 12, 1980, the Connecticut Department of Environmental Protection collected soil samples of materials from a manhole excavation in the industrial park which was built on the Site. Contaminants detected include the hazardous substances chlorobenzene, carbon tetrachloride, chloroform, toluene, and xylene.

On September 21, 1984, the Connecticut Department of Environmental Protection (CT DEP) signed a Consent Order with the Town of Southington. Under that Order, as modified on December

16, 1985, the Town was required to investigate a portion of the contamination at the Landfill. Subsequently, Goldberg-Zoino & Associates -(GZA) was retained by the Town to conduct a hydrogeologic study pursuant to that Order.

In August 1992, an agreement was signed by the Connecticut Department of Environmental Protection and the Town of Southington to implement a landfill gas monitoring and mitigation plan at the Site. The plan is being administered by the Southington Fire Department and Potentially Responsible Parties. The plan consists of monitoring all homes and businesses on site for methane and other landfill gases. If such gases are detected inside the buildings, appropriate mitigating measures are taken to prevent further gas migration.

Federal Enforcement Activities

On September 29, 1987, three Potentially Responsible Parties (PRPs), the Town of Southington, United Technologies Corporation, Pratt & Whitney Division and Solvents Recovery Service of New England, Inc. (SRSNE) signed an Administrative Order by Consent to perform the RI/FS. At some time after 1987, SRSNE stopped participating after it became insolvent. In 1989, General Electric also agreed to participate in the performance of the RI/FS. The RI/FS was completed in December 1993. In May 1994, EPA issued an Addendum to the RI/FS. Both documents are part of the Administrative Record.

In January 1993, EPA notified approximately 320 parties of their potential liability with respect to the Site. The liability of these parties was premised on evidence which suggested that these PRPs either owned or operated the facility, generated wastes that were shipped to the facility, arranged for the disposal of wastes at the facility, or transported wastes to the facility.

III. COMMUNITY PARTICIPATION

Throughout the Site's history, community concern and involvement has been high. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

In October 1988, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed and involved in remedial activities. On December 14, 1988, EPA held an informational meeting in the Southington Public Library in Southington, Connecticut to describe the plans for the Remedial Investigation and Feasibility Study. On August 26, 1992, EPA held an informational meeting in Southington, Connecticut to discuss the methane gas problem at the Site.

On May 23, 1994, EPA completed the administrative record which includes documents that were used by EPA to propose the remedy for the Site. These documents are available for public review at EPA's offices in Boston, Massachusetts and at the site repository at the Southington Public Library in Southington, Connecticut. EPA published a notice and brief description of the Proposed Plan on June 1, 1994 in the Meridian Record Journal and on June 2, 1994 in the Southington Observer. The proposed plan was made available to the public on May 23, 1994 at the Southington Public Library.

On June 14, 1994, EPA held a public meeting to discuss the results of the Remedial Investigation, the cleanup activities presented in the Feasibility Study and to present the Agency's Proposed Plan. Also during this meeting, the Agency answered questions from the public. From June 15, 1994 to July 14, 1994, the Agency held a 30-day public comment period to accept written comments on the alternatives presented in the Feasibility Study, the Proposed Plan, and on any other documents previously released to the public. On June 29, 1994, residents of the Southington community requested a 30-day extension of the public comment period to August 13, 1994, which was granted by EPA.

On July 12, 1994, the Agency held a public hearing to discuss the Proposed Plan and to accept oral comments. A transcript of this hearing and comments, along with the Agency's response to comments are included in the Responsiveness Summary found in Appendix A of this Record of Decision (ROD).

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy is an interim remedy which will address, in part, the source of contamination at the Site. Source control remedies prevent or minimize the continued release of hazardous substances to the environment and rely on the prevention of exposure for the protection of human health and the environment.

Subsequent groundwater studies will be required that will define the extent of the plume and determine if the plume is impacting any downgradient natural resource areas. Monitoring data collected from the interim remedy will also be used to evaluate improvements in groundwater quality resulting from construction of an impermeable cap and excavation and consolidation of discrete materials found in SSDA1. EPA will determine when and if a meaningful trend in groundwater quality has been established. This information will be useful in developing groundwater remedial alternatives that address groundwater remediation at and off-site. The selection of any necessary groundwater remediation will be addressed in a final remedy.

In summary, EPA's selected interim remedy includes: 1) permanently relocating the affected businesses and residences and removing all buildings from the landfill, 2) excavating and consolidating discrete, highly contaminated materials currently located in semi-solid disposal area 1 (SSDA1) into a lined disposal cell to be constructed elsewhere within the landfill,

3) constructing a low permeability cap over all of the landfill area to reduce the amount of precipitation from contacting the Site waste, 4) placing waste from Black Pond underneath the cap, 5) installing a gas collection system (and potential treatment system) to control landfill gas build-up under the cap and migration off-site, 6) implementing a monitoring plan at and near the Site to monitor the effectiveness of the limited source control remedy by monitoring soil gas, groundwater, surface water, and sediment, and, 7) implementing institutional controls to restrict future use of the Site. Five year reviews of this limited source control plan will also be included as part of this selected remedy.

Potential future exposure to contaminated subsurface soils will be minimized by capping the landfill with a low permeability cover. Potential exposure to landfill gases will be minimized through the installation of a gas collection system (and potential treatment system) that will also control potential migration of gases. The required long-term monitoring will ensure that the selected source control remedy remains protective of human health and the environment.

V. SUMMARY OF SITE CHARACTERISTICS

Investigations were conducted at the Site to determine the nature and extent of contamination resulting from landfilling activities. Actions undertaken to meet this objective included: conducting interviews with former landfill and town employees; reviewing Town and State records; reviewing historical aerial photographs of the Site; installing test borings to determine the landfill boundary; installing monitoring wells; and sampling groundwater, surface water, sediment, soil gas, and surface and subsurface soils.

The PRPs who signed the Administrative Order on Consent to perform the RI/FS (RI/FS PRP Group), under EPA direction and oversight, initiated the first phase of field investigations to determine the extent of landfill contamination in the fall of 1988, and completed them in November 1991. The RI/FS PRP Group conducted the second phase of field investigations in May 1992; this phase was completed in January 1993. Additional subsurface soil investigations were conducted in October 1993 at a location referred to as Semi-Solid Disposal Area 1 (SSDA1), where disposal of liquid and semi-solid wastes had occurred (see Figure 2 for SSDA1 location).

The information gathered in all phases was used to prepare the RI/FS for all aspects of the Site. However, during the evaluation of the RI/FS documents, EPA and CT DEP determined that insufficient information on the extent and nature of the groundwater contamination had been compiled. Additional groundwater studies will be necessary in order to determine an appropriate final remedy at the Site. Therefore, the RI/FS dated December 1993, along with an addendum to the Feasibility Study

(FS) that was prepared by the EPA and issued in May 1994, is being used by EPA to select an interim remedy. The major conclusions and results of this RI are summarized below. These results are presented in detail in the RI Report (Volumes IA through 1E).

Contaminant concentrations discussed below are compared to levels in samples taken from areas not affected by the landfill, known as background samples, or, in the case of groundwater samples, to existing federal and state drinking water standards, known as maximum contaminant levels (MCLs).

Subsurface Soil/Landfill Wastes

A total of 108 soil borings were drilled to determine the boundaries of the landfill, the thickness of the landfill wastes, and the types of contamination present in the subsurface soils and landfill wastes. The borings were drilled to depths ranging from 9 to 60 feet below ground surface. The approximate boundary of the landfill is shown in Figure 2.

The test results indicated that different types of waste disposal activities were conducted in specific areas of the landfill. The landfill area can generally be divided into the following areas as shown on Figure 2: the northern area (currently residential), the southern area (currently commercial/industrial) and two Semi-Solid Waste Disposal Areas (SSDAs) known as SSDA1 and SSDA2.

The northern area of the landfill was primarily used for disposal of wood stumps and construction-type debris such as glass, bricks and asphalt. Some or all of the debris in this area was burned, resulting in the formation of polynuclear aromatic hydrocarbons (PAHs), a type of semi-volatile organic compounds (SVOCs). Subsurface soils contain varying levels of PAHs.

The southern area of the landfill was used for the disposal of both municipal, commercial, and industrial wastes. Soil samples collected from borings in this area contained primarily metal, paper, plastic, and glass. Chemical analysis of this area's subsurface soils indicates a wide variety of contaminants including volatile organic compounds (VOCs), SVOCs and metals. Pesticides were also detected in a few of the samples.

SSDA1 and SSDA2 were excavations located in the southern area of the landfill that were used for a period of time for the disposal of liquid and semi-solid industrial wastes. Samples collected from SSDA1 and SSDA2 contained high levels of VOCs such as toluene, ethylbenzene, xylenes, 1,2-dichlorethene, tetrachloroethene, and trichloroethene. Two visually distinct industrial-type wastes designated as "discrete materials A and B", were found in SSDA1. Discrete material A is a white, putty-like material, and discrete material B is a thick, brown, grease-like material. Samples of these industrial-type materials contained very high levels of VOCs and SVOCs. The high levels of contamination found in SSDA1 make this area a "hot spot" of contamination in the landfill. Borings in SSDA2 did not encounter the discrete industrial-type wastes found in SSDA1.

Surface Soil

Forty surface soil samples were collected from the landfill area and three background locations. Sixteen of these were collected from the northern area of the Site. No VOCs were found in surface soil samples collected in the northern area. However, VOCs were found in several areas of the southern portion of the landfill.

The major contaminants of concern found in surface soils were SVOCs, which were detected in a large number of samples collected across the Site. The majority of these SVOCs were PAHs which were detected above background levels in both the northern and the southern areas. Low levels of pesticides were detected in soil samples collected from the landfill surface in both the northern and southern areas of the landfill.

Background levels of metals were detected in many of the surface soil samples. Several samples collected in the southern industrial area of the landfill were found to have contained metals (arsenic, lead and mercury) that were above background levels.

Landfill Gases

Methane and other landfill gases have been measured in soils at the Old Southington Landfill since 1985. In November 1991, EPA was notified by CT DPHAS that gases were detected in floor cracks of the Parks & Recreation Building, and that two employees from the Southington Metal Fabricating Company had complained of illness (See Figure 2 for building locations). A landfill gas monitoring and mitigation program is in place at the landfill. It is being administered by the RI/FS PRP Group and the Southington Fire Department (SFD) through an agreement with CT DEP and in consultation with the EPA, CT DPHAS, and the Agency For Toxic Substances and Disease Registry (ATSDR). The program consists of on-site alarms in every home and business with regular monitoring by the SFD and Environmental Services and Engineering Inc.(ESE) (RI/FS PRP Group consultant). If landfill gases are detected migrating inside any of the homes or businesses, appropriate measures are taken to mitigate the problem. To date, methane has not been detected in any of the homes on the landfill, but has been detected inside some of the commercial buildings from time to time. This monitoring and mitigation program is only a temporary one until the interim remedy is implemented and the gas migration is permanently controlled.

Soil gases from the landfill have also been sampled for combustible gases and VOCs as part of the RI. These samples were collected from two to eight feet below ground surface depending on the elevation of the water table. Combustible gases were measured at 110 locations. High levels of these gases were recorded at about 55 test locations. Most of the high readings were detected in the southern area of the landfill.

Soil gases were also measured for the presence of specific VOCs at 23 of the locations. The highest levels of VOCs detected in soil gas were found in the southern area of the landfill that received municipal and industrial wastes. Of the sixteen soil gas samples collected in the northern residential area of the Site, seven were found to have detectible levels of VOCs. Some of the VOCs detected include benzene, ethylbenzene, toluene, vinyl chloride and xylenes.

Groundwater

Groundwater samples from 57 monitoring wells installed in the landfill study area (see Figure 2) were analyzed for VOCs, SVOCs, Pesticides/PCBs, and Metals. Sampling results indicated that several VOCs, including vinyl chloride, trichloroethene, 1,2-dichloroethene, ethylbenzene, toluene, and xylenes were present in the groundwater both at the landfill and to the west of the landfill (downgradient). Most of the VOCs were present at levels many times higher than MCLs.

SVOCs in groundwater were detected at only two locations and were generally found at much lower concentrations than the VOCs. Some of the SVOCs found include dichlorobenzenes and various types of phenol and phthalate compounds. Groundwater collected from two locations just west of the landfill contained traces of pesticides at concentrations below MCLs. Polychlorinated Biphenyls (PCBs) were detected in one well at concentrations above the MCL.

The groundwater sampling results indicated that metal concentrations exceeded background levels in wells both at and west of the landfill (downgradient). Many of these metals were also found in several wells at levels that exceeded MCLs. These included antimony, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver and thallium. Although an extensive groundwater investigation has been performed in the vicinity of the Site, additional groundwater studies are necessary before a final remedy can be determined.

Surface Water

VOCs and SVOCs were found at levels below or near MCLs in surface water samples collected from Black Pond and its outlet stream. Most metals occurred at or below background levels and MCLs. Antimony, cadmium, lead and thallium MCLs were each exceeded at least once.

Levels of metals detected in surface water samples were also compared to federal ambient water quality criteria (AWQC), standards established to be protective of aquatic life. Copper, lead and zinc exceeded these standards in some of the surface water samples that were collected.

Sediments

Sediment samples collected from Black Pond and its outlet stream were found to contain VOCs such as carbon disulfide, 1,2-dichloroethene, toluene and trichloroethene. SVOC analysis indicates the presence of PAHs at levels above background concentrations. PCBs were also found in three of the sediment samples collected. Concentrations of metals, including lead, mercury, and vanadium were higher than background levels.

Hydrogeology

The water table at the landfill varies from about 2 feet to 34 feet below the ground surface. It is shallower near the pond to the north and deeper to the south of the site. Landfill wastes are located both above and below the water table depending upon the specific area of the Site. Based on the data collected during the RI, it is estimated that approximately two-thirds of the landfill waste is located above the water table. A portion of the material in SSDA1 is located at or below the water table (depending on seasonal water table fluctuations). All of the material in SSDA2 is located above the water table. Waste located below the water table acts as a continuing source of contamination to the groundwater. Contaminated soils located above the water table also act as a source of contamination to groundwater as precipitation and snow melt infiltrate down through the waste transporting contamination to it.

The regional groundwater flow is westerly toward the Quinnipiac River. Studies undertaken thus far show that contaminated groundwater in the unconsolidated aquifer migrates in a westerly direction from the landfill. The majority of the unconsolidated groundwater aquifer is comprised of sand which allows groundwater to flow through the sand easily. The plume of contaminated groundwater is known to have migrated to monitoring well clusters B-308 and B-309 at the western edge of Chuck & Eddie's Used Auto Parts, the property located directly west of the landfill (see Figure 2).

VI. SUMMARY OF SITE RISKS

A human health baseline risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site. The public health risk assessment followed a four step process: 1) contaminant identification, which identified those hazardous substances which, given the specifics of the site were of significant concern; 2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and 4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the Site, including carcinogenic and non-carcinogenic risks. The results of the public health risk assessment for the Old Southington Landfill Superfund Site are discussed below followed by the conclusions of the ecological risk assessment.

Thirty-two chemicals in groundwater, 21 chemicals in northern surface soils, 21 chemicals in southern surface soils, 20 chemicals in on-site sediments, 17 chemicals in off-site sediments, 9 chemicals in surface water and 12 chemicals in air were selected as contaminants of concern for evaluation in the risk assessment. Table 1 below presents the contaminants of concern for groundwater. Tables 2 through 10 in Appendix B of this Record of Decision presents the contaminants of concern for all other media.

These contaminants constitute a representative subset of the 42 chemicals in groundwater, 42 chemicals in northern surface soils, 36 chemicals in southern surface soil, 49 chemicals in on-site sediment, 41 chemicals in off-site sediment, 23 chemicals in surface water and 12 chemicals in air identified at the Site during the Remedial Investigation. The contaminants of concern were selected to represent potential Site related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. A summary of the health effects of each of the contaminants of concern can be found in Appendix D of the Human Health Risk Assessment Report (HHRA).

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the Site.

Currently, the Site consists of residential, commercial and industrial properties. Two residences are located in the northern portion of the Site and seven commercial/industrial buildings are located on the southern portion of the Site. In the future, the landfill will be capped so that industrial, commercial, or residential use of the Site will not occur.

TABLE 1: SUMMARY OF CONTAMINANTS OF CONCERN IN GROUNDWATER

Contaminants of Concern	Average Concentration (mg/l)	Maximum Concentration (mg/l)	Frequency of Detection
antimony	0.06	0.84	12/58
aroclor 1248	0.0004	0.001	1/34
aroclor 1254	0.001	0.014	2/34
aroclor 1260	0.001	0.008	1/34
arsenic	0.005	0.05	22/58
barium	1.24	19.4	58/58
benzene	0.005	0.066	16/112
beryllium	0.003	0.04	24/58
bis(2-ethylhexyl) phthalate	0.03	0.7	6/42
butylbenzylphthalate	0.008	0.13	3/42
cadmium	0.03	0.95	13/58
carbon disulfide	0.008	0.13	13/112
chloroform	0.009	0.11	21/112
chromium, hexavalent(1)	0.11	1.17	31/58
chlordane (gamma)	0.00003	0.0001	2/34
1,2-dichloroethene (total)	1.08	33	34/112
ethylbenzene	0.31	10	15/112
lead	0.45	15.4	46/58
manganese	4.79	116	54/58
mercury	0.0004	0.006	18/58
methylene chloride	0.007	0.13	2/112
nickel	0.21	4.39	32/58
silver	0.03	0.9	13/58
tetrachloroethene	0.006	0.062	10/112
thallium	0.002	0.017	2/58
toluene	0.57	23	27/112
1,1,1-trichloroethane	0.06	1.8	8/112
trichloroethene	0.15	5.4	26/112
vanadium	0.17	2.29	36/58
vinyl chloride	0.075	3.45	20/112
xylenes (total)	0.34	13	21/112
zinc	1.25	38.2	58/58

(1) Based on total chromium analyses, assumed to be 100% hexavalent chromium.

Passive recreation might be allowed on the northern part of the Site, so long as the integrity of the cap and its' associated components are not compromised. Currently, the land use north of the Site is residential, west of the Site is mainly commercial and industrial, south of the Site is a mixture of residential and light industrial, and east of the Site are wetlands, some industries and residences. In the future the land use in the areas surrounding the Site is expected to stay essentially the same with perhaps a small increase in residential development.

The following is a brief summary of the exposure pathways evaluated. A more thorough description can be found in Section 4.0 of Volume 2A of the HHRA Report. To evaluate exposure to contaminated groundwater, a young child (1-6 years), older child (6-18 years) and an adult (18-30 years) were assumed to ingest 2 liters of water per day for a total of 30 years. Dermal contact and incidental ingestion of northern surface soils was evaluated for a young child, an older child and an adult who would be exposed 150 days per year for a total of 30 years. Dermal contact and incidental ingestion of southern surface soils was evaluated for an adult worker who would be exposed 250 days per year for 25 years. Subsurface soils were not evaluated because the presumptive remedy was used. Under the presumptive remedy the Site will be capped and will prevent future exposure to subsurface soils. There is no current exposure to subsurface soils. For the inhalation pathway a model was used to predict indoor and outdoor air concentrations of VOCs measured in northern soils. For the northern part of the site, exposure was evaluated for a young child, an older child and an adult who would spend 16 hours per day indoors and 8 hours per day outdoors for 350 days per year for a total of 30 years. A model was used to predict indoor and outdoor air concentrations of volatile compounds measured in southern soils and exposure was evaluated for an adult worker who would spend 8 hours outdoors or 8 hours indoors, depending on the job, for 250 days per year for 25 years.

Incidental ingestion and dermal contact with surface water while swimming in Black Pond was evaluated for an older child and an adult who would swim in the pond 36 days per year for a total of 24 years. Dermal contact with surface water while wading in Black Pond and off-site wetlands was evaluated for a young child, an older child and an adult who would wade 75 days per year for a total of 30 years. Dermal contact with sediments in Black Pond while swimming was evaluated for an older child and an adult who would swim 36 days per year for a total of 24 years. Incidental ingestion and dermal contact with sediments while wading was evaluated for a young child, older child, and adult who would wade in Black Pond on off-site wetlands for 75 days per year for a total of 30 years. For each pathway evaluated, an average and a reasonable maximum exposure estimate was generated corresponding to exposure to the average and the maximum concentration detected in that particular medium.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical specific cancer factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6} or 1/1,000,000) and indicate (using this example), that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure as defined by the compound at the stated concentration. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The hazard index was also calculated for each pathway as EPA's measure of the potential for non-carcinogenic health effects. A hazard quotient is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects for an individual compound. Reference doses have been developed by EPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The hazard quotient is often expressed as a single value (e.g. 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is approximately one third of an acceptable exposure level for the given compound). The hazard quotient is only considered additive for compounds that have the same or similar toxic endpoint and the sum is referred to as the hazard index (HI). (For example: the hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

Although to date, there has been no measurable inhalation or explosion risk due to landfill gases or methane respectively, such gases have been detected migrating into some of the industrial buildings on the landfill. In addition, two soil gas monitoring wells located on two residential properties have shown significant concentrations of methane during monitoring. Because groundwater was the only pathway evaluated which exceeded EPA's target risk range, this is the only pathway for which detailed risks are presented below. Table 11 and 12 depict the carcinogenic and non-carcinogenic risk summary for the contaminants of concern in groundwater evaluated to reflect present and potential future exposures from ingestion. These risks correspond to the average and the reasonable maximum exposure (RME) scenarios. Risks from all other pathways are summarized in Table 13. For a more detailed analysis of the risks from other pathways see Tables 4-2 through 4-6 in Volume 2A

TABLE 11
CARCINOGENIC RISKS FOR THE POSSIBLE FUTURE INGESTION OF GROUNDWATER

Contaminant of Concern (Class)	Conc. (mg/L) ave	Conc. (mg/L) max	Exposure Factor (L/kg/day)	Cancer Potency Factor (mg/kg-dy)-1	Risk Estimate ave	Risk Estimate RME
aroclors (B2)	0.003	0.023	1.8E-02	7.7	4.1E-04	3.2E-03
arsenic (A)	0.0053	0.042	1.8E-02	1.75	1.7E-04	1.3E-03
benzene (A)	0.005	0.066	1.8E-02	0.029	2.6E-06	3.4E-05
beryllium (B2)	0.003	0.044	1.8E-02	4.3	2.3E-04	3.4E-03
bis(2-ethylhexyl)phthalate	0.028	0.7	1.8E-02	0.014	7.0E-06	1.8E-04
chlordane-gamma (B2)	0.0002	0.0003	1.8E-02	1.3	4.7E-06	7.0E-06
chloroform (B2)	0.009	0.11	1.8E-02	0.0061	9.8E-07	1.2E-05
methylene chloride (B2)	0.007	0.13	1.8E-02	0.0075	9.4E-07	1.7E-05
tetrachloroethene (B2)	0.006	0.062	1.8E-02	0.052	5.6E-06	5.8E-05
trichloroethene (B2)	0.151	5.4	1.8E-02	0.011	3.0E-05	1.1E-03
vinyl chloride (A)	0.075	3.45	1.8E-02	1.9	2.6E-03	1.2E-01
				SUM	3.0E-03	1.2E-01

TABLE 12
NONCARCINOGENIC RISKS FOR THE POSSIBLE FUTURE INGESTION OF GROUNDWATER

Contaminant of Concern	Conc. (mg/L) ave	Conc. (mg/L) max	Exposure Factor (L/kg/day)	Reference Dose (mg/kg/dy)	Target Endpoint of toxicity	Hazard Quotient ave	Hazard Quotient RME
antimony	0.056	0.841	0.043	0.0004	blood	6.0E+00	9.0E+01
aroclors	0.003	0.0229	0.043	0.00007	fetotox.	1.8E+00	1.4E+01
arsenic	0.0053	0.0474	0.043	0.0003	skin	7.6E−01	6.8E+00
barium	1.24	19.4	0.043	0.07	blood	7.6E−01	1.2E+01
beryllium	0.0032	0.0437	0.043	0.005	no obs eff.	2.8E−02	3.8E−01
bis(2−ethylhexyl)phthalate	0.0277	0.7	0.043	0.02	liver	6.0E−02	1.5E+00
butylbenzylphthalate	0.0084	0.13	0.043	0.2	wgt. gain	1.8E−03	2.8E−02
cadmium	0.0295	0.946	0.043	0.0005	kidney	2.5E+00	8.1E+01
carbon disulfide	0.0083	0.13	0.043	0.1	fetotox.	3.6E−03	5.6E−02
chlordane	0.00019	0.0003	0.043	0.00006	liver	1.4E−01	2.2E−01
chloroform	0.0099	0.11	0.043	0.01	liver	4.3E−02	4.7E−01
chromium	0.113	1.17	0.043	0.005	no obs. eff	9.7E−01	1.0E+01
1,2−dichloroethene(total)	1.08	33	0.043	0.01	blood	4.6E+00	1.4E+02
ethylbenzene	0.312	10	0.043	0.1	liver, kidney	1.3E−01	4.3E+00
lead *	0.449	15.4	0.043	ND	CNS	ND	ND
mercury	0.0004	0.006	0.043	0.00034	kidney	5.1E−02	7.6E−01
methylene chloride	0.0073	0.128	0.043	0.06	liver	5.2E−03	9.2E−02
manganese	4.79	116	0.043	0.005	CNS	4.1E+01	1.0E+03
nickel	0.211	4.39	0.043	0.02	wgt. loss	4.5E−01	9.4E+00
silver	0.0277	0.902	0.043	0.005	skin	2.4E−01	7.8E+00
tetrachloroethene	0.0064	0.062	0.043	0.01	liver	2.8E−02	2.7E−01
thallium	0.0022	0.0166	0.043	0.00008	no obs. eff.	1.2E+00	8.9E+00
toluene	0.566	23	0.043	0.2	liver, kidney	1.2E−01	4.9E+00
1,1,1−trichloroethane	0.0581	1.8	0.043	0.09	liver	2.8E−02	8.6E−01
vanadium	0.174	2.29	0.043	0.007	no obs. eff.	1.1E+00	1.4E+01
xylenes	0.344	13	0.043	2	wgt loss	7.4E−03	2.8E−01
zinc	1.25	38.2	0.043	0.3	blood	1.8E−01	5.5E+00
					ENDPOINT HIs		
					HI Blood	12	248
					HI liver	0.6	13
					HI kidney	3	91
					HI No obs. eff.	3	33
					HI Wgt. loss	0.5	10
					HI skin	1	15
					HI CNS	41	1000
					HI fetotox	2	14

* − Lead is evaluated quantitatively by use of EPA's IEUBK Model, Version 0.5. See Human Health Ri k Assessment.
ND − not determ d

TABLE 13
SUMMARY OF RISK ESTIMATES FOR EXPOSURE
PATHWAYS NOT EXCEEDING EPA'S TARGET RISK RANGE

Exposure Pathway	Total Risk ave	Total Risk RME	Total Hazard Index ave	Total Hazard Index RME
On-site Resident (Surface soil north)				
Soil	3.7E-05	1.4E-04	5.2E-01	6.9E-01
Indoor air	2.6E-07	1.6E-07	2.2E-03	4.1E-03
Outdoor air	8.6E-09	5.0E-08	7.0E-05	4.5E-04
Total	3.7E-05	1.4E-04	5.3E-01	7.0E-01
Outdoor worker (Surface soil south)				
soil	1.6E-05	5.9E-05	2.8E-02	5.2E-02
outdoor air	3.5E-06	1.3E-05	1.4E-04	6.3E-04
total	2.0E-05	7.2E-05	2.8E-02	5.3E-02
Indoor worker (Southern area)				
indoor air	6.4E-06	2.3E-05	2.5E-04	1.2E-03
Swimmer				
Sediment	1.8E-06	4.9E-06	1.5E-04	3.0E-04
Surface water	1.5E-08	1.8E-08	4.0E-02	1.5E-01
total	1.8E-06	4.9E-06	4.0E-02	1.6E-01
On-site wader				
sediment	4.2E-05	1.1E-04	3.1E-02	1.0E-01
surface water	4.2E-09	5.1E-09	2.9E-03	1.1E-02
total	4.2E-05	1.1E-04	3.4E-02	1.1E-01
Off-site wader				
sediment	1.1E-05	2.7E-05	5.9E-03	1.3E-02
surface water	4.2E-09	5.1E-09	2.9E-03	1.1E-02
	1.1E-05	2.7E-05	8.8E-03	2.4E-02

of the HHRA Report.

The only exposure pathway exceeding EPA's target risk range of 10^{-4} to 10^{-6} is the ingestion of groundwater. The major contributors to carcinogenic risk in groundwater are beryllium, bis(2-ethylhexyl)phthalate, trichloroethene, vinyl chloride, arsenic and aroclors. The major contributors to noncarcinogenic risk estimates are; antimony, barium, bis(2-ethylhexyl)phthalate, cadmium, chromium, 1,2-dichloroethene, ethylbenzene, nickel, silver, thallium, toluene, vanadium, arsenic, manganese, zinc and aroclors. MCLs were exceeded for antimony, barium, beryllium, cadmium, chromium, mercury, nickel, thallium, 1,1,1-trichloroethane, 1,2-dichloroethane, benzene, chloroform, ethylbenzene, methylene chloride, tetrachloroethene, toluene, trichloroethene, vinyl chloride, xylenes and aroclors. The action level for lead was also exceeded.

Version 0.5 of the EPA's Integrated Uptake Biokinetic Model (IUBK) was used to assess the health risks from potential exposures to lead in groundwater and soil at the Site. The IUBK model predicts blood lead levels in children 0-6 years of age due to exposures to lead in air, water, soil/dusts, and diet as well as contributions from maternal sources. For this risk assessment, average concentrations of lead in surface soils and groundwater at the study site were used. The daily intakes of lead from air and diet were the default values provided in the model. The lead concentration in household dust was assumed to be the same as that of outdoor soil. Exposure variations are specifically accounted for within the model by its application of the geometric standard deviation (GSD) to calculate a distribution of lead levels for an exposed population. The default GSD value was used to define exposure distributions.

The results of the IUBK model predict that 99.93% of children drinking groundwater containing an average of 448ug of lead/L would have blood lead levels greater than 10ug/dL. (Ten micrograms per dL is the blood lead level below which the occurrence of adverse health effects in children has not yet been confirmed.) This exceeds EPA's target for blood lead in children which states that no greater than 5% of the blood lead levels of the population exposed shall exceed 10ug/dL.

Ecological Risk Assessment

The focus of the ecological risk assessment was to determine the Site's potential impact on environmental receptors such as birds, small mammals, reptiles, amphibians and fish. The ecological risk assessment included a delineation of wetlands, a qualitative animal survey and an ecological hazard assessment of the study area of the Old Southington Landfill. The initial step of the ecological risk assessment involved identification and preliminary characterization of potential physical and chemical stressors, the ecosystems potentially at risk and ecological effects.

The physical stressors in the study area include the landfill and residential and commercial/industrial properties. Chemical stressors include volatile organic, semivolatile organic and inorganic compounds, polychlorinated biphenyl compound (PCBs) and pesticides. The primary ecosystem considered in the risk assessment was the aquatic system,(i.e., plants and animals supported by Black Pond and the associated wetlands).

The potential ecological effects were evaluated semi-quantitatively by comparing surface water concentrations of chemical stressors that were Constituents of Potential Concern (CPC) to Ambient Water Quality Criteria (AWQC). Sediment concentrations of CPC were compared to National Oceanic and Atmospheric Administration (NOAA) sediment quality values or by using the Equilibrium Partitioning Approach.

The risk assessment indicates that the potential risks to animals are generally low and are associated with specific areas, including an isolated wetland area south of Black Pond, and portions of the northern area of the Site. Overall, the study area is affected by typical residential/urban activities in addition to potential landfill impacts. Residential and urban impacts could include street runoff containing oil, PAHs and metals that drain into Black Pond. Residential usage of paints, solvents, oil, gasoline, pesticides and other chemicals may also impact Black Pond through surface runoff from areas where these chemicals may have been spilled.

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to the public health or welfare or the environment. The proposed remedy once implemented would: immediately prevent contact with the landfill waste; would effectively and permanently control landfill gases, including methane; would improve the quality of surface water in Black Pond, and would improve the quality of groundwater until a final remedy for groundwater can be selected.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these congressional mandates.

Using the information gathered from the RI and HHRA, and other technical documents, EPA identified several source control response objectives to use in developing alternatives to prevent or minimize the release of contaminants from the Site. The limited source control objectives are:

1. Minimize the current and future effects of landfill contaminants on groundwater quality; specifically, reduce to a minimum the amount of precipitation allowed to infiltrate through the unsaturated waste column and contaminate the groundwater;

2. Eliminate potential future risks to human health through direct contact with landfill contaminants by maintaining a physical barrier;

3. Control surface water run-on, run-off and erosion at the Site;

4. Prevent risks from uncontrolled landfill gas migration and emissions;

5. Comply with state and federal applicable or relevant and appropriate requirements (ARARs); and

6. Minimize potential impacts of implementing the selecte limited source control alternative on adjacent surface waters and wetlands.

A comprehensive evaluation of containment and management of contaminated groundwater migrating from the landfill will be addressed by the final response action. As part of this interim remedy, subsequent groundwater studies will be necessary to define the extent and nature of the plume and determine if the plume is impacting any natural resource areas downgradient of the Site. Monitoring data collected from the interim remedy will be used to evaluate improvements in groundwater quality resulting from construction of the impermeable cap and excavation and consolidation of discrete materials A and B found in SSDA1. This information will be useful in developing groundwater remedial alternatives that address groundwater remediation at and off-site. The selection of any necessary groundwater remediation will be addressed in a final remedy.

B. Technology and Alternative Development and Screening

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. Because many CERCLA municipal landfill sites share similar characteristics, they lend themselves to remediation by similar technologies. EPA has established a number of expectations as to the types of technologies that should be considered and alternatives that should be developed; they are listed in the National Contingency Plan (40 CFR 300.430(a)(1)). For CERCLA municipal landfill sites, it is expected that;

1. The principal threats posed by a site will be treated wherever practical, such as in the case of remediation of a hot spot.

2 Engineering controls such as containment will be used for waste that poses a relatively low long-term threat or where treatment is impractical.

3. A combination of methods will be used as appropriate to achieve protection of human health and the environment. An example of combined methods for municipal landfill sites would be treatment of hot spot in conjunction with containment (capping) of the landfill contents.

4. Institutional controls such as deed restrictions will be used to supplement engineering controls, as appropriate, to prevent exposure to hazardous wastes.

5. Innovative technologies will be considered when such technologies offer the potential for superior treatment performance or lower costs for performance similar to that of demonstrated technologies.

6. Groundwater will be returned to beneficial uses whenever practical, within a reasonable time, given the particular circumstances of the site.

The presumptive remedy for CERCLA municipal landfills was used at this Site which relates primarily to containment (capping) of the landfill waste and collection and, if necessary, treatment of landfill gas. EPA has determined that such containment measures are appropriate at municipal landfills that contain wastes that pose a relatively low long-term threat or where treatment of the entire waste mass is impracticable due to the volume and mixture of wastes disposed of at the landfill.

Capping of the landfill waste along with collection and, if necessary, treatment of landfill gases is the presumptive containment remedy selected in the FS for this Site. In the FS, this remedy is combined with other remedial actions that address source control of the landfill wastes. The presumptive remedy does not address exposure pathways outside of the source area (landfill) such as groundwater.

Groundwater alternatives were included in the FS Report. These alternatives were based on insufficient data. Additional groundwater studies must be performed as part of this interim remedy before EPA, in consultation with CT DEP, will make a determination on any necessary groundwater remediation.

VIII. DESCRIPTION OF SOURCE CONTROL ALTERNATIVES

This section provides a narrative summary of each alternative evaluated. There are several other activities which are common to all the limited source control alternatives considered, except the no action alternative, SC1. These common activities include: 1) permanent relocation of the residences and businesses; 2) institutional controls which could include fencing to limit future Site activities; 3) groundwater monitoring; and 4) five-year reviews of the remedial alternative.

Alternative SC1: No Action

The FS evaluated the No Action Alternative to serve as a baseline for comparison with other remedial alternatives under consideration. The RI/FS Addendum dated May 1994 makes a correction to the No Action Alternative in the FS to point out the following. Under the No Action Alternative, no treatment or containment of solid waste would occur and no effort would be made to contain gas migration or restrict potential exposure to Site contaminants. The landfill waste would continue to leach contaminants to groundwater. The objectives of this alternative are to merely maintain the Site as it currently exists and conduct long-term monitoring of the groundwater with existing and new monitoring wells.

Estimated Time for Well Installation 1 month
Estimated Time of Operation: Not applicable
Estimated Capital Cost: $203,000
Estimated Operation and Maintenance Cost (net present worth): $2,377,000
Estimated Total Cost (net present worth): $2,580,000

Alternative SC2A: Cap Northern Landfill Area with a Soil Cap and Southern Area with a RCRA Subtitle C Composite Cap

This alternative involves only capping the landfill area. The northern part of the Site would be capped with a soil cap and the southern part would be capped with a RCRA Subtitle C composite cap. The soil cap would consist of a minimum of two feet of granular soil which would be overlain by eight inches of topsoil and vegetative cover. No soil gas collection/treatment system is proposed on the northern part of the landfill in this alternative.

A RCRA Subtitle C composite cap, consisting of several low permeability layers to prevent further leaching of contaminants and to prevent direct contact with the wastes, would be implemented in this area. A RCRA Subtitle C composite cap is typically four to five feet thick and typically consists of six layers of materials: a sandy fill layer placed on top of the existing ground surface, a low permeability geocomposite layer overlain by a second low permeability layer consisting of a flexible membrane liner (FML), a geosynthetic drainage layer, a layer of sand, and a layer of topsoil for a vegetative cover. The cap would be approximately 10 acres in areal extent. This alternative would also incorporate institutional controls which could include fencing, long-term groundwater, monitoring, and Five-Year Reviews.

The soil cap and RCRA Subtitle C composite cap would prevent human contact with contaminated soils. However, rain and snow melt would penetrate the soil cap, and eventually contact buried wastes potentially causing contaminants to leach to the groundwater. The RCRA Subtitle C composite cap in the southern area of the Site would be constructed with two low permeable liners that would prevent the infiltration of rain and snow melt into waste located above the water table. Thus, contaminants would be prevented from leaching into the groundwater. However, because groundwater would not be contained or treated, waste that is located below the water table would continue to leach contaminants that would migrate off-site to the west of Old Turnpike Road.

Estimated Time for Design and Construction: 30 months
Estimated Time of Operation: 30 years
Estimated Cost of Permanent Relocation: $1,760,000
Estimated Capital Cost: $7,514,000
Estimated Operation and Maintenance Cost (net present worth): $3,893,000
Estimated Total Cost (net present worth): $13,170,000

<u>Alternative SC2B: Cap Northern Landfill Area with a Single-Barrier Cap and Southern Area with a RCRA Subtitle C Composite Cap</u>

This alternative involves only capping the landfill area. This capping would consist of two different types of low permeability caps over specific areas. A single-barrier low permeability cap would be constructed over the northern landfill area providing a low permeability barrier. This cap would also prevent soluble contaminants that may be present above the water table in this area from contacting precipitation and in turn leaching into the groundwater. Typically, a single-barrier cap consists of: a bottom layer of sandy fill, a low permeable flexible membrane liner (FML) which is a plastic-like material, then a geosynthetic drainage layer, followed by another layer of sand, and finally, a layer of topsoil for vegetative growth. The cap would cover an area of approximately 2.5 acres.

The southern area of the Site would be covered with a RCRA Subtitle C composite cap as described for Alternative SC2A. This alternative would include a soil gas collection/treatment system throughout the entire landfill and incorporate the institutional controls, which could include fencing, long-term groundwater monitoring and Five-Year Reviews.

Estimated Time for Design and Construction:	30 months
Estimated Time of Operation:	30 Years
Estimated Cost of Permanent Relocation:	$1,760,000
Estimated Capital Cost:	$8,138,000
Estimated Operation and Maintenance Cost (net present worth):	$3,893,000
Estimated Total Cost (net present worth):	$13,791,000

<u>Alternative SC6: Cap Northern Landfill Area with a Single-Barrier Cap and Southern Area with a RCRA Subtitle C composite cap/Excavate Discrete Material in SSDA1 and Consolidate in a lined cell within the Southern Landfill Area</u>

This alternative would include capping as described for Alternative SC2B, and soil gas collection/treatment, excavation of the SSDA1 discrete materials A and B (estimated volume is 500 to 1,100 cubic yards) along with a two-foot buffer zone around these materials and consolidation of these materials in a low permeability lined cell within the southern portion of the landfill area. Institutional controls which could include fencing, long-term groundwater, surface water, sediment and soil gas monitoring, and Five-Year Reviews would also be a part of this alternative.

Excavating the SSDA1 discrete materials would serve to reduce the potential migration of high levels of contaminants from these wastes into the groundwater.

Estimated Time for Design and Construction:	37 months
Estimated Time of Operation:	30 years
Estimated Cost of Permanent Relocation:	$1,760,000
Estimated Capital Cost:	$ 9,738,000
Estimated Operation and Maintenance Cost (net present worth):	$4,537,000
Estimated Total Cost (net present worth):	$16,035,000

<u>Alternative SC7: Cap Northern Landfill with a Single-Barrier Cap and Southern Area with a RCRA Subtitle C Composite Cap/Excavate Discrete Material in SSDA1 and Incinerate Off-Site</u>

This alternative would include capping and soil gas collection/treatment as described in SC2B, and excavation and off-site treatment (incineration) of the SSDA1 discrete materials A and B (estimated volume is 500 to 1,100 cubic yards). Institutional controls which could include fencing, long-term groundwater monitoring, and Five-Year Reviews would also be a part of this alternative.

In the FS, it was determined that off-site incineration would be the most effective means of treating the discrete materials which are high in volatile and semi-volatile organic compounds. However, there are a limited number of incinerators that accept this type of waste, and incineration can be a costly treatment/disposal method. In addition, there are a limited number of facilities that can perform incineration. By excavating the SSDA1 discrete materials, especially those located below the water table, the potential for migration of high levels of VOCs from SSDA1 into groundwater would be eliminated. Treatment of this material would result in a permanent destruction of the VOC and SVOC contaminants. However, metals would remain in the incinerator ash and may be considered a hazardous waste that would need special handling and disposal.

Estimated Time for Design and Construction:	37 months
Estimated Time of Operation:	30 years
Estimated Cost of Permanent Relocation:	$1,760,000
Estimated Capital Cost:	$15,144,000
Estimated Operation and Maintenance Cost (net present worth):	$3,893,500
Estimated Total Cost (net present worth):	$20,797,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the National Contingency Plan articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are summarized as follows:

Threshold Criteria

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with applicable or relevant and appropriate requirements (ARARS)** addresses whether or not a remedy will meet all the ARARs of other Federal and State

environmental laws and/or provides grounds for invoking a waiver.

Primary Balancing Criteria

The following five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

3. **Long-term effectiveness and permanence** addresses the criteria that are utilized to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume (TMV) through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

5. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and Operation maintenance (O&M) costs, as well as present-worth costs.

Modifying Criteria

The modifying criteria are used on the final evaluation of remedial alternatives generally after EPA has received public comment on the RI/FS and Proposed Plan.

8. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS report.

A detailed tabular assessment of each alternative according to the nine criteria can be found in The Table entitled "EPA

Addendum to RI/FS - Old Southington Landfill Superfund Site Comparative Analysis of Remedial Alternatives Operable Unit 1 - Limited Source Control" of the RI/FS Addendum dated May 1994.

Following the detailed analysis of each individual alternative, a comparative analysis was conducted focusing on the relative performance of each alternative against the nine criteria.

The section below presents the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analysis.

1. Overall Protection of Human Health and the Environment

The preamble to the National Contingency Plan (NCP) identifies municipal landfills as a type of site where treatment of the waste may be impracticable because of the size and heterogeneity of the contents. EPA generally considers containment to be an appropriate response action for large municipal landfills. Because the Old Southington Landfill Site is a large municipal landfill, the alternatives evaluated consider containment to be the appropriate response action for source control.

Alternative SC1, No Action, will not meet this criterion because no measures would be taken to prevent potential exposure to Site contaminants.

Alternatives SC6 and SC7 address source control by capping the landfill and excavation and consolidation of SSDA1 discrete materials and providing overall protection of human health and the environment by preventing direct contact with contaminated subsurface soils and controlling landfill gas migration and emissions. The discrete industrial wastes found above and below the water table in SSDA1 are removed and isolated in a low permeability lined cell (SC6), or incinerated off-site (SC7), preventing the potential for future migration of contaminants from these wastes into groundwater. Alternatives SC2A and SC2B, are similar to Alternatives SC6 and SC7 in that they have the same level of protection for the capping component. However, alternatives SC2A and SC2B do not provide for the excavation and consolidation of SSDA1 contaminants, and thus, do not prevent the potential future migration of these contaminants into groundwater.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The No Action Alternative SC1, does not comply with the ARARs identified because it will not satisfy the RCRA requirement to minimize the potential for releases of hazardous contaminants to the environment and it does not fully satisfy design, operating, or closure and post-closure requirements for hazardous waste landfills.

Alternatives SC2A, SC2B, SC6 and SC7 will meet the closure requirements for hazardous waste landfills in the southern area of the landfill where a RCRA Subtitle C composite cap will be installed and will meet the closure requirements in the northern part of the Landfill for RCRA Subtitle D Solid Waste landfills. All other ARARs would be met by the alternatives. Groundwater ARARs (e.g., Federal and State MCLs) will be addressed under the final remedy.

3. Long-term Effectiveness and Permanence

With the exception of the No Action Alternative, SC1, all of the alternatives would provide long-term effectiveness. SC1 would not provide direct engineering controls to prevent direct contact with contaminated soils and debris, nor control soil gas migration, and would provide no additional protection of groundwater from continued leaching of waste from the landfill.

The long-term effectiveness of landfill caps has been proven to be excellent. The potential risks from exposure to contaminated soils and debris are eliminated by a combination of the cap and institutional controls. All of the alternatives except the No Action Alternative significantly reduce infiltration of rain and snow melt into the unsaturated wastes, resulting in an improvement in groundwater quality over time. Alternatives SC2B, SC6 and SC7 are more effective than Alternative SC2A because they include a single-barrier low permeable cap on the northern area of the landfill rather than a soil cap. The soil cap does not include a soil gas collection system and allows more infiltration of rain and snow melt than does the single-barrier low permeability cap. Groundwater will be addressed under the final remedy.

Alternative SC6 is more effective in reducing potential risks from the SSDA1 industrial wastes by excavating and placing them in a lined cell than all other alternatives except SC7. Alternative SC7 involves incineration of the SSDA1 wastes which eliminates the risks associated with these materials by destroying the organic contaminants.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives SC2A, SC6 and SC2B (capping only) and Alternative SC1 (No Action) provide no treatment of landfill derived wastes and consequently, no reduction in toxicity, mobility or volume through treatment because treatment of the entire landfill area is impracticable. However, Alternative SC6 does reduce the mobility of contaminants in SSDA1 wastes by excavation/placement in a low permeable lined cell, eliminating direct contact of these materials with groundwater. Of all of the source control alternatives, Alternative SC7, which includes incineration of SSDA1 materials, would provide the most reduction in toxicity, mobility or volume through treatment.

5. Short-term Effectiveness

Alternative SC1, No Action, would pose the least short-term risk of adverse impacts on human health and the environment because it does not include any disturbance of contaminated areas.

The short-term risks of Alternative SC6 and the other alternatives that include capping are equivalent. The short-term risks relate to airborne dust and volatilization of contaminants during construction of the landfill cap. Excavation of potentially contaminated wastes would occur primarily along Old Turnpike Road and along the shore of Black Pond. Contaminants may be released to Black Pond and the outlet streams during excavation activities. Impacts to Black Pond and associated wetlands due to the construction of Alternatives SC2A, SC2B, SC6, and SC7 would be minimized to the extent possible by the design and engineering controls.

Risks to construction workers and the area residents can be controlled and minimized through the use of engineering controls such as dust suppression techniques, access limitations during specific activities, control of traffic on Old Turnpike Road, air monitoring and compliance with a health and safety plan. Standard construction practices and controls would be implemented to minimize site soil erosion and siltation to Black Pond and the outlet stream.

Alternatives SC6 and SC7 involve excavation of the SSDA1 discrete materials. The potential risk of exposure to workers and off-site populations would be highest for Alternative SC7 due to the potential release hazards associated with the excavation and transportation of SSDA1 materials to an off-site incineration facility. Alternatives SC6 and SC7 would pose roughly the same short-term risks from excavation of the SSDA1 materials. Worker exposure to contaminated soils and both worker and community exposure to hazardous volatile emissions is greater for these actions than for the other alternatives. Consequently, the risk of exposure to workers and off-site populations are worse under Alternatives SC6 and SC7 than Alternatives SC2A and SC2B. The risk can be controlled through the following. SSDA1 excavation/consolidation activities can be completed in a relatively short period of time (approximately one week). Furthermore, the risks associated with SC6 and SC7 would be minimized through the implementation of: special engineering precautions which can include dust suppression, access limitations and control of traffic on Old Turnpike Road; air monitoring and contingency planning for potential emergencies; and compliance with a health and safety plan and federal and state regulations.

All alternatives would result in similar increased traffic on Old Turnpike Road from construction-related vehicular traffic, except SC7, which would cause additional traffic due to the off-site transportation of SSDA1 waste for incineration.

6. Implementability

Alternative SC1, No Action, is the most easily implemented since it requires no construction and minimal administrative approvals, including institutional controls.

The various components of all of the alternatives for limited source control are common elements of remedial projects that could be readily implemented. Excavation and consolidation or treatment of SSDA1 materials, which are components of Alternatives SC6 and SC7, are easily implemented through the use of standard construction techniques and special procedures to minimize release of contaminants. Excavation and consolidation components require additional precautions due to the hazardous constituents present in the waste.

Alternative SC7 requires long distance transport of SSDA1 materials to an off-site incineration facility. The availability of such facilities is dependent upon the facility's capacity and regulatory status at the time of disposal.

7. Cost

The least costly of the alternatives would be the No Action Alternative, SC1, which includes no active efforts to contain the contamination at the Site. The difference in the total net present worth of the least and most costly limited source control alternatives is approximately $7.6 million (SC2A = $13,170,000; SC2B = $13,791,000; SC6 = $16,035,000; and SC7 = $20,797,000).

The total cost of Alternative SC6 is $2.2 to $2.9 million greater than Alternatives SC2B and SC2A, respectively. EPA believes that the added cost for Alternative SC6 provides a greater overall level of protection through the single barrier low permeability cap and soil gas collection/treatment system in the northern area, and through excavation/consolidation of SSDA1 discrete materials. The single barrier cap would be more effective in preventing direct contact with contaminated soils and the gas collection system would prevent landfill gases from migrating off-site. Excavating SSDA1 materials and isolating them within a lined cell within the landfill will effectively isolate these materials and prevent them from contributing to future groundwater contamination.

SC7 includes all of the components of Alternative SC6 and also includes off-site incineration of the SSDA1 materials. The total cost of this alternative is approximately $4.8 million greater than Alternative SC6. EPA believes that the additional cost of incineration does not provide a significant additional benefit for protection of human health in comparison to Alternative SC6. In addition, other factors associated with incineration of the waste such as the availability of treatment facilities, increased truck traffic through town and the potential for the release of contaminants during off-site transportation make this option less favorable.

The operation and maintenance cost of all of the source control alternatives is approximately $3.9 to $4.5 million.

8. State Acceptance

The State's comments on the Proposed Plan are provided in the Responsiveness Summary included in Appendix A. The State concurs with the Selected Remedy. Their letter of concurrence, documenting the State's position on the Selected Remedy is provided in Appendix C of this ROD.

9. Community Acceptance

The comments received from the community on the RI/FS and the Proposed Plan during the public comment period and EPA's responses to these comments are summarized in the Responsiveness Summary in Appendix A.

Based on written and oral comments received during the comment period, there are opposing views with respect to the limited source control remedy. Responses to all public comments are summarized in the Responsiveness Summary in Appendix A.

X. THE SELECTED REMEDY FOR LIMITED SOURCE CONTROL

The selected remedy is Alternative SC6. The components of this remedy are summarized in Section VIII of this ROD. In summary, the selected remedy for limited source control consists of the following components:

1. Removing all residential and commercial structures from the landfill and off-site relocation of all affected residents and businesses;

2. Excavating and consolidating discrete semi-solid materials A and B from SSDA1 including a two-foot buffer zone around these materials to prevent wastes below the water table from further contaminating the groundwater;

3. Constructing a low permeability cap over all of the landfill area to reduce the amount of water entering the Site waste;

4. Installing a gas collection and, if necessary, treatment system to prevent landfill gas build up under the cap and to collect the landfill gases;

5. Implementing a monitoring plan to determine the long-term effectiveness of the cap on groundwater, surface

water, sediment quality, and the effectiveness of the soil gas collection/treatment system;

6. Developing and implementing institutional controls, which could include fencing, to ensure the integrity of the remedy by controlling future site use and access; and

7. Performing Five Year Reviews.

The costs of the selected remedy are summarized below.

Estimated Cost of Permanent Relocation: $1,760,000
Estimated Capital Cost: $9,738,000 (exclusive of relocation costs)
Estimated Operation & Maintenance Costs (net present worth): $4,537,000
Estimated Total Cost (net present worth): $16,035,000

The EPA and CT DEP have carefully reviewed the remedial data and evaluations relating to this Site, and have considered all public comments received during the comment period. The agencies agree that there is sufficient information available to proceed with a limited source control remedy for the Old Southington Landfill. These components are described below and are required to be implemented under this interim ROD.

In addition, pursuant to this interim ROD, additional groundwater studies will be required and shall proceed concurrently with the implementation of this remedy. The purpose of these future studies will be to define the boundary of the plume and determine if the plume is impacting any natural resource areas. Groundwater monitoring data collected from the interim remedy will be reviewed by the Agencies. EPA will make a determination as to when this data shows a meaningful reading of the effects of the cap on groundwater. This data, in conjunction with the results of the groundwater studies, will be used to evaluate groundwater remedial alternatives so that EPA, in consultation with CTDEP, will be able to determine an appropriate final remedy.

Removal of all Residential and Commercial Structures From the Landfill

Removing all of the residential and commercial structures from the landfill and the off-site relocation of the affected businesses and residences will be necessary prior to construction of the cap at the Site. The permanent relocation of businesses and residences will ensure the long-term integrity of the cap which is necessary to prevent future releases of contaminants and to protect public health by eliminating the potential for future exposure of residents and commercial workers to the landfill contaminants. The permanent relocation of the businesses and residences is environmentally preferable and more cost-effective than excavation of landfill wastes which would be necessary to allow residences and businesses to remain on the Site.

Excavation and Consolidation of Discrete Semi-Solid Materials in SSDA1 into a Lined Cell On Site

Semi-solid discrete materials A and B (estimated to be 500 to 1,100 cubic yards) found in SSDA1 along with a two-foot buffer zone around these materials will be excavated and consolidated into a lined cell. This cell would be placed above the water table and located somewhere in the southern part of the landfill beneath the RCRA Subtitle C composite cap. The cell will be constructed to prevent infiltration of rainwater and snow melt to these materials to prevent leaching into the groundwater. Detailed criteria for handling these materials and construction of the cell will be developed during remedial design to allow for the use of the most current materials and procedures appropriate for the specific Site conditions.

Because SSDA1 is located next to Old Turnpike Road, the road would be closed off during excavation to allow sufficient space for construction equipment and to prevent potential exposure to VOC emissions. Controls to be implemented to minimize potential worker and off-site population exposure to contaminated dust and VOC emissions may include watering of the excavation, covering spoil piles with plastic sheeting, access limitations, complete or partial encapsulation of work area, adjusting the size of work area, and compliance with a health and safety plan. An air monitoring program will be required and incorporated into the health and safety plan.

The water table at the Site may have to be temporarily lowered to facilitate the implementation of construction activities, such as SSDA1 excavation. Consistent with expectations in the FS, the effluent from this dewatering process will be removed to an off-site disposal facility. If other disposal alternatives which have environmental implications become warranted, further analysis will be required.

Capping the Landfill

The northern, residential part of the landfill was used primarily for disposal and burning of municipal waste consisting mainly of wood and construction debris. The primary contaminants of concern found in this area are PAHs. EPA has selected a single-barrier low permeability cap for this part of the landfill. This cap is puncture resistant and will effectively and reliably prevent direct contact with the landfill waste. The cap will also minimize infiltration of rainwater and snow melt into the landfill waste.

The southern portion of the landfill received mixed municipal, commercial, and industrial waste. Approximately two-thirds of this waste is located above the water table. In general, these materials are more soluble and more hazardous in nature than those found in the northern part of the landfill. EPA has selected a cap for this area that complies with the Resource Conservation and Recovery Act (RCRA) Subtitle C landfill closure regulations. This cap will prevent direct contact with landfill wastes and will minimize infiltration into the landfill waste; significant improvement in the quality of groundwater is expected.

Detailed design criteria for both caps will be developed during remedial design to allow for the use of the most current materials and procedures appropriate for the specific conditions at this site. Both caps will include provisions for a gas collection and, if necessary, treatment system. This component of the cap will prevent unsafe exposure to landfill gases and threats from potential methane explosion. Construction of surface water run-on and run-off control measures will be implemented to prevent erosion of the cap and on-site and off-site flooding problems.

Additional testing of Black Pond is required during pre-design and possibly during the construction phase to better define the extent of waste in Black Pond that resulted from landfill disposal practices. That waste will be excavated and placed underneath the landfill cap. Landfill waste close to Old Turnpike Road may need to be excavated and placed underneath the cap. Provisions for this work will be included in the design report.

A comprehensive evaluation of rainfall data and Site parameters is required to determine what changes construction of the cap may have on surface water elevations of Black Pond. Based on this evaluation, engineering measures may be necessary to ensure that surface water elevations do not adversely impact neighboring properties or wetlands associated with Black Pond due to construction activity. Furthermore, the culvert that connects Black Pond to the wetlands to the west is currently crushed and is not functioning properly. Thus, based on the results of this evaluation, this culvert may need to be redesigned and reconstructed or a comparable conduit(s) may be necessary to meet the objectives set forth in the rainfall and site parameter evaluation.

Gas Collection System

A gas collection system will be installed throughout the entire area of the landfill as a component of both caps. During pre-design, a pilot study will be performed to determine whether venting is appropriate or if treatment of landfill gases is necessary. The pilot study will be performed on the southern part of the landfill where higher concentrations of VOCs and methane have been found. If venting is selected and later proves not to be protective of human health or the environment, a gas treatment system will be required.

Long-term Monitoring Plan

A long-term monitoring plan is required to monitor the effectiveness of the selected remedy. This plan will consist of an appropriate number of groundwater monitoring wells and soil gas monitoring wells around the entire landfill area. The number and location of wells, sampling frequency, and sampling parameters will be determined during design. Periodic surface water and sediment sampling is also required in Black Pond and at the outlet of the culvert or comparable conduit(s) that connects Black Pond to the wetland area to the west of the site. The frequency, locations, and parameters of this sampling will also be determined during design. The objective of the surface water and sediment sampling is to ensure that site related construction work does not adversely impact Black Pond or downgradient wetland areas. This information will also be used to determine the long-term effectiveness of the cap.

Institutional Controls

Institutional controls will be implemented at the Site to prevent current or future use of contaminated groundwater and assure the integrity of the cap and associated systems by limiting future activities on the landfill. A Site security plan will be developed and implemented to control future site use and access to the Site.

Five Year Reviews

As provided in the NCP, EPA will review the Site at least once every five years after the initiation of remedial action since hazardous substances, pollutants and contaminants remain at the Site. This will ensure that the remedial action continues to protect human health and the environment.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Old Southington Landfill Site is consistent with CERCLA and the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost-effective. This limited source control remedial action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy does not satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element because treatment of the entire landfill area is impracticable. The selected remedy will reduce mobility of contaminants through its containment features.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this Site will permanently reduce the risks posed to human health and the environment through engineering controls and institutional controls.

Capping of the landfill will provide protection of human health and the environment by preventing direct contact with wastes that contain VOCs, SVOCs, pesticides/PCBs and metals. Landfill gases at the Site will be collected to prevent off-site migration and eliminate potential explosion hazards. The cap will also prevent erosion and potential transport of contaminated wastes into Black Pond and the wetland areas. Excavation and consolidation of the SSDA1 discrete wastes prevents these wastes from acting as potential long-term contributors to groundwater contamination.

Capping the landfill with a low permeability cover minimizes infiltration of precipitation through the cap and significantly reduces further leaching of contaminants from wastes located above the water table to the aquifer. A significant improvement in groundwater quality over the long-term is anticipated due to the isolation of approximately two-thirds of the waste currently above the water table under a low permeability cap. The aquifer at the Site is very permeable and water flows through it very quickly. This is a positive characteristic because the ability of the aquifer to naturally flush contaminants is high. This flushing ability, combined with the landfill cap, is expected to create a significant improvement in groundwater quality over time.

B. The Selected Remedy Attains ARARs

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to the Site. Environmental laws from which ARARs for the selected remedial action are derived, and the specific ARARs include:

<u>Action Specific</u>

<u>Federal Requirements</u>

* Resource Conservation and Recovery Act (RCRA) - Closure and Post-Closure of Municipal Solid Waste Landfills, 40 CFR Part 258, Subpart F.
* RCRA - Emergency Preparedness and Prevention, 40 CFR Part 264, Subparts C, D.
* RCRA - Closure and Post-Closure Requirements, 40 CFR Part 264, Subpart G.
* Clean Air Act - National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61.

State Requirements

* Solid Waste Management Regulations, RCSA 22a-209-1-15.
* Hazardous Waste Management Regulations, RCSA 22a-449(c)-100-110.
* Air Pollution Regulations, Stationary Sources, CGS 22a-174-3.
* Air Pollution Regulations, Fugitive Dust Emissions, CGS 22a-174-18[b].
* Air Pollution Regulations, Control of Odors, CGS 22a-174-23.
* Air Pollution Control Regulations, Incineration Regulations, CGS 22a-174-18(c).
* Air Pollution Regulations, Hazardous Air Pollutants, CGS 22a-174-29.
* Water Quality Standards, CGS 22a-426.
* Water Pollutant Control Act, Permitting Requirements, CGS 22a-430-430(b).
* Water Pollution Control Regulations, Permitting Regulations, CGS 22a-430 1-8.

Chemical Specific

Federal Requirements

* None identified for this limited source control interim remedy.

State Requirements

* None identified for this limited source control interim remedy.

Location Specific

Federal Requirements

* Protection of Wetlands, Executive Order No. 11990, 40 CFR Part 6, Appendix A.
* Clean Water Act §404 Dredge and Fill Activities, 40 CFR Part 230; 33 CFR Parts 320-328
* Fish And Wildlife Coordination Act, 40 CFR Part 6

State Requirements

* Connecticut Inland Wetlands Regulations, RCSA 22a-39-1 through 15.

The following policies, criteria, and guidance will also be considered (TBC) during the implementation of the remedial action:

Action Specific

* USEPA Technical Guidance for Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA/530-SW-89-047.
* Clean Air Act - Non-methane organic compounds (NMOCs) (Proposed Rule - 56 FR 24468, to be codified at 40 CFR Part 60, Subpart WWW).

Chemical Specific

* USEPA Human Health Assessment Cancer Slope Factors (CSFs).
* USEPA Reference Doses (RfDs).

All the listed ARARs can be found in the tables included in Appendix D of this Record of Decision. These tables provide a brief synopsis of the ARARs and an explanation of the actions necessary to meet the ARARs. These tables also indicate whether the ARARs are applicable or relevant and appropriate to the actions to be taken at the Site. In addition to ARARs, the tables describe the standards that are To-Be-Considered (TBC) with respect to remedial actions.

The purpose of the remedy selected in this interim ROD is to control, in part, the source of contamination. No groundwater clean-up levels are established in this interim ROD. After additional studies, as required under this interim remedy, have been undertaken, a decision on the appropriate remedial action with respect to groundwater will be set forth in the final remedy.

This ROD establishes certain action-specific requirements for groundwater including compliance with the Connecticut State Water Quality Standards, which sets forth the antidegradation policy of the state, as well as the Connecticut Water Pollution Control Act and the Connecticut Water Pollution Control Regulations which are described more completely in the tables in Appendix D. These action-specific requirements shall apply to remedial activities that result in discharges to groundwater and surface water, if any should occur.

C. The Selected Remedial Action is Cost-Effective

In EPA's judgment, the selected remedy is cost-effective, i.e., the remedy affords overall effectiveness proportional to its costs. In selecting this remedy, once EPA identified alternatives that are protective of human health and the environment and that attain, or, as appropriate, waive ARARs, EPA evaluated the overall effectiveness of each alternative by assessing the relevant three criteria - long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The estimated costs of this remedial alternative are summarized below.

Capital Costs: $9,738,000
Cost of Permanent Relocation: $1,760,000
Operation & Maintenance Costs: $4,537,000 (net present worth)
Total Cost: $16,035,000 (net present worth)

The total cost of the selected remedy is $2.2 to $2.9 million greater than Alternatives SC2B and SC2A, respectively. EPA believes that the added cost for the selected remedy SC6, provides a greater overall level of protection through the single-barrier low permeability cap and soil gas collection/treatment system in the northern area, and by excavation and consolidation of SSDA1 discrete materials. The single-barrier cap will be more effective in preventing direct contact with contaminated soils and the gas collection system will prevent landfill gases from migrating off-site. Excavating SSDA1 materials and isolating them within a lined cell within the landfill will effectively isolate these materials and prevent them from contributing to future groundwater contamination.

Alternative SC7 includes all the components of the selected remedy plus off-site incineration of the SSDA1 materials. The total cost of SC7 is about $4.8 million greater than the selected remedy. EPA believes the additional cost of incineration does not provide a significant additional benefit for protection of human health in comparison to the selected remedy. In addition, other factors associated with off-site waste incineration, such as availability of treatment facilities and the potential for release of contaminants during transportation make this option less favorable.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

Once the Agency identified those alternatives that attain or, as appropriate, waive ARARs and that are protective of human health and the environment, EPA identified which alternative utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility or volume through treatment; 3) short-term effectiveness; 4) implementability; and 5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the various alternatives.

The No Action alternative, SC1, is not protective of human health and the environment. EPA evaluated alternatives SC2A, SC2B, SC6 and SC7 to determine which one provided the best balance in terms of the criteria presented above. Alternative SC6 was selected as the limited source control remedy because of its long-term effectiveness and it provides the most significant benefits for the cost. The EPA has determined that it is not practical to treat SSDA1 "hot spot" materials because of the relatively small volume of waste and the complexity of contaminants which rules out most treatment processes with the exception of incineration. Of all of the limited source control alternatives only SC7 provides for treatment of waste to provide a reduction in toxicity, mobility and volume of contaminants. Metals contamination in the waste would not be addressed through incineration. Due to the heterogeneity of the hot spot waste, other treatment methods are relatively unsuitable. Incineration is significantly more costly than SC6. Alternative SC7 also has additional problems associated with it which include: off-site transportation of highly contaminated materials onto public roads, which could result in a traffic accident which could lead to an uncontrolled exposure to these contaminants for some period of time; increased truck traffic through Town; and limited availability of treatment facilities. Overall, SC6 provides the best balance of protectiveness to human health and the environment for the cost.

During predesign, studies of landfill soil gases will determine if natural venting or treatment of these gases is appropriate. If treatment is selected, this would provide a small reduction in TMV for this selected remedy.

E. The Selected Remedy does not satisfy the Preference for Treatment which Permanently and Significantly Reduces the Toxicity, Mobility or Volume of the Hazardous Substances as a Principal Element because treatment of the entire landfill area is impracticable.

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. Because many CERCLA municipal landfill sites share similar characteristics, they lend themselves to remediation by similar technologies. EPA has established a number of expectations as to the types of technologies that should be considered and alternatives that should be developed; they are listed in the National Contingency Plan (40 CFR 300.430(a)(1)) and EPA Guidance Document "Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites" EPA/540/P-91/001.

The selected remedy includes capping of the landfill waste. The large volume and heterogeneity of waste of the Site makes treatment impractical. Excavation and treatment of such a large volume would also involve unacceptable risk to human health and the environment and would not be cost effective.

The selected alternative does utilize a combination of methods to achieve protection of human health and the environment. Excavation of the SSDA1 discrete "hot spot" materials in combination with capping and soil gas collection will address principal threats posed by potential exposure to contaminated subsurface soils, groundwater below the Site and landfill soil gases. Predesign studies will determine if landfill soil gas will require treatment or could be vented to the atmosphere.

Groundwater will be further studied and the necessary response action will be addressed in a final ROD. It is expected that installation of the impermeable landfill cap will result in a significant gradual improvement of the groundwater quality down gradient of the landfill site.

XII. DOCUMENTATION OF NO SIGNIFICANT DIFFERENCES

EPA presented a Proposed Plan (preferred Alternative) for remediation of the Site in May 1994. As described in the Proposed Plan (and previously in Section X of this ROD), the limited source control alternative includes, among other things, construction of a single-barrier low permeability cap over the northern part of the landfill and a RCRA Subtitle C composite barrier low permeability cap on the southern portion of the landfill; excavation and consolidation of the SSDA1 discrete materials and placing these materials within a lined cell in the southern part of the site; and installation of a gas collection and, if necessary, treatment system; and a long-term monitoring plan.

This interim remedy includes the following change from the Proposed Plan. Under the Proposed Plan, EPA proposed to proceed with two operable units. Under the first operable unit, EPA proposed to implement limited source control by capping the Site. EPA then proposed that groundwater studies be conducted and that groundwater be addressed under a second operable unit.

Rather than proceed with two operable units, EPA has decided to implement an interim remedy to address, in part, the source of Site contamination by capping the Site. This interim remedy requires that additional groundwater studies will be undertaken concurrent with the implementation of the cap and will be followed by a final remedy after the necessary additional studies have been completed. This approach does not modify the scope, performance or cost of the remedy. Further, EPA believes that this approach is more consistent with the implementation of a limited source control alternative and effectively addresses concerns expressed by the public about the necessity of taking final action based on the groundwater studies that are required under this interim remedy.

XIII. STATE ROLE

The Connecticut Department of Environmental Protection has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the RI/FS Report and Risk Assessment to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. The State of Connecticut concurs with the selected remedy for the Old Southington Landfill Site. A copy of the declaration of concurrence is attached as Appendix C.

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

OLD SOUTHINGTON LANDFILL SUPERFUND SITE

SOUTHINGTON, CONNECTICUT

SEPTEMBER 1994

094-170
9/23/94

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PREFACE

The U.S. Environmental Protection Agency (EPA) held a 60-day public comment period, from June 15, 1994 to August 13, 1994, to provide an opportunity for interested parties to comment on EPA's Preferred Alternative for a limited source control remedy at the Old Southington Landfill Superfund Site (Site) in Southington, Connecticut. A final Remedial Investigation (RI), Risk Assessment (RA), and Feasibility Study (FS) report was prepared by the Potentially Responsible Parties (PRPs) in December 1993. An RI/FS addendum, dated May 1994 was prepared by EPA that addresses areas that were not completely addressed in the RI/FS and RA. Based on all of these documents, EPA identified its preliminary recommendation of a Preferred Alternative for limited source control in a Proposed Plan, issued in May 1994. On the evening of June 14, 1994, EPA conducted a public meeting to discuss the Proposed Plan and answer questions. On July 12, 1994, EPA held a public hearing at which 21 commenters spoke. Thirty-one commenters responded during the public comment period, seven of whom responded both in writing and at the public hearing.

The purpose of the Responsiveness Summary is to document EPA's responses to the comments and questions raised during the public comment period. EPA considered all of the comments summarized in this document before selecting a remedial action to address the source of contamination at the Old Southington Landfill Site.

The Responsiveness Summary is divided into the following sections:

Section I: Overview. This section outlines the objective of the Feasibility Study (FS), identifies the limited source control alternatives evaluated in the FS and identifies EPA's selected remedy for the Site.

Section II. Background on Community Involvement and Concerns. This section contains a summary of the Site history and the history of community interest and concerns regarding the Old Southington Landfill Site.

Section III. Summary of Major Comments Received During the Public Comment Period and EPA's Response to those Comments. Each written and oral comment from the public and interested parties on the FS and Proposed Plan are summarized and responded to directly.

ATTACHMENT A - This attachment provides a list of the community relations activities that EPA has conducted for the Old Southington Landfill Superfund Site.

ATTACHMENT B - This attachment is the transcript of the July 12, 1994 public hearing held in Southington, Connecticut.

ATTACHMENT C - This attachment includes the written comments received during the public comment period.

1.0 OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY AS PRESENTED IN THE PROPOSED PLAN

Using the information gathered during the Remedial Investigation (RI), including the human health baseline risk assessment and the ecological risk assessment, EPA identified several source control response objectives for the Old Southington Landfill Superfund Site. The limited source control objectives seek to:

1. Minimize the current and future effects of landfill contaminants on groundwater quality; specifically, reduce to a minimum the amount of precipitation allowed to infiltrate through the unsaturated waste column and contaminate the groundwater;

2. Eliminate potential future risks to human health through direct contact with landfill contaminants by maintaining a physical barrier;

3. Control surface water run-on, run-off and erosion at the Site;

4. Prevent risks from uncontrolled landfill gas migration and emissions;

5. Comply with state and federal applicable or relevant and appropriate requirements (ARARs); and

6. Minimize potential impacts of implementing the selected limited source control alternative on adjacent surface waters and wetlands.

Consistent with the above response objectives, this interim source control remedy addresses the landfill waste, contaminated soils and associated soil gases. Containment and management of contaminated groundwater migrating from the landfill will be addressed in a final remedy. As a part of this interim remedy, groundwater studies will be necessary to define the extent and nature of the plume and to determine if the plume is affecting any natural resource areas downgradient of the Site. Monitoring data collected from the interim remedy will be used to evaluate improvements in groundwater quality resulting from construction of this interim source control remedy.

Based on the above objectives, four alternatives were developed and evaluated to address limited source control which were presented in the Proposed Plan and are described briefly below. Groundwater alternatives were included in the FS Report. However, these alternatives were based on insufficient data and did not comprehensively address groundwater contamination both at and downgradient of the Site. As noted above, additional groundwater studies must be performed as a part of this interim remedy before EPA, in consultation with the Connecticut Department of

Environmental Protection (CT DEP), will make a determination on a final groundwater remedy.

Feasibility Study Alternatives

The five alternatives evaluated in the FS and presented in the Proposed Plan have several activities in common except the No Action Alternative, SC-1. These common activities include: 1) permanent relocation of the residences and businesses on site; 2) Capping of the landfill area; 3) institutional controls which may include fencing to limit future Site activities; 4) groundwater monitoring; and 5) Five-Year Reviews of the remedial alternative.

Alternative SC1 No Action: The RI/FS Addendum dated May 1994 makes a correction to the No Action Alternative in the FS to point out the following. Under the No Action Alternative, no treatment or containment of solid waste would occur and no effort would be made to contain gas migration or restrict potential exposure to Site contaminants. The objectives of this alternative are to merely maintain the Site as it currently exists and conduct long-term monitoring of the groundwater with existing and new monitoring wells.

Alternative SC2A Cap Northern Landfill Area with a Soil Cap and Southern Area with a RCRA Subtitle C Composite Cap: This alternative involves only capping the landfill area. The northern part of the Site would be capped with a soil cap (minimum of two feet of granular soil overlain by eight inches of topsoil) and the southern part would be capped with a RCRA Subtitle C composite cap. Soil gas collection/treatment system is proposed only on the southern part of the landfill in this alternative. The RCRA Subtitle C composite cap would consist of several low permeability layers to prevent further leaching of contaminants and to prevent direct contact with the wastes.

Alternative SC2B Cap Northern Landfill Area with a Single-Barrier Cap and Southern Area with a RCRA Subtitle C Composite Cap: This alternative involves only capping the landfill area. A single-barrier low permeability cap would be constructed over the northern landfill area providing a low permeability barrier. The southern area of the Site would be covered with a RCRA Subtitle C composite cap as described for Alternative SC2A. This alternative would include a soil gas collection and, if necessary, treatment system throughout both the northern and southern landfill areas.

Alternative SC6 Cap Northern Landfill Area with a Single-Barrier Cap and Southern Area with a RCRA Subtitle C composite cap/Excavate Discrete Material in SSDA1 and Consolidate in a lined cell within the Southern Landfill Area: This alternative would include capping as described for Alternative SC2B, and soil gas collection and, if necessary, treatment. Alternative SC6 also includes excavation of the semi-solid disposal area 1 (SSDA1) discrete materials A and B (estimated volume is 500 to 1,100 cubic yards) along with a two-foot buffer zone around these materials and consolidation of these materials in a low permeability lined cell within the southern portion of the landfill area. Additional institutional controls for this alternative include long-term surface water, sediment and soil gas monitoring.

Alternative SC7 Cap Northern Landfill with a Single-Barrier Cap and Southern Area with a RCRA Subtitle C Composite Cap/Excavate Discrete Material in SSDA1 and Incinerate Off-Site: This alternative would include capping and soil gas collection and, if necessary, treatment as described in SC2B, and excavation and off-site treatment (incineration) of the SSDA1 discrete materials A and B (estimated volume is 500 to 1,100 cubic yards).

Based on the results of the FS, EPA has selected Alternative SC6 for this limited source control remedy. The selected remedy is an interim remedy which will address, in part, the source of contamination at the Site. Source control remedies prevent or minimize the continued release of hazardous substances to the environment and rely on the prevention of exposure for the protection of human health and the environment.

Subsequent groundwater studies will be required that will define the extent of the plume and determine if the plume is impacting any downgradient natural resource areas. Monitoring data collected from the interim remedy will also be used to evaluate improvements in groundwater quality resulting from construction of an impermeable cap and excavation and consolidation of discrete materials found in SSDA1. EPA will determine when and if a meaningful trend in groundwater quality has been established. This information will be utilized in developing groundwater remedial alternatives that address groundwater remediation at and off-site. The selection of any necessary groundwater remediation will be addressed in a final remedy.

In summary, EPA's selected interim remedy includes: 1) permanently relocating the affected businesses and residences and removing all buildings from the landfill, 2) excavating and consolidating discrete, highly contaminated materials currently located in semi-solid disposal area 1 (SSDA1) into a lined disposal cell to be constructed elsewhere within the landfill, 3) constructing a low permeability cap over all of the landfill area to reduce the amount of precipitation from contacting the Site waste, 4) placing waste from Black Pond underneath the cap, 5) installing a gas collection system (and potentially treatment system) to control landfill gas build-up under the cap and migration off-site, 6) implementing a monitoring plan at and near the Site to monitor the effectiveness of the limited source control remedy by monitoring soil gas, groundwater, surface water, and sediment, and, 7) implementing institutional controls to restrict future use of the Site. Five-year reviews of this limited source control plan will also be included as part of this interim remedy.

2.0 SITE HISTORY AND BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The following sections provide a brief summary of the Site history of the Old Southington Landfill Superfund Site and a chronology of community relations activities conducted at the Site and general community concerns.

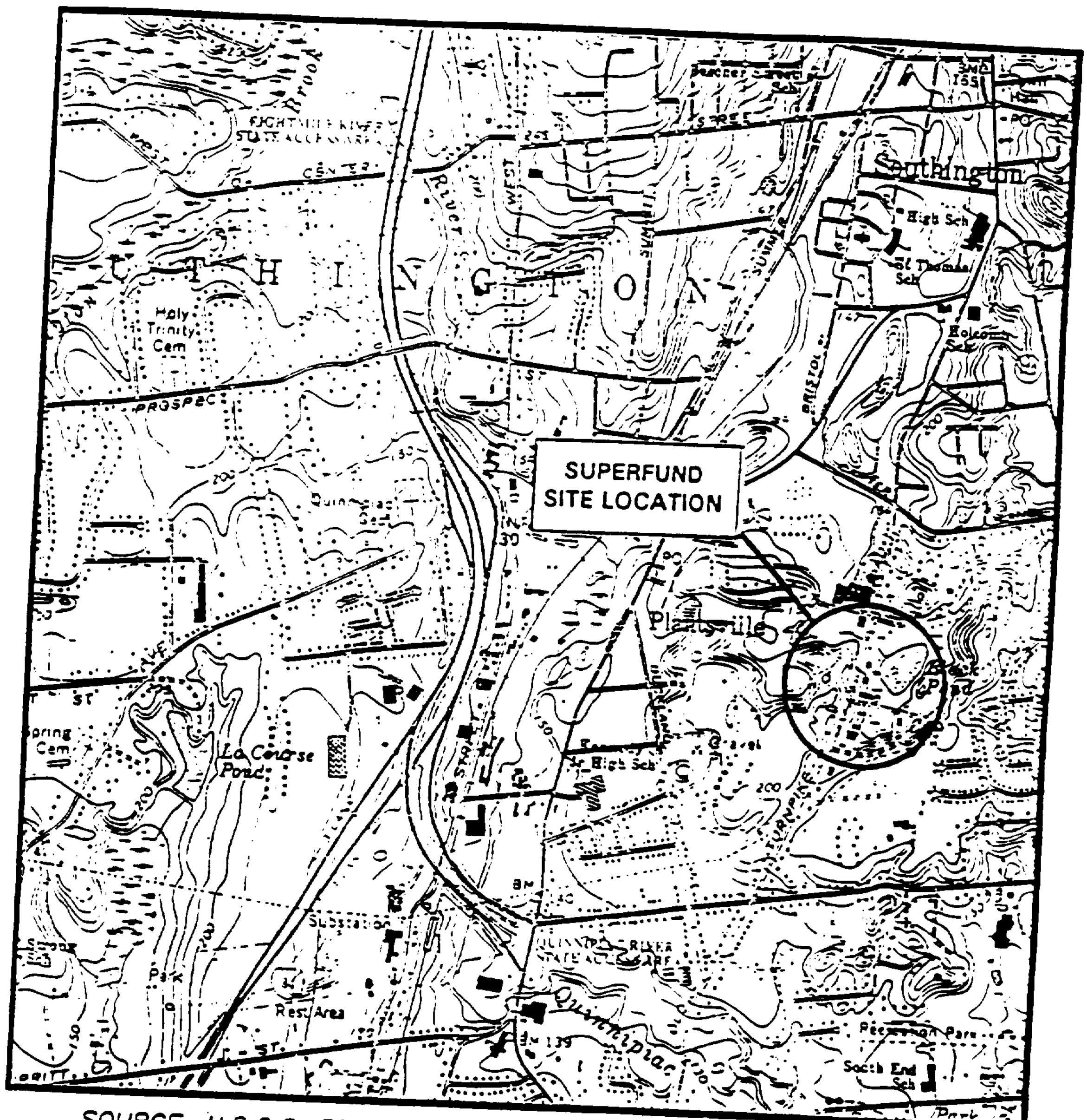
2.1 SITE HISTORY

The Old Southington Landfill Superfund Site (Site) is approximately 11 acres and is located in Southington, Connecticut, (see Figure 2-1). The Site abuts Old Turnpike Road to the west, Rejean Road to the north, Black Pond with associated wetlands to the east and northeast, and industries to the south (see Figure 2-2). The Site is located in a mixed industrial, commercial/residential area. There are currently seven commercial and industrial buildings, and two residential homes on the Site. Two other homes were demolished and removed from the Site, one in July 1993 and the other in January 1994. An intermittent, unnamed stream flows westerly from Black Pond through a culvert, under the landfill and Old Turnpike Road and eventually discharges to a wetland west of the Site.

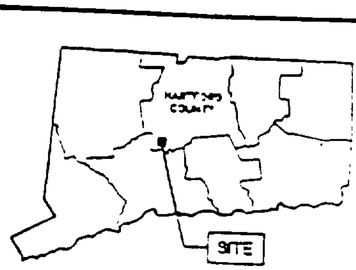
The Old Southington Landfill Superfund Site operated as a municipal and industrial landfill between 1920 and 1967. During that period, mixed residential, commercial and industrial solid and liquid wastes were disposed of at the landfill. The northern, now residential, area of the landfill was used primarily for disposal and burning of municipal waste consisting primarily of wood and construction debris. The southern, now industrial, area received municipal, commercial and industrial wastes. Two areas in the southern portion of the landfill are known to have been used for the disposal of aqueous, semi-solid and semi-liquid wastes. These areas, namely Semi-Solid Disposal Area 1 (SSDA1) and Semi-Solid Disposal Area 2 (SSDA2), are located just east of Old Turnpike Road as shown on Figure 2.

In 1967, the Town of Southington (Town) closed the landfill and placed an approximately 2 foot thick soil cover over the Site. In 1971, municipal Well No. 5 was installed approximately 700 feet northwest of the Site. From the early 1970s to the 1980s, the landfill property was subdivided, and developed into residential, industrial and commercial properties. In 1979, Well No. 5 was deactivated due to exceedence of water supply guidelines of contaminants including 1,1,1-trichloroethane. Well No. 5 was decommissioned and municipal water was supplied to the local community from another source.

Several preliminary investigations were performed by the U.S. Environmental Protection Agency (EPA) and the Connecticut Department of Environmental Protection (CT DEP) in 1980. Groundwater samples from two monitoring wells installed between the Site and Well No. 5 contained chlorinated volatile organic compounds (VOCs). Soil samples from a manhole excavation on land



SOURCE: U.S.G.S. TOPOGRAPHIC MAP, SOUTHINGTON, CONNECTICUT QUADRANGLE. 7.5 MINUTE SERIES, PHOTOREVISED 1984.



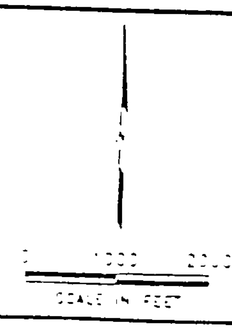
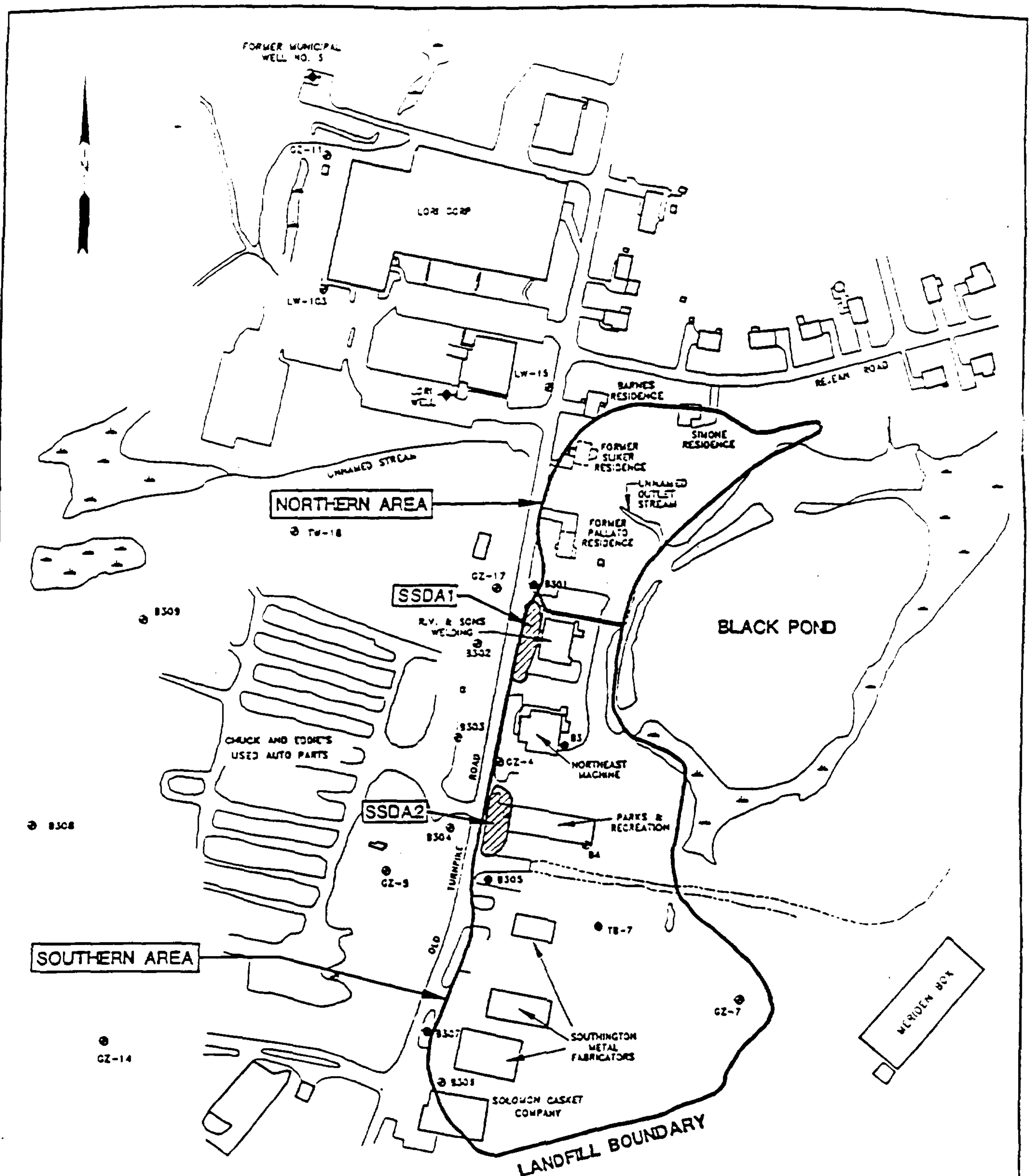


FIGURE 1

OLD SOUTHINGTON LANDFILL
SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

LOCATION MAP



LEGEND:

- ● TRIPLE MONITORING WELL CLUSTERS
- ⊘ SINGLE MONITORING WELL
- ▲ WETLANDS
- SSDA1 SEMI-SOLID DISPOSAL AREA

0 100 200 400
SCALE IN FEET

FIGURE 2

OLD SOUTHINGTON LANDFILL SUPERFUND SITE

DWG.EPA032

that had once been part of the landfill showed the presence of chlorinated and non-chlorinated VOCs. In 1984, the Site was formally listed on the National Priorities List (NPL).

A more detailed description of the Site history and previous investigations can be found in the Remedial Investigation Report Section 1.3.3.

2.2 CHRONOLOGY OF COMMUNITY RELATIONS ACTIVITIES CONDUCTED AT THE OLD SOUTHINGTON LANDFILL SUPERFUND SITE

Throughout the Site's history, community concern and involvement has been high. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings. Attachment A presents a summary of the community relations activities conducted at the Site.

In October 1988, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed and involved in remedial activities. On December 14, 1988, EPA held an informational meeting in the Southington Public Library in Southington, Connecticut to describe the plans for the Remedial Investigation and Feasibility Study. On August 26, 1992, EPA held an informational meeting in Southington, Connecticut to discuss issues associated with methane gas production at the Site.

On May 24, 1994, EPA completed the administrative record which includes documents that were used by EPA to propose the remedy for the Site. These documents are available for public review at EPA's offices in Boston, Massachusetts and at the site repository at the Southington Public Library in Southington, Connecticut. EPA published a notice and brief description of the Proposed Plan on June 1, 1994 in the Meridian Record Journal and on June 2, 1994 in the Southington Observer. The Proposed Plan was made available to the public on May 24, 1994 at the Southington Public Library.

On June 14, 1994, EPA held a public meeting to discuss the results of the Remedial Investigation, the cleanup activities presented in the Feasibility Study and to present the Agency's Proposed Plan. During this meeting, the Agency answered questions from the public. From June 15, 1994 to July 14, 1994, the Agency held a 30-day public comment period to accept written comments on the alternatives presented in the Feasibility Study, the Proposed Plan, and on any other documents previously released to the public. On June 29, 1994, residents of the Southington community requested a 30-day extension of the public comment period to August 13, 1994, which was granted by EPA.

On July 12, 1994, the Agency held a public hearing to discuss the Proposed Plan and to accept oral comments. A transcript of this hearing is included in Attachment B and written comments are included in Attachment C of this Responsiveness Summary.

3.0 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

This Responsiveness Summary addresses the comments received by EPA concerning the Proposed Plan, RI/FS and Addendum for the Old Southington Landfill Superfund Site in Southington, Connecticut. Seventeen sets of written comments from citizens, local government officials, the State of Connecticut and PRPs were received during the 60 day public comment period. Oral comments were also received during the July 12, 1992 informal public hearing held at the DePaolo Junior High School in Southington, Connecticut. A copy of the public hearing transcript is included as Attachment B and can also be found in the Site Repository and Administrative Record. Several of the public hearing commenters also submitted their comments in writing. These written comments are included as Attachment C.

The comments and responses are organized below by document control number (DCN). The comments are either excerpted directly or summarized to indicate what EPA believes to be the substance of each comment. EPA's response to each comment follows the excerpted/summarized comment. Section 3.1 addresses the public hearing comments; Section 3.2, addresses the Citizen Comments; Section 3.3 presents the comments made by local government officials; Section 3.4 includes comments received from the State of Connecticut; and Section 3.5 presents the comments received from the Potentially Responsible Parties (PRPs).

3.1 SUMMARY OF PUBLIC HEARING COMMENTS

The oral comments received during the hearing are listed below. Seven of the hearing commenters also submitted their oral hearing comments to EPA in writing. The comments made by these individuals are not included in this section but are addressed in the appropriate Sections 3.2, 3.3 or 3.5 below. Many of the oral comments made by individuals concerned the same issues. These issues were summarized by topic. A total of 13 oral comments were excerpted from the hearing transcript and are summarized in Table 3-1 by comment number, commenter and comment description. The DCN number for the hearing transcript is 19 and a copy of the transcript is included in Attachment B.

3.1.1 DCN 19-1

DCN 19-1 COMMENT

Many commenters stated that EPA should address groundwater contamination at the Site under this proposed remedy, rather than in the future in a second Operable Unit, after the cap is installed. Several commenters stated that it would be more difficult or impossible to remediate groundwater after a cap is installed.

Table 3-1

Comment Tracking Sheet
Public Hearing Transcript
Document Control Number 19

Comment No.	Commenters	General Description of Comment
19-1	Terry Delahunty Jeffrey Otis Mary Ann O'Brien Marie Tuccitto Judy Lange Robert Seibel Leslie DeLeo	Groundwater contamination should be addressed in this remedy not in a separate operable unit.
19-2	Terry Delahunty Mary Ann O'Brien Judy Lange Robert Seibel Leslie DeLeo	SSDA1 excavation will result in the creation of many hazards; material should be treated off-site rather than consolidated in a cell on-site.
19-3	Jeffrey Otis Mary Ann O'Brien Marie Tuccitto Judy Lange Robert Seibel Leslie DeLeo	EPA should investigate remedial alternatives that involve treatment of the landfill waste. Waste should not be left in place.
19-4	Jeffrey Otis Judy Lange Robert Seibel Leslie DeLeo Henry Dickenson	Residents are hurt financially by the Site. A buffer area free of homes is needed around the landfill.
19-5	Sean Egar Gary Wilson Victoria Triano Ed Malczyk Jim Vergerman	EPA's remedy is appropriate for the Site and is protective of human health and the environment.
19-6	Mary Ann O'Brien	The Proposed Plan must address off-site migration of methane.
19-7	Judy Lange	Black Pond waste needs to be completely delineated.
19-8	Judy Lange	Community involvement in future remedial decisions is needed.
19-9	Robert Seibel	Relocation of landfill residents/businesses should occur as soon as possible.
19-10 & 19-11	Henry Dickenson	Excavation of waste could create odors and emissions. The cap will trap gas underneath it.
19-12	Jonas Gillis	PRPs should be linked to contamination through chemical tracing.
19-13	Dan Kogut	Town and residents should meet to discuss most appropriate long-term remedy for the Site.

DCN 19-1 RESPONSE

This comment was received from many of the citizen and PRP commenters. EPA has reviewed these public comments and has decided to select an interim remedy that will be followed by a future final remedy instead of a two operable unit approach to the Site. Because insufficient data was gathered during the RI/FS to adequately evaluate comprehensive groundwater remedial alternatives, additional groundwater studies must be performed prior to issuing a final Record of Decision (ROD). As noted in the Record of Decision, additional data is needed to evaluate groundwater contamination at and downgradient of the Site. As discussed in the response to comment DCN 5-1 in section 3.2.3, additional data collection will proceed concurrently with implementation of the limited source control remedy for the Site. When this data is gathered, EPA will make a determination on the final remedy for the Site. The public will have the opportunity to review and comment on the Community Relations Plan and Health and Safety Plan. The community will be kept apprised of all work leading to the final remedy.

The presence of the landfill cap will not preclude the implementation of an active groundwater remedy for the Site. Groundwater extraction wells can still be placed around the perimeter of the cap and even through the cap if special construction and engineering precautions are taken. Many of these precautions are commonly implemented construction techniques.

3.1.2 DCN 19-2

DCN 19-2 COMMENT

Five commenters expressed concern for the potential health and safety hazards to the community that may exist during excavation of the SSDA1 discrete materials. They would like to know how exactly these hazards will be addressed through sampling and monitoring, excavation plans, etc. They also want the materials taken off-site for treatment and/or disposal, rather than placed in a cell within the landfill cap. One commenter requested that EPA investigate treatment of the SSDA1 waste in place.

DCN 19-2 RESPONSE

The actual methods and Health and Safety Plan that will be used during excavation of SSDA1 materials will be determined during remedial design. All of the SSDA1-related remedial activities will take the needs of the surrounding community into account. A Health and Safety Plan will be developed to address potential exposure hazards and emergency situations. The community will be given the opportunity to comment on the Health and Safety Plan. The details of the design and of the Health and Safety Plan can not be determined until the Record of Decision is signed and the design phase is underway.

EPA plans to develop a community relations plan for all future design, construction, and operation and maintenance activities. The community relations plan will be developed to ensure that community concerns are addressed.

In order to identify community concerns, EPA may hold informal meetings with residents and/or conduct interviews with individuals in the community. Communication of site activities and community concerns may occur through a variety of means, such as public meetings, fact sheets, and informal discussions. If appropriate, meetings will be held with residents that may be affected by site construction activities to discuss activities that will be conducted, exposure pathways, monitoring and control of releases, and health and safety measures that workers and residents must follow.

EPA has evaluated the alternative of removing the SSDA1 materials and incinerating them at an off-site facility. EPA has determined that off-site incineration, which would be significantly more expensive, does not provide more protection to human health and the environment over consolidation of the materials on-site within a cell located underneath the cap, but above the water table. Furthermore, transportation of the waste off-site could result in an unexpected release of contaminants. Finally, although incineration is the most suitable means of destroying most organic contaminants, metals are not destroyed during incineration and the remaining ash may require special disposal. Consequently, the availability of incineration facilities is usually dependent upon the facility's capacity and regulatory status.

3.1.3 DCN 19-3

DCN 19-3 COMMENT

Seven people commented that EPA should look at other alternatives for addressing the contamination at the Site besides capping. Specifically, the commenters indicated that treatment technologies that would permanently eliminate the contaminants were preferable to leaving the waste in place. Some of the technologies mentioned included air sparging, soil vapor extraction and bioremediation.

DCN 19-3 RESPONSE

EPA did evaluate potential technologies for treating waste in conjunction with installation of a low permeability cap. EPA believes that a cap is necessary to prevent direct contact with waste and to control the migration of landfill soil gases. Please reference EPA's response to comment DCN 5-2 in Section 5.2.3 which addresses this issue. See also response to comment DCN 5-5 in Section 3.2.3.

3.1.4 DCN 19-4

DCN 19-4 COMMENT

Eight commenters including home owners adjacent to the Site expressed concern about the detrimental financial impact of the Site on nearby and adjacent property values. Five of those commenters requested that a "buffer strip" be set up around the landfill, to eliminate potential risks to residents during remediation and over the long-term.

DCN 19-4 RESPONSE

EPA has no control over property value nor does it have the authority to require permanent relocation based on a decline in property value. During the implementation of the interim remedy, a health and safety plan will be developed and citizen input will be solicited. During construction activities, every precaution will be taken to ensure the health and safety of the community as well as that of the remedial workers. Under certain conditions, temporary relocation of some residents could take place while some aspects of the remedy are implemented. The logistics of this temporary relocation would be discussed and worked out with such residents before such remedial activity would take place. The selected interim remedy will provide long-term protection of human health and the environment.

3.1.5 DCN 19-5

DCN 19-5 COMMENT

Five commenters stated that they support EPA's proposed remedy of capping and soil gas collection. Several commenters noted that groundwater remediation is expensive, that groundwater is not being used in the Site vicinity and poses no current risk to residents. They support EPA's decision to evaluate groundwater remediation under a separate plan.

DCN 19-5 RESPONSE

EPA's selected interim remedy of capping, soil gas collection and treatment (if necessary), and excavation and consolidation of SSCA1 materials is the first important step to achieve protection of human health and the environment at the landfill Site. EPA points out that a final decision on groundwater remediation can not be made at this time because data is lacking on the full nature and extent of contamination downgradient from the Site and on whether downgradient natural resources are being affected. EPA also notes that once the cap is installed, monitoring of groundwater quality will provide additional information that will be incorporated into the decision-making process for the final remedy for the Site.

3.1.6 DCN 19-6

DCN 19-6 COMMENT

One commenter requested that the remedy for the Site address off-site migration of methane.

DCN 19-6 RESPONSE

The selected interim remedy does include off-site long-term monitoring of methane and other gases. Additional information on the proposed monitoring program can be found in the responses to comments DCN 6-5 (section 3.2.4) and DCN 7-2 (section 3.2.5) of this Responsiveness Summary.

3.1.7 DCN 19-7

DCN 19-7 COMMENT

A commenter expressed concern that the waste in Black Pond had not been fully delineated.

DCN 19-7 RESPONSE

Additional testing will be performed in Black Pond to better define the extent of waste associated with landfilling activities. This testing will be conducted during pre-design activities and possibly during construction of the cap as well.

3.1.8 DCN 19-8

DCN 19-8 COMMENT

One commenter requested that the community have the opportunity to become involved in the decisional process during remedial design and construction. It was suggested that regular meetings be held so that residents could provide direct input into the health and safety plan, site restoration and construction management.

DCN 19-8 RESPONSE

As noted in the responses to comments DCN 5-7 (section 3.2.3) and DCN 16-8 (section 3.2.7), the Old Southington Landfill Community Relations Plan will be revised for the upcoming remedial activities. Community input will be solicited in developing this plan to ensure that community concerns are addressed. Potential means for dispersing information and concerns regarding the remedial action include meetings, fact sheets and informal discussions.

3.1.9 DCN 19-9

DCN 19-9 COMMENT

Two commenters requested that the residents and businesses currently located on the landfill be relocated as quickly as possible to ensure their safety.

DCN 19-9 RESPONSE

The selected remedy includes the relocation of the homes and businesses located on the landfill. EPA agrees that the residents and businesses will need to be relocated in order to construct the cap. There is a landfill gas monitoring and mitigation program currently in effect at the Site to control potential gas migration into homes and buildings. To date, landfill gases have not been found inside any of the homes on the landfill.

3.1.10 DCN 19-10

DCN 19-10 COMMENT

One commenter stated that excavating any waste could potentially cause more serious contamination problems if drums were ruptured and wastes were released into groundwater.

DCN 19-10 RESPONSE

EPA agrees that excavation of large portions of the landfill waste could create a variety of nuisances and hazards including undesirable odors, emissions of volatile organic compounds and possible contaminated dust releases. However, appropriate engineering controls will be used to minimize any nuisances and hazards from remedial activities.

3.1.11 DCN 19-11

DCN 19-11 COMMENT

Concern for the buildup of methane under the cap and the potential explosion hazard was expressed by one commenter.

DCN 19-11 RESPONSE

Methane and other gases will continue to be produced within the landfill waste and would build up under a cap if measures were not taken to control and vent the gases. However, EPA's selected remedy for the Site includes the construction of an extensive gas collection and venting system underneath the cap to prevent migration and accumulation of these gases. During pre-design, a soil gas pilot study will be performed to determine if treatment is necessary, and if so, what type of treatment is most appropriate.

The effectiveness of the system will be monitored closely after construction of the cap by gas monitoring wells that will be installed outside the entire boundary of the landfill.

3.1.12 DCN 19-12

DCN 19-12 COMMENT

One commenter stated that the chemical contamination at the landfill should be scientifically linked to the PRPs responsible for disposal. He noted that the town and taxpayers should not bear the cost of remediation.

DCN 19-12 RESPONSE

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) imposes liability on any person or entity that owns or operates a facility at which hazardous substances were disposed or who owned or operated the facility at the time of disposal. The Town of Southington owned and operated the Old Southington Landfill, and thus, has been named as one of approximately 320 Potentially Responsible Parties, often referred to as "PRPs".

3.1.13 DCN 19-13

DCN 19-13 COMMENT

One commenter indicated that based on the hearing comments made there are clearly two positions regarding the best plan for remediation of the landfill. The Town supports EPA's plan for limited source control while the residents that live adjacent to the landfill feel that other alternatives, specifically involving treatment or removal of the waste, should seriously be evaluated. The commenter suggested that the Town officials and residents meet to discuss the best long-term solutions for the Site.

DCN 19-13 RESPONSE

After analyzing several possible remedial alternatives, EPA has selected a limited source control interim remedy which includes capping to contain approximately two thirds, or the majority of the landfill waste above the water table. This partial containment is expected to significantly improve the quality of the groundwater. There are also other benefits to capping the Site such as: preventing future contact with landfill waste; controlling gas migration on and off-site; and improving the quality of surface water and sediment in Black Pond and associated wetlands.

The remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. Due to the heterogeneity and extent of the waste at Superfund Landfill Sites, treatment of the entire landfill or large portions thereof is not practicable. Removal of the entire volume of landfill waste or large portions thereof would be cost prohibitive and would pose greater risk to the community and remedial worker associated with excavation and transportation of such large quantities of waste. The selected remedy complies with all State and Federal requirements, is cost-effective, and is protective of human health and the environment.

3.2 CITIZEN COMMENTS

This section of the Responsiveness Summary presents the comments submitted to EPA by citizens of the Town of Southington and the corresponding EPA responses. The comments include written comments that were presented at the July 12, 1994 informal public hearing. Table 3-2 identifies the document control number (DCN) for each set of comments and the commenter.

Table 3-2

Comment Tracking Summary of Written Citizen Comments

Document Control No.	Source	Date
3	Cohen & Channin representing Mr. and Mrs. Barnes and Mr. and Mrs. Simone	6/27/94
4	Mr. James A. Wallace, Sr.	7/10/94
5	Mr. Robert McPeak	7/12/94
6	Mr. James Delahunty	7/12/94
7	Mr. and Mrs. Thomas Kavan	7/12/94
14	Mr. and Mrs. James Delahunty	8/8/94
15	Mr. Robert McPeak for IES, TAG consultant representing SOLV.	8/11/94

3.2.1 COHEN & CHANNIN

DCN 3-1 COMMENT

Cohen & Channin, representatives of the Barnes and Simones (residents that currently reside on the landfill) and of the Pallatos (residents that have been relocated from the landfill), request that a medical monitoring and surveillance program be conducted on the landfill residents as part of the remedial plan. The purpose of the monitoring would be early detections of "latent disease".

DCN 3-1 RESPONSE

Under the Superfund law (CERCLA), established in 1980, EPA is required to perform a Human Health Baseline Risk Assessment to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Superfund sites. The results of this risk assessment aids EPA in selecting remedies that are protective of human health and the environment. CERCLA does not authorize EPA to perform or enforce medical monitoring or surveillance programs on people that could be affected by a Superfund Site and at EPA's Boston Office.

However, Superfund legislation in 1980 authorized the Agency for Toxic Substances and Disease Registry (ATSDR) to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances in the environment. ATSDR has been working closely with EPA at this Site and has prepared a Health Assessment Report on the Old Southington Landfill Site. This report is available to the public at the Southington Library.

A copy of this Record of Decision with public comments is being forwarded to ASTDR. If the commenter wishes to contact ASTDR directly, he may call Ted Bazenas, Regional Representative, at (617)860-4619. For the commenter's information, ATSDR carries out its mission by conducting actives in the following areas:

Public Health Assessments

Evaluate data and information on the release of hazardous substances into the environment to assess any current or future impact on public health, develop health advisories other health recommendations, and identify studies or actions needed to evaluate and mitigate or prevent human health effects. Conduct health assessments for all Superfund Sites on the National Priorities List and respond to petitions from concerned individuals and organizations.

Health Investigations

Increase our understanding of the relationship between exposure to hazardous substances and adverse human health effects, through epidemiologic, surveillance, and other studies to toxic substances and their effects.

Exposure and Disease Registry

Establish and maintain a registry of persons exposed to hazardous substances and a registry of serious diseases and illnesses in persons exposed to hazardous substances in the environment.

Emergency Response

Provide health-related support to states, local agencies, and health care providers in public health emergencies involving exposure to hazardous substances, including health consultations on request and training for first responders.

Toxicological Profiles

Summarize and make available to the public data on the health effects of hazardous substances, identify significant gaps in knowledge, and initiate research in toxicology and health effects where needed.

Health Education

Develop and disseminate to physicians and other health care providers materials on the health effects of toxic substances, establish and maintain a publicly accessible inventory of hazardous substances, and maintain a list of sites closed or restricted to the public because of hazardous substance contamination.

Applied Research

Conduct or sponsor research to increase scientific knowledge about the effects on human health of hazardous substances released from waste sites or of other releases into the environment.

DCN 3-2 COMMENT

Cohen & Channin comment that the operable unit two (2) groundwater investigation be implemented immediately as "the health of the individuals exposed should be determined as soon a possible". They also believe that a subsequent plan to remediate groundwater may disturb the cap and delay final cleanup. They recommend that measures to control expansion of the plume be undertaken during capping of the landfill.

DCN 3-2 RESPONSE

Capping the Site will contain approximately two-thirds, or the majority, of landfill waste above the water table. Removing SSDA1 from the water table also contributes to the improvement of the groundwater quality.

Additional groundwater studies are necessary to define the nature and extent of the plume and determine if it is impacting any downgradient natural resource areas. The results of these studies are necessary before EPA, in consultation with CTDEP, is in a position to select any final groundwater remedy. These studies will not be delayed by the selection of this interim remedy, but rather will be performed concurrently with its implementation.

Regarding potential exposure to contaminated groundwater, there is currently no known household use of groundwater at or downgradient of the landfill. Capping of the landfill will not delay the final remedial action since capping will not preclude future collection and treatment of contaminated groundwater at the landfill. Groundwater recovery wells can be installed adjacent to the edge of the cap and also through the cap. Special construction and engineering precautions would need to be taken when installing wells through the cap; however, these precautions are commonly implemented construction techniques.

3.2.2 MR. JAMES WALLACE, SR.

DCN 4-1 COMMENT

Mr. Wallace states: "The Old Turnpike dump ... was run in accordance with then accepted rules and practices; wastes were separated, compacted and covered daily with the view towards reclaiming the land for park or industrial purposes. The more than 300 people who have been cited for violations and are being forced to bear the burden of the clean-up (along with the taxpayers of the Town) broke no laws. It is quite obvious that these people are now being involved because the government chose to punish them by instituting "retroactive laws". In a sense, the EPA and others are making a declaration that something which was legal at the time has now been retroactively declared illegal. Could the government now pass a law saying that those who failed to utilize current auto anti-pollution measures at a time when none existed be punished because what was then legal has suddenly become illegal? I think not."

DCN 4-1 RESPONSE

The Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA) imposes liability when there has been a release or threat of a release of a hazardous substance at a facility which causes the incurrence of response costs. This liability attaches to owners and operators of the facility, to owners and operators at the time of disposal of hazardous substances, and to generators and transporters of the hazardous substances. EPA issued general notice letters to those potentially liable parties believed to fall within this liability scheme. The courts have repeatedly upheld the retroactive liability scheme in CERCLA.

DCN 4-2 COMMENT

Mr. Wallace believes that removing all of the waste, as proposed by some members of the community, would be an unbearable process due to the odors that would be released during excavation. He also feels that capping would not be very effective because the materials would continue to migrate downward "because of their very liquid nature".

DCN 4-2 RESPONSE

EPA agrees that the overall size and depth of the landfill make excavation of all landfill contaminants impracticable and might cause odor problems. EPA does, however, believe that very limited excavation in the SSDA1 area can be accomplished relatively efficiently. During this limited excavation, organic vapor and odor problems will be closely monitored and, if necessary, corrective measures to minimize problems will be rapidly implemented.

EPA notes that there are several reasons for capping the landfill. First, capping the landfill is necessary to minimize the potential for exposure to contaminants in the landfill through direct contact. Second, capping the landfill will help to minimize the migration of organic contaminants from the unsaturated zone to the underlying aquifer. Many of these contaminants are likely adsorbed onto unsaturated zone soils and are not necessarily in a free-standing liquid state. These contaminants will continue to leach into rainwater passing downward through the unsaturated zone if the landfill is not capped.

DCN 4-3 COMMENT

Mr. Wallace believes that because there has been "no evidence of any surface bubbling or any indication of the release of toxic materials" the landfill should be left alone and extensive monitoring should be conducted to identify any health hazards. He notes that the aquifer is not being used and that monies that would be spent on remediation could be used instead to provide "free city water supplies to those who might be adversely affected by any leachate in the future".

DCN 4-3 RESPONSE

EPA does not agree that the landfill can or should "be left alone". The results of the remedial investigation program clearly document the presence of toxic materials and hazardous substances in the landfill, including volatile organic, semi-volatile organic, PCBs and inorganic chemical contaminants. These contaminants pose a potential exposure hazard to humans.

The results of the remedial investigation clearly indicate that chemical contaminants from the landfill have migrated downward to the underlying aquifer and are migrating off-site. Furthermore, in the absence of any corrective actions, the potential remains for additional contaminant migration off-site through processes such as erosion and leaching from the soil and/or volatilization into the air.

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and with the National Oil and Hazardous Substances Pollution

Contingency Plan (NCP), EPA, the lead agency at this Site, is entrusted to protect human health and the environment through timely and effective remediation at Superfund sites. The selected remedy achieves this goal by eliminating potential future risks to human health through direct contact with landfill contaminants by maintaining a physical barrier; preventing risks from uncontrolled landfill gas migration and emissions; and minimizing the current and future effects of landfill contaminants on groundwater quality.

3.2.3 MR. ROBERT MCPEAK, TAG CONSULTANT

The following written comments were presented during the July 12, 1994 public hearing by Mr. Robert McPeak, representing Integrated Environmental Services (IES). IES is the Technical Assistance Grant (TAG) consultant for the Southington Old Landfill Victims (SOLV) organization.

DCN 5-1 COMMENT

Mr. Robert McPeak commented that the project should not be divided into two operable units and that groundwater should be addressed as a part of this remedy. He noted that EPA's proposed remedy leaves approximately 100,000 cubic yards of waste below the water table and that data collected during the RI/FS clearly indicates the presence of significant groundwater contamination at and down-gradient of the Site.

DCN 5-1 RESPONSE

EPA has decided not to proceed with the remedy for the Old Southington Landfill Site as two operable units. Instead, the selected remedy is an interim remedy that will be followed by a final remedy. Subsequent groundwater studies will be required as part of the interim remedy that will define the extent of the plume and determine if the plume is impacting any downgradient natural resource areas. Monitoring data collected from the interim remedy will also be used to evaluate improvements in groundwater quality resulting from construction of an impermeable cap and excavation and consolidation of discrete materials found in SSDA1. EPA will determine when, and if, a meaningful trend in groundwater quality has been established. This information will be useful in developing groundwater remedial alternatives that address groundwater remediation at and off-site. The selection of any necessary groundwater remediation will be addressed in a final remedy.

DCN 5-2 COMMENT

Mr. McPeak comments that EPA should employ treatment of landfill wastes in its cleanup plan. Mr. McPeak believes that treatment technologies such as air sparging, soil vapor extraction or other treatment technologies in combination with off-site disposal would be more appropriate than capping.

DCN 5-2 RESPONSE

It has been EPA's experience that employing treatment technologies or removing the entire landfill, or large portion thereof, is not practicable or cost effective due to the heterogeneous nature and large volumes of waste present at landfills. EPA believes that on-site capping, including the consolidation of the SSDA1 wastes in a separate cell, is a protective remedy. While EPA has evaluated the possibility of air sparging and soil vapor extraction in combination with the cap, EPA believes the additional effectiveness of these technologies will be minimal in light of the gas collection system (active or passive) that will be installed as part of the landfill cap. The gas venting system that will be installed with the cap will, if necessary, have air pollution controls to treat the landfill gases and can be designed to operate in either an active or passive manner. Under active operations, vacuum pumps will draw the gases through a system of pipes to a centralized treatment unit(s).

With regard to potentially treating the SSDA1 material, EPA believes that a separate on-site landfill cell for this material will be protective. However, EPA has evaluated potentially treating this material. This evaluation was completed during the FS and was based on EPA's detailed evaluation criteria and the following considerations: the incremental difference in effectiveness between off-site incineration and securing the wastes in an on-site landfill cell, the assumed volume of waste, the number and locations of off-site incinerators permitted to treat this material, and the costs associated with treatment. Based on these factors and EPA's detailed evaluation criteria, EPA believes on-site containment is protective and is cost-effective as required by the Superfund law.

DCN 5-3 COMMENT

Mr. McPeak commented that the RI did not satisfactorily address SSDA2 and the potential high contaminant concentrations there. He pointed out the high levels of contaminants at Well B-304 in comparison to B302 (downgradient from SSDA1) and the known presences of volatile gases in the parks and recreation building.

DCN 5-3 RESPONSE

EPA acknowledges that elevated levels of several volatile organic contaminants were identified in the area of SSDA2 during the remedial investigation (RI). The Agency carefully reviewed this information as part of its overall evaluation of the RI results. However, based upon a detailed data comparison, EPA concluded that given the variety and concentrations of organic contaminants detected throughout the rest of the landfill, the nature and concentrations of contaminants in SSDA2 did not warrant this area to be regarded as a hot spot area.

DCN 5-4 COMMENT

Mr. McPeak requested that the reclassification process for the aquifer (from GA to GB) be reviewed to verify that it was "justified and was performed in accordance with all state regulations and requirements". He noted the EPA policy indicates that "institutional controls shall not substitute for active response".

DCN 5-4 RESPONSE

The CT DEP informed EPA that the Town of Southington requested reclassification of the groundwater aquifer at this Site from class GA to GB. One of CT DEP's main concerns with this request was the re-use of the well field in the future. As a condition of the reclassification, the Southington Water District agreed to relinquish all future water diversion rights for the entire aquifer. The Town also successfully argued that for social and economic reasons the reclassification of the groundwater was appropriate. The reclassification was part of an extensive public hearing process on reclassification of the Quinnipiac River Basin. The public hearing process was conducted in accordance with all State requirements. The reclassification request was granted. According to CT DEP, reclassification of the aquifer from GA to GB does not necessarily preclude the need for remediation of the aquifer.

As stated in this Record of Decision, additional groundwater studies will be performed to define the extent of the plume, determine what impacts it may have on natural resource areas, evaluate the effect of the cap on groundwater, and determine the specific need for groundwater remediation at and off-site.

DCN 5-5 COMMENT

Mr. McPeak had the following comments regarding Black Pond.

a) **There is no information to demonstrate that contaminants will not leak back into the pond after the cap is installed.**

b) **The waste materials beneath the pond were not sufficiently delineated.**

c) **Measures must be taken to minimize the spread of contamination during excavation of waste along the pond shoreline.**

d) **Testing should be continued in the pond after remediation to ensure the unrestricted access is acceptable and protective of human health and the environment.**

DCN 5-5 RESPONSE

a) The hydraulic levels in Black Pond and the low permeability sediments along the bottom of the pond create a hydraulic condition such that reversal of flow from groundwater into the pond is not likely to occur.

b) During pre-design and possibly during construction of the cap, additional testing will be performed to delineate the extent of waste within the pond due to landfilling activity. This waste will be consolidated under the cap.

c) Appropriate engineering controls will be implemented during construction activities to minimize landfill waste release and erosion into the pond. Typical controls that may be used include silt fences and/or curtains, hay bales, etc. The appropriate controls will be determined during remedial design.

d) As a part of EPA's selected remedy, long-term monitoring of surface water, sediment and groundwater quality will be conducted. Surface water and sediment samples will be periodically collected in Black Pond and at the culvert outlet during and after construction of the remedy. The actual sample locations, numbers and frequency of sampling will be determined during design.

DCN 5-6 COMMENT

Mr. McPeak requests that future investigations address the potential impact of off-site migration of groundwater contamination on the Quinnipiac River.

DCN 5-6 RESPONSE

The details of the additional studies that will be conducted as a part of this interim remedy will be determined in close consultation with the CT DEP. These studies will collect data to better define the nature and extent of contamination that is migrating from the landfill. This information will be used to evaluate the impacts of any contaminated groundwater on any wetlands or surface waters that exist in these areas. Based on the results of these studies, along with the results of the groundwater monitoring that will be implemented, remedial alternatives will be developed to address groundwater contamination at and downgradient of the landfill. The selection of any necessary groundwater remediation will be addressed in a final remedy.

DCN 5-7 COMMENT

The commenter requests that public meetings be held on a quarterly basis and that a Community Advisory Council be established to allow the community to participate in report preparation and remedial action planning activities.

DCN 5-7 RESPONSE

Following the issuance of this Record of Decision, EPA and CT DEP will commence negotiations for Remedial Design and Remedial Action (RD/RA) with the PRP group. This process typically ranges from six months to a year, but could take longer depending on the dynamics of site related issues. Following the negotiation process, EPA will develop a community relations plan for future work. EPA plans to work with the community in developing a Community Relations Plan to ensure that community concerns are addressed. It has been EPA's experience that maintaining flexibility with respect to the type and frequency of communication works best. There may be periods where a larger number of meetings may be necessary and there may be times where fewer meetings or fact sheets may be more appropriate. Some examples of methods of involving the community include public meetings, informal discussion, and fact sheets. The community may have other ideas that will contribute to the success of this project.

3.2.4 MR. JAMES DELAHUNTY

DCN 6-1 COMMENT

Mr. Delahunty comments that removal of SSDA1 is a very hazardous activity and requests that residents living near the Site be relocated during this activity.

DCN 6-1 RESPONSE

EPA recognizes the potential health and safety hazards involved with removal of these materials. Prior to the excavation of SSDA1, a plan for excavation/removal of the SSDA1 material will be developed so that potential emissions of contaminants and other hazards are prevented from adversely impacting the community through engineering controls (see also response to comment DCN 7-5). A Health and Safety Plan will also be developed to address potential exposure hazards to site workers and to the immediate surrounding community. The community will be given the opportunity to provide input into the development of the Health and Safety Plan. The Health and Safety Plan will evaluate the potential exposure pathways that may occur and will determine appropriate action levels for the implementation of health and safety measures for workers and area residents. The Health and Safety Plan will also identify potential emergency situations and will address measures to be taken during such incidents. Depending upon the emergency situation, evacuation and temporary relocation of specific area residents may be appropriate. Area residents and workers that may be affected by remedial activities at the landfill will be involved in health and safety meetings that will provide information on potential exposure situations and actions that must be undertaken to provide adequate protection to human health and the environment.

DCN 6-2 COMMENT

The commenter believes that the SSDA1 material should be removed from the Site rather than moving it to another location of the Site.

DCN 6-2 RESPONSE

EPA has considered the alternative of removing SSDA1 materials to an off-site treatment and disposal facility. There are several reasons why EPA chose to consolidate these materials in a cell within the landfill instead of removing the materials to an off-site treatment facility. The most suitable treatment process for the SSDA1 materials is incineration due to the heterogeneous nature of the waste. The availability of incineration facilities is dependent upon the facility's capacity and regulatory status. The residues that remain after incineration may contain metals at concentrations that would require special disposal procedures. In addition, the off-site transport of these materials increases the potential for a release of hazardous substances in the event of a traffic accident. Transportation off-site would also cause a temporary increase in truck traffic through suburban/residential areas of the Town until all of the SSDA1 discrete waste is removed from the Site. EPA believes that all of these factors as well as the additional cost of incineration of the SSDA1 materials does not provide a significant additional benefit for protection of human health in comparison to consolidation on-site.

Disposal of SSDA1 wastes in an off-site RCRA landfill facility is not desirable for many of the same reasons listed above. In addition, land disposal regulations would likely require some type of treatment of these wastes prior to disposal. Therefore, this option is most likely not more cost-effective than off-site incineration.

DCN 6-3 COMMENT

Mr. Delahunty comments that once the cap is on the landfill, it would be almost impossible to treat contaminated soil and groundwater in the future.

DCN 6-3 RESPONSE

Based on the presumptive remedy selected for this Site, it is not EPA's intent to treat the soils that will be covered by the cap. The cap serves to isolate the soils from contact with precipitation that would generate additional leachate. The capping of the Site does not preclude addressing the groundwater contamination at the Site. There is still the potential to place wells at the edge and through the cap to collect and treat groundwater. Special construction and engineering precautions would need to be taken when installing wells through the cap; however, these precautions are commonly implemented construction techniques.

DCN 6-4 COMMENT

Mr. Delahunty believes that reconstructing the culvert does have benefits but is concerned that residents near the Site may be exposed to "toxic contamination uncovered by the lowering of the pond level". He is also concerned that areas west of the Site could become contaminated by this action.

DCN 6-4 RESPONSE

Some areas currently covered by the pond may become exposed when the pond level is lowered due to culvert reconstruction. Appropriate monitoring and engineering controls will be used to ensure that no one is exposed to waste or landfill gas emissions. The Health and Safety Plan, which will be developed and undergo public review, will provide all appropriate and necessary provisions to ensure the health and safety of the community as well as that of the remedial workers. Appropriate engineering controls will also be implemented to minimize erosion or temporary degradation of the wetland area west of the Site.

DCN 6-5 COMMENT

Mr. Delahunty comments that EPA's remedial plan does not include testing for migration of methane off-site.

DCN 6-5 RESPONSE

EPA's selected remedy does include testing for off-site migration of landfill soil gases such as methane. Soil gas monitoring wells will be installed outside the entire boundary of the landfill to monitor the effectiveness of the soil gas collection system and to ensure that no gases are migrating off-site. The actual locations and numbers of soil gas monitoring wells will be determined during the design phase of the project.

In addition, soil gas testing is planned to start over the next few months within the residential area to the north and east of the landfill. For more information, reference the response to comment number DCN 7-2 (Section 3.2.5).

DCN 6-6 COMMENT

The commenter states that the people most affected by the Site should have the most input into the final cleanup plan. He suggests meetings between EPA and the residents to facilitate this exchange. He believes the ROD should be delayed until a cleanup plan that both the community and EPA accepts is agreed upon.

DCN 6-6 RESPONSE

EPA recognizes that people that live and work on and near the landfill have unique interests and concerns relating to the Site. EPA always has been, and continues to be, in favor of providing information to the public and receiving community input in whatever manner proves most helpful. EPA plans to work with the community in developing a Community Relations Plan to ensure that community concerns are addressed. Very serious consideration has been given by EPA to all comments received during the comment period. Based on EPA's evaluation of all the comments received, results of the risk assessment, and technical evaluations performed, EPA has determined that proceeding now with the selected remedy is appropriate. By moving forward now, EPA can begin to prevent or reduce risk to human health and the environment.

3.2.5 MR. AND MRS. THOMAS KAVAN

DCN 7-1 COMMENT

The commenters believe that more testing for solid wastes, metals and chemicals is needed along the northeast section of the pond shoreline and in the Site wetlands.

DCN 7-1 RESPONSE

Additional testing will be conducted in Black Pond to better define the extent of waste that may have been disposed of during landfilling activities. This waste will be consolidated under the cap. This testing will occur during pre-design and possibly during construction of the cap as well.

DCN 7-2 COMMENT

The commenter requests that methane testing be conducted in all homes surrounding the Site.

DCN 7-2 RESPONSE

Off-site soil gas testing is planned to start over the next few months within the residential area to the north and east of the landfill. The testing program will consist of testing utility lines with temporary sampling probes to determine if methane or other landfill gases are migrating along these utility lines which in turn could act as conduits to homes near the landfill. The testing program will also include placing sampling probes north of Rejean Road and northeast of the landfill. These latter sampling probes will be monitored once a month for a year to obtain a complete seasonal cycle of data. At the end of the year, a determination will be made whether an extension of the program is necessary. Eventually, soil gas monitoring wells will be placed around the entire perimeter of the landfill to ensure that the gas collection system is effective.

DCN 7-3 COMMENT

The commenter believes that further investigations of potential cleanup methods used at similar sites needs to be done (before deciding on a remedy for the Southington Site).

DCN 7-3 RESPONSE

Through the Feasibility Study and remedy selection process, EPA has reviewed technologies that may be appropriate for the Old Southington Landfill Site. In addition, EPA has reviewed the remedies selected for source control at all of the Superfund landfill sites in the New England region. This review indicates that capping has been selected as the preferred remedy for twelve of the fourteen landfill sites. EPA has determined that the characteristics of the Old Southington Landfill make it a suitable candidate for installation of a low permeability cap. Treatment of such a large volume of heterogeneous waste is not practicable or technically feasible and is cost prohibitive. Further, EPA believes that capping the landfill is the most effective means of preventing potential future exposures to the landfill contaminants through direct contact.

DCN 7-4 COMMENT

The commenter believes that Operable Units 1 and 2 should be conducted simultaneously.

DCN 7-4 RESPONSE

See response to comment DCN 5-1 in Section 3.2.3.

DCN 7-5 COMMENT

The commenter feels that capping the landfill with excavation/consolidation of SSDA1 presents a greater health risk to residents that remain near the Site because the SSDA1 contaminants will remain within the landfill.

DCN 7-5 RESPONSE

EPA believes that consolidation of the SSDA1 material into a lined cell located above the groundwater table in the southern area of the landfill is the most effective way to control and isolate this waste. The potential risk to residents posed by the waste cell would be minimal because access to the southern landfill area will be restricted. In addition, the waste cell would be located beneath the RCRA Subtitle C landfill cap, which further reduces the potential for release. EPA believes that the short-term exposure risks associated with the potential release of the contaminants during the construction of the cap and the excavation of SSDA1 can be controlled and minimized through careful planning of construction activities and through the implementation of a comprehensive health and safety plan.

DCN 7-6 COMMENT

The commenter believes it would be better to delay the ROD for a year to look for a better cleanup plan.

DCN 7-6 RESPONSE

Extensive studies have been performed to date to determine the nature and extent of contamination at and, to some degree, off the Site. A risk assessment has been performed to identify potential risks to human health and the environment. The Feasibility Study evaluated a wide range of viable remedial alternatives to appropriately address site remediation. Based on the results of these studies, as well as the evaluation of all public comments, EPA has determined that actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the interim response action selected in this Record of Decision, may present a current or potential threat to human health and the environment. The selected interim remedy will eliminate potential future risks to human health through direct contact with landfill contaminants by maintaining a physical barrier; will prevent risks from uncontrolled landfill gas migration and emissions; and will minimize the current and future effects of landfill contaminants on groundwater quality.

3.2.6 MR. AND MRS. JAMES DELAHUNTY

DCN 14-1 COMMENT

The Delahunty's state: "Exactly what additional data is needed and how much longer will it take? Studies have been conducted to determine the nature of contamination for 11 years, why hasn't the correct data been obtained? Is the primary reason for not treating the groundwater at this time due to PRP threatened withdrawal? If groundwater contamination poses significant risk to human health (page 13), why isn't the EPA insisting on groundwater clean up NOW?"

DCN 14-1 RESPONSE

The remedial investigation (RI) field activities that were performed to characterize the nature and extent of contamination at this Site started in 1988 and were completed in 1993, totalling 5 years. The RI was used by EPA to select a remedy that is protective of human health and the environment. The selected remedy addresses groundwater in part and all other media completely. EPA is requiring additional groundwater studies in order to obtain data that is necessary for EPA to determine the nature and extent of the groundwater contamination. Once this data is collected, a determination about the final remedial action will be made.

The additional groundwater studies will proceed concurrently with the implementation of the selected interim remedy. In addition, to this work, EPA and CT DEP will also evaluate the performance of the cap through the long-term monitoring program to determine its effect on groundwater and local geologic conditions. EPA will determine when sufficient groundwater monitoring data has been obtained to show a meaningful trend in the quality of groundwater.

The decision to forego making a final decision on groundwater at this time was based on the fact that although enough information has been obtained to select most components of a remedy (i.e., cap, soil gas collection/treatment, excavation and consolidation of SSDA1, long-term monitoring) not enough data was collected during the RI to determine the appropriate groundwater remedial action both on and off-site. However, EPA has determined that waiting for that additional information before implementing the other components of the remedy is not protective of human health and the environment. In addition, going forward with an interim remedy and installing a cap on the landfill will result in modified groundwater and geologic conditions. The changes in these conditions will be monitored through the long-term groundwater monitoring program that shall be implemented as part of the interim remedy. This information will be very useful in developing the necessary groundwater remedial alternatives. The selection of any necessary groundwater remediation will be addressed in a final remedy. The final remedy will ensure that over the long term, human health and the environment are being protected.

DCN 14-2 COMMENT

The following comment was made in reference to the Proposed Plan, Pg. 2, Par. 2, which is quoted as "The presumptive remedy for CERCLA municipal landfill sites relates primarily to containment (capping)."

"We feel this is the wrong remedy for this site. No mention of toxic industrial waste is made in this statement. Additionally, waste will not be contained at this site, due to continued groundwater contamination and spread of the contaminated plume."

DCN 14-2 RESPONSE

In reference to the statement "the presumptive remedy for CERCLA municipal landfill sites relates primarily to containment (capping)", it is EPA's experience with other municipal landfills throughout the country that containment through capping is the appropriate remedy. This same presumption applies to this Site. The Old Southington Landfill, as explained in the Proposed Plan in several places (i.e., pg. 5, para. 2; pg. 8, para. 3; pg. 9, para. 2&3; and pg. 12, para. 1), received a mixture of municipal, commercial and "industrial waste in the southern part of the landfill". It also identifies two areas, SSDA1 and SSDA2, which received semi-solid and liquid "industrial waste".

Containment and how it relates to the presumptive remedy can mean complete containment or, in our case, partial containment. The cap to be constructed at this Site will contain approximately two thirds, or the majority, of the landfill waste from further contaminating the aquifer. This is why the Proposed Plan proposes a limited source control remedy and not a "complete" source control remedy at this time. The additional groundwater information that will be gathered concurrently with the implementation of this interim remedy will be used to support a complete source control remedy.

DCN 14-3a COMMENT

The Delahunty's state: "We urge the EPA to delay the ROD until a complete clean up package is selected."

DCN 14-3a RESPONSE

EPA has given careful consideration to all of the public comments received and has closely evaluated all of the technical data collected and evaluations performed for the Old Southington Landfill Site. Based on this evaluation, EPA has determined that actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the interim response action selected in this Record of Decision may present a current or potential threat to human health and the environment. The selected interim remedy will eliminate potential future risks to human health through direct contact with landfill contaminants by maintaining a physical barrier; prevent risks from uncontrolled landfill gas migration and emissions; improve the quality of surface water and sediment in Black Pond and associated wetlands; and minimize the current and future effects of landfill contaminants on groundwater quality.

DCN 14-3b COMMENT

The commenters state: "We are requesting additional meetings with the EPA to inform residents of progress made."

DCN 14-3b RESPONSE

See response to comment DCN 5-7 in Section 3.2.3.

DCN 14-4 COMMENT

The commenters question the conclusion that the northern area of the landfill was primarily used for disposal of construction type debris rather than municipal waste. The commenters note that contaminants such as VOCs, metals and pesticides were detected in certain borings in this area.

DCN 14-4 RESPONSE

EPA acknowledges that certain borings within the area which has been defined as the northern area of the landfill contains certain waste materials and/or contaminants which may not necessarily be associated with construction debris. However, EPA has carefully reviewed the overall data from the significant number of borings and substantial data which was collected across the northern portion of the landfill. Based on this review, the Agency has concluded that the overall character of the waste in the northern portion of the landfill substantively differs from that in the southern portion. The northern portion appears to be more characteristic of construction debris, although isolated non-construction debris disposal may have occurred.

DCN 14-5a COMMENT

The commenters note that varying levels of PAHs were detected in the northern portion of the landfill. The commenters are concerned about the health risks posed by these contaminants. The commenters are also concerned about the health risks to the public that may occur during remediation.

DCN 14-5a RESPONSE

EPA recognizes that certain subsurface soils in the northern area of the Site possess varying and/or elevated PAH levels. As a result of this data, EPA is proposing to cap the northern portion of the landfill in order to minimize the possibility of direct contact exposure to the PAHs which have been detected. During remediation activities and installation of the proposed cap, EPA plans to have monitoring of ambient air emissions as part of its overall site health and safety plan. The details of the design of the Health and Safety Plan can not be determined until the Record of Decision is signed and the design phase is underway. See also the response to comment DCN 6-1 in Section 3.2.4.

DCN 14-5b COMMENT

The commenters are concerned about the health risks posed by the levels of VOCs, SVOCs, metals and pesticides detected in the southern portion of the landfill. The commenters are also concerned about health risks to the public that may occur during remediation of this portion of the Site.

DCN 14-5b RESPONSE

EPA agrees that the southern portion of the Site contains contaminants that are generally more hazardous in nature than does the northern portion of the Site. EPA also agrees that the variety and concentrations of contaminants in the southern portion of the Site are indicative of industrial rather than only municipal wastes. For this reason, EPA proposes to construct a RCRA cap in the southern portion of the Site. The cap will help to minimize the possibility for direct contact exposure to site contaminants as well as airborne transport of contaminants on soil/dust particles. In addition, the cap will also reduce the leaching of subsurface soil contaminants into the underlying groundwater. During cap construction activities, air monitoring will be conducted as part of the overall site health and safety plan. The details of the design of the Health and Safety Plan can not be determined until the Record of Decision is signed and the design phase is underway.

DCN 14-5c COMMENT

The commenters are concerned about the levels of VOCs and SVOCs in SSDA1 and SSDA2 and the health risk they may pose. The commenters are also concerned about health risks to the public that may occur during remediation.

DCN 14-5c RESPONSE

The nature and concentration of contaminants found in SSDA2 is similar to those found throughout the rest of the southern portion of the landfill. Thus, EPA does not consider SSDA2 a hot spot area. However, materials found in SSDA1 had contamination levels that were much higher than those found throughout the southern part of the landfill, with a portion of these highly contaminated materials located within the water table. EPA considers SSDA1 a hot spot area.

The remedy requires that SSDA1 be excavated and consolidated in a lined cell underneath the cap in the southern part of the Site. Protective measures will be taken to ensure the health and safety of local residents and remedial workers. The specifics of these measures will be addressed in the health and safety plan. EPA plans to seek public comment in developing this plan.

DCN 14-6 COMMENT

The commenters note that some site surface soils are contaminated with SVOCs, VOCs, PAHs, pesticides and metals. The commenters are concerned that these contaminants in surface soils may cause an air health risk from volatilization or migration as dust particles.

DCN 14-6 RESPONSE

The remedial Investigation/Feasibility Study (RI/FS) and Risk Assessment (RA) concluded that exposure to these soils does not pose a threat to human health or the environment. EPA believes that the construction of a cap across the northern and southern portions of the Site, along with institutional controls, will eliminate the potential for any direct contact exposure to contaminated subsurface soils as well as airborne transport on contaminated dust from the subsurface soils.

EPA also notes that the results of air sampling and analysis for VOCs during the remedial investigations did not indicate the presence of significant concentrations of volatile organics in the air at Site boundaries.

DCN 14-7 COMMENT

The commenters want to know what compounds in addition to methane and carbon dioxide may be present in landfill gas.

DCN 14-7 RESPONSE

EPA notes that the exact composition of landfill gases, is to some extent, dependent upon the waste materials present in the landfill. Methane and carbon dioxide are typically dominant gases which may be present in municipal landfills. In addition, small amounts of certain other gases such as nitrogen or possibly nitrogen-containing gases and water vapor may be emitted. Trace levels of certain volatile organics may be present in landfills such as alkanes (for example hexane), chlorinated alkanes (trichloroethane) or volatile aromatics (ethyl benzene). The possible presence of these trace volatile organics depends upon the nature of the waste materials which were deposited into the landfill, the age of the landfill, and the amount of microbiological degradation which has taken place. Tables 4-5 through 4-9 in the RI report present the gases detected at this landfill.

During pre-design, a soil gas pilot study will be performed to further characterize the gases present and better define the concentrations at which they are being emitted. The results of this study will allow EPA to determine if natural venting is appropriate or treatment of the gases is necessary. Ultimately, the soil gas collection/treatment system will control and/or treat all landfill gases including methane.

DCN 14-8a COMMENT

The Proposed Plan makes the following statements: "Testing to detect combustible gases was conducted at 110 locations. High levels of these gases were recorded at about 55 locations." The commenters want to know the exact number of locations.

DCN 14-8a RESPONSE

The intent of the Proposed Plan is to provide a summary level description of the results of the RI/FS. Detailed information can be found in the December 1993 RI/FS Report, as noted on page 8 of the Proposed Plan. In general, combustible gases were detected at levels greater than 25 % LEL at approximately half of the locations tested as shown on Figure 4-1 and in Table 4-2 of the RI Report.

DCN 14-8b COMMENT

The Proposed Plan makes the following statement: "Most of the high readings were detected in the southern portion of the landfill." The commenters want to know the exact numbers in the north and south landfill areas.

DCN 14-8b RESPONSE

Please refer to the response to comment DCN 14-8a above. Detailed information on the locations of readings recorded in both areas of the landfill can be found in the RI Report Section 4.1.3, Table 4-2 and Figure 4-1.

DCN 14-9 COMMENT

The Delahunty's state: "VOCs were detected at 7 locations in the northern area and an undisclosed amount in the southern area of the site. Two of the VOCs detected are benzene and vinyl chloride. Both are carcinogens and are "dissipating into the atmosphere" we breath. What measures are being taken to protect residents?"

DCN 14-9 RESPONSE

VOCs were detected in the northern and southern portion of the Site. These samples were collected from approximately two to eight feet, depending on the water table elevation, below the surface of the landfill to obtain the highest VOC concentrations. Table 2-7 of the Human Health Risk Assessment Report presents the compounds of potential concern which includes benzene and vinyl chloride. The risk assessment report evaluated the inhalation pathway for indoor and outdoor residents, including children, and workers from VOC concentrations measured in the soils. Section IV of the ROD as well as the Human Health Risk Assessment report provide more detail on how the risk assessment for inhalation was performed. No measurable inhalation risk was found at this Site due to VOCs.

The selected remedy will include a soil gas collection, and if necessary, treatment system which will collect and control all landfill gases. In addition, the long-term monitoring plan will consist of soil gas monitoring wells around the entire perimeter of the landfill to ensure that the remedy is working properly and no threats are being posed to the community.

DCN 14-10 COMMENT

"Metals exceeding MCLs include:

Barium	**poisonous metal**
Beryllium	**cancer-causing metal**
Chromium	**cancer-causing metal**
Mercury	**highly toxic**
Nickel	**carcinogen**
Thallium	**highly toxic**

The results of the metals alone should be enough to warrant immediate remediation of the groundwater."

DCN 14-10 RESPONSE

See the response to Comment DCN 14-1 in this section.

DCN 14-11 COMMENT

The commenters are concerned that the concentrations of certain VOC, SVOC and metal contaminants in surface water samples exceed MCLs. The commenters are concerned that MCL exceedences represent a health concern.

DCN 14-11 RESPONSE

EPA recognizes that contaminants in surface water can be a potential public health concern. For this, and ecological reasons, EPA included surface water and sediment sampling of Black Pond in the remedial investigation. The "MCL" or "Maximum Contaminant Level" is the maximum permissible level of a contaminant in water which is delivered to any user of a public water supply. MCLs are developed to be protective of individuals ingesting two liters of water per day from a drinking water source. Black Pond is not a drinking water source and thus a comparison of surface water concentrations of contaminants in Black Pond and nearby wetlands to MCLs does not provide a meaningful evaluation of potential human health risks. A more accurate method of evaluating potential human health risks from swimming and wading in these areas is to conduct a risk assessment for these exposure routes. This was accomplished in the human health risk assessment for this Site. Results of the human health risk assessment indicated that adverse health effects from exposure to surface water while swimming and wading in Black Pond and nearby wetlands were unlikely. In addition, no MCLs were exceeded in surface water in Black Pond or nearby wetlands.

DCN 14-12 COMMENT

The commenters noted: "For some unknown reason, people fish in the pond. Adequate precautions should be taken to protect residents from the hazards of eating fish contaminated with toxic metals."

DCN 14-12 RESPONSE

In September 1992, the CT DPHAS collected 25 fish from a sample of approximately 200 specimens from Black Pond. The specimens collected for testing included catfish, yellow perch, bass, and white suckers from Black Pond. The fish were tested for metals and PCBs. The results of the testing showed that the fish were not contaminated. A copy of these test results is available in the Administrative Record under section 3.4.32. In addition, the selected remedy when implemented will include further delineation of waste found in Black Pond due to landfilling activity and placement of it under the cap. This response action is expected to improve the quality of water and aquatic life of Black Pond.

DCN 14-13 COMMENT

The commenters observe that: "Exposure to sediment is probably a frequent occurrence. People fishing in Black Pond or the stream stand in the water. Anyone, especially children, can step into or play in the water and sediment of the pond and stream. VOCs, SVOCs, PAHs, PCBs, lead, mercury and other metals are detected in an easily accessible area. Who is protecting residents? This area <u>is not</u> being addressed in the "Preferred Alternative"."

DCN 14-13 RESPONSE

The human health baseline risk assessment (HHBRA) analyzed exposure to an older child (6-18 years of age) and an adult (18 to 70 years of age) who would swim in Black Pond 36 days per year for 2.6 hours per swimming event. While swimming it was assumed that these individuals would accidentally ingest surface water, dermally contact surface water, and dermally contact sediment. The HHBRA also assumed that a younger child (ages 1 to 6), an older child, and an adult would spend 2 hours wading in Black Pond and in associated wetland areas west of the site for 3 days per week for 6 months of the year. While individuals wade, it was assumed that they would come into dermal contact with Site contaminants in surface water and sediment and accidentally ingest sediments.

The results of the HHBRA indicated that adverse health effects were not expected to occur to adults and children who might swim or wade in Black Pond or the wetland areas to the west of the Site. A more detailed discussion of these findings can be found in the "Old Southington Landfill Remedial Investigation/Feasibility Study; Volume 2A Human Health/Ecological Risk Assessment." In order to minimize the chance of underestimating human health risk at the Site, the HHBRA used several health protective assumptions which are more likely to result in an overestimate rather than an underestimate of the actual risk at the Old Southington Landfill Site.

Furthermore, during construction of the selected remedy, waste found within the pond due to landfill disposal activities will be placed under the cap. This is expected to improve the quality of surface water and sediment of Black Pond and associated wetlands to the west of the Site.

DCN 14-14 COMMENT

The Proposed Plan states on page 11, para. 5, "The water table at the landfill varies from about 2 to 34 feet below the ground surface ... All material in SSDA2 is located above the water table."

The commenters note that "The data indicates that a significant concentration source is below the water table at SSDA2. Based on Plate 3-5, the water table is approximately 16 feet below land surface at TB-114. Table 4-17 states that subsurface soil was collected at TB-114 at a depth of 20 to 23.8 feet below land surface. Also boring logs from TB-101, TB-103 and TB-112 refer to "solvent odor, petroleum smell and oily soil."

DCN 14-14 RESPONSE

Contamination found below the landfill waste and the water table in the SSDA2 area is likely the result of precipitation infiltrating downward through the waste, resulting in contamination of the lower unsaturated zone soils and underlying groundwater. The remedial investigation data shows that volatile organic compounds (VOCs) exist in the unsaturated soil samples from SSDA2 area test borings TB-101, -102, -103, -105 and -112. Two soil samples collected from the water table zone in test borings TB-103 and TB-114 were also contaminated with VOCs. As discussed in Section 3.2.3 response to comment DCN 5-3, soil samples from test borings completed in SSDA2, while containing appreciable levels of contaminants, do not indicate SSDA2 as significant a source of contamination as the materials sampled in SSDA1.

The test boring logs from TB-103, -105, and 114 indicate that the water table is 23 to 24 feet below ground surface. These logs also show that landfill waste/refuse is not located below 5 feet in TB-102, 10 feet in TB-103, 21 feet in TB-105, 10 feet in TB-112 and 25 feet in TB-114. Because the water table in these borings was found at 23 to 24 feet, clearly the majority of waste is above the water table. It should be noted that physically distinct industrial-type wastes were not observed in any of the borings located in SSDA2.

Placement of a low permeability cap over the landfill will act to minimize the downward migration of contaminants from the unsaturated soils to the saturated soils and groundwater in this area.

DCN 14-15 COMMENT

The commenters expressed concern that information on groundwater flow to the north is limited and thus, migration of contamination is unknown in this area.

DCN 14-15 RESPONSE

Information on groundwater flow to the north is not as extensive as the data collected along the western edge of the Site. However, sufficient data does exist to show that this northerly component of flow is a result of the radial discharge from Black Pond and that this flow is directed to the west by the regional groundwater gradient. EPA's plan for additional monitoring wells in this area will provide more data to corroborate these initial findings.

DCN 14-16 COMMENT

In the Proposed Plan page 13, par. 2, it states the following:

> **"An evaluation of the risks associated with potential exposure to subsurface soil was not conducted because EPA is selecting the presumptive remedy of containment for this municipal landfill.** Consequently, direct exposure to subsurface soils will be prevented."
>
> "The presumptive remedy chosen by the **EPA will be the cause of exposure to subsurface soils, not the prevention.** No sane person would dig in the landfill, however EPA's remedy will do just that. Exposing residents to toxic contaminants by dermal

contact and inhalation. Additionally not all of the contaminated areas surrounding the site wills be capped. Therefore, anyone wishing to dig a hole (for any reason) will be exposed to the contaminated subsurface soil."

DCN 14-16 RESPONSE

All of the landfill wastes will be covered by the landfill cap including wastes found in Black Pond due to landfilling activity. These wastes will be placed under the cap. EPA recognizes the potential risks to workers and residents that are present during the remedial activities. However, as noted in the response to comment DCN 6-1 (Section 3.2.4), 7-5 (Section 3.2.5), and 19-2 (Section 3.1.2) potential exposures can be minimized through careful design considerations and development and implementation of a health and safety plan that identifies potential exposures and provides a means to address them.

DCN 14-17 COMMENT

In reference to the Proposed Plan discussion of ecological risk, the commenter notes that "although residential impact <u>may</u> contribute to the contamination of Black Pond, it is hardly worth mentioning considering the millions of gallons of toxic industrial waste and other substances that are being left on site."

DCN 14-17 RESPONSE

The purpose of the ecological risk assessment is, in part, to identify the potential chemical sensors in the ecosystem being evaluated. There may be stressors present in the ecosystem that did not originate from the hazardous waste site. Although wastes will be "left on site" under this selected remedy, the wastes will be contained by a low permeability cap that will prevent future migration of contaminants via transport by air and surface water runoff and will reduce leaching into groundwater. Further, the cap will prevent direct contact with hazardous substances present in the landfill waste.

DCN 14-18 COMMENT

The Proposed Plan states that excavation and consolidation of discrete semi-solid materials from SSDA1 and placement back into the southern part of the landfill within a lined cell will prevent wastes below the water table from further contaminating groundwater. The Delahunty's indicate that boring logs from TB-134 show the waste to be 31 feet deep and the water level to be at 11 feet. They want to know how excavation will be conducted at 22 feet below the water level and how the two-foot buffer zone will be determined. The are also concerned about the RI/FS determination of the estimated volume of SSDA1 (500 to 1,100 cubic yards) and are worried that the final volume may be much greater.

DCN 14-18 RESPONSE

The estimated depth of excavation in the SSDA1 area is 17 feet including a two-foot "buffer" zone (i.e. the area that will be excavated around the SSDA1 waste to ensure that the majority of the waste has been removed). Approximately four feet of the SSDA1 material plus the buffer zone material is located below the water table. Since the water table changes on a seasonal basis, the bottom of the excavation may or may not have to be dewatered to support removal of the SSDA1 material. The two-foot buffer zone will be excavated adjacent and below the limit of the area designated for removal by the remedial design criteria. The RI/FS estimated the discrete materials A and B in SSDA1 to be between 500 - 1100 cubic yards. This estimate does not include the additional two-foot buffer zone.

DCN 14-19 COMMENT

The Proposed Plan states "after excavation, these materials would be consolidated and placed in a lined cell beneath the cap. The lined cell would be located above the water table and would have an impermeable liner and a leachate collection system." The Delahunty's would like to know why a leachate collection system is needed if the cell is impermeable. They are concerned that the cell would not be 100 % effective and would crack or tear from ground movement.

DCN 14-19 RESPONSE

EPA notes that no landfill cell is guaranteed to be 100% effective. However, EPA believes that a properly designed, constructed and maintained landfill cell will effectively contain the SSDA1 wastes. The design efforts would include selecting a chemically resistant liner material based on the analytical chemistry results from the RI/FS studies. During construction, the materials would be tested in accordance with the applicable American Society of Material Testing (ASTM) standards. These standards include a comparison of the materials with their design specifications and standards for construction operations such as seaming. It is important to note that the cell would be constructed in an area of the Site where the potential for settling of the soils under the cell would be minimal. This, in combination with the appropriate engineering design, construction and monitoring will prevent the cell from cracking.

A leachate collection system may be placed <u>above</u> the liner within the cell and may be used to collect any leachate that may seep out of the waste. The need for a leachate collection system will be evaluated and determined during design.

DCN 14-20 COMMENT

The Delahunty's express concern for the impact of construction on the residential neighborhood. Specifically, they note that the equipment is loud, noisy and smelly, and they are concerned about heavy truck traffic through the neighborhood. They are also concerned that vibrations from the operating equipment may "unsettle landfill material and gases" and want to know how residents will be protected. They state that the logical solution is relocation.

DCN 14-20 RESPONSE

EPA shares the commenters concerns' regarding potential construction-related impacts including traffic, noise and air emissions. EPA is committed to community involvement and will work directly with area residents and the local community to minimize construction-related impacts. EPA's plans for development and implementation of a Community Relations Plan is detailed in the response to Comment DCN 19-2 in Section 3.1.1. The design documents will address routing of construction traffic, allowable hours and days for construction activities, health and safety concerns, air monitoring activities, and emissions criteria. Temporary relocation of residents during certain remedial activities will be evaluated as the Health and Safety Plan is developed.

DCN 14-21 COMMENT

The Proposed Plan states that: "Controls to be implemented to minimize potential worker and off-site population exposure to contaminated dust and VOC emission include watering of the excavation, covering spoil piles with plastic sheeting, access limitations and compliance with a health and safety plan." The Delahunty's do not believe that these controls are adequate to protect residents and that EPA should relocate residents. They believe that SSDA1 excavation should be conducted within a fully-contained air tight container to prevent exposure to contaminated dust and VOC emissions. They request that continuous air monitoring be conducted. The commenters also believe that the waste should be removed from the Site, not placed in a cell.

DCN 14-21 RESPONSE

EPA will monitor air emissions during remediation of SSDA1 and will evaluate appropriate options to protect human health and the environment. See also response to DCN 19-4 in Section 3.1.4.

DCN 14-22 COMMENT

The Delahunty's are concerned that any excavation of landfill material during construction of the cap will present a public health risk. They are specifically concerned with the wastes along

the edge of Black Pond and "what will prevent more material from leaching out, if this volume of debris is removed."

DCN 14-22 RESPONSE

EPA believes that the landfill cap will greatly reduce the leaching of any wastes including those that will be excavated from Black Pond and SSDA1. EPA will minimize the amount of wastes to be excavated and will also conduct air monitoring to provide protection for both the site workers and the surrounding residents. During the design process, the long-term stability of the cap and potential impacts to Black Pond will be considered. The analysis of the long-term stability of the cap shall include ensuring the soil will support a cap, and making sure the cap will not settle beyond its design limits.

DCN 14-23 COMMENT

The Delahunty's state: "Toxic landfill debris and industrial waste are located on all borders of the landfill. The minimum height added due to cap construction is 4-5 feet. The cap requires sloping for surface water run-off. How can an additional height of 4-5 feet be added to the very edge of the landfill (to cover all of the contaminants) and still be sloped? How will a cap have the desired result on this site?"

DCN 14-23 RESPONSE

The landfill cap will be designed at the appropriate side slopes to facilitate drainage while preventing erosion. Some of the wastes along the edge of the landfill may need to be moved to appropriately grade the landfill. However, EPA will utilize appropriate engineering controls during the construction process and will conduct on-site and perimeter air monitoring to provide protection for the site workers and the area residents.

DCN 14-24 COMMENT

The Delahunty's question the effectiveness of capping stating that: "People living near a landfill that has been capped have stated that capping does not work. The cap has cracked and is the cause of pollution to a nearby lake. The sole purpose of a cap is to prevent infiltration of surface water through contaminated soil. The effectiveness of the cap is greatly diminished, or made useless, when it cracks."

DCN 14-24 RESPONSE

The effectiveness of a cap is dependent in part upon the materials used to construct it and on the inspection and maintenance of the cap. Some caps may have structural problems because the cap was poorly engineered, inappropriate materials were utilized and/or inspection and maintenance activities were not conducted frequently enough to identify problems and repair them before they become significant.

The EPA and the CT DEP will ensure that a technically sound cap is constructed that meets all federal and state requirements. In addition, the operation and maintenance plan for the landfill will be reviewed by EPA and CTDEP to ensure that sufficiently frequent inspections are conducted to identify potential erosion and cracking problems before they become significant so that appropriate repair measures can be taken to ensure the integrity of the cap. EPA is confident that a sound, effective cap can be constructed for the Southington landfill. Capping is a common technology that has been implemented for many years. The cap will not only prevent infiltration of precipitation, but will also prevent direct contact with hazardous substances present in the wastes and soils of the Site.

DCN 14-25 COMMENT

We are adamantly opposed to any venting of gas into the atmosphere. There are children living a few feet from the site, emitting toxic gases is not permissible to the local residents. No treatment is 100% safe. What would this type of system look like, smell like or would it be noisy? We are concerned about the health and safety of our families and friends. Any emission from the landfill can be toxic. Even small amount of some toxins can be deadly.

DCN 14-25 RESPONSE

During the design phase, EPA will conduct a vigorous evaluation of the volume and nature of the gas that is produced and will analyze the appropriate options. One option that will be considered is to route the gas through a series of underground pipes to a centralized treatment facility. Specifically, during the design process, the appropriate treatment technologies will be selected based on the gas characterization results.

In addition, the landfill and the gas treatment system would be monitored for potential emissions following construction to ensure they are functioning properly.

DCN 14-26a COMMENT

The commenters state: "Neighbors near the site would like to have an input into this plan. We feel that our health, safety and welfare are at risk. Workers on site have the protection of "space suits", while we and our children remain unprotected."

DCN 14-26a RESPONSE

EPA plans to seek input from the community on the Health and Safety Plan that will be developed to ensure the health and safety of the community, on-site remedial workers, and future maintenance workers. See also response to comment DCN 19-2.

DCN 14-26b COMMENT

The commenters state: "We also feel that local doctors and health institutions should be advised that extensive and hazardous construction is being undertaken in the area and the types of contaminants that will be exposed."

DCN 14-26b RESPONSE

The CT Department of Public Health and Addiction Services (DPHAS) has a program in place to inform physicians and health professionals about the Old Southington Landfill and other Superfund Sites in the State. These programs include:

1) Conducting seminars on environmental health issues and hazards to increase health professionals' ability to respond to patient needs.

2) Distributing resource materials to health practitioners.

3) Encouraging health professionals to become involved in community environmental health education programs.

Information has been mailed to Primary Care Physicians and other health professionals. Materials that are available to these health professionals include:

1) Videotape: "The Exposure History: A key to Better Care for Your Patients" with accompanying handbook.
2) Environmental and Occupational Health Reference Guide providing a detailed list of resources.
3) CADA (Computer Assisted Diagnostic Aid), a computer program to assist health professionals in evaluating potential health effects of exposure to CT National Priorities List of toxic waste site.
4) Fact Sheets on the 15 CT Superfund sites (including Old Southington Landfill) and various environmental hazards.
5) Case Studies in Environmental Medicine: self-instructional monographs for physicians on specific environmental hazards.

Further information on the Connecticut Environmental Health Education Project for Health Professionals can be obtained by contacting Kenny Foscue at (203) 240-9022.

DCN 14-27 COMMENT

A question was raised about what would happen if the culvert from the pond was to leak under the proposed cap.

DCN 14-27 RESPONSE

In the event that the culvert were to leak, the pond water would likely infiltrate to the groundwater below. The combined surface water - groundwater mixture would be evaluated in the data collected within the groundwater monitoring system installed at the cap perimeter. Given that the available sampling data indicate that surface water contamination is minimal, no adverse impact on groundwater is anticipated.

DCN 14-28 COMMENT

Regarding the issue of fencing at the Site, the commenter is opposed to "a barbed wire fence with orange day-glow signs posted all over it." However, the commenters believe that if the Site is made into a recreational area, vandalism and digging will occur, compromising the integrity of the cap and the health and safety of people walking in the area.

DCN 14-28 RESPONSE

The southern part of the landfill received municipal, commercial, and industrial waste. The waste in this part of the landfill is more hazardous in nature than that disposed in the northern part of the Site which received primarily municipal waste. EPA has selected a composite multi-layer RCRA Subtitle C cap for the southern part of the landfill and a single low permeability layer cap for the northern part of the Site. Because of the nature of the waste found in the southern part of the Site and the high cost associated with a RCRA Subtitle C cap, future use of this part of the Site is not appropriate. Access restrictions to the southern part of the landfill is warranted and can be accomplished in a number of ways which may include fencing with or without signs.

The northern part of the landfill is conducive to passive recreation, such as a park with flowers and benches. As part of the selected remedy, a Site Security Plan will be developed to control access to the Site to ensure the integrity of both caps and their associated components. The specifics of these controls will be developed into the Site Security Plan (Plan). EPA is cognizant of the residents' concerns regarding the aesthetics of the Site and will encourage the Potentially Responsible Parties to solicit input from the community in developing the Plan. The Plan will need to meet EPA approval. Ultimately, the goal of this Plan is to protect human health and the environment and to accomplish this objective, the integrity of the cap and its associated components must not be compromised.

DCN 14-29 COMMENT

The Proposed Plan states "waste that is located below the water table will continue to leach contaminants". The commenter criticizes the decision to spend $16,035,000 on a remedy that will "allow continued leaching of toxic materials."

DCN 14-29 RESPONSE

It is estimated that approximately two-thirds of the waste material in the landfill is located above the water table (unsaturated waste) and one-third is below (saturated waste). Although contaminants will continue to leach from the saturated waste into the groundwater, capping will prevent continued downward migration of contaminants present in the unsaturated waste. With this potential future source of groundwater contamination eliminated, the overall quality of groundwater downgradient from the landfill is expected to improve with time.

The purpose of the cap is to not only prevent infiltration of precipitation into landfill waste, but also to prevent direct contact with waste and to control the migration of landfill gases from the Site. Capping will prevent potential future exposures to landfill contaminants by controlling these exposure pathways.

DCN 14-30 & 31 COMMENT

The commenters question the results of the investigation in the northern portion of the landfill. They note that test borings TB-13, TB-14 and TB-15 show high PID readings and the presence of wood or refuse and questions the delineation of the landfill boundary on the existing data.

DCN 14-30 & 31 RESPONSE

The boring log for TB-15 shows that only a trace of wood was found in the sample collected from 5 to 7 feet and from 10 to 12 feet. There was no visual observation of refuse such as plastic, metal, or paper reported in this boring or in test boring TB-14. Based on the historical aerial photographs of landfill activities and the absence of landfill materials in TB-18 (northeast of TB-15) and TB-110, the landfill boundary was delineated as shown.

Plate 1-1 in Volume 1B of the RI Report shows that a total of 10 test borings were placed north of TB-13 for the purpose of delineating the landfill boundary. These borings included BP-7, TB-120, TB-117, TB-115, TB-113, TB-111, TB-107, TB-17, TB-16 and TB-119. Several of these borings were located in the front and side yards of the residential homes. EPA believes that sufficient data has been gathered to determine the extent of landfilling activities. The photoionization detection (PID) readings observed in northern area borings were typically one to two orders of magnitude lower than many of the soil samples that were screened from southern area test borings.

DCN 14-32 COMMENT

The commenters question: "When deciding that 2/3 of this solid waste is above ground water, what boring information did you use?"

DCN 14-32 RESPONSE

In determining the volume of waste above and below the water table in the southern portion of the landfill, the entire southern area landfill surface was subdivided into a total of 37 distinct areas.

Data from test borings located in each distinct area were used to develop an average waste depth above and below the water table. This average depth was then multiplied by the area of that distinct portion of the landfill to calculate the volume in cubic yards above and below the water table. These were then added to calculate the estimated total volume of landfill waste in the southern area.

DCN 14-33 COMMENT

The Delahunty's note that elevated levels of certain PAHS were detected in test boring TBG-20 north of the Rejean Road. The commenter indicates that this may reflect past dumping by the town.

DCN 14-33 RESPONSE

EPA agrees that several PAHs were detected in soil boring TBG-20 north of Rejean Road. However, EPA notes that the location of soil boring TBG-20 is considerably removed (north of) what is believed to be the northern boundary of the landfill. In fact, boring TBG-20 was originally intended to be a background location for the off-site sampling program.

During the sampling program, the owner of the property at which sample TBG-20 was collected noted that some off-site fill material obtained from some other area in Town had been deposited in areas of the property in which boring TBG-20 was located.

It should also be noted that organic chemical contaminants (including PAHs) are relatively absent from soil borings closer to and between boring TBG-20 and the delineated northern boundary of the landfill. This leads EPA to conclude that the results for TBG-20 are not indicative of area-wide conditions north of Rejean Road.

DCN 14-34 COMMENT

The Delahunty's contend that historical indicates the presence of plastic-lined pits in the landfill that were used by Solvents Recovery for disposal purposes. They want to know if these pits have been located or that plans were to treat the waste in the pits and if they haven't been found, what plans are there to find them?

DCN 14-34 RESPONSE

Extensive investigations were conducted to learn about the landfilling disposal activities that occurred at the Old Southington Landfill Site: interviews were conducted with former landfill operators and Town employees who had knowledge of the Site's operations; historical areal photographs were analyzed; and extensive field investigations were performed at the Site. Two areas, located in the southern part of the landfill (see Figure 2 in this Responsiveness Summary for location), received liquid and semi-solid wastes, namely SSDA1 and SSDA2. These areas are addressed in more detail in the RI/FS reports and EPA RI/FS

Addendum (located at the Southington Library). The waste found in SSDA2 is similar in concentration and in nature to that found throughout the rest of the southern portion of the landfill and does not warrant consideration as a hot spot area. Discrete semi-solid materials A and B found in SSDA1, have considerably higher contaminant concentrations than what is found throughout the rest of the southern part of the landfill. In addition, part of this waste sits in the water table. EPA considers this area a hot spot area and has selected as part of the interim remedy, excavation of Materials A and B with a two foot buffer zone around these materials. These materials will be placed in a lined cell some where in the southern part of the landfill underneath the RCRA Subtitle C cap.

DCN 14-35 COMMENT

The Delahunty's wish to know why certain samples from the north and east of the Site were held for 7 days or more prior to laboratory analysis.

DCN 14-35 RESPONSE

EPA notes that the EPA Contract Laboratory Program through which these samples were analyzed has established guidelines for sample analysis including guidelines which were complied with for holding times for samples prior to analysis. These guidelines vary depending upon the chemical constituent being analyzed. For the semi-volatile organics and PAHs of particular concern in the northern portions of the landfill, the guidelines for soil samples indicate that they should be extracted within 7 days of sample receipt by the laboratory and analyzed within 40 days of sample receipt.

DCN 14-36 COMMENT

The Delahunty's wish to know why acetone and methylene chloride were reported in certain GZA soil boring samples, but not reported in subsequent ESE reports including this same data.

DCN 14-36 RESPONSE

EPA notes that acetone and methylene chloride are common laboratory contaminants which are often introduced in samples during laboratory analysis. As a result, they may not always be reported with environmental data or may be deleted during QA/QC review if there is reason to believe they may be laboratory artifacts.

DCN 14-37 COMMENT

The commenters note that "Table 3-1 shows test boring TB-137 and TB-137A as a solid waste cell. What does this mean and why isn't it listed in any other report?"

DCN 14-37 RESPONSE

Table 3-1 lists TB-137 and TB-137A as being located in the southern area of the landfill. They are not listed as a "solid waste cell". However, TB-127 and TB-127A were located within the semi-solid disposal area number 1 (SSDA1) where industrial wastes were known to be disposed.

DCN 14-38 COMMENT

The Delahunty's question: "Test boring TB-7SA shows waste was located 15 feet below surface soil. Yet, in test borings TB-8, TB-9 and TB-12 the end of the boring was at 14 feet. Why did you stop before waste material depth?"

DCN 14-38 RESPONSE

The criteria for maximum boring depth for the Phase 1A boring program that included the above referenced test borings was as follows: "The maximum depth of each boring will be 10 feet below ground or 5 feet beyond the base of refuse or fill materials, which ever is deeper". Consequently, in borings where refuse was encountered within the first 10 feet, the boring was continued until refuse/fill was no longer apparent, such as in TB-7SA. Test borings TB-9 and TB-12, were terminated at 12 feet when no refuse was found and it appeared that natural soil materials were present in the bottom of the boring. No refuse or fill was encountered in TB-8 after 3 feet although a trace of wood was seen between 10 and 12 feet. This boring was terminated at 14 feet to confirm the absence of landfill type materials. TB-8 was determined to be within the landfill boundary while TB-9 and TB-12 were determined to be outside of the boundary.

DCN 14-39 COMMENT

The Delahunty's state: "Removal of all residential and commercial structures from the site" will be required for capping of the landfill. Nowhere in the EPA alternative is it stated that all vegetation (including every tree, shrub and bush on site) must also be removed. How will this be accomplished? Will the roots be removed? Will this pull up contaminated soil? Will the area by enclosed to prevent contaminated dirt from disbursing? The procedure must be fully explained to residents <u>before</u> any removal is done. The very thought of living less than 40 feet from the site when this work is done terrifies us.

DCN 14-39 RESPONSE

The clearing and grubbing activities needed to construct the cap will be described in detail in the landfill cap design documents that will be made available to the public.

In general, the vegetation may be cut at the base leaving the roots in place or be removed in a manner that minimizes dust. While the landfill is currently covered by a layer of generally clean fill, the loose dirt from the roots would be removed. EPA anticipates that the first activity would be the construction of a temporary fence to prevent access to the Site and the placement of green wind screens along the fence. Air monitoring would be conducted to protect both the site workers and the surrounding residents. In addition, hay bales would also be placed along the inside of the fence to prevent off-site erosion of soils.

DCN 14-40 COMMENT

The Delahunty's state: "As all structures must be removed, what will happen to the existing utility and sewer hook-ups? Landfill gases follow the route of least resistance. The abandoned utility liens would be a perfect avenue for gas migration. Landfill gases could enter cracks in the services and migrate to homes off site. The sewer and utility lines must be removed and not just disconnected and capped."

DCN 14-40 RESPONSE

EPA agrees with the Delahunty's concern and will appropriately decommission the utility connections. However, EPA believes that in some cases, it may be prudent to cap both ends of the pipe instead of removing the entire length of pipe. At a minimum, the connection will be capped at the service connection at the street (outside of the landfill cap area) and both ends of the abandoned lines. During the design process, decisions regarding utility abandonment procedures for each property will be made on a property specific basis. The public will have the opportunity to provide input to the design process.

3.2.7 MR. ROBERT MCPEAK, TAG CONSULTANT

The following comments were submitted by Mr. Robert McPeak, representing Integrated Environmental Services (IES). IES is the Technical Assistance Grant (TAG) consultant for the Southington Old Landfill Victims (SOLV) organization.

DCN 16-1a COMMENT

If groundwater remediation is included in the preferred remedy, the FS will require revision. The public should be provided an opportunity to comment on the this new FS.

DCN 16-1a RESPONSE

The selected interim remedy does not address groundwater remediation at this time. Additional groundwater studies are necessary to define the extent of the plume and determine whether the plume has any adverse impact on downgradient natural resource areas. These studies will proceed concurrently with the implementation of the interim remedy. In addition, EPA will review groundwater monitoring data obtained after the cap is installed to determine what impacts the cap has on the quality of groundwater, and surrounding geologic conditions. All of this information will be used in developing remedial alternatives to address groundwater remediation on and off site. See also the response to comment DCN 15-4c in Section 3.5.4.

DCN 16-1b COMMENT

The RI/FS documents and the Proposed Plan do not appear to be consistent. The FS indicates that the groundwater objective is to prevent ingestion (pg. 1-22); where the Proposed Plan indicates the objective is to minimize the effects of contaminants on groundwater quality. "The FS objectives should be revised to be more consistent with those specified in the Proposed Plan prepared by EPA, because current EPA policy indicates that groundwater objectives should not be achieved solely by institutional controls (i.e. just prevention of ingestion)."

DCN 16-1b RESPONSE

There is no need to revise the FS. EPA prepared an Addendum to the RI/FS, dated, May 1994 (available in the Administrative Record) which addresses areas that had not been fully addressed in the RI/FS and which explains why complete source control remedies were not appropriate at this time.

DCN 16-1c COMMENT

The FS establishes a series of five year reviews which will be utilized to assess the success of the cap in reducing leaching of contaminants from the landfill. If the final plan does include a second operable unit for groundwater, action levels should be established and compared with the containment concentrations in the groundwater during each five year review. If during these reviews it is discovered that the cap has not been successful in reducing contaminant concentration to below established action levels, additional groundwater remedial action should be implemented without delay.

DCN 16-1c RESPONSE

The selected interim remedy will not proceed under two operable units. Additional studies will be performed concurrently with the implementation of the interim remedy and groundwater monitoring data will be collected after the cap is in place. All of this data will be used to develop groundwater remedial alternatives. Appropriate action levels will be established in the final remedy.

DCN 16-2 COMMENT

The commenter does not believe the Proposed Plan adequately addresses treatment of the landfill wastes in contact with the groundwater and believes that by treating the wastes, the time frame for restoration of the groundwater would be reduced.

Although the commenter recognizes the potential limitations associated with implementing in-place technologies at the Old Southington Landfill, they believe additional consideration should be given to their application.

DCN 16-2 RESPONSE

EPA believes that capping the landfill and the removal and containment of SSDA1 are the necessary first steps in the cleanup remedy at the Old Southington Landfill Site. In addition to protecting against potential risks associated with the landfill gases and direct contact with the landfill soils, these containment actions will also improve groundwater quality at the Site. EPA's experience in evaluating cleanup alternatives for landfills similar to the Old Southington Site has demonstrated that it is generally impracticable to attempt to treat the entire landfill. However, EPA does believe that it often makes sense to actively cleanup individual areas within the landfill that are highly contaminated such as SSDA1. Accordingly, EPA believes the approach of capping the entire landfill and removing the SSDA1 wastes from direct contact with the water table and isolating them in a separate cell is the appropriate first steps in the cleanup of the landfill.

Regarding treatment of the wastes in place and treatment of the SSDA1 wastes, see EPA's response to comment DCN 5-2 in Section 3.2.3.

DCN 16-3 COMMENT

The commenter is concerned about EPA's conclusions regarding SSDA1 and SSDA2. In particular, the commenter is concerned that no specific remediation is proposed for SSDA2 other than capping despite evidence that SSDA2 may be contributing to downgradient groundwater contamination. Finally, the commenter is also concerned that estimates should be made concerning the amounts of waste and associated chemical contaminants in the saturated zone of the landfill particularly at SSDA2.

DCN 16-3 RESPONSE

See response to comment CN 14-5c in Section 3.2.6.

DCN 16-4 COMMENT

The commenter questions the aquifer reclassification process that was recently conducted and recommends that the process be reviewed to verify that the reclassification is justified and that it was performed in accordance with state regulations and requirements.

DCN 16-4 RESPONSE

Please reference the response to comment DCN 5-4 in section 3.2.3.

DCN 16-5 COMMENT

The commenter notes that "No information has been provided which demonstrates that contaminants will not leach from the landfill back into Black Pond if the additional soil pressure of capping material is added to the top of the landfill." The commenter requests that sediment samples in Black Pond be analyzed for contaminants during operation and maintenance of the cap to determine whether a release of material is occurring.

The commenter also states that the waste material beneath Black Pond has not been sufficiently delineated and that existing waste may not be properly addressed during site cleanup.

DCN 16-5 RESPONSE

The selected interim remedy includes long-term monitoring of not only groundwater but also surface water, sediments and soil gas.

See the response to comment DCN 5-5 in section 3.2.3 for EPA's response to the last part of the above comment concerning waste delineation in Black Pond.

DCN 16-6 COMMENT

The RI report indicates that the human health risk assessment was conducted using only the 1992 data because the "1992 data set provides a more current and complete database..." Therefore, the sediment data collected by ESE in 1990 and the earlier data collected by GZA were not used to evaluate potential exposure point concentrations. As a result, samples with elevated levels of contamination were not included in the analysis. For example, sample SED-5, collected by ESE on 7/3/93, contained a concentration of total SVOCs of 128.09 ppm; this sample represented the highest detection of SVOCs of any sediment sample collected at the Site, and should have been included in the calculation of exposure point concentrations. In addition, the data collected by GZA indicated total PAH concentrations in sediment of up to 125.84 ppm. By using only the 1992 sediment data, the risk assessment does not consider samples which contained significant contamination and which therefore may present a human health risk. Just because these data are not the most current does not provide sufficient justification to exclude them from the analysis.

DCN 16-6 RESPONSE

Surface water and sediment samples were collected by GZA in 1990 and by ESE in 1992. ESE did not collect any sediment data in 1993. The 1990 data set did not include an analysis of all of the chemicals of concern for which EPA typically monitors. The 1992 data set included an analysis of all of the chemicals of concern, sampled all of the same locations included in the 1990 data set and had a greater number of total sample locations than the 1990 data set. Thus the 1992 data set was considered to be more representative of exposure.

In addition, estimates of "total SVOCs" or "total PAHs" are not good indicators of human health risk since individual PAHs and other SVOCs have varying degrees of toxicity. For an accurate assessment of the affects of these compounds on risk, individual compounds must be evaluated separately.

DCN 16-7 COMMENT

The commenter states "the cost estimates appear to be high in several cases, thus influencing the perception of the scope of work and selection of alternatives. For example, calculations for the transportation and disposal of the SSDA1 (Appendix B, Alternative SC7, pg. 8&9) have several overly conservative assumptions and quotes." The commenter specifically believes that the following assumptions used in preparing the cost estimate for SC7 were overly conservative:

- **The unit weight of the SSDA1 material at 1.5 tons per cubic yard.**
- **The assumption that each truckload of material that would leave the site for off-site treatment would require an analytical chemistry profile.**
- **The unit cost for incineration of $1,600 per ton.**
- **Indirect capital costs at 20% for engineering, 25% for health and safety, and 25% for contingencies.**

The commenter states that "it is possible that the material in the SSDA1 area could be disposed of off-site for approximately 30 to 40% less than originally estimated." The commenter further states: "Additional review of cost estimates for this alternative should be performed and the decision to keep that material on should be re-evaluated."

DCN 16-7 RESPONSE

EPA disagrees with the commenter that the estimated costs for alternative SC7 need to be re-evaluated at this time. EPA believes the cost estimate to be within the +50%, -30% range of accuracy required for Feasibility Study cost estimates. EPA notes that this range is consistent with the commenter's estimated level of accuracy.

With regard to the individual technical comments, EPA believes:

- The inconsistency in the assumed unit weight (1.5 tons/cy versus 1.35 tons/cy) was a clerical error. However, the use of either value would be within the range of unit weight anticipated for this material.

- The assumption that each truckload of material that transported off-site would require characterization is realistic, especially since the landfill wastes include heavy metal contamination that can dramatically influence incineration and ash costs.

- The estimated cost for off-site incineration at $1,600/ton is representative. Although the commenter reportedly received quote of $1,300/ton from a vendor, it is not clear that the waste profile given to the vendor included the facts that the material would be from a Superfund site and that is likely contained heavy metals. Also, the commenter did not specify what the environmental compliance record was for the facility that provided the quote to the commenter. This is an important consideration for the Agency and does not always coincide with the lowest cost. Notwithstanding this, the commenter's estimate was only 20% less than EPA's and thus still within the Feasibility Study range of accuracy.

- The estimated indirect costs for engineering (20%); health and safety (actually 45% as opposed to 20% mentioned by the commenter); and an additional 25% in contingencies (for direct and indirect costs) are appropriate for the SSDA1 components of SC6. While this brings the multiplier to over two times the estimated direct costs, EPA believes this estimate is appropriate given the level of planning required to conduct these operations, the much lower work related efficiencies due to the health and safety constraints, and experience with similar sites.

DCN 16-8 COMMENT

The commenter notes that following the ROD, engineering designs will be performed and various reports will be prepared including: a plan for the soil gas pilot study, health and safety plan, and others. The commenter states that: "After the ROD is signed, there are no requirements for the EPA to hold public hearings or to solicit public comments. It's up to EPA to provide information to the public however and whenever they feel it is appropriate."

"A schedule should be established for quarterly public meetings, regardless of what has or has not occurred during that quarter, so that the community is kept well informed about the project activities. In addition, it is recommended that the PRPs and EPA solicit the input of the community during preparation of the health and safety plan, the site restoration plan and the construction management plan (regarding traffic, site security, etc.) and other appropriate documents. The solicitation of community input during preparation of these documents, rather than providing them to the community after they have been prepared, will be more effective in keeping the community informed and ensuring that community concerns are addressed."

DCN 16-8 RESPONSE

EPA plans to revise the community relations plan for the Remedial Design and Remedial Action (RD/RA) phase of the project. This phase also includes the performance of additional groundwater studies that will occur concurrently with the implementation of the interim remedy. EPA will solicit input from the community in developing the community relations plan.

DCN 16-9 COMMENT

The commenter states: "The Ecological Risk Assessment addressed only the site itself, Black Pond and the adjoining wetlands. No evaluation was conducted regarding the impact of groundwater which has and will continue to migrate off-site into downstream environmental receptors such as the Quinnipiac River. Future investigations should include as an objective the identification of off-site environmental receptors and the potential impact of contaminated groundwater on those receptors."

DCN 16-9 RESPONSE

As a part of this interim source control remedy, additional studies will be conducted to determine the full nature and extent of the groundwater contamination emanating from the Site and the potential impact of any contamination or downgradient natural resources. See also the response to comment DCN 5-6 in Section 3.2.3.

DCN 16-10 COMMENT

The commenter states: "Numerous project documents refer to the Site as a municipal landfill. Based upon this classification, the use of the presumptive remedy for municipal landfills (containment) has been adopted as the preferred remedy. The Feasibility Study (date: 12-10-93, page: 1-5) states that "CERCLA municipal landfills are primarily composed of municipal, and to a lesser extent hazardous wastes..." This statement does not accurately describe the Site because the southern portion of the Site, which is the major area of concern, may not be primarily composed of municipal waste. Therefore, it should not be presumed that containment is the appropriate remedy, and other remedial technologies should have been more fully evaluated in the FS."

DCN 16-10 RESPONSE

Based on the Site characterization results presented in the RI Report, EPA believes that selection of a presumptive remedy of containment (capping) is protective of human health and the environment. The presumptive remedy approach provides for the treatment of hot spot areas that may exist within the landfill mass. EPA has chosen to address one hot spot area (SSDA1) by excavation and consolidation of the SSDA1 materials in a low permeability cell within the landfill. EPA also evaluated treatment of this waste, but determined that consolidation on-site provided the most cost-effective means of providing the same level of protection to human health and the environment.

EPA notes that the soil gas collection system that will be installed underneath the cap may be an active or passive system that will result in removal of volatile organic contaminants from the unsaturated waste below the cap. A pilot soil gas study that will be conducted during the pre-design phase will determine whether an active or passive collection system is most appropriate and whether treatment of the soil gases is necessary.

3.3 LOCAL GOVERNMENT COMMENTS

EPA received comments from the various Town of Southington Council members. The comments and responses are organized by the Document Control Number (DCN) with the comment portion shown in bold text. Table 3-3 summarizes the local government comments by DCN and the commenter.

Table 3-3

Comment Tracking Summary of Written
Town of Southington Comments

Document Control No.	Source	Date
8	Mr. Thomas Langdon, Town Council	7/12/94
9	Mr. Andrew J. Meade, Town Council	7/11/94
10	Ms. Maureen Temchin, Town Council	7/12/94

3.3.1 MR. THOMAS P. LANGDON, TOWN COUNCIL

DCN 8-1 COMMENT

Mr. Langdon requests that EPA consider not only the benefits of remediation but the costs and their burden to the residents and businesses in the town.

DCN 8-1 RESPONSE

In accordance with the requirements of the National Contingency Plan (NCP), 40 CFR 300.430, EPA has considered the cost of construction of the selected remedy (capital costs), the estimated long-term costs for operation and maintenance (O&M) of the remedy and the net present value of capital and O&M. Cost is one of the nine criteria that EPA evaluates when analyzing proposed alternatives for remediation of a hazardous waste site. Thus, EPA cannot, when selecting an alternative, consider only the "burden" of costs to the potentially responsible parties when evaluating alternatives with respect to the NCP criteria. However, EPA does consider the comments of the state and community during it's final decision that is documented in the Record of Decision (ROD).

DCN 8-2 COMMENT

Mr. Langdon believes it is better from a public health perspective to leave the SSDA1 materials in the ground and to cap that area.

DCN 8-2 RESPONSE

EPA does not agree that the SSDA1 material should be left in place and capped. The most important factors considered in EPA's decision to remove the SSDA1 materials are: 1) the high levels of contaminants found in the waste; 2) the potential for such contaminants to continue to migrate downward even after cap installation; and, 3) the fact that a portion of the SSDA1 waste is currently located within the water table. The actual amount of waste in the water table varies depending upon seasonal fluctuations. This highly contaminated waste, if not removed, will continue to adversely impact the quality of groundwater.

EPA recognizes the potential health and safety hazards that may be encountered during excavation of SSDA1. However, EPA believes that these hazards can be adequately controlled and minimized through the implementation of a health and safety plan and specific construction and engineering precautions (See the response to Comment DCN 6-1 in Section 3.2.4).

3.3.2 MR. ANDREW MEADE, TOWN COUNCIL

DCN 9-1 COMMENT

Mr. Meade concurs with EPA's decision to conduct additional investigations of groundwater and believes that expenditures for groundwater remediation at this time would provide little benefit to the community and environment.

DCN 9-1 RESPONSE

EPA notes this comment. No response is necessary.

3.3.3 MS. MAUREEN TEMCHIN, TOWN COUNCIL

DCN 10-1 COMMENT

Ms. Temchin comments that the remediation process should be implemented as quickly as possible. She notes that further prolongation of the process will only increase the cost to the town.

DCN 10-1 RESPONSE

EPA notes this comment. No response is necessary.

3.4 STATE OF CONNECTICUT COMMENTS

This section includes comments submitted by the State of Connecticut and EPA's responses. The comments were submitted by the Connecticut Department of Environmental Protection (CT DEP) Bureau of Water Management and the Connecticut General Assembly members. The comments are organized below by document control number (DCN) with the comment portion shown in bold text. The State comments are summarized by DCN and commenter in Table 3-4.

Table 3-4

Comment Tracking Summary of State of Connecticut Comments

Document Control No.	Source	Date
12	Ann P. Dandrow, Dennis H. Cleary, Angelo M. Fusco; General Assembly	6/20/94
18	Christine Lacas; Bureau of Water Management	8/12/94

3.4.1 ANN DANDROW, DENNIS CLEARY, ANGELO FUSCO; STATE OF CONNECTICUT GENERAL ASSEMBLY

DCN 12-1 COMMENT

State of Connecticut representatives Ann P. Dandrow, Dennis H. Cleary and Angelo M. Fusco provided their approval of the EPA's Proposed Plan for remediation of the site.

DCN 12-1 RESPONSE

EPA notes this comment. No response is necessary.

3.4.2 MS. CHRISTINE LACAS, CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

DCN 18-1 COMMENT

The Connecticut Department of Environmental Protection indicates that it believes that the Connecticut Water Quality Standards are an action-specific ARAR, even if a groundwater remedy is not being pursued as part of this interim remedy.

DCN 18-1 RESPONSE

EPA agrees that if remedial activities occur that result in discharges regulated under the Connecticut Water Quality Standards (WQS), the WQS are considered action-specific ARARs. No groundwater clean-up levels, however, are established in this interim ROD.

3.5 POTENTIALLY RESPONSIBLE PARTIES COMMENTS

EPA received five documents containing comments from Potential Responsible Parties (PRPs) during the public comment period. These comments are organized by Document Control Number (DCN) with the comment portion shown in bold text. Table 3-5 summarizes the DCN and commenters.

Table 3-5

Comment Tracking Summary of Potentially Responsible Party Comments

Document Control No.	Source	Date
2	Mr. Joseph E. Tuttle	6/20/94
11	J.S. Needham; The Pike Realty Company	7/14/94
13	Mr. and Mrs. Harold L. Charette	8/1/94
15	Ad Hoc Old Southington Landfill PRP Group	8/12/94
17	John C. Bullock; Handy & Harman	8/13/94

3.5.1 MR. JOSEPH TUTTLE

DCN 2 - 1a COMMENT

Mr. Tuttle suggests a method to lower the level of the water table within the landfill by:

1) **installing a barrier along the east edge of Old Turnpike Road, then eastward 400 feet. The barrier bottom should be at 145 feet mean sea level (msl); and,**

2) **dredging the outflow stream from Black Pond to maintain a surface water elevation of 145 feet msl.**

The commenter indicates that these actions would reverse the gradient of the contaminated plume so that it would no longer flow westward. The commenter also suggests that municipal Well No. 5 be reactivated to control the level of water in the wetlands. The pumped water could be discharged to the wetlands northeast of Well No. 5.

DCN 2-1a RESPONSE

Regional groundwater flow is to the west at this Site. Groundwater migrates from the highlands area near Meriden Box. Dredging of the stream channel and culvert would divert some flow and help lower water levels in the immediate vicinity of the channel. However, if the principal purpose is to lower the groundwater below the solid waste, further depression of the water table is required (see cross-section AA' and K-K' in the RI).

Creation of a barrier along Old Turnpike Road would cause a backup of groundwater behind the barrier. This groundwater will still have passed through the contami ated landfill waste. Some of this waste-contaminated water would ek hydraulic relief around the edge of the barrier. Depending the head build up and the depth of the barrier, contaminated fl could also be under the barrier. Thus, the barrier would not prevent migration of contaminated water off-site.

The use of municipal Well No. 5 is also impractical because the well has been abandoned. Even if it was operational, discharge of the water so close to the well's zone of influence would create a directed recharge to the well and minimize flow from the targeted capture area.

DCN 2-1b COMMENT

The commenter suggests placing genetically engineered bacteria into Black Pond, the wetlands and outlet stream to digest organic compounds in these areas.

DCN 2-1b RESPONSE

EPA notes that the potential public health and environmental risks in Black Pond, the wetland areas and the outlet stream are currently within EPA's acceptable range. However, additional testing will be performed in Black Pond to further delineate waste associated with landfilling activities. This waste will be placed under the cap and is expected to improve the quality of surface water and sediment in the pond and associated wetlands.

EPA has evaluated the potential use of biodegradation at the Old Southington Landfill and believes it would not be effective in treating the wastes at the Site. The primary limitation of this technology is the toxicity of the heavy metals and the chlorinated organic compounds on micro-organisms.

With regard to genetically engineered bacteria, EPA notes that while efforts to overcome technology limitations are being conducted in private research and academic settings, the technology has not been developed to a point where EPA is confident that bioremediation would be successful in treating the wastes at the Old Southington Site.

DCN 2-2 COMMENT

Mr. Tuttle believes that the landfill should not be capped; that natural process should be allowed to flush away the contaminants slowly. He advocates the introduction of woody vegetation at the site to encourage natural degradation processes and to slow percolation of rainwater into the Site.

DCN 2-2 RESPONSE

EPA does not believe that natural flushing and attenuation is an appropriate remedy for the Site for several reasons.

First, in the absence of a cap, the potential exists for individuals to be exposed to site contaminants through direct contact with subsurface soils and/or contact with liquid phase contaminants which may leach out of these soils. EPA believes that fencing alone may not provide an adequate barrier to exposure.

EPA also believes that in the absence of a cap, contaminants will continue to migrate downward into the groundwater for unacceptably long time periods. The results of the remedial investigations conducted at the site indicate that substantial quantities of chemical contaminants may remain in landfill unsaturated zone soils above the water table. In the absence of a cap, many of the contaminants are likely to continue to migrate into underlying groundwater and then off-site for time periods of tens to possibly more than one hundred years. EPA believes that continuing the long term contamination of the area groundwater aquifer in this manner is unacceptable.

Finally, EPA disagrees that the introduction of woody vegetation would provide an effective barrier to infiltration. Rainwater would continue to infiltrate through the landfill since roots are not an effective barrier.

DCN 2-3 COMMENT

The commenter suggests the installation of radon gas mitigation systems in the existing buildings to remove potential radon gas and methane on a continuous basis at a cost of only $1 to $2 per square foot of building. The commenter notes that these systems are very inexpensive to operate.

DCN 2-3 RESPONSE

With regard to the installation of radon gas mitigation systems, EPA believes that as part of the cap, a gas collection system is necessary and that this system should be employed to prevent gases from leaving the landfill area, not to remove the gases from the building once they are within the basement areas as would be accomplished by a typical radon mitigation system.

DCN 2-4 COMMENT

The commenter notes that the cell lining for the hot spot material can not be obtained in one piece. He questions whether welding can be performed effectively during construction of the liner to eliminate the possibility of voids and spaces where water can enter the waste. The commenter also expressed concern regarding the potential for frost to penetrate the cell.

DCN 2-4 RESPONSE

EPA acknowledges that the cell lining would be delivered from the manufacturer in long rolls that are typically 20 to 35 feet in width. When placing the lining material, these sections or sheets are overlapped and then welded together. The welding process includes heat, pressure and dynamic action which results in the joints being as strong as the High Density Polyethylene (HDPE) sheet itself. In addition, the American Society for Testing and Materials (ASTM) has developed specific test protocols for the liner materials and the seams which will be used to document the integrity of the liner prior to the placement of the SSDA1 material.

With regard to potential frost damage, EPA notes the HDPE liner material is designed to be flexible such that it will not rip under freeze-thaw conditions.

DCN 2-5 COMMENT

The commenter contends that landfill caps and cells have not been implemented long enough to be proven to be truly effective on a long term basis.

DCN 2-5 RESPONSE

EPA notes that low permeability landfill caps of various types have been constructed for over 20 years. The Resources Conservation and Recovery Act (RCRA) sets forth rigorous requirements for landfills that contain hazardous wastes. EPA has determined that containment of wastes by capping is the most effective means of preventing further migration of landfill contaminants by soil erosion and infiltration of precipitation. Landfills typically contain large volumes of heterogeneous wastes having varying levels and types of contamination. EPA has determined that it is not practicable or cost-effective to treat such wastes. Capping provides an effective means of adequately containing the wastes and preventing potential exposures and minimizing impacts to groundwater. A typical impermeable cap that is well maintained will provide long-term protection.

3.5.2 J.S. NEEDHAM, THE PIKE REALTY COMPANY

DCN 11-1 COMMENT

"Please consider the current commercial property owners especially unique in the Old Southington Landfill Superfund Site that they be afforded the same rights and privileges given to the current residential landowners. The properties were sold to the general public after the landfill was closed and soil capped. The current residential owners were not cited as Potential Responsible Parties (PRPs) due to an Environmental Protection Agency (EPA) policy. In this special case the current commercial landowners, who were cited as PRPs solely on the basis of current land ownership and not for their contribution to the landfill, should be treated in the same way as home owners."

"The burden, be it psychological or financial, of your citing the current commercial property owners as PRPs because they purchased their property through "dumb luck" is not morally fair. A small business owner can not sustain such a burden in today's market place. There are approximately 45 jobs within the old landfill area that can easily be lost to the town of Southington and state of Connecticut. A policy decision relieving the current commercial property owners as PRPs would go a long way in reducing the anxiety this superfund site is causing."

DCN 11-1 RESPONSE

Current landowners of facilities at which there has been a release or a threat of a release of hazardous substances are among the types of potentially responsible parties who are liable under CERCLA. On this basis, the current owners of land on the Site were noticed as PRPs.

On a national policy level EPA has determined that in the exercise of its enforcement discretion, it will not take enforcement actions against an owner of residential property to require such an owner to undertake response actions or pay response costs, unless the residential homeowner's activities lead to a release or threat of release of hazardous substances that results in the taking of a response action at the Site, or unless the owner of residential property fails to cooperate with the response action at the Site. The decisions taken at the OSL Site are consistent with this policy. Consequently, neither the businesses or the residents at this Site were singled out for treatment inconsistent with other Sites throughout the country.

EPA is sensitive, however, to the unique position that the current owners are in both as PRPs and as owners of land and businesses that will require relocation prior to the implementation of response action at the Site. As the remedial process moves forward, EPA will remain involved with the issues that confront these land/business owners.

3.5.3 MR. AND MRS. HAROLD CHARETTE

DCN 13-1a COMMENT

In their comment letter, Mr. and Mrs. Charette oppose the remedy in the Proposed Plan. They say they have heard remarks about contaminated water, contaminated land, methane gas, but to date, nobody has been able to document any harm that has occurred from this landfill. They also say that the EPA proposal will not bring any satisfaction to the immediate neighborhood.

DCN 13-1a RESPONSE

See the response to comment DCN 14-3a in Section 3.2.6.

Extensive studies have been performed on and off-site to determine the nature and extent of contamination from the Old Southington Landfill Superfund Site. A human health and environmental risk assessment has also been conducted. The results of these investigations and evaluations are documented in the Remedial Investigation Feasibility Study and Risk Assessment reports and the EPA Addendum to these reports. These reports are available at the Southington Library in Southington, CT and at the EPA Record Center, in Boston, MA.

EPA is cognizant that nearby citizens have concerns relating to the limited source control remedy. EPA plans to solicit public input in developing the Health and Safety Plan and the Community Relations Plan. It is also EPA's intent to keep citizens apprised of future investigations and remedial activities, as well as be available to answer questions throughout the remediation process.

DCN 13-1b COMMENT

Mr. and Mrs. Charette state: "As a taxpayer in the Town of Southington, I believe that the expenditure that will be mandated by the Town of Southington should be brought to a referendum to see how the people feel about the senseless dollars that will be required to clean up this abandoned landfill."

DCN 13-1b RESPONSE

The Town of Southington which has been named as a Potentially Responsible Party (PRP) is the appropriate body to address this issue.

DCN 13-1c COMMENT

Mr. and Mrs. Charette state: "Please accept this letter as a formal notice that there shall be no more monitoring, testing, or trespassing on this site located at 477 Old Turnpike Road until an agreement between the property owner and the three known polluters is reached regarding the possible liability of the clean up on this site."

DCN 13-1c RESPONSE

Access issues will be addressed as necessary during the construction phase of the remedial action.

3.5.4 AD HOC OLD SOUTHINGTON LANDFILL PRP GROUP

DCN 15-1a COMMENT

The PRP Group states that EPA's plan for addressing the health and environmental concerns at the Old Southington Landfill is comprehensive and is based on sound technical data compiled during the RI/FS process in communication with the EPA and CT DEP.

DCN 15-1a RESPONSE

EPA notes this comment. No response is necessary.

DCN 15-1b COMMENT

The PRP Group states that EPA's selected remedy of a cap and gas collection system "are consistent with the policy set forth in EPA's Municipal Solid Waste Landfill Presumptive Remedy Guidance". They note that the selected remedy components are protective of human health and the environment. The PRPs agree that removal of residential and commercial structures is necessary for construction of the cap and for maintaining long-term integrity. The PRPs state that it is not necessary to remove or relocate structures not located on the Site because 1) they will not interfere in the design or construction of the remedy; 2) the cap and gas collection system will eliminate potential exposures to Site contaminants; and, 3) the cost of such an action would be unnecessary and arbitrary because there are no identifiable risks to human health or the environment.

DCN 15-1b RESPONSE

EPA notes this comment. No response is necessary.

DCN 15-2a COMMENT

The commenters indicate that SSDA1 materials do not constitute a "hot spot" as defined by the EPA guidance, and should not be excavated. The commenters argue that most of the guidance criteria which may be used to identify a landfill "hot spot" are not met in the case of SSDA1. In reaching this conclusion; the commenters specifically identify the four areas of general EPA guidance criteria which they believe are not met when considering SSDA1 a "hot spot". They are as follows:

1) Does evidence exist to indicate the presence and approximate location of waste?

2) Is the hot spot known to be a principal threat waste?

3) **Is the waste in a discrete, accessible part of the landfill?**

4) **Is the hot spot known to be large enough that its remediation will reduce the threat posed by the overall site but small enough that it is reasonable to consider removal?**

DCN 15-2a RESPONSE

EPA disagrees with the commenters overall conclusions that SSDA1 is not a "hot spot".

1) Does evidence exist to indicate the presence and approximate location of waste?

Response: Yes, the area containing the semi-solid discrete materials in SSDA1 has been fairly well defined by the RI boring program. The RI estimates the volume of this material to be 500 to 1100 cubic yards.

2) Is the hot spot known to be principal threat waste?

Response: EPA believes it is. The average concentrations of many of the nonchlorinated and chlorinated Volatile Organic Compounds (VOCs) found in the semi-solid discrete materials in SSDA1 (hot spot) were found to be at least 6 times greater than those found elsewhere in the landfill. In addition, the highest concentrations of some chemicals of concern such as TCE, were also found here. The discrete materials found in SSDA1 are clearly industrial waste and are different in chemical nature from the rest of the landfill waste. In addition, these materials are in a localized area at the western edge of the Site. The regional groundwater also flows in a westerly direction. If these discrete materials are not removed under the interim remedy, difficult and/or costly groundwater remediation may be inevitable in the final remedy. All in all, EPA believes that removing the discrete materials found in SSDA1 from the water table, will result in the reduction of a principal threat to human health and the environment.

3) Is the waste in a discrete accessible part of the landfill?

Response: The waste is in a discrete accessible part of the landfill. The main reason the SSDAs were located at the edge of Old Turnpike Road was because it provided easy access to vehicles transporting liquid and semi-solid industrial wastes for disposal. Furthermore, when it comes time to excavate the waste from SSDA1, the building that currently infringes over this area will be removed and traffic on Old Turnpike Road will be restored.

4) Is the hot spot known to be large enough that its remediation will reduce the threat posed by the overall Site but small enough that it is reasonable to consider removal (e.g., 100,000 cubic yards or less)?

Response: The semi-solid discrete materials in SSDA1 have been estimated in the RI to consist of 500 - 1100 cubic yards of material. This quantity is less than 100,000 cubic yards, yet large enough to be of concern.

DCN 15-2b COMMENT

The PRP Group recommends that EPA follow the 1994 legislative proposal in determining whether or not SSDA1 should be considered a hot spot. In their comments, the PRP Group expresses differences and similarities between the 1994 legislative proposal and the currently used EPA guidance. The PRP Group also adds, "that Congress is working with EPA to make Superfund more workable, efficient, and cost and time effective. The proposed statutory language was drafted in this spirit and should be looked to for guidance in regard to the remedy for this site."

DCN 15-2b RESPONSE

EPA has determined that the area containing semi-solid discrete materials found in SSDA1 constitutes a hot spot area and needs to be addressed as one. EPA made this decision based on guidance that is currently in place (Presumptive Remedy for CERCLA Municipal Landfill Sites (OSWER Directive No. 9355.0-49FS, September 1993). It is not appropriate for EPA to use legislative proposals that have not yet been accepted or enacted. See also response to comment DCN 15-2a.

DCN 15-2c COMMENT

The PRPs state that "Excavation of SSDA1 would be difficult logistically, could potentially be very costly, and could pose significant and unwarranted risks to workers." The PRPs contend that the $1.6 million SSDA1 cost may be underestimated and note worker health and safety and logistical problems as potential cost items that may have been underestimated. The PRPs point to the McColl Superfund Site as an example where unanticipated logistical problems and exorbitant cost where associated with a hot spot removal. The PRPs note that the cost for excavation activities at McColl were $526 per ton in comparison to $26 per ton in the RI/FS for this Site.

DCN 15-2c RESPONSE

Excavation and consolidation of SSDA1 materials can be preformed in a number of viable ways. This Record of Decision provides flexibility of performing this work to allow for technically feasible, cost effective, and health protective ways of implementing this work. Detailed planning will be required to conduct these activities in a safe and efficient manner. As for the costs associated with implementing these activities in a safe manner, EPA questions the back-up for the PRPs revised $8 million estimate to conduct this work included with their comments. Since the $1.6 million estimate within the Proposed Plan was developed by the PRPs, it is unclear why their estimate of cost has changed so dramatically.

DCN 15-2d COMMENT

The commenter believes if excavation of material in SSDA1 is ultimately deemed appropriate, then EPA's plan should anticipate and address other issues and factors. The PRPs are particularly concerned that:

a) The PRPs state that the delineation of material to be removed from SSDA1 must be based on visual rather than chemical differentiation of the material. They are concerned that excessively large volumes of waste will need to be excavated if chemical criteria are used due to the variable and unpredictable spatial distribution of contaminants of concern.

b) "EPA should retain flexibility in the ROD to allow for other methods of handling and isolating these materials. For example, EPA should encourage employment of value engineering in the design of any excavation and relocation program, the location, design, and construction of any waste cell liner or cap, and the management of waste leachate. Final decisions on the disposition of this material should be made during the design phase, based on the technologies available at that time."

DCN 15-2d RESPONSE

a) EPA agrees that the method of establishing the limits of any excavation of waste materials in SSDA1 requires careful consideration. EPA also agrees that the approach must be sufficiently well defined and restrictive such that unacceptably large volumes of materials are not excavated or that excavations do not go beyond the general area of SSDA1 and across the landfill. For this reason, EPA is requiring that discrete materials A and B be excavated along with a two-foot buffer zone around these materials. EPA does not, however, agree that these goals necessarily prohibit the utilization of chemical specific guidelines to help define the extent of the semi-solid discrete materials A and B in SSDA1. Therefore, in developing the guidelines for any excavation in SSDA1, EPA will carefully evaluate the possible use of visual soil characteristics (as proposed by the commenter) as well as chemical-specific guidelines for SSDA1.

b) EPA agrees that it is appropriate and beneficial to maintain flexibility in the ROD to allow for various viable engineering methods as well as health protective measures in implementing the various components of the remedy. Section X of the ROD articulates the required objectives of the interim remedy components while providing flexibility in their implementation.

DCN 15-3 COMMENT

The PRPs state that: "EPA's selected remedy should contain performance standards, not specific design requirements, to allow for design flexibility and to encourage value engineering."

"The PRPs recommend that EPA identify and mandate the remedy for the Site through the identification of performance standard goals, instead of specifying design details. The specification of performance standards allows for the use of lower cost, but equivalent or better, performing technologies as they become available. This "value engineering" approach is the best way to avoid overly specific directives that might result in the inadvertent and inappropriate exclusion of effective and efficient remedial design and implementation methods." The PRPs specifically note that the performance standards approach should be used for specific cap design, handling of waste along the Black Pond shoreline, culvert outlet design and reconstruction and the gas collection/control system.

DCN 15-3 RESPONSE

The action-specific ARARs pertinent to the cleanup remedy and any other pertinent ARARs will define many of the performance standards. Consistent with the PRPs request, EPA believes the remedial design activities should focus on accomplishing the objectives and intent of the Record of Decision while complying with ARARs and utilizing cost-effective engineering solutions. As highlighted below, the PRPs have misinterpreted representative technologies taken from their own RI/FS document as declarative specifications by EPA for the only engineering solutions to achieve the performance standards set forth by the ARARs for this Record of Decision. It is clearly EPA's intent to include prudent engineering practice and flexibility during the remedial design process.

With respect to the waste found in Black Pond due to landfilling activities, the action-specific ARARs, in this case, Section 404 of the Clean Water Act states that wetland areas may only be filled when no other practicable alternative exists. To that end, the PRPs should recognize that the design of the project will have to evaluate the available engineering approaches and recommend one that isolates the wastes from the pond and is consistent with ARARs.

With regard to reconstruction of the culvert, EPA believes the activities to re-establish an adequate hydraulic connection between Block Pond and the downgradient wetlands should be guided by the relevant wetlands regulations and environmentally prudent engineering practices.

It is not EPA's intent to specify the design details of the gas collection system at this time. Rather, EPA believes the gas collection system for the cap should be designed to adequately prevent the buildup of gas beneath the cap and that this should occur as a part of the design process. However, EPA notes that in many cases, it may not be clear during the design process whether an active or passive collection system will best fit the needs of a particular project. As such, it may be important to incorporate flexibility into the completed collection system such that it can be operated in either mode as appropriate.

DCN 15-4a COMMENT

"The PRPs agree that groundwater remediation is not necessary."

"The PRPs concur with the EPA in its decision that groundwater remediation is not warranted at this time." The PRPs provide the following reasons in support of their concurrence.

1) **"Groundwater is not used as a drinking water supply." ... "Institutional controls already in existence, including stringent controls at both the State and local levels, prevent the use of groundwater ...".**

EPA RESPONSE TO NO. 1:

EPA has <u>not</u>, in this interim remedy, decided that groundwater remediation is not necessary. Currently, insufficient data exists to determine the complete nature and extent of the contaminated plume emanating from the Site and whether there are any adverse affects on downgradient natural resources. EPA also notes that the installation of the low permeability cap is expected to improve groundwater quality over time and that monitoring data documenting changes in quality will be used to develop a final remedy for the Site.

Institutional Controls do not prevent the continued leaching of contaminants from wastes located below the water table. The NCP and current EPA policy provide that the use of Institutional Controls shall not substitute for active response measures that may be appropriate for a site, unless active measures are determined not to be protective.

2) "Groundwater is not adversely affecting surface waters." The PRPs present the following to support this statement:

   a. "Black Pond is upgradient of the Site ... and acts as a major recharge to groundwater." ... "Therefore, contaminants in groundwater ... do not impact Black Pond.

Surface water sampling performed during the RI confirms this fact."

b. **"Wetlands are present only in areas that are either upgradient or significantly downgradient of the Site." RI data show that the upgradient wetlands are not affected by the landfill. Because downgradient groundwater contamination is present in the deep rather than shallow aquifer, downgradient wetlands potentially affected by shallow groundwater discharge are not likely to be affected by contaminated groundwater emanating from the Site.**

c. **"Direct groundwater discharge to the [Quinnipiac] River, is not likely to occur." The PRPs note that the levels of contaminants likely to discharge to the River and downgradient wetlands are at levels below those "typically expected to affect aquatic plants or animals".**

EPA RESPONSE TO NO. 2a-c:

EPA agrees that Black Pond and the associated wetlands are not significantly affected by the landfill as demonstrated in the RI/FS and risk assessment reports. However, in the absence of actual data, EPA can not agree with the PRPs that downgradient wetlands and the Quinnipiac River are not affected by the Site. The NCP requires that the extent of the contamination caused by the Site be identified during investigation activities.

3) **"Groundwater remediation would not be effective at this Site, and could in fact have detrimental effects." The PRPs note specifically the uncertainties involved with remediating groundwater, production of wastes from the treatment process, and the potential affects of discharge of a large volume of treated effluent to the Quinnipiac River.**

EPA RESPONSE TO NO. 3:

EPA recognizes the uncertainties associated with the effectiveness of groundwater remediation systems in meeting cleanup goals for the aquifer. These and the other concerns noted by the PRPs will be evaluated as part of the process for determining a final remedy for the Site. The additional groundwater data collected during implementation of the interim remedy will supplement existing data and reduce some of the uncertainties noted by the PRPs. The NCP requires that the selected remedy provide overall protection of human health and the environment. EPA will weigh this and other criteria such as long-term effectiveness, reduction in toxicity, mobility and volume of waste, and implementability, when evaluating the potential remedial alternatives for addressing groundwater contamination at and downgradient of the Site.

DCN 15-4b COMMENT

The PRPs state that "A remedy that does not involve treatment of groundwater at the Site is consistent with other EPA RODs and policies, and with the mandates of CERCLA." "Under circumstances similar to those at this Site, where contaminated groundwater does not pose a threat to either human health or the environment, Region I has selected remedies at CERCLA sites on a case-by-case basis which required no action with respect to groundwater." The PRPs note that EPA may under appropriate circumstances, select a remedial action that does not meet applicable or relevant and appropriate requirements (ARARs). ARARs may be waived if compliance with the requirement will result in a greater risk to human health and the environment or if compliance is technically impracticable. The PRPs state that risks associated with extraction and treatment of groundwater and handling of treatment residuals may outweigh the benefits of treatment. The PRPs also indicate that the extraction, treatment and disposal of large volumes of groundwater that would be necessary to realize "significant and permanent improvements in groundwater quality are enormously complex, and probably cost prohibitive. Treatment of these volumes of groundwater, when compared to the tenuous value of benefits resulting from such treatment, may be illogical, infeasible and indefensible from a health and environmental standpoint."

DCN 15-4b RESPONSE

In some cases, groundwater remediation may not be appropriate for a number of reasons. However, EPA is not prepared to make a decision on groundwater remediation at this Site until additional data is obtained to determine the nature and extent of contamination emanating from the landfill, the potential affects of any contamination on downgradient natural resources, and the impact of the cap on groundwater quality.

DCN 15-4c COMMENT

A new, separate RI/FS is not necessary for OU 2.

DCN 15-4c RESPONSE

As set forth in the ROD, EPA has decided that it is appropriate to proceed with an Interim Record of Decision designed to provide limited source control for the Site. This limited action will be followed by a final response action at the Site.

EPA agrees with the commenter that data generated by the existing RI/FS should be utilized in generating the approach for the final remedy at the Site. Because insufficient data was gathered during the RI/FS, additional groundwater studies must be performed prior to issuing a final ROD for the Site.

These additional studies will undergo an RI/FS process similar to that for the interim remedy. This process can proceed in a number of ways, such as a supplemental or focused RI/FS. The type and scope of this RI/FS will be determined during the negotiation process with the CT DEP and Potentially Responsible Parties. The public will again have the opportunity to review and comment on the Proposed Plan and related documents for the final remedy.

3.5.5 MR. JOHN BULLOCK, HANDY & HARMAN

DCN 17-1 COMMENT

Mr. John Bullock, from Handy & Harman objects to the selection of a remedy involving excavating and surface re-engineering, and supports selection of a less intrusive and less expensive remedy. He adds that excavating hazardous materials and moving them to another part of the Site to place under a RCRA cap will not terminate the long term danger of excavating through the cap and coming in contact with the materials. This action alone will not work without administrative controls. He also adds that the Site is suitable for a modified no action remedy, with appropriate administrative restrictions and a permanent commitment by the local government, who is a PRP, to police and monitor the area. Groundwater use can be prevented through land use restrictions, excavation on the Site can be prevented through deed restrictions, and gas migration into buildings can be monitored and adequately vented to prevent exposure to the gas.

DCN 17-1 RESPONSE

A no action alternative or one involving only administrative controls for the Old Southington Landfill Site would not be protective of human health and the environment. Discrete industrial materials found in SSDA1 are highly contaminated and are located in a localized accessible area in the landfill. Removal of these materials from the aquifer will improve the quality of groundwater and possibly reduce future groundwater remediation costs.

It is difficult for an individual to dig through the material of a RCRA cap. However, the cap can be damaged by improper use of the Site such as the use of dirt bikes, heavy equipment, or foul play. Therefore, EPA agrees institutional controls are also required in the selected remedy to ensure the integrity of the cap and its associated components.

Capping the landfill will not only prevent the risk of future contact with the landfill waste but also contain approximately two thirds, or the majority, of the landfill waste above the water table. This is expected to have a significant improvement on groundwater quality. Groundwater contamination is a concern not only to human health, but also, to the environment. Downgradient environmental impacts from the Site's groundwater plume have not yet been determined. Although administrative controls could be used to prevent human ingestion of groundwater, these controls do nothing to stop contaminated groundwater from impacting natural resource areas.

For the short term, the soil gas monitoring program has been effective. However, the selected remedy will permanently addresses any risks by relocating all residents and businesses from the landfill in order to cap it. This action will also eliminate the possibility of future gas migration into these homes and buildings. The soil gas collection/treatment system will also control gas buildup under the cap and will prevent future potential off-site gas migration which could impact homes and buildings near the landfill.

DCN 17-2 COMMENT

The CT DPHAS Health Assessment shows that no one is at risk from the Site. There are three exposure pathways which could present a risk, but all are currently blocked. The first exposure pathway is to contaminated groundwater. However, this exposure ended when the Town well was deactivated in 1979. The second exposure is to buried hazardous chemicals. However, it is clear to the observer that no such excavations are taking place. In addition, the areas of concern have been identified in the RI. The third exposure is to methane gas from the decomposition of landfill waste which could migrate into buildings located over the waste. However, the on-going monitoring program by the Southington Fire Department will detect and prevent that exposure. Therefore, there does not appear to be any circumstance at the Site which is actually threatening to human health and the environment.

DCN 17-2 RESPONSE

The Health Assessment prepared by ATSDR and the CT DPHAS states that the Old Southington Landfill Superfund Site is a public health hazard. Landfill gas exposure has and continues to occur on a continual basis in several industrial buildings on the landfill. Although to date the levels detected have not presented an appreciable risk, there is no remedy in place to permanently abate the problem.

See responses to DCN 4-3a in Section 3.2.6 and DCN 17-3 below which explains why the selected interim remedy is protective of human health and the environment.

DCN 17-3 COMMENT

The commenter suggests that continued infiltration of rain through the landfill wastes with subsequent leaching into groundwater promotes breakdown of the landfill wastes. The commenter opposes the cap because it preserves the present hazards and costs money to maintain. The commenter notes that the cap "increases protection of human health only if there is an exposure to groundwater, and such exposure has been stopped by administrative steps."

DCN 17-3 RESPONSE

The commenter should be aware that the cap not only limits rainwater from infiltrating through the waste and generating leachate, but also serves to minimize a second exposure pathway - direct contact with the wastes on the Site. This contact can be either through excavation or through direct contact with materials that rise to the surface and become wind borne or carried off by surface runoff. The cap will also reduce the amount of leachate produced until the appropriate groundwater cleanup measures are identified in the final remedy decision. In addition, part of the cap includes a gas collection/treatment system which will control gas migration.

DCN 17-4 COMMENT

The commenter believes that capping of the landfill will make control of methane more difficult and will cause methane to migrate laterally. The commenter believes that methane can discharge harmlessly to the surface in the absence of a cap and recommends monitoring of buildings on and near the Site in place of an expensive gas collection system.

DCN 17-4 RESPONSE

EPA disagrees with the commenter's recommendation that the landfill not be capped and methane gas be allowed to vent naturally. Methane gases have been found in buildings on the landfill and future settling of these structures may create additional pathways for migration of gases. The removal of all buildings from the landfill and the construction of a soil gas collection system will eliminate the possibility of future exposures to occupants of these buildings and will control the potential migration of soil gases into off-site areas. Soil gas testing is planned to start over the next few months to determine whether gases from the landfill are migrating from the Site, along utility lines to adjacent properties.

DCN 17-5 COMMENT

The proposed remedy will cause direct contact exposure to hazardous materials and dust in the course of excavation and other engineering actions, not only to workers on the Site but also to the surrounding community. This may pose a psychological stress upon nearby residents. At the July 12, 1994 public hearing, a number of residents in the area expressed sincere concern with their health and safety during the excavation and waste relocation process. That concern, and the actual exposure to hazardous materials to which it relates, can be eliminated by reliance upon administrative steps to ensure continuation, and enhancement, of the present status of the Site.

DCN 17-5 RESPONSE

Excavation of SSDA1 is protective of human health and the environment because it removes highly contaminated industrial waste from the water table and places it in a lined cell underneath the landfill cap where it will no longer further degrade the groundwater. Once this work is complete, individuals will not come into contact with this waste because institutional controls will be in place to prevent improper actions or Site use.

During excavation and consolidation of SSDA1 underneath the cap, all appropriate engineering controls and health and safety measures will be taken to ensure the health and safety of the community, remedial workers, and future maintenance workers. Furthermore, EPA will look for community input in developing the Health and Safety Plan for the remedial work to ensure that their concerns are addressed.

DCN 17-6 COMMENT

Mr. John Bullock requests that EPA consider cost effectiveness not only in relation to other remedies proposed in the FS, but also from a broader economic context. The preferred remedy involves an enormous expenditure of truly scarce societal resources. There are other ways in which those same resources could be spent which would provide greater protection of public health and safety, although not in the context of Superfund. The Town of Southington, which is not a wealthy town, could greatly enhance the protection and well-being of its citizens, beyond any incremental benefit which m actually be derived from the proposed remedy, through judicious u of only a fraction of the money which would be spent upon tha remedy.

DCN 17-6 RESPONSE

See the response to Comment DCN 4-3 in Section 3.2.2.

ATTACHMENT A

Community Relations Activities Conducted at the Old Southington Landfill Site in Southington Connecticut

COMMUNITY RELATIONS ACTIVITIES CONDUCTED AT THE OLD SOUTHINGTON LANDFILL SITE IN SOUTHINGTON, CONNECTICUT

Community relations activities conducted at the Old Southington Landfill Superfund Site include:

- EPA published a Community Relations Plan in October 1988 detailing community relations activities to be implemented, to address concerns raised by the community and to ensure that information is factual and applicable.

- EPA conducted a public meeting on December 14, 1988 to discuss the Remedial Investigation (RI) and cleanup process at the Old Southington Landfill site.

- EPA issued a fact sheet describing the RI/ Feasibility Study (FS) process in December 1988.

- EPA issued a fact sheet update describing the completed and ongoing RI activities and the cleanup process in June 1990.

- EPA issued an information update in July 1991 describing the completed RI activities conducted at the site.

- EPA conducted interviews with residents on or near the landfill on August 7, 1991.

- EPA issued a fact sheet update in August 1992 addressing methane gas concerns at the landfill.

- EPA conducted a public meeting on August 26, 1992 to discuss methane gas concerns at the landfill.

- EPA issued a public notice on September 20, 1992 in the Meriden Record Journal announcing that a Technical Assistance Grant (TAG) application had been filed. Others interested in applying for a TAG were encouraged to do so, or to work with the applicants.

- EPA issued a fact sheet summarizing the results of the RI and additional sampling conducted to determine the landfill boundary in April 1993.

- EPA released a Proposed Plan for Limited Source Control (OUI) dated May 1994 to discuss the FS and the preferred alternative.

- EPA issued a public notice on June 1, 1994 in the Meriden Record Journal and on June 2, 1994 in the Southington Observer announcing the Proposed Plan for Limited Source

Control (OUI) at the site.

- EPA conducted a public meeting on June 14, 1994 to discuss the Preferred Alternative for Source Control (OUI). EPA also conducted a public hearing on July 12, 1994 to solicit public comment on the Preferred Alternative. Forty-two people signed the sign-in sheet for the public meeting; twenty-one people testified during the public hearing. A copy of the hearing transcript is included in the Administrative Record at the Information Repositories at the Southington Public Library and at the EPA Record Center.

- EPA accepted public comments on the Proposed Plan for Limited Source Control (OUI) from June 15, 1994 through August 13, 1994. Seventeen people submitted written comments. Seven of these comment letter were presented orally at the public hearing. The comments are addressed in the Responsiveness Summary which is included in the Administrative Record.

Superfund Program Fact Sheet

Region I

Old Southington Landfill Site
Southington, Connecticut

April 1993

Remedial Investigation Activities Completed at the Old Southington Site

INTRODUCTION

This fact sheet contains a summary of completed ***Remedial Investigation (RI)****** activities and preliminary results of sampling from May 1992 through January 1993 at the Old Southington Landfill site. In addition, this fact sheet provides a description of upcoming activities and explains how and where to obtain more detailed information.

COMPLETED ACTIVITIES

The ***potentially responsible parties' (PRPs)*** conducted various RI activities in 1989, 1990, and 1991 including test borings to determine the landfill boundary, installation of monitoring wells, and sampling of ***groundwater***, surface water, ***sediment, soil gas***, and ***surface and subsurface soils***. The results from these investigations were summarized by the PRPs' consultant, Environmental Science & Engineering, Inc. (ESE) in a May 1992 report titled, "Post-Screening Investigation Report and Work Plan". The report found that additional information was necessary to provide a better understanding of the extent of contamination so that various cleanup options for the site could be appropriately developed and evaluated. The work plan section of the report presented the additional field sampling activities that the PRPs conducted in the summer and fall of 1992. These activities are briefly outlined below:

Subsurface Soil/Refuse - Soil borings were taken to determine the limits of the southern landfill area and further characterize the landfill refuse. Subsurface soils were collected and analyzed to determine the extent of contamination in selected areas.

Surface Soil - Surface soil samples were collected from locations across the landfill including the residential area and visibly stained areas around the industries.

Groundwater - Activities associated with groundwater included installation of 22 new monitoring wells (primarily west of the landfill) measurement of water levels, and collection of groundwater samples. The samples were analyzed to determine the type and extent of contamination and to investigate potential westward migration of contamination in groundwater

* Words appearing in bold italic print are defined in the glossary on page 8.

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Surface Water - Surface water and sediment samples were collected from Black Pond and its outlet stream to determine the presence and extent of contamination.

Soil Gas - Soil gas sampling was conducted to determine the potential presence and impact of chemicals that could migrate from the soil into the atmosphere and into buildings on and near the site.

Wetlands - Studies were conducted to define the wetland boundaries in the landfill area and to identify plant and animal species that could be affected by potential contamination.

In September 1992, based on preliminary results of the field sampling and well installation activities, EPA and the PRPs agreed that additional groundwater wells were needed to the west of the landfill to provide information on the potential westward migration of groundwater contamination through Chuck & Eddie's junkyard (see Figure 1). The PRPs installed the wells in the early fall and conducted sampling in November 1992 and January 1993.

PRELIMINARY RESULTS OF SITE ACTIVITIES

Preliminary test results from the 1992 field program are summarized below. The data is being evaluated and will be presented in a Remedial Investigation report as described under Upcoming Activities on page 5.

Contaminant concentrations discussed below are compared to levels in samples taken from areas not affected by the landfill, known as ***background*** samples, or to existing federal and state drinking water standards, known as ***maximum contaminant levels (MCLs)***.

Subsurface Soil/Refuse - Seventeen soil borings were drilled to determine southern boundaries of the landfill and the thickness of the refuse. The borings were drilled to depths ranging from 22 to 60 feet below ground surface. Landfill boundaries were determined by analyzing the content of the borings for landfill refuse (see figure 1 on page 3). [Chemical analysis results from subsurface soil are not yet available.]

Surface Soil - Forty surface soil samples were collected from the landfill area and three background locations. Sixteen of these were collected from the northern (residential) area of the site. No ***volatile organic compounds (VOCs)*** were found in soil samples collected in the northern area. ***Pesticides*** were detected at generally low levels in soil samples collected from the landfill surface.

The major contaminants of concern found in surface soils are known as ***semi-volatile organic compounds (SVOCs)*** and were detected in a large number of samples collected across the site. The majority of these SVOCs were ***polynuclear aromatic hydrocarbons (PAHs)*** which were detected above background levels in both the northern (residential) end of the landfill and the industrial area.

Surface soil samples collected on the landfill were generally found to contain background levels of ***metals***. Many metals are naturally present in soils and are essential to plant growth. Several samples collected in the industrial area of the landfill were found to have a few metals ***(arsenic, lead and mercury)*** that were above typical background levels.

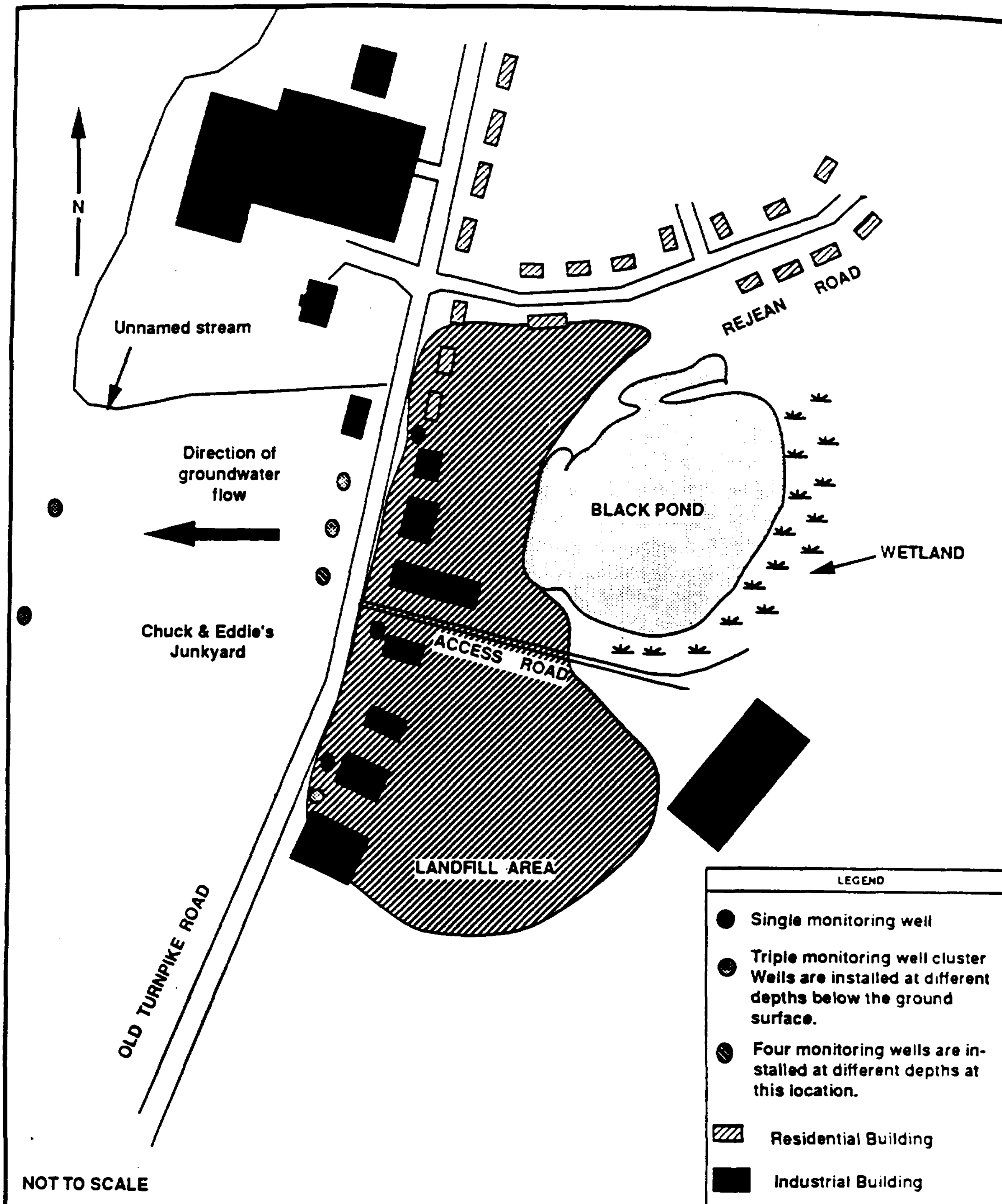


FIGURE 1 LOCATIONS OF NEW MONITORING WELLS AT THE OLD SOUTHINGTON LANDFILL IN SOUTHINGTON, CONNECTICUT

Soil Gas - VOCs were detected in soil gas samples collected throughout the landfill area. The highest levels of VOCs were detected in samples collected in the industrial area and included: ***benzene, ethyl benzene, toluene, vinyl chloride and xylenes.***

Groundwater - Groundwater samples collected from the 22 newly installed wells were analyzed for VOCs, SVOCs, Pesticides/PCBs, and Metals. Six of these wells are located on the landfill, and the other 16 are located to the west of the landfill (see Figure 1). In addition, samples were also collected from existing wells both on and off the landfill. These wells were analyzed for VOCs which were the primary contaminants of concern identified in previous sampling rounds. Sampling results indicated that several VOCs, including vinyl chloride, ***trichloroethene, 1,2-dichloroethene***, ethyl benzene, toluene, and xylenes were present in the groundwater both at the landfill and to the west of the landfill. Most of the VOCs were at levels higher than MCLs.

SVOCs in groundwater were present at only two locations and were generally found at much lower levels than the VOCs. Some of the SVOCs found include ***dichlorobenzenes*** and various types of ***phenolic*** and ***phthalate*** compounds. Groundwater collected from two locations just west of the landfill contained traces of pesticides at levels below MCLs. ***Polychlorinated Biphenyls (PCBs)*** were detected in one well at a level above the MCL.

Metals, which occur naturally in groundwater, are present in various concentrations depending upon the type of rock or soil the groundwater flows through. A limited number of metals were found in the new monitoring wells at levels above MCLs. These included ***beryllium, chromium, lead, and nickel.***

Homes located near the landfill, including those to the north of Rejean Road, are on municipal water which is not drawn from the contaminated ***aquifer*** at the Old Southington Landfill.

Surface Water - VOCs and SVOCs were found at levels below or near MCLs in surface water samples collected from Black Pond and its outlet stream. Metals were generally found to occur at background levels. Lead was found in only one sample at a level above the MCL.

Sediments - Sediment samples collected from Black Pond and it's outlet stream were found to contain VOCs such as ***carbon disulfide***, 1,2-dichloroethene, toluene and trichloroethene in isolated areas. The SVOC analysis indicated the presence of PAHs at levels above background concentrations. PCBs were also found in three of the sediment samples collected. Metals concentrations that were found to be higher than background include lead, mercury, and ***vanadium***.

CONCLUSIONS

In summary, extensive work has been performed at the site to define the nature and extent of landfill contamination. The southern part of the landfill, where the businesses now exist, contains municipal and hazardous waste. The northern end, where four houses are located south of Rejean Road, contains mostly construction debris, wood material, and stumps.

Studies show that groundwater migrates in a westerly direction towards the Quinnipiac River. A plume of contaminated ground water is also migrating in this direction. Based on monitoring well data, the northern boundary of this plume appears to be south of the landfill residents. All residents in the site area use municipal water.

including a drill rig, sampling equipment, decontamination materials, and safety equipment to perform field work. Once the activities are complete, the contractor will decontaminate and remove the equipment and will analyze and summarize the data that have been collected. After EPA's review of the data, the information will be available to the public in the Remedial Investigation Report.

Feasibility Study (FS)

Once the RI has established the nature and extent of the contamination at the site, EPA evaluates a number of different cleanup alternatives to determine which is appropriate. This review process is called the Feasibility Study (FS). The FS uses information obtained in the RI to develop, screen, and thoroughly evaluate available ***remedial alternatives***. The main objective of the FS is to determine the suitability of various remedial technologies for achieving the cleanup objectives set for the site and provide sufficient information for EPA to select a preferred remedial alternative.

SITE LOCATION AND LAND USE HISTORY

The Old Southington Landfill consists of approximately 10 acres of land located adjacent to Old Turnpike Road in the Plantsville section of the Town of Southington, Connecticut (see Exhibit 2). From approximately 1920 to 1967, the landfill was used as a municipal disposal area. Liquid and solid refuse were accepted from residential, commercial, and industrial users.

In 1967, the Town of Southington closed the landfill. Closure procedures included compacting loose refuse, covering the landfill with at least two feet of clean material, and seeding with grasses.

Between 1973 and 1980 parts of the landfill were subdivided and sold for commercial development. Several residential and commercial/industrial structures presently occupy the closed landfill and adjacent areas.

The former landfill is located approximately 700 feet southeast of the former municipal Well No. 5. Well No. 5 was installed in 1971 by the Town of Southington Water Department as a public water supply. In 1979, the municipal well was deactivated because groundwater analyses indicated the presence of volatile organic compounds (VOCs), including 1,1,1-trichloroethane (TCA), at levels that exceeded the Connecticut Department of Health Water Quality Standards. The well was never reactivated and was abandoned by the Town in August 1987.

In 1984, the Old Southington Landfill, formerly known as the Old Turnpike Landfill, was placed on EPA's National Priorities List (NPL) of hazardous waste sites due to groundwater contamination found in municipal Well No. 5. The placement of the site on the NPL made it eligible for federal funding for investigation and cleanup.

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

Following completion of the RI field studies, the RI report will be prepared. After release of the RI report, a public meeting will be held, at which time the public may comment on or ask questions about the report. EPA welcomes public comment at any time during the Superfund process at the site. Other public meetings will be scheduled throughout the site remedial activities. The public will be kept informed of progress at the site through informational mailings such as this fact sheet.

> **Superfund Technical Assistance Grant (TAG) Program**
>
> The Superfund Technical Assistance Grant (TAG) program was established under the Superfund Amendments and Reauthorization Act (SARA) of 1986. These grants of up to $50,000 per Superfund site are designed to enable community groups to hire a technical advisor or consultant to assist them in interpreting and commenting on site findings and proposed cleanup actions. Further information on the TAG Program is available from:
>
> Mary Grealish
> U.S. EPA Region I
> JFK Federal Building (HDA-CAN4)
> Boston, MA 02203
> (617) 573-5701

ADDITIONAL INFORMATION

Additional information about the Old Southington Landfill Superfund site is available at the following information repository:

Southington Public Library
225 Main Street
Southington, CT 06489
(203)628-0947

Contact: Audrey Brown, Director

Hours: Mon - Thurs 9:15 am - 9:00 pm
Fri & Sat 9:15 am - 5:00 pm

or contact:

Margaret Velie
Remedial Project Manager
U.S. Environmental Protection Agency
JFK Federal Building (HEC-CAN3)
Boston, MA 02203
(617) 573-9660

or

Susan Frank
Community Relations Coordinator
U.S. Environmental Protection Agency
JFK Federal Building (RPA-2203)
Boston, MA 02203
(617) 565-3419

Information regarding Southington's other NPL site, the Solvents Recovery Services Superfund site, may also be obtained from Susan Frank at the address above.

GLOSSARY

Administrative Order on Consent: A legal and enforceable agreement signed between EPA and potentially responsible parties (PRPs) whereby PRPs agree to perform or pay the cost of site cleanup. The agreement describes actions to be taken at a site and may be subject to a public comment period. An Administrative Order on Consent does not have to be approved by a judge.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Act created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either: (1) pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or (2) take legal action to force parties responsible for site contamination to clean up the site or pay back the Federal government for the cost of the cleanup.

Emergency Removal Action: An immediate action taken over the short term to address a release or threatened release of hazardous substances.

Enforcement: EPA's efforts, through legal action if necessary, to force potentially responsible parties to perform or pay for the site cleanup.

Feasibility Study (FS) Report: A report that summarizes the development and analysis of remedial alternatives that EPA considers for the cleanup of Superfund sites.

Geophysical: Pertaining to the science that deals with physical properties of the earth and its soil and rock materials, including electrical, magnetic and gravitational properties.

Groundwater: Water found beneath the earth's surface that fills pores between media such as sand, soil, and gravel, and often serves as a principal source of drinking water.

National Priorities List (NPL): EPA's list of the most serious hazardous waste sites identified for possible long-term remedial action under Superfund.

Potentially Responsible Party (PRP): An individual(s) or company(s) (such as owners, operators, transporters, or generators) potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, EPA requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated.

Proposed Plan: A brief summary of EPA's preferred approach to the method of cleanup at a site and other alternatives that have been considered for use at the site.

Record of Decision (ROD): A public document that describes the cleanup alternative(s) to be used at an NPL site. The Record of Decision is based on information and technical analysis generated during the Remedial Investigation/Feasibility Study and consideration of public comments and community concerns.

Remedial Action (RA): The actual construction or implementation phase that follows the remedial design of the selected cleanup alternative at a site on the NPL.

Remedial Alternative: An option evaluated by EPA to address the source and/or migration of contamination at a Superfund site to meet health-based cleanup goals.

Remedial Design (RD): An engineering phase that follows the record of decision when technical drawings and specifications are developed for the subsequent remedial action at a site on the NPL.

Remedial Investigation (RI) Report: A summary report of the information collected on the nature and extent of contamination found at a Superfund site and the problems that the contamination causes. It directs the types of cleanup options that are developed in the Feasibility Study.

Responsiveness Summary: A summary of oral and/or written public comments received by EPA during a comment period for key EPA documents, and EPA's responses to those comments. The responsiveness summary highlights community concerns considered by EPA decision-makers prior to selecting a remedial action at a site.

Sediment: Material that settles to the bottom of a stream, lake, or wetland area, or other body of water.

Superfund: The common name for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Surface Water: Bodies of water on the earth's surface that are exposed to the air, such as streams, rivers, lakes, and oceans.

Soil Gas: Gas contained within the porous and void spaces of soils.

1,1,1-Trichloroethane (TCA): A non-flamable liquid chemical used in cold-type metal cleaning, also in cleaning plastic molds. This chemical is irritating to eyes, mucous membranes, and in high concentrations, becomes narcotic.

Volatile Organic Compounds (VOCs): A group of chemical compounds composed primarily of carbon and hydrogen that are charcterized by their tendency to evaporate (or "volatilize") into the air from water or soil. VOCs include substances that are contained in common solvents and cleaning fluids. Some VOCs are known to cause cancer.

Wetland: An area that is regularly saturated by surface or groundwater and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include: swamps, bogs, marshes, fens, and estuaries. Wetlands are federally protected because they purify water, prevent floods, feed and shelter fish and wildlife, and offer recreational opportunities.

Superfund Program Fact Sheet
Update

Old Southington Landfill Site
Southington, Connecticut

Region I
June 1990

TESTING AT THE OLD SOUTHINGTON LANDFILL SUPERFUND SITE CONTINUES

The U.S. Environmental Protection Agency (EPA) is continuing to oversee testing of groundwater, surface water, and soil conditions at the Old Southington Landfill hazardous waste site in Southington, Connecticut. These tests are intended to identify the nature and extent of contamination at the site. This fact sheet focuses on activities at the Old Southington Landfill site including a review of completed tasks, ongoing sampling and testing activities, future investigation and cleanup activities, as well as a brief overview of the site location and land use history. Means for obtaining more detailed information about the Old Southington Landfill site and opportunities for public involvement are also provided.

There are two ***National Priorities List (NPL)*** hazardous waste sites located in Southington, Connecticut. This site, the Old Southington Landfill, is located adjacent to Old Turnpike Road in the Plantsville section of Southington. The second NPL site, Solvents Recovery Services of New England, is located on Lazy Lane.

THE SUPERFUND PROCESS

Exhibit 1 provides a general overview of the Superfund process at the Old Southington Site, from site discovery through cleanup. As shown in Exhibit 1, the ***Remedial Investigation (RI)**** at the Old Southington Landfill site is now in progress.

STATUS OF ACTIVITIES

Remedial Investigation

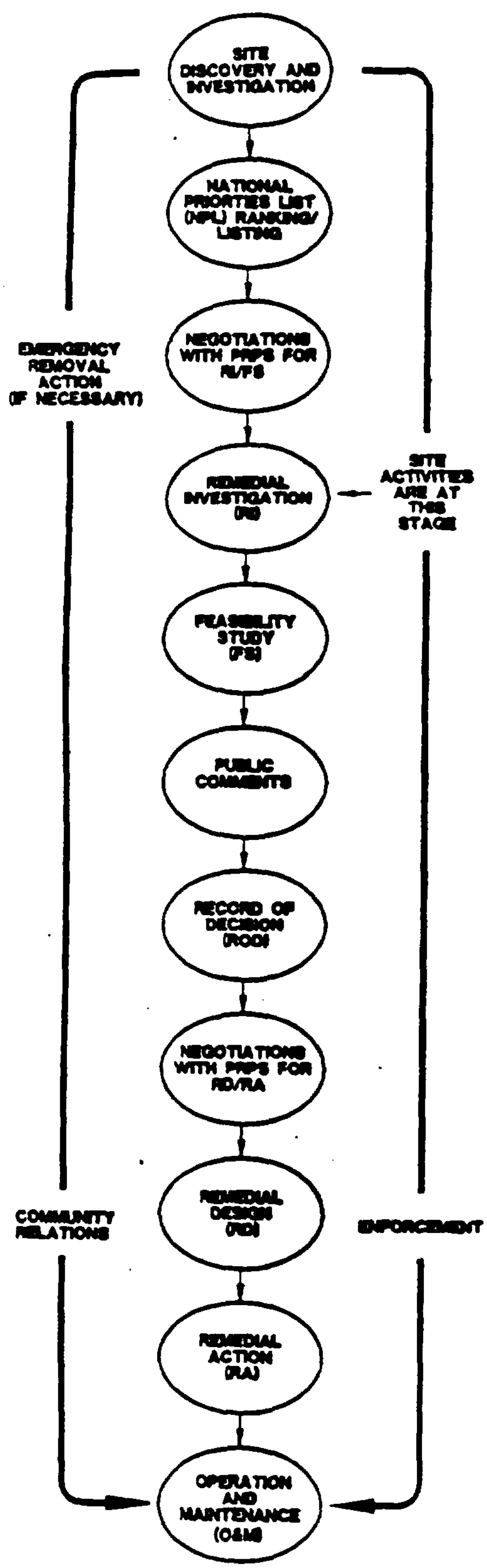
Before EPA cleans up a hazardous waste site, the nature and extent of the contamination at the site must be determined. The process established by EPA to do this is the Remedial Investigation (RI). RI field studies at the Old Southington Landfill site began in the spring of 1989. The field investigations are ongoing and results of the studies will be included in the RI report, expected to be available by the fall of 1991.

Enforcement

The 1980 ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)***, otherwise known as "***Superfund***," calls for parties responsible for the disposal of hazardous waste to perform or pay for the cleanup process. Under Superfund, EPA may negotiate with or take legal action to have the PRPs clean up the site. Based on a 1987 legal agreement, the investigative studies at the Old Southington Landfill Superfund site are being conducted by three PRPs. These PRPs are the Town of Southington; Solvents Recovery Services of New England, Inc.; and United Technologies Corporation, Pratt & Whitney Division. Goldberg-Zoino and Associates (GZA), a geohydrological/geotechnical consulting firm, has been retained by the PRPs

* Words appearing in ***bold italic print*** are defined in the glossary on page 6.

Exhibit 1
The Superfund Process



- 1980: Site discovery and investigation by the State of Connecticut.
- EPA's evaluation of hazards posed by site contamination resulted in the 1984 addition of the site to the NPL.
- Negotiations with three ***potentially responsible parties (PRPs)*** resulted in a 1987 ***Administrative Order on Consent***. The Order requires the PRPs to conduct the site Remedial Investigation (RI) and ***Feasibility Study (FS)*** with EPA oversight. The RI, which assesses the seriousness of the contamination; the kinds of contaminants present; and characterizes potential risks to the community, is currently ongoing at the Old Southington Landfill Superfund site. The FS examines the practicability of various cleanup alternatives.
- Upon completion of the RI and FS reports, EPA will issue a document called the ***Proposed Plan*** that briefly summarizes EPA's preferred site cleanup alternative. At that time, EPA will conduct a public comment period for a minimum of 30 days to receive input concerning the preferred alternative. After the close of the comment period EPA will issue a ***Record of Decision (ROD)*** detailing the selected remedy to address site contamination. The ROD will include a ***Responsiveness Summary*** to respond to oral and written comments received.
- The ***Remedial Design (RD)*** defines the precise methods and technical specifications for subsequent cleanup action.
- ***Remedial Action (RA)*** is the actual cleanup of the site.
- Operation & Maintenance (O&M) activities are conducted after implementation of the RA. O&M ensures that the cleanup and/or containment systems continue to function effectively.

Ongoing activities throughout the Superfund process at the Old Southington Landfill site include community relations, ***emergency removal action*** (if necessary), and ***enforcement***.

- Community relations activities scheduled during the remedial cleanup process are intended to keep residents informed and to encourage public input. EPA's community relations plan for the Old Southington Landfill Superfund Site is available at the information repository listed on page 5 of this fact sheet.
- If at any time during the investigation and cleanup process at the site, a release or threatened release of hazardous substances occurs, EPA conducts an emergency removal action. This has not been an issue at the Old Southington Landfill site, but should such a problem occur, EPA will take immediate action.
- During the Superfund process, EPA's enforcement efforts include actions to identify PRPs who may be legally obligated to perform or pay for site cleanup. At the Old Southington Landfill site EPA has entered into a settlement agreement with three PRPs to conduct investigative studies at the site and is investigating other PRPs.

to conduct the RI/FS for the site. EPA, with assistance from Ebasco Services, Inc. (EPA's technical contractor), is overseeing the site studies. Margaret Velie is the EPA Project Manager responsible for overseeing site activities. Coordination of day to day activities in the field is being conducted by Chris Kopley, GZA's field representative in charge of on-site field investigations. Ms. Velie can be contacted at the address listed on page 6 of this fact sheet.

Completed Field Activities

Several activities have been completed at the site. These activities include:

- *Evaluation of Existing Information* - This task involved the examination and summarization of previous studies conducted in the landfill area to provide background information for current and future studies of the Old Southington Landfill site.

- *Site Survey* - The area of the Old Southington Landfill site has been mapped. This base map provides a resource for current and future site investigations.

- *Soil Gas Survey* - Samples of gases were collected from soils to help assess the distribution of contaminants throughout the site. Preliminary results indicate that ***volatile organic compounds (VOCs)*** are present in soil gas in certain areas beneath the site.

- *Geophysical Investigations* - Geophysical studies of the Old Southington Landfill site indicate that waste disposal was restricted to areas east of Old Turnpike Road, west of Black Pond and Meriden Box Company, south of Rejean Road and north of Solomon Casket Company.

- *Wetlands* - Wetland studies show that the site appears to contain diverse wildlife species typically found within suburban areas, and species of birds that may frequent the site during periods of migration. No rare or endangered species were identified.

Ongoing Field Activities

A number of field activities are currently underway and will be continuing through the summer of 1990. Exhibit 2 shows the location of new wells being installed and areas currently being tested. Ongoing field activities include:

- *Monitoring Well Installation* - Wells are being installed at eight locations on or near the site to establish permanent groundwater collection points. Test borings taken during monitoring well installation also enables field technicians to study the soils on or near the site in order to characterize subsurface conditions. The wells are up to 225 feet deep which is the depth to bedrock in some areas.

- *Groundwater Sampling* - Samples are being collected to characterize the quality of groundwater in the area.

- *Test Borings* - A drill rig is being used to collect soil samples from up to 45 feet in depth to determine the vertical and horizontal extent of the landfill and physical soil properties.

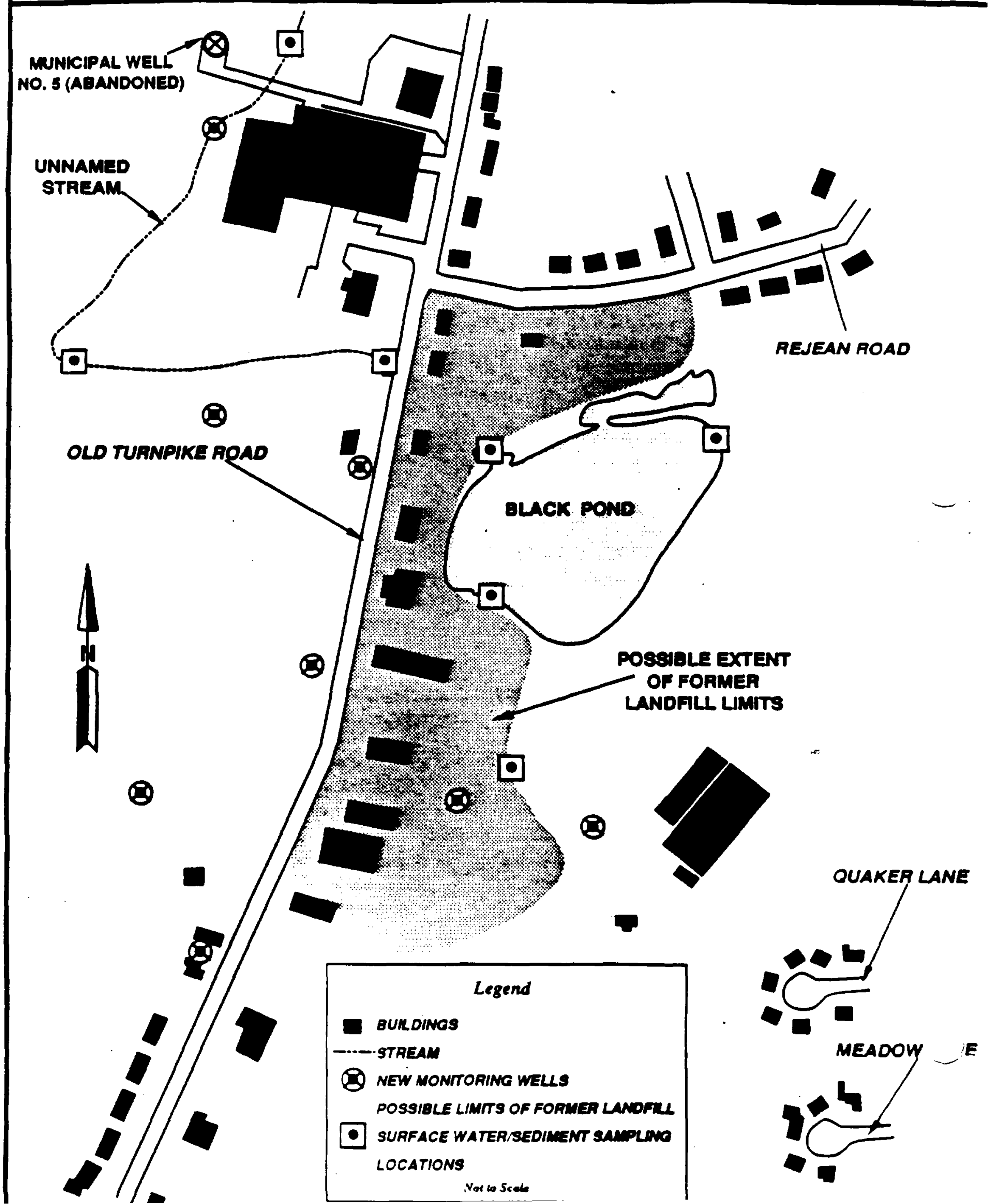
- *Air Quality Monitoring* - Field technicians continue to monitor the air quality surrounding the site before, during, and after subsurface investigations in order to determine possible changes in air quality as a result of the ongoing field investigations.

- *Surface Water and Sediment Wetlands Sampling* - Samples of surface water and sediment in wetland areas are being collected to characterize the quality of the surface water and underlying sediments. The samples will also provide information on the interrelationship of the surface water system and the groundwater system.

GZA, the contractor performing the site studies has temporarily located equipment on the site

Exhibit 2

Old Southington Landfill Site Map
Southington, Connecticut



Mailing List Additions

If you or someone you know would like to be placed on the Old SouthingtonLandfill Site Mailing List, please fill out and mail this form to:

Susan Frank
U.S Environmental Protection Agency, Region I
Office of Public Affairs (RPA-2203)
John F. Kennedy Federal Building
Boston, Massachusetts 02203-2211

Name: ____________________

Address: ____________________

Affiliation: ____________________ Phone: ____________

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Superfund Program Information Update

Region I

Old Southington Landfill Site
Southington, Connecticut

July 1991

EPA Completes Phase I Cleanup Activities at the Old Southington Landfill Site

Phase I of a ***Remedial Investigation (RI)*** has recently been completed at the Old Southington Landfill Superfund Site in Southington, Connecticut (see Figure 1). With the oversight of the United States Environmental Protection Agency (EPA), the Town of Southington, Pratt & Whitney Division of United Technologies Corporation (Pratt & Whitney), and Solvents Recovery Services of New England, Inc. (SRSNE), have been conducting tests of ***groundwater***, surface water, and soil to determine the nature and extent of contamination at the Old Southington Landfill site. The site is located at the corner of Old Turnpike Road and Rejean Road, in Southington, Connecticut. Phase I activities included collecting and analyzing existing data, as well as conducting soil, water, air, and sediment sampling at the site.

This fact sheet contains a brief description of the site location and site history, an explanation of the Superfund process, and a summary of recently completed and ongoing site activities. This fact sheet also explains how to get more detailed information about the Old Southington Landfill site and how the public can become involved.

SITE LOCATION AND HISTORY

The Old Southington Landfill site is one of two ***National Priorities List (NPL)*** Superfund sites in Southington, Connecticut, which is approximately 25 miles southwest of Hartford. The Old Southington Landfill Superfund Site consists of approximately 10 acres of land. The site abuts Old Turnpike Road to the west and Rejean Road to the north in the Plantsville section of the Town of Southington. The second NPL site, Solvents Recovery Services of New England, Inc., is located on Lazy Lane and is approximately five miles north of the Old Southington Landfill site.

From approximately 1920 to 1967, the Old Southington Landfill, formerly known as the Old Turnpike Landfill, was used as a municipal disposal area. Liquid and solid wastes were accepted from residential, commercial, and industrial users.

In 1967, the Town of Southington closed the landfill. Closure procedures included compacting loose refuse, covering the landfill with at least two feet of soil cover, and seeding the cover with grass.

Between 1973 and 1980, the landfill was subdivided and sold. Several residences and businesses presently occupy the area over the closed landfill and adjacent areas.

The former landfill is located approximately 700 feet southeast of the former municipal Well No. 5. Well No. 5 was installed in 1971 by the Town of Southington Water Department as a public water supply. In 1979, the municipal well was closed

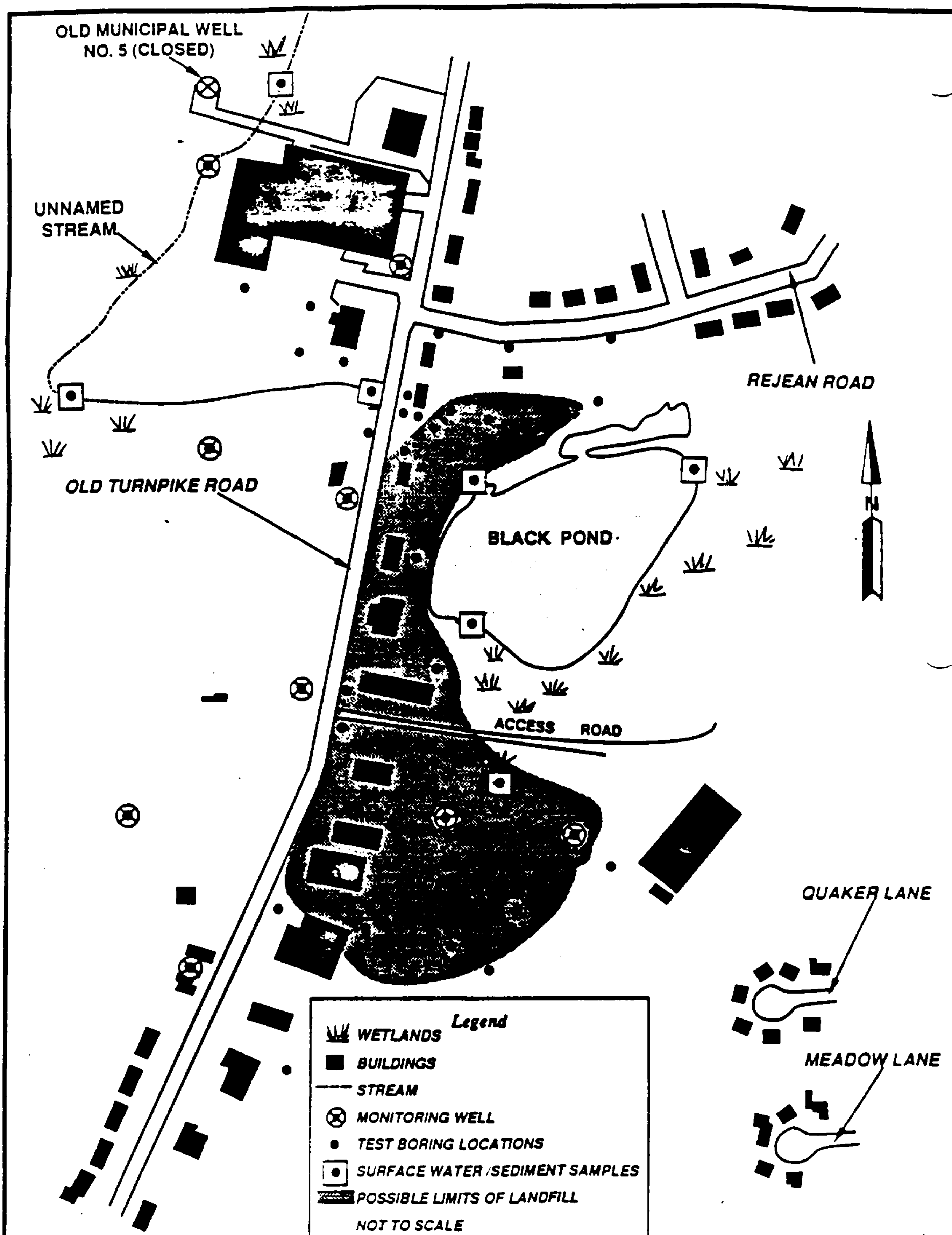


FIGURE 1
OLD SOUTHINGTON LANDFILL SITE MAP
SOUTHINGTON, CONNECTICUT

because groundwater analyses indicated the presence of ***volatile organic compounds (VOCs)***, including ***1,1,1-trichloroethane (TCA)***, at levels that exceeded the Connecticut Department of Health Water Quality Standards. The well was never used again and was closed formally by the Town in August 1987.

In 1984, the Old Southington Landfill was placed on EPA's National Priorities List (NPL) of hazardous waste sites due to groundwater contamination found in municipal Well No. 5. Placement of the site on the NPL made it eligible for federal funding from Superfund for investigation and cleanup.

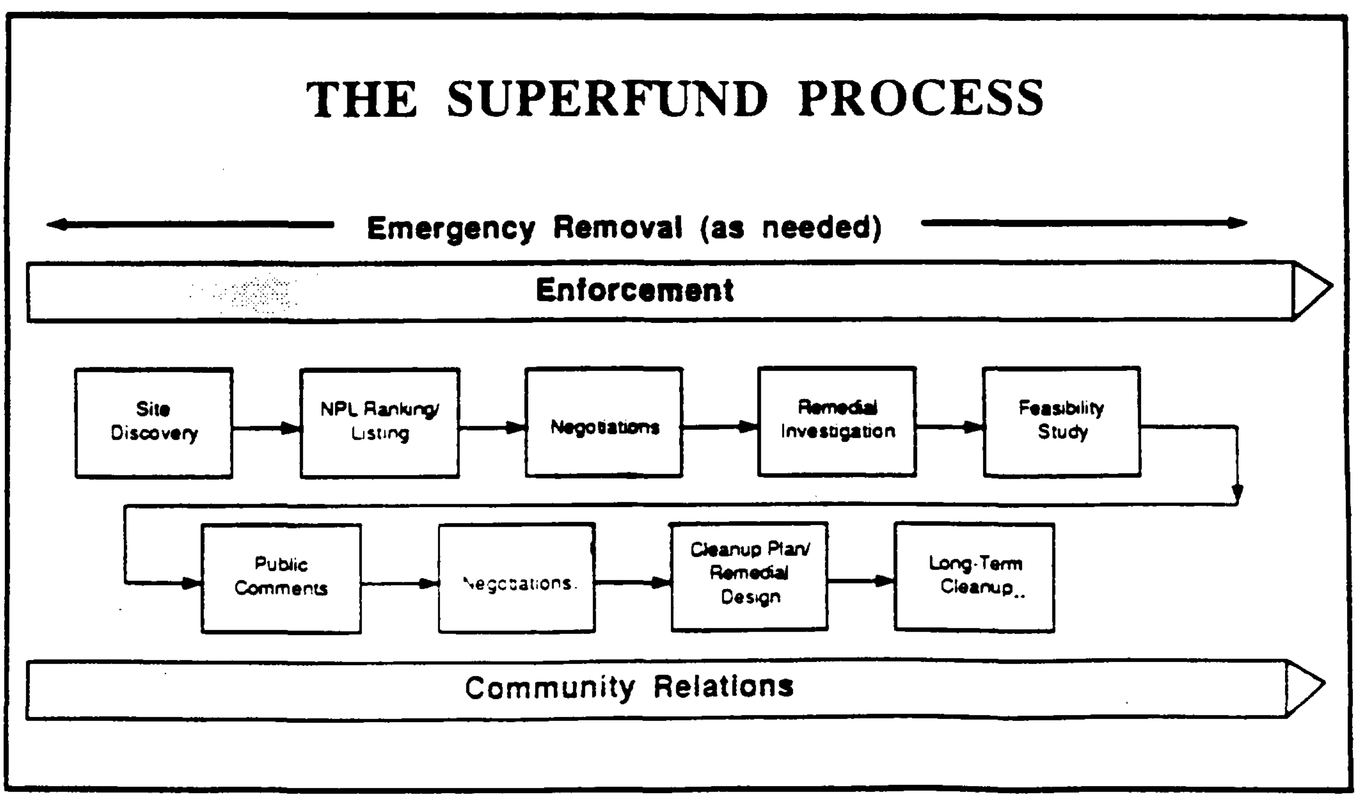
THE SUPERFUND PROCESS

The diagram below illustrates, in a simplified manner, the many aspects of the process for investigating and cleaning up a Superfund site. After a site is discovered, EPA investigates and ranks the site using a system that takes into account:

- o Potential health risks to the human population.
- o Potential hazards (for example, from direct contact, inhalation, fire, and/or explosion) of substances at the site.
- o Potential for substances at the site to contaminate drinking water supplies.
- o Potential for substances at the site to pollute or harm the environment.

If the site's problems are serious enough, it is placed on the EPA's NPL, a roster of the nation's worst hazardous waste sites. Sites on the NPL are eligible for federal Superfund cleanup money. EPA negotiates with ***potentially responsible parties (PRPs)*** to pay for and conduct site studies.

Next, EPA or the PRPs conduct an RI to assess the extent of the contamination, the type of contaminants present, and the potential risks to the environment and the public health at the site. At the Old Southington Landfill site, three PRPs (the Town of Southington, Pratt & Whitney, and SRSNE) are conducting the studies with EPA oversight. The RI is followed by a ***Feasibility Study (FS)***, which examines the feasibility of various clean-up alternatives. Following public comment on the FS, a specific cleanup plan is then chosen by EPA from these alternatives.



EPA's choice of a cleanup plan is documented in the ***Record of Decision (ROD).*** After the details of the cleanup plan are designed, the actual cleanup can begin. -

The time required to complete an RI/FS, hold negotiations between EPA and the PRPs, complete the design of the selected remedy, and implement the remedy may take many years. If groundwater is contaminated, the final cleanup can take decades. Obtaining legal access to the Old Southington Landfill site and analyzing field investigation results have delayed the RI process at the Old Southington Landfill site.

Ongoing activities during the Superfund process include monitoring, community relations, and enforcement:

o Periodic monitoring of the site conditions. If a site becomes an imminent threat to public health or to the environment during the normal course of an RI/FS, EPA may conduct an emergency cleanup, known as an emergency removal. No emergency cleanup activities are anticipated at the Old Southington Landfill site.

o Community relations activities. To keep citizens and officials informed and to encourage public input, public meetings and other community relations activities are conducted throughout the cleanup process. Specific activities vary from site to site, depending on the level and nature of community concern. In 1988, EPA interviewed local officials and citizens to develop a community relations plan (CRP). The CRP assists the EPA in developing a program to address community concerns. As part of the community relations program at the Old Southington Landfill site, EPA has published several fact sheets, similar to this, to update the public on the cleanup progress. EPA will continue to provide the public with information updates throughout the cleanup process. Further information about community relations activities and opportunities for public involvement at the Old Southington site is provided on pages 6 and 7 of this fact sheet.

o Enforcement. The Superfund law, passed by Congress in 1980, officially entitled ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*** calls for parties responsible for the contamination at the site to perform or pay for the cleanup process. Parties may be responsible if they owned or own the property, operated the site, transported materials with hazardous substances to the site, or generated material containing hazardous substances that were transported to the site. Under CERCLA, EPA may negotiate with Potentially Responsible Parties (PRPs) or take legal action to have PRPs clean up the site. This part of the Superfund process is called enforcement, and goes on throughout EPA's involvement at the site. The Town of Southington, SRSNE, and Pratt & Whitney have been identified as PRPs at the Old Southington Landfill site. These three PRPs entered into a legal agreement with EPA in 1987 to do the RI/FS and have been planning and conducting the investigative studies at the Old Southington Landfill since then. The PRPs hired GZA GeoEnvironmental, Inc. (GZA), a geohydrological and geotechnical consulting firm, to conduct the RI/FS studies at the site. EPA is overseeing the site activities.

RESULTS OF SITE ACTIVITIES

A work plan for a RI and FS, prepared by GZA for the PRPs and approved by EPA, is available for public review at the EPA Records Center and the Southington Public Library. The addresses and business hours of these locations are listed on page 7.

Field activities and analyses for Phase I of the RI were completed in July 1991. The Phase I study included evaluating existing information, mapp[illegible] the site and surrounding areas, collecting sampl[illegible] and analyzing data. Samples were taken and tests were performed to analyze and characterize the air quality, soil and ***soil gas*** contamination, geology and ***hydrogeology*** in the site area. Tests were also performed to determine the boundaries of the landfill, groundwater, surface water, and sediment quality at and surrounding the Old Southington Landfill site. The test results have been compiled in a 1991 report called the "Revised Draft Remedial Investigation Site Characterization Analysis." The completion of this report concluded Phase I of the Old Southington Landfill site RI. The site characterization report along with EPA comments on this report and GZA's responses to EPA comments are available for public review at the information repositories listed on page 7.

A human health risk assessment and an ecological risk assessment will also be completed and provided in the final RI/FS report.

Test results addressed in the site characterization analysis for each environmental medium are summarized below. Levels of contaminant concentrations in the test samples discussed below are compared with ***background levels*** in samples taken in areas not affected by the landfill.

o Air/Soil Gas - Preliminary screening of ***ambient air*** for organic vapors, oxygen, and combustible gases indicate no immediate threat to the public or to the environment.

A soil gas survey was conducted to help identify potential areas of high concentrations of VOCs in soils. The soil gas survey of the study area located two areas of VOCs within the landfill mass, one in the central area of the site and the other along the southern part of the site. Subsequently, soil borings were conducted in those areas to further investigate this contamination.

o Soil/Refuse - Numerous soil borings and soil samples so far have shown that the thickness of refuse in the landfill ranges from three to 31 feet. The estimated volume of refuse is 230,000 cubic yards of mixed solid waste consisting of wood, paper, plastic, metal, and rubber in a mixture of sand and gravel. Much of the refuse is to the west and south of Black Pond and is located within the groundwater.

Low levels of VOCs were found at many of the locations sampled in the landfill area. However, in the areas of the landfill where contaminated soil gas was found, high levels of VOCs were found. The primary VOCs detected in soil/refuse and soil gas were ***benzene, toluene, ethyl benzene, xylene, tetrachloroethene,*** and ***trichloroethene***. These compounds are the contaminants most likely to migrate from the site due to their chemical and physical properties.

Soil and refuse samples from within and immediately below the refuse indicate that ***polychlorinated biphenyls (PCB)s, pesticides,*** and ***cyanide*** are present at low levels at some of the locations sampled. Pesticides and PCB compounds typically do not migrate easily due to their chemical and physical properties.

Semi-volatile organic compounds (SVOCs) found in the study area were mostly ***polynuclear aromatic hydrocarbons (PAHs)*** and ***phthalates***. SVOCs were detected above background concentrations in soil/refuse samples at several locations throughout the landfill area.

Many metals are naturally present in soils and are essential to plant growth. However, soil samples collected within the landfill area were found to contain several metals at concentrations above background levels including ***antimony, cadmium, chromium,*** and ***lead***.

o Groundwater - Groundwater tests show that groundwater generally flows west-northwest from the site toward the Quinnipiac River.

Groundwater samples collected from the landfill area and west of the landfill indicate the presence of several VOCs including ***1,2-dichloroethene, vinyl chloride,*** trichloroethene, tetrachloroethene, benzene, toluene, and xylene. Several of these compounds were detected at levels above existing federal and state drinking water standards known as *maximum contaminant levels (MCLs)*. As noted previously, VOCs easily migrate from the site.

Groundwater samples from the landfill also indicate the presence of SVOCs, PCBs, pesticides, and cyanide in a limited number of locations beneath the landfill.

Groundwater is also contaminated by ***metals***. A limited number of metal concentrations exceed MCLs including antimony, cadmium, ***beryllium***, and lead.

o Surface Water/Wetlands - Black Pond and its outlet stream are the major surface water bodies in the study area that collect runoff from surrounding roadways and industrial, residential, and commercial properties. South of Black Pond and the Meriden Box Company access roadway is a small wetland area. This area is connected to Black Pond by a culvert.

Surface water and sediments from the wetland area contain low levels of VOCs and elevated levels of metals. VOCs and metals were also detected in surface water and sediment samples collected from Black Pond and the outlet stream, but at lower levels than in the wetland area. SVOCs were detected at relatively high levels in sediments in the outlet stream and in the wetland.

CURRENT SITE ACTIVITIES

EPA and the three PRPs have begun Phase II of the RI. The PRPs are now preparing a work plan, for EPA approval, that describes additional field work necessary to answer questions raised during the Phase I studies and to provide information essential for developing potential cleanup alternatives for the site. This includes further defining the full extent of the groundwater contamination and the quantity and extent of soil and refuse contaminants. Once the work plan has been approved by EPA, the field work for Phase II of the RI will begin. This work is expected to start in the fall of 1991.

Currently, EPA is also reviewing evidence and conducting investigations to find additional parties that may be potentially responsible for contamination at the site under Superfund.

OPPORTUNITIES FOR PUBLIC COMMENT

Following completion of the Phase II RI studies, the RI report will be prepared. After release of the report, anticipated in early 1992, EPA will hold a public meeting to present results obtained in the RI and invite the public to comment on the studies. EPA welcomes public comment at any time during the Superfund process.

Preliminary work on the FS has begun. The FS uses information obtained in the field investigations to develop, screen, and evaluate the best possible cleanup methods available.

When both the RI and FS are completed, the EPA will publish, for public comment, a proposed plan that presents EPA's preferred alternative for addressing the site contamination. An informational public meeting will be held by EPA to present and explain its proposed cleanup plan and for the public to ask questions about the plan. A 30-day public comment period will follow, during which time the public is encouraged to comment on the proposed plan, and the RI/FS. During this formal public comment period, an informal public hearing will be held so that the public may comment orally on the proposed plan. EPA will respond in writing to all public comments received during the 30-day public comment period. A Record of Decision (ROD) that describes the remedy EPA has selected to clean the site and includes EPA's responses to the public's comments will be issued following the comment period.

SUPERFUND TECHNICAL ASSISTANCE GRANT (TAG) PROGRAM

The Superfund Technical Assistance Grant (TAG) program was established under the Superfund Amendments and Reauthorization Act (SARA) of 1986. These grants of up to $50,000 per Superfund site are designed to enable community groups to hire a technical advisor or consultant to assist them in interpreting and commenting on site findings and proposed cleanup actions. Further information on the TAG program is available from:

Michael J. McGagh
U.S. EPA Region I
JFK Federal Building (HPC-CAN3)
Boston, MA 02203
(617) 223-5534

A TAG was awarded in the beginning of July 1991 to a local group called the Southington Association for the Environment (SAFE) to assist the public at the Solvents Recovery Services of New England Superfund Site in Southington. A second $50,000 grant is still available to a group interested in the Old Southington Landfill site.

ADDITIONAL INFORMATION

Additional information about the Old Southington Landfill Superfund Site is available at the following loc ns:

Southington Public Library
255 Main Street
Southington, CT 06489
(203) 628-0947

Contact: Audrey Brown, Director

Hours:

Monday through Thursday, 9:15 am to 9:00 pm
Friday and Saturday, 9:15 am to 5:00 pm
Closed Saturdays in July and August

and

EPA Records Center
90 Canal Street
Boston, MA 02114
(617) 573-5729

Contact: Evo Cunha

Hours:

Monday through Friday, 8:30 am to 1:00 pm
2:00 pm to 5:00 pm

or contact:

Almerinda Silva
Project Manager
U.S. Environmental Protection Agency
JFK Federal Building (HEC-CAN6)
Boston, MA 02203
(617) 573-9627

or:

Susan Frank
Community Relations Coordinator
U.S. Environmental Protection Agency
JFK Federal Building (RPS)
Boston, MA 02203
(617) 565-3419

Information regarding Southington's other NPL site, the Solvents Recovery Services Superfund Site, may also be obtained from Susan Frank at the above address.

GLOSSARY

Ambient Air - Any unconfined portion of the atmosphere: open air, surrounding air.

Antimony - A metal used in the manufacture of alloys used to make tableware, bullets, and bearings; in fireworks; for blackening iron and coating metals. Antimony and its compounds have been reported to cause eye and skin inflammation, and nasal passage sores through direct contact, fumes, or dust.

Background Level - The concentration of a given contaminant resulting from non-site related, natural, and/or man made sources.

Benzene - A highly flammable liquid with a distinct odor used in the manufacture of medicinal chemicals, dyes, artificial leather, linoleum, oil cloth, airplane fuel, gasoline, varnishes and lacquers, and as a solvent for waxes, resins, and oils. Benzene has been listed as a cancer-causing substance by the EPA.

Beryllium - A toxic metal used in aerospace structures, radio tube parts, and in nuclear reactors. EPA has listed beryllium as a cancer-causing substance.

Cadmium - A toxic metal that accumulates in the environment and is used to make alloys for batteries, dental amalgams, and electroplating. Cadmium and certain cadmium compounds have been listed as cancer-causing by the EPA.

Chromium - A metal used in the manufacture of stainless steel. Chromium has been listed as a cancer-causing substance by the EPA.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Act created a tax on the chemical industry that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under Superfund, EPA can either: (1) pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or (2) take legal action to force parties responsible for site contamination to clean up the site or reimburse the Superfund for the cost of the cleanup.

Cyanide - A toxic compound used in the extraction of gold and silver from ores, dye manufacturing, electroplating, photography, and as a fumigant and insecticide. Exposure to low concentrations of cyanide may cause headaches, nausea, and vomiting, and in high concentrations can be fatal.

1,2-Dichloroethene - A liquid with an ether-like odor used as a solvent for fats, in rubber manufacturing, as a refrigerant, and as an additive to dye and lacquer solutions.

Ethyl Benzene - A flammable liquid used as an intermediate in the production of other chemical compounds. Exposure to ethyl benzene causes irritation to eyes, skin, mucous membranes, and in high concentrations causes drowsiness.

Feasibility Study (FS) Report - A report that summarizes the development and analysis of remedial alternatives that EPA considers for the cleanup of Superfund sites.

Groundwater - Water found beneath the earth's surface that fills pores between media such as sand, soil, and gravel, and often serves as a principal source of drinking water.

Hydrogeology - The study of groundwater properties and groundwater movement through the earth's subsurface.

Lead - A metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations.

Maximum Contaminant Levels (MCLs) - A federal regulatory standard that sets the maximum permissible level of a contaminant in water delivered to any user of a public water system.

Metals (or Inorganic Compounds) - Chemical substances of mineral origin, not carbon structured such as antimony, cadmium, and lead.

National Priorities List (NPL) - EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. A site must be on the NPL to receive money from the Superfund for remedial action. EPA is required to update the NPL at least once a year.

Organic - Referring to or derived from living organisms. In chemistry, any compound containing carbon such as benzene, toluene, xylene, and trichloroethene.

Pesticide - A substance intended for preventing, destroying, repelling, or mitigating any pest. Also, any substance intended to regulate, defoliate or dry plants. Pesticides can contaminate the environment if misused.

Phthalates - An organic compound used in the manufacture of dyes, resins, plasticizers, and insecticides.

Polychlorinated Biphenyls (PCBs) - A group of toxic persistent chemicals used to insulate transformers, and in gas pipe systems as a lubricant. Sale and new use of PCBS has been banned by federal law.

Polynuclear Aromatic Hydrocarbons (PAHs) - A group of organic chemicals present in substances such as coal tar, dyes, steroids, and cigarette smoke. These compounds are typically solids and do not dissolve in water. Some PAHs are known or suspected to cause cancer in humans and/or laboratory animals.

Potentially Responsible Parties (PRPs) - Individuals or companies who are potentially responsible under CERCLA for contributing to contamination at a Superfund site. Whenever possible, EPA requires PRPs (such as owners, operators, transporters, or generators) through administrative and judicial legal act s to pay for or conduct the cleanup of hazardous waste sites with which they may have source connection.

Record of Decision (ROD) - An EPA document released to the public that describes EPA's selected cleanup alternative or combination of alternatives to be used at an NPL site. The Record of Decision is based on information and technical analysis generated during the Remedial Investigation/Feasibility Study (RI/FS) and on consideration of public comments and community concerns.

Remedial Investigation (RI) Report - A summary report of the information collected on the nature and extent of contamination found at a Superfund site and the risks that the contamination may pose. This information is used to develop types of cleanup options that are evaluated in the Feasibility Study.

Sediment - Material that settles to the bottom of a stream, lake, or wetland area or other body of water.

Semi-Volatile Organic Compounds (SVOCs) - A type of volatile organic compound that is heavier in weight and has as higher vapor pressure such that it does not volatize (or evaporate) as readily as other VOCs. Man-made SVOCs include such substances as pesticides and PCBs. Some SVOCs are known to cause cancer.

Soil Gas - Gas contained within the spaces in soils.

Tetrachloroethene - A non-flammable liquid chemical used in dry cleaning, for degreasing metals, and as a solvent. Tetrachloroethene can cause skin inflammation and in high concentrations causes drowsiness.

1,1,1-Trichloroethane - A non-flammable liquid chemical used in cold-type metal cleaning and in cleaning plastic molds. This chemical is irritating to eyes, mucous membranes, and in high concentrations causes drowsiness.

Trichloroethene - A nonflammable liquid with an odor resembling chloroform, used as a solvent for fats, waxes, resins, oils, rubbers, paints, and varnishes. Moderate exposures can cause symptoms similar to drowsiness. Higher concentrations can have a narcotic effect.

Toluene - A flammable liquid used in the manufacture of dyes and explosives; as a solvent for paints, lacquers, gums, and resins; and as a gasoline additive. Toluene may cause mild anemia and in high concentrations causes drowsiness.

Vinyl Chloride - A chemical compound used in producing some plastics that is believed to cause cancer.

Volatile Organic Compounds (VOCs) - Chemical compounds composed primarily of carbon and hydrogen, including materials such as oils, pesticides, and solvents, which are characterized by their tendency to evaporate to the air from water or soil.

Xylene - A flammable liquid used as a solvent to manufacture dyes and polyester fibers; and as a cleaning agent. Xylene may cause drowsiness in high concentrations.

Mailing List Additions

If you or someone you know would like to be placed on the Old Southington Landfill site mailing list, please fill out and mail this form to:

Susan Frank
U.S. EPA, Region I
Office of External Affairs, RPS
John F. Kennedy Federal Building
Boston, Massachusetts 02203
(617) 565-3419

Name: ____________________

Address: ____________________

Affiliation: ____________________ Phone: __________

United States
Environmental Protection Agency

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Superfund Update

Mailing List Additions

If you or someone you know would like to be placed on the Old Southington Landfill site mailing list, please fill out and mail this form to:

Jim Sebastian
Community Relations Coordinator
U.S. EPA, Region I
JFK Federal Building
Boston, MA 02203

Name: ____________________

Address: ____________________

Affiliation: ____________________

☐ ***Please remove my name from the Old Southington Landfill Superfund site mailing list***

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Superfund Program Information Update

Region I

Old Southington Landfill Site
Southington, Connecticut

August, 1992

Methane Gas Concerns at the Old Southington Landfill Superfund Site

INTRODUCTION

The U. S. Environmental Protection Agency (EPA) has recognized, for some time, the potential for landfill gas migration at the Old Sothington Landfill site, located in Southington, Connecticut. However, it wasn't until November 1991, that EPA was informed by the Connecticut Department of Health Services (CT DHS) that methane, and possibly other landfill gases, were migrating into commercial buildings on-site. Since that time, EPA has consulted with the CT DHS, the Connecticut Department of Environmental Protection (CT DEP), the Agency for Toxic Substance and Disease Registry (ATSDR), the Occupational Safety and Health Administration (OSHA), the Town of Southington Fire Department (SFD) and EPA's Environmental Services Division, Emergency Planning and Response Branch (EPRB) to establish a program to monitor potential migration of landfill gases into buildings near or on-site (see Figure 1 on page 2). The purpose of the monitoring program is to ensure the safety of residents and personnel working in the commercial buildings. Residents and workers should be aware and should understand the potential hazardous situations (fire/explosion) associated with methane and participate in the methane monitoring program.

This Information Update was prepared by EPA to provide residents and workers with accurate information regarding the nature and status of combustible landfill gas investigations at the Old Southington Landfill site. The focus of this information update is on methane due to the fact that methane typically makes up the largest volume of landfill gas, it has explosive properties, and the ability to carry other gases into the atmosphere. Specifically, this Information Update provides a brief site history, a description of the properties of these gases, its sources, a summary of on-site monitoring activities, and a discussion of upcoming activities to alleviate and address gas migration. Recommendations to alleviate the gas problem, and references and contacts for further information about the Old

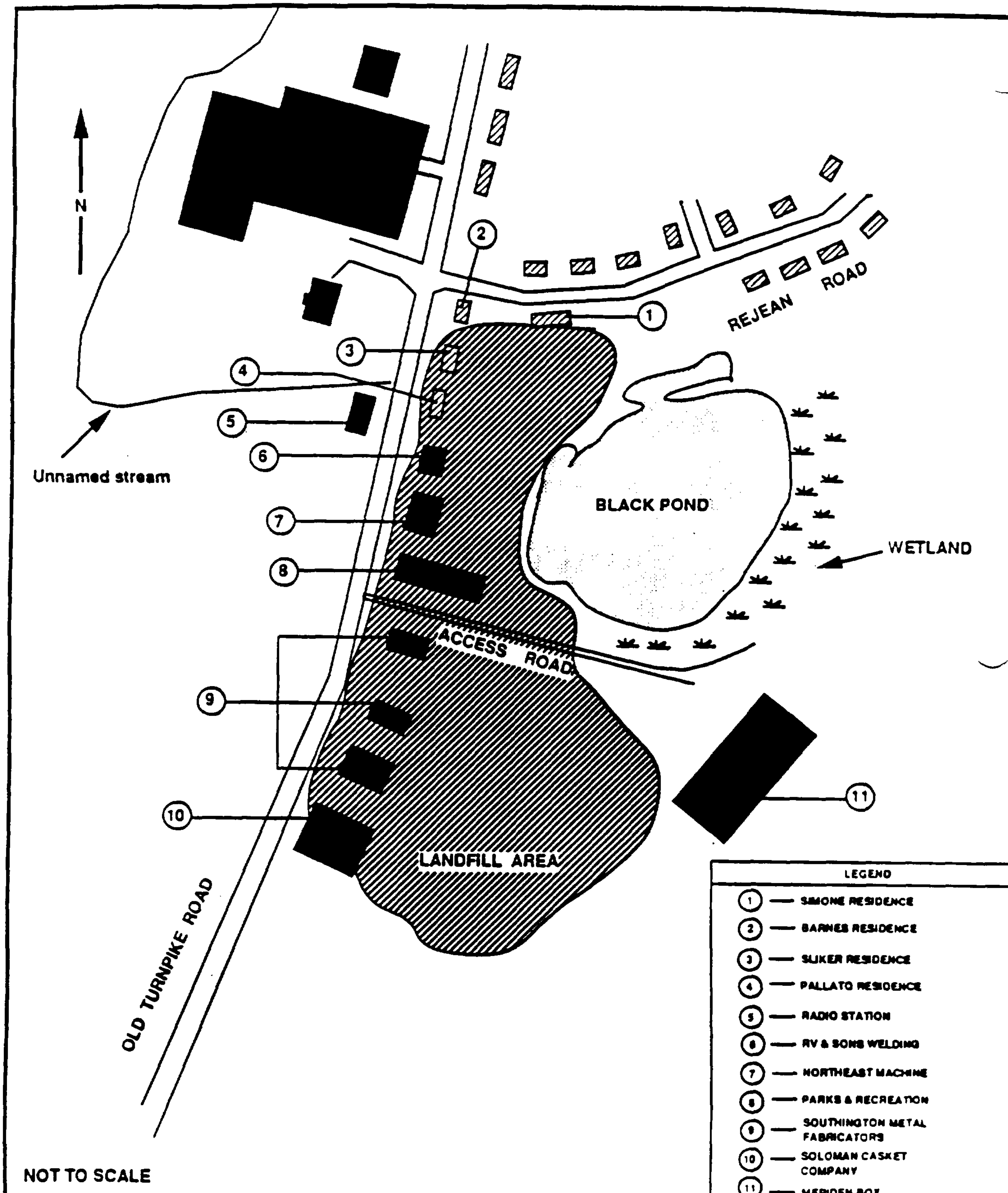

FIGURE 1
OLD SOUTHINGTON LANDFILL SITE MAP
SOUTHINGTON, CONNECTICUT

Southington Landfill site are identified.

SOURCES OF METHANE

Landfills commonly generate methane gas as a result of the natural decomposition of organic materials present in landfill refuse. Typically, landfill materials through their decomposition process, break down into approximately 50% methane, 40% carbon dioxide, with the remaining percentage consisting of nitrogen, with some traces of ammonia, hydrogen sulfide and other gases. As the decomposition process reaches completion, the generation of methane gas ceases, but methane gas may remain trapped in the subsurface. Over time, as the wastes become compacted and compressed, pressure may build up in the landfill. The amount of gas pressure depends largely on whether gas is trapped or still being generated. This pressure can cause gases to migrate through the soil and potentially escape to the surface. Gases that do escape can dissipate into the atmosphere or seep into buildings and collect in confined spaces.

Methane gas and other combustible landfill gases are routinely measured with a combustible gas indicator (CGI), an instrument that measures the percentage of combustible gases (gases that can be ignited and burned) in the atmosphere. Results are presented as percentages of the lower explosive limit (LEL) of methane. The LEL is the minimum amount of gas required in air, by volume, to sustain combustion (5% for methane).

PROPERTIES OF METHANE

Methane is a flammable, colorless, tasteless and odorless gas. Methane gas, in the presence of a sufficient concentration of oxygen and an ignition source (such as a cigarette or static electricity spark), can be ignited and burned. When a sufficient amount of methane gas (approximately 5-15% methane mixed with air) is confined in a small enough space (such as a closet), an explosion may occur. In rare cases, significant volumes of methane can displace available oxygen inside of a building, causing possible asphyxiation of the building occupants. Because of the characteristics described above, methane gas must be monitored to prevent hazardous situations. To date, methane levels that have been recorded have not been great enough to cause explosion or asphyxiation.

CHRONOLOGY OF METHANE GAS RELATED ISSUES

Prior to November 1991, several studies were conducted to investigate landfill combustible gas levels at the Old Southington Landfill. These studies involved the measurement of gases, both inside and outside selected landfill buildings. In addition, a pilot gas venting system study was conducted by a consultant to the Town of Southington in 1990 - 1991.

Table 1 on page 7, provides a chronological history of the activities to date that concern the methane gas issue. In November 1991, EPA was notified by the CT DHS that there were reports of methane gas being ignited in the floor cracks, during welding operations, at a Southington Metal Fabricator building. In addition, town employees reportedly complained of feeling ill when inside the Parks and Recreation Building. Subsequently, the Southington Fire Department (SFD) was asked to monitor for explosive conditions in the on-site buildings. As a result of that investigation, the potentially responsible parties (PRPs) provided combustible gas alarms to the SFD for distribution to the on-site commercial buildings and residences. The PRPs are companies who are potentially responsible under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for contributing to contamination at the Superfund site and include the Town of Southington, Pratt and Whitney-United Technologies, Inc., and Solvent Recovery Service of New England. EPA notified each business and residence that alarms were available and encouraged everyone to obtain one from the SFD. Commercial building owners and the residences have been provided with instructions to follow in the event of an alarm sounding.

On several occasions, monitoring activities have indicated the presence of low to high levels of landfill gases in the floor cracks of the Parks and Recreation Building and the northern and southernmost Southington Metal Fabricator Buildings (see Table 1 on page 7 and Figure 1 on page 2). ATSDR, in its July 1, 1992, Health Consultation report indicated that due to the ceiling height, floor space, and adequate daily ventilation of the structures, it is unlikely that enough methane could accumulate in these buildings to cause an explosion or health hazard. However, the report notes that accumulation of methane gases in a small, confined space, such as a closet, is possible and could create a dangerous situation.

Several measures have been taken to address landfill combustible gas migration in these buildings. In addition to the monitoring alarms mentioned above, the SFD has been conducting monitoring regularly for combustible gases in the on-site buildings.

CURRENT STATUS

A Remedial Investigation (RI) of the landfill is being conducted by the PRPs under an EPA Consent Order. This work is being done pursuant to CERCLA because the site is ranked on the National Priority List. The RI is an intensive investigation of the potential impacts of the landfill on human health and the environment. This includes investigations of contamination of soil, groundwater, surface water, and air on or migrating from the site. The investigation of potential impacts of landfill gases is part of the RI process.

On July 15, 1992, in response to recent reports of combustible gases entering the buildings at the site, the CT DEP issued an administrative order to the Town of Southington. The CT DEP withdrew the Order on August 14, 1992 based upon a written commitment by the Town of Southington to perform and implement the activities outlined in a letter dated August 14, 1992 by the Director of the Permitting, Enforcement and Remediation Division of CT DEP. Under this commitment, the PRPs have conducted or will conduct the activities that are listed below. EPA and CT DEP feel that the recent discovery of combustible gases in buildings warrants immediate investigation and action. This work does not interface with or duplicate the more extensive remedial investigation underway for the entire site. Information gathered during performance of these measures will be used in determining a final clean-up plan for the site.

<u>Short-Term Measures (2 weeks - 1 month)</u>

The PRPs have completed the following:

- o Inspect and monitor all buildings which are potentially impacted by landfill gases both on-site and off-site for: floor cracks; actual or potential settling; actual or potential entry points for landfill gases; and for the presence of landfill gases. This activity is ongoing.
- o Provide combustible gas alarms to be installed at appropriate interior locations to detect the intrusion of landfill gases at all buildings on-site, and all buildings off-site where the presence of landfill gases emanating from the site is detected or may reasonably be expected to be found.
- o Monitor and immediately seal all known or potential entry points for landfill gases in each building where landfill gases have been detected.
- o Where entry points are detected that indicate combustible gases are collecting beneath or entering the buildings, use of passive ventilation is acceptable as a short-term measure.

Intermediate Measures (1 month - 6 months)

The PRPs will:

- o Assess those buildings where remedial action such as passive ventilation was instituted, for the action's effectiveness and to evaluate the need for any additional measures. Submit a report to the CT DEP at the conclusion of the six month period regarding the effectiveness of all remedial actions performed as of that date. Include recommendations for additional or alternative actions to be performed.

- o Continuously evaluate the passive ventilation program proposed for the northern- and southern-most Southington Metal Fabricators buildings and the Parks and Recreation building.

- o If off-site migration of landfill gases is detected, propose a plan for appropriate screening and engineering measures to eliminate this condition.

- o Provide for an ongoing inspection and monitoring program of all potentially effected buildings every two weeks. At the conclusion of the six month period submit any recommendations for alteration of the inspection and monitoring frequency.

- o Include within the inspection program a log to be maintained of all inspections.

- o Provide a copy of the log on a monthly basis to CT DEP and EPA project managers. The log shall be accompanied by a cover letter which acknowledges that the Town Manager has reviewed and is familiar with the information contained therein.

Long Term Measures (6 months - 1 year)

The PRPs will:

- o Commit to implement additional remedial measures as determined necessary, including, but not limited to active ventilation systems to prevent landfill gases from entering buildings and landfill gas migration off-site. A permanent solution to the problem of landfill gases potentially endangering human health is required.

- o Provide a specific, detailed time schedule for the performance of monitoring or remedial actions to address the long term problems of settling, current and future floor slab cracks, intrusion of gases into on-site or off-site affected or potentially affected buildings, and lateral migration of gases.

ADDITIONAL INFORMATION

Additional information about the Old Southington Landfill Superfund Site is available at the following locations:

Director's Office at the Southington Public Library
255 Main Street
Southington, CT 06489
(203) 628-0947
Contact: Audrey Brown, Director's Office
Hours: Monday - Thursday, 9:15 am to 9:00 pm
Friday and Saturday, 9:15 am to 5:00 pm
Closed Saturdays in July and August

AND

EPA Records Center
90 Canal Street
Boston, MA 02114
(617) 573-5729
Contact: Ellen Culhane
Hours: Monday - Friday, 8:30 am to 1:00 pm, and 2:00 pm to 5:00 pm

OR CONTACT:

Almerinda Silva
Project Manager
U.S. Environmental Protection Agency
JFK Federal Building (HEC-CAN6)
Boston, MA 02203
(617) 573-9627

OR:

Jim Sebastian
Community Relations Coordinator
U.S. Environmental Protection Agency
JFK Federal Building (RPS)
Boston, MA 02203
(617) 565-3423

SITE BACKGROUND AND HISTORY

The Old Southington Landfill Superfund site was operated as a municipal and industrial landfill between 1920 and 1967. Liquid, solid and hazardous wastes were disposed of at the landfill. In 1967, the landfill was closed. Later, the property was sold, subdivided and developed into residential, industrial and commercial properties. In 1984, the site was placed on EPA's National Priorities List of hazardous waste sites due to groundwater contamination in the vicinity of the landfill. Currently, Remedial Investigation (RI) activities are underway to assess the extent of groundwater, surface water and soil contamination. Potential risks to the environment and the public, including those risks associated with landfill combustible gases are also being investigated. Figure 1 on page 2, provides a layout of the landfill site.

Initial field investigations of the extent of landfill contamination and potential health and environmental effects were initiated by the potentially responsible parties (PRPs) in fall 1988 as a part of the Remedial Investigation and Feasibility Study (RI/FS) for addressing site contamination. The second phase of field investigations was initiated by the PRPS in May 1992 and is currently ongoing.

TABLE 1
OLD SOUTHINGTON LANDFILL
CHRONOLOGICAL HISTORY OF METHANE RELATED ACTIVITIES

Date	Agency	Activity	Outcome/Results
1985-1986	Town of Southington Consultant	Monitored selected buildings and gas wells for methane gas.	Methane detected in floor cracks of one building and in a closet and bathroom. Gas well study indicated low to high levels of methane present in landfill soils. Town asks consultant to conduct landfill venting system study.
4/10/89	PRP Consultant	Landfill combustible gas monitored at base of on and off-site structures.	No elevated combustible gas readings were recorded.
7/90 to 9/91	Town of Southington Consultant	Conducted test of pilot venting system.	Recommendations for periodic monitoring in potentially affected structures.
11/91	CT DHS	Informed EPA of combustible gas problems at commercial buildings on-site.	EPA requests input on combustible gas problem from ATSDR, CT DEP, CT DHS, and SFD.
11/91	SFD	Monitored on-site commercial buildings for combustible gas.	Employees from the Parks and Recreation building were asked to leave for the remainder of the day. The building was ventilated and cracks in the floor were sealed.
11/91	EPA-ERPD, SFD	Monitored on-site commercial buildings for combustible gases.	Moderate to high levels of methane were detected in floor cracks at the Town Parks and Recreation building.

TABLE 1 (continued)
OLD SOUTHINGTON LANDFILL
CHRONOLOGICAL HISTORY OF METHANE RELATED ACTIVITIES

Date	Agency	Activity	Outcome/Results
11/91 (continued)	SFD	Businesses and residences on-site are monitored every two weeks if access is available. Residents, if not available during working hours, may also make an appointment with SFD.	Combustible gas levels were not detected in resident's homes.
12/91	EPA EPRB, SFD	Performed an on-site air monitoring survey. Monitored 3 residences and 9 commercial buildings for combustible gases.	One commercial building had elevated levels of combustible gases (possibly industry related). Town Parks and Recreation and Southington Metals Fabricator buildings had above background levels of methane. Remaining buildings and residences which were monitored had no readings above normal background levels.
2/92	SFD	Provided combustible gas alarms to commercial building owners and residences.	Combustible gas alarms were provided to on-site buildings at owner's request. Instructions were given outlining proceedures to follow in the event of an alarm sounding.
6/92	CT DHS, SFD	Monitored buildings for combustible gases.	High readings in floor cracks in Parks and Recreations and in Southington Metal Fabricators. Workers in Southington Metal Fabricators reported alarms sounding in mornings. EPA referred federal OSHA to investigate buildings where there were worker complaints.

TABLE 1 (continued)
OLD SOUTHINGTON LANDFILL
CHRONOLOGICAL HISTORY OF METHANE RELATED ACTIVITIES

Date	Agency	Activity	Outcome/Results
6/22/92	Federal OSHA	Monitored Southington Metal Fabricator buildings.	Floor crack readings for combustible gases ranged from moderate to high.
6/22/92	State OSHA, SFD	Monitored Town Parks and Recreation building.	Floor crack readings for combustible gases were high. SFD results concur.
6/25/92	EPA-EPRB, SFD	Monitored buildings on the landfill.	No methane levels detected at residences. Two commercial buildings without previous methane problems were not available for monitoring. All other commercial buildings including the Parks and Recreation and Southington Metal Fabricators buildings had no significant methane readings above normal background levels.
6/26/92	PRPs	Distribution of methane monitoring plan.	The plan describes past and future monitoring activities.
7/1/92	ATSDR	Issues Health Consultation report.	ATSDR recommends: Fixed methane monitors be installed in lower floors of all buildings on the landfill. All floor and foundation cracks be sealed Expediting the planned EPA soil gas study. Conducting periodic indoor air monitoring at likely gas collection points (cabinets, closets, etc.).

TABLE 1 (continued)
OLD SOUTHINGTON LANDFILL
CHRONOLOGICAL HISTORY OF METHANE RELATED ACTIVITIES

Date	Agency	Activity	Outcome/Results
7/15/92	CT DEP	Issues Order to Town of Southington and landfill property owners.	Order requires: • Field investigations of landfill gas presence and migration. • Evaluation of remedial alternatives. • Carry out remedial actions.
7/16/92	Federal OSHA	Cited Southington Metal Fabricators.	Southington Metal Fabricators to comply with citation.
7/92 - 8/92	PRP Consultant	As part of the RI/FS activities, testing for methane and toxic gases is being conducted across the site (outside of buildings).	Preliminary results show elevated methane across southern area of site and a few high readings in the northern part of the site.
8/13/92	CT OSHA	Cited Town of Southington (Parks & Recreation Building).	Town of Southington to comply with citation.
8/14/92	CT DEP, Town of Southington	CT DEP order is withdrawn. Town commits to perform and implement measures.	Town will conduct short, intermediate and long-term measures to study and address the landfill gas problem.

Notes:
ATSDR - Agency for Toxic Substances and Disease Registry
CT DEP - Connecticut Department of Environmental Protection
CT DHS - Connecticut Department of Health Services
EPA - US Environmental Protection Agency
EPRB - Emergency Planning and Response Branch
OSHA - Occupational Safety and Health Administration
PRP - Potentially Responsible Parties
SFD - Southington Fire Department

Mailing List Additions/Deletions/Changes

If you or someone you know would like to be added to (or deleted from) the Old Southington Landfill Superfund site mailing list, please fill out and mail this form to:

Jim Sebastian
Community Involvement Coordinator
U.S. Environmental Protection Agency
JFK Federal Building (RPS)
Boston, MA 02203

Name ______________________________
Address ______________________________
Affiliation (optional) ______________________________

☐ ADD ☐ DELETE ☐ CHANGE

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION I - REA
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MA 02203
Forwarding and Address Correction Requested

Old Southington Landfill Site

Official Business
Penalty for Private Use
$300

First Class Mail
Postage and Fees Paid
EPA
Permit No. G-35

UPCOMING ACTIVITIES

The upcoming 1993 activities for this project include:

Remedial Investigation/Feasibility Study (RI/FS) Report: The major function of RI/FS report is to present the results of the RI and the potential cleanup options for the Old Southington Landfill. The RI sections will summarize and discuss the information collected on the type and extent of contamination found at the site. The FS sections will present the development of potential cleanup alternatives which will be evaluated against specific criteria to determine their effectiveness in meeting the cleanup objectives for the landfill.

Risk Assessment Report: The risk assessment will evaluate the potential health and environmental risks that the landfill may pose to humans and ecological receptors that may be exposed to contamination.

Ongoing Gas Monitoring

The potential for landfill gas migration exists at the Old Southington Landfill (OSL). As a general rule, methane makes up the largest volume of gas at landfills. Methane is not a toxic gas. Methane, however, has properties which under very specific conditions could pose a health threat. There are two specific conditions: 1) when approximately 5-15% of methane is confined in a small enough space (such as a closet), and an ignition source is introduced, such as a lit match, an explosion could occur; 2) in rare cases, if sufficient volumes of methane displace available oxygen, in a confined space, asphyxiation could occur. To date methane levels recorded have not been high enough to cause explosion or asphyxiation.

As a safety measure and temporary control, combustible gas alarms have been installed in all of the businesses and homes located on the landfill. If the alarms should sound, the fire department is immediately called to investigate the situation and take all appropriate actions. In addition, the fire department monitors the buildings on the landfill on a regular basis for elevated combustible gas levels, such a methane. To date, no methane or other landfill gases have been detected inside any of the homes located on the northern part of the landfill. On occasion, elevated methane levels have been detected migrating through floor cracks in some of the businesses located on the southern part of the site. These cracks are sealed as soon as methane is detected. To further control the threat of landfill gas migration, venting systems have been installed in the industries where methane has been detected on a continual basis.

As part of the permanent remedy, landfill gases will be controlled and/or treated at the landfill itself to protect the public from all possible adverse health effects.

UPCOMING ACTIVITIES (continued)

EPA's Proposed Plan: The Proposed Plan will present EPA's preferred cleanup alternative along with the other alternatives that were developed and evaluated in the Feasibility Study. The Proposed Plan will be mailed to the public and will be presented at a public meeting to be held in early summer.

Public Comment Period: Following the Proposed Plan public meeting, the public will have the opportunity to comment on EPA's preferred alternative for cleanup. These comments will be considered by EPA prior to the Record of Decision (ROD) for the site.

Record of Decision (ROD): A ROD will be issued following the public comment period and will document EPA's rationale and selection of the preferred remedial alternative for cleanup of the Old Southington Landfill. The ROD will include a Responsiveness Summary which will address the public's comments on the preferred alternative.

Landfill Residents' Relocation: The PRPs have made offers to buy four home located on the landfill and relocate those residents. Negotiations between the PRPs and the homeowners are ongoing.

SUPERFUND TECHNICAL ASSISTANCE GRANT

The Superfund Technical Assistance Grant (TAG) program was established under the Superfund Amendments and Reauthorization Act (SARA) of 1986. These grants of up to $50,000 per Superfund site are designed to enable community groups to hire a technical advisor or consultant to assist them in interpreting and commenting on site findings and proposed cleanup actions.

In January 1993, EPA awarded a TAG to a local citizens group, known as Southington Old Landfill Victims (SOLV). This group has received $50,000 to interpret site related information and to represent the community throughout the cleanup process. SOLV plans to use the services of a technical advisor to complete a detailed analysis of investigation results and proposed remedies, brief SOLV, and prepare written comments on behalf of SOLV. The long term TAG activity will involve the monitoring and analysis of data obtained during the remedial design and construction of the remedy. Ms. Laurie Barnes, president of SOLV, is the community contact for concerns of the locally affected citizens. She can be reached at (203) 686-8905.

Further information on the TAG program is available from:

Michael J. McGagh
U.S. EPA Region I
JFK Federal Building (HPC-CAN3)
Boston, MA 02203
(617) 223-5534

FOR MORE INFORMATION

All EPA reports on the Old Southington Landfill Superfund site, along with general Superfund information, are available for public review at the information repositories established at the following locations:

Southington Public Library
255 Main Street
Southington, CT 06489
Contact: Audrey Brown, Director

SITE BACKGROUND AND HISTORY

The Old Southington Landfill Superfund site was operated as a municipal and industrial landfill between 1920 and 1967. Liquid, solid and hazardous wastes were disposed of at the landfill. In 1967, the landfill was closed. Later, the property was sold, subdivided and developed into residential, industrial and commercial properties. In 1984, the site was placed on EPA's National Priorities List of hazardous waste sites due to groundwater contamination in the vicinity of the landfill. Currently, Remedial Investigation (RI) results are being evaluated to assess the extent of groundwater, surface water sediment and soil contamination. Potential risks to the environment and the public, including those risks associated with landfill combustible gases are also being investigated. Figure 1 on page 3 provides a layout of the landfill site.

Initial field investigations of the extent of landfill contamination and potential health and environmental effects were initiated by the potentially responsible parties (PRPs) in fall 1988 as a part of the Remedial Investigation and Feasibility Study (RI/FS) for addressing site contamination. The second phase of field investigations was initiated by the PRPs in May 1992 and was completed in January 1993. An RI/FS report and Risk Assessment are currently being prepared and are expected to be completed in early summer 1993.

Hours: Monday-Thursday
9:15 a.m. - 9:00 p.m.
Friday and Saturday
9:15 a.m. - 5:00 p.m.
Closed Saturdays in July and August

OR

EPA Records Center
90 Canal Street, 1st Floor
Boston, Massachusetts 02114
(617) 573-5729
Contact: Jim Kyed
Hours: Monday-Friday 10:00 a.m. - 1:00 p.m.
and 2:00 p.m. - 5:00 p.m.

If you have any questions about this site or would like additional information, you may call or write:

Almerinda Silva
Remedial Project Manager
U.S. EPA, Region I
JFK Federal Building (HEC-CAN6)
Boston, MA 02203
(617) 573-9627

OR

Jim Sebastian
Community Relations Coordinator
U.S. EPA, Region I
JFK Federal Building (RPS)
Boston, MA 02203
(617) 565-3423

GLOSSARY

Aquifer - A layer of rock or soil that can supply usable quantities of groundwater to wells and springs. Aquifers can be a source of drinking water and provide water for other uses as well.

Asphyxiation - Unconsciousness caused by lack of oxygen. Prolonged occurrences can result in death.

Background Level - The concentration of a given contaminant resulting from non-site related, natural, and/or man made sources.

Benzene - A highly flammable liquid with a distinct odor used in the manufacture of medicinal chemicals, dyes, artificial leather, linoleum, oil cloth, airplane fuel, gasoline, varnishes and lacquers, and as a solvent for waxes, resins, and oils. Benzene has been listed as a cancer-causing substance by the EPA.

Beryllium - A toxic metal used in aerospace structures, radio tube parts, and in nuclear reactors. EPA has listed beryllium as a cancer-causing substance.

Carbon Disulfide - A poisonous, foul smelling, very flammable liquid used in the manufacturing of rayon, electronic vacuum tubes, and soil disinfectants, and as a solvent for fats, resins, and rubbers.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Act created a tax on the chemical industry that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under Superfund, EPA can either: (1) pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or (2) take legal action to force parties responsible for site contamination to clean up the site or reimburse the Superfund for the cost of the cleanup.

Chromium - A metal used in the manufacture of stainless steel. Chromium has been listed as a cancer-causing substance by the EPA.

1,2-Dichloroethene - A liquid with an ether-like odor used as a solvent for fats, in rubber manufacturing, as a refrigerant, and as an additive to dye and lacquer solutions.

Ethyl Benzene - A flammable liquid used as an intermediate in the production of other chemical compounds. Exposure to ethyl benzene causes irritation to eyes, skin, mucous membranes, and in high concentrations causes drowsiness.

Feasibility Study (FS) Report - A report that summarizes the development and analysis of remedial alternatives that EPA considers for the cleanup of Superfund sites.

Groundwater - Water found beneath the earth's surface that fills pores between media such as sand, soil, and gravel, and often serves as a principal source of drinking water.

Lead - A metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds. Its use has been sharply restricted or eliminated by federal laws and regulations.

GLOSSARY (continued)

Maximum Contaminant Levels (MCLs) - A federal regulatory standard that sets the maximum permissible level of a contaminant in water delivered to any user of a public water system.

Mercury - A liquid metal that can accumulate in the environment and is highly toxic if breathed or swallowed. It is used in barometers, thermometers, fluorescent lamps and dentistry.

Metals (or Inorganic Compounds) - Chemical substances of mineral origin, not carbon structured, such as antimony, cadimuim, and lead.

Nickel - A silvery-white metal used extensively for making stainless steel and coinage. Listed as a carcinogen by EPA.

Organic - Referring to or derived from living organisms. In chemistry , any compound containing carbon such as benzene, toluene, xylene, and trichloroethene.

Pesticide - A substance intended for preventing, destroying, repelling, or mitigating any pest. Also, any substance intended to regulate, defoliate or dry plants. Pesticides can contaminate the environment if misused.

Phthalates - An organic compound used in the manufacture of dyes, resins, plasticizers, and insecticides.

Polychlorinated Biphenyls (PCBs) - A group of toxic persistent chemicals used to insulate transformers, and in gas pipe systems as a lubricant. EPA banned the use of PCBs in 1979 and has classified PCBs as a probable carcinogen.

Polynuclear Aromatic Hydrocarbons (PAHs) - A group of organic chemicals present in substances such as coal tar, dyes, steroids, wood ash, and cigarette smoke. These compounds are typically solids and do not dissolve in water. Some PAHs are known or suspected to cause cancer in humans and/or laboratory animals.

Potentially Responsible Parties (PRPs) - Individuals or companies who are potentially responsible under CERCLA for contributing to contamination at a Superfund site. Whenever possible, EPA requires PRPs (such as owners, operators, transporters, or generators) through administrative and judicial legal actions to pay for or conduct the cleanup of hazardous waste sites with which they may have source connection.

Record of Decision (ROD) - An EPA document released to the public that describes EPA's selected cleanup alternative or combination of alternatives to be used at an NPL site. The Record of Decision is based on information and technical analysis generated during the Remedial Investigation/Feasibility Study (RI/FS) and on consideration of public comments and community concerns.

Remedial Investigation (RI) Report - A summary report of the information collected on the nature and extent of contamination found at a Superfund site and the risks that the contamination may pose. This information is used to develop types of cleanup options that are evaluated in the Feasibility Study.

GLOSSARY (continued)

Sediment - Material that settles to the bottom of a stream, lake, or wetland area, or other body of water.

Semi-Volatile Organic Compounds (SVOCs) - A type of volatile organic compound that is heavier in weight and has a higher vapor pressure such that it does not volatize (or evaporate) as readily as other VOCs. Man-made SVOCs include such substances as pesticides and PCBs. Some SVOCs are known to cause cancer.

Soil Gas - Gas contained within the spaces in soils.

Subsurface Soils - Generally refers to those soils greater than one to two feet below the ground surface.

Surface Soils - Generally refers to those soils located at the ground surface, to a depth of twelve inches.

Trichloroethene - A nonflammable liquid with an odor resembling chloroform, used as a solvent for fats, waxes, resins, oils, rubbers, paints, andvarnishes. Moderate exposures can cause symptoms similar to drowsiness. Higher concentrations can have a narcotic effect.

Toluene - A flammable liquid used in the manufacture of dyes and explosives; as a solvent for paints, lacquers, gums, and resins; and as a gasoline additive. Toluene may cause mild anemia and in high concentrations causes drowsiness.

Vanadium - A toxic, light gray or white lustrous powder used mainly as a steel additive.

Vinyl Chloride - A chemical compound used in producing some plastics that is believed to cause cancer.

Volatile Organic Compounds (VOCs) - Chemical compounds composed primarily of 10 EPA Superfund Fact Sheetcarbon and hydrogen, including materials such as oils, pesticides, and solvents, which are characterized by their tendency to evaporate to the air from water or soil.

Xylene - A flammable liquid used as a solvent; to manufacture dyes and polyester fibers, and as a cleaning agent. Xylene may cause drowsiness in high concentrations.

ATTACHMENT B

Transcript of the July 12, 1994 Informal Public Hearing

EPA REGION I

SUPERFUND PROGRAM

OLD SOUTHINGTON LANDFILL SITE

SOUTHINGTON, CONNECTICUT

PUBLIC HEARING HELD ON JULY 12, 1994

IN RE: SUPERFUND PROGRAM - OLD SOUTHINGTON LANDFILL SITE

HELD BEFORE:

DENNIS P. GAGNE, HEARINGS OFFICER

ALMERINDA P. SILVA, REMEDIAL PROJECT MANAGER

MR. GAGNE: Good evening. Can everybody hear me back there? I guess so. I'm Dennis Gagne, of the U.S. Environmental Protection Agency, and I'm chief of its Connecticut Superfund Section, and I'm also the hearing officer for tonight's public hearing. Almerinda Silva, to my left, a remedial project officer for the Old Southington Landfill Site. The purpose of the hearing is to formally receive oral comments on the proposed plan for the Old Southington Landfill Superfund Site. We will be responding in writing to the comments received tonight and to any written comments that we receive during the comment period.

This hearing is intended to receive your comments. We will not be responding to any comments or questions during the hearing. Our responses will be contained in a document called a Responsiveness Summary which is part of the record of decision. The comment period for the Old Southington Landfill Proposed Plan has been extended an additional thirty days to August 13th, 1994.

Now let me describe the format for the meeting. First, Almerinda will be giving a quick overview of the proposed plan for the Old Southington Landfill Site. Following her presentation, we will accept oral comments for the record. As you can see, we have a court reporter here to record all the comments that we receive. Those of you wishing to comment hopefully have already filled out a card; if not, please fill out one of these cards, they're on the back table, and, I guess, Donna, can you go around and pick up any cards? Just hold your hand up if you've got a card or wish to comment. I'm going to call the cards in the order in which we receive them. And when called, please come up to one of the two microphones and speak clearly so your comments can be heard and properly recorded.

Are there any questions on how we plan on conducting the hearing?

I'd like to ask Almerinda, then, to give a quick overview of the proposed plan.

MS. SILVA: Good evening, everybody. The U.S. Environmental Protection Agency has proposed a clean-up plan referred to as the preferred alternative to address contamination at the Old Southington Landfill Site in Southington, Connecticut. The proposed alternative is EPA's preliminary selection of a remedy and may be changed if public comment or new information is presented to EPA during the public comment period that significantly affects EPA's evaluation of the alternatives.

The EPA and Connecticut Department of Environmental Protection have closely reviewed the data in the remedial investigation and feasibility study, and agree that additional data needs to be collected and an evaluation performed in order to be able to select a complete ground water remedy at and down-gradient of the site. The agencies also agree enough information is available to proceed with all other aspects of the remedy. Therefore, the decision process has been divided into two phases or operable units. The remedy for operable unit one is what we currently -- excuse me -- the remedy for operable unit one is what is currently being proposed in the proposed planned and consists of all components of the remedy except ground water. The second operable unit will follow the record of decision for operable unit one and will further study and evaluate a complete ground water remedy at and down-gradient of the site.

The following are the components of the preferred alternative, SC6, where SC stands for source control: Relocate all homes and businesses from the landfill; excavate and consolidate discrete materials from SSDA1, which we refer to as the hot spot area, and place it in a lined cell within the southern part of the landfill, above the ground water table; install a soil gas collection system throughout the entire landfill area to prevent gas build-up under the cap and to select the landfill -- excuse me -- and to collect the landfill gasses. Pre-design studies would determine if treatment of the gasses is necessary. Construct a single barrier low-permeability cap on the northern part of the landfill and a RCRA subtitle C composite low permeability cap on the southern part of the landfill to reduce the amount of water entering the site waste. Reconstruct the culvert that lies underneath Old Turnpike Road. Perform long-term monitoring of ground water, surface water, sediment, and soil gas. Implement regulatory controls on site use. Perform five-year reviews to evaluate remedy's performance. And perform long-term operation and maintenance of the remedy.

If public comment and further information change EPA's evaluation of this or any other alternative, EPA may decide on another alternative for its final selection.

I'd like to quickly run through the other alternatives that were presented in the proposed plan.

Alternative SC1 is the no-action alternative, under which no further work at the site would take place, except ground water monitoring.

Alternative SC2A involves capping the northern part of the landfill with a soil cap and the southern part of the land will with a RCRA subtitle C composite cap. A gas collection system is not proposed in the northern part of the landfill, only in the southern part of the landfill. SC2A also proposes permanent relocation of homes an businesses from the landfill, regulatory controls on site use, long-term monitoring and five-year reviews as discussed in the preferred alternative SC6.

Alternative SC2B includes capping the landfill area as described in alternative SC6 with one major difference: SC2B would not include the removal of a hot spot area. All other components of SC6 are the same for this alternative.

Alternative SC7. All of the components in this alternative are the same as those proposed in SC6, with the exception of one. Instead of excavating the hot spot area and placing it in a lined cell back into the landfill, SC7 proposes to excavate the hot spot area and take it off site for incineration.

MR. GAGNE: Thanks Al. A number of people have indicated they would like to comment tonight. In the interests of allowing all those interested an opportunity, please try and keep your oral comments brief and to the point. If you have lengthy comments, please consider submitting them to us in writing. You can do that tonight or you can submit them to us through the mails at the address indicated on page four of the proposed plan. We've brought extra copies of the proposed plan if you don't have yours, and they're up in the back of the room. Try to focus on the major points for the record. Remember, everything you say tonight is being recorded. Speak clearly into the microphone so the reporter can correctly transcribe your comments. With that, I'd like to begin with Andrew J. Meade. Is that microphone on?

MR. MEADE: I think it is.

MR. GAGNE: Okay. Great.

MR. MEADE: Can you hear me all right? Excuse my back here; somebody's always going to have the back, I guess.

MR. GAGNE: You can turn around put your back to --

MR. MEADE: I'm chairman of the Southington Town Council, and I wish to address the group tonight. I have a letter prepared that I have written, and also, I have passed it in to the record, but I would like to read it. It's addressed to Ms. Silva. "Dear Ms. Silva: In my capacity as chairman of the Southington Town Council, I would like to express my appreciation for the opportunity to submit these comments on the proposed remedial action plan, "the plan," for this Southington Landfill Superfund Site, referred to as "the site," on behalf of the town. The parties which have performed the investigation at the site have expended more than five million dollars over the last seven years. To date, very little of that money has been spent for remediation. It is appropriate that the focus and funding shift now to containing the site. The RI/FS process has been a lengthy, frustrating and expensive one for the town, its citizens and all parties involved, and we are glad that it is finally over and that a remedy has been identified that will protect the health of Southington residents and the environment. As the town's governing body, the council must represent the interests of all of its citizens: A task which carries with it the mandate to protect their health and safety. This is not a task which the town takes lightly. Our willingness to work with the EPA to investigate the site and to expend large sums of money to do so is evidence of our commitment. EPA developed and designed the plan specifically to protect our citizens. The proposed cover for the landfill and the collection system for the gases being generated by decomposition of landfill waste will ensure that people do not come in contact with the waste materials. People living on this site or owning businesses there will be relocated. The price tag for these measures and the ground water monitoring that accompanies them is high. We estimate it to be in excess of twenty-five million, once all of the costs are calculated. Nevertheless, it is important that these steps be taken. We also applaud EPA's decision not to require ground water treatment or containment but to first undertake further investigations regarding the efficacy of the cap. Fortunately, local and state regulations bar use of the ground water in this area as drinking water source. Requiring expenditures of at least an additional twenty-five million to contain the water in this aquifer would provide little benefit to the community or the environment, and would not be prudent. The prudent course of action to properly cover and vent the site, install the necessary additional monitoring equipment and evaluate this under EPA's auspices. The success of the work. The

Town of Southington has been and will continue to ensure that issues of concern to its residents are considered as remediation goes forward. While the town must work to protect our citizens' health, we must also be aware of the enormous burden remediation required by this plan will have on our tax payers and on the business members of our community targeted as potential responsible parties. Those businesses face not only paying a share of the remediation costs, but also having their taxes raised. Especially in these recessionary times, these impacts on our business community could be far-reaching. We may not agree with the lack of fairness inherent in Superfund. The administrative red tape greatly inflates the cost of the process or the staggering enormity of the remedial costs, but we must work to further the goal of protecting our citizens' health. The town believes that the proposed plan provides appropriate safeguards for our community. Thank you for your consideration.

MR. GAGNE: Thank you, Mr. Meade. Jim Wallace.

MR. WALLACE: Thank you. My name is Jim Wallace, and I too am a member of the town council at present. I would like to briefly paraphrase a letter from -- that was written by my father, Jim Wallace, Sr., who could not be here tonight to read it, and it will be brief. In the mid-1960s my father served on the Southington Board of Selectman, the then administrative body for the town, and as a part-time official, assisted in maintaining a dump site. The Old Turnpike Dump was run in accordance with then-accepted rules and practices. Wastes were separated, compacted and covered daily with a view towards reclaiming the land for park or industrial purposes. Back in the mid-1960s, because of restricted space, and prior to the availability of additional land, the town was forced to raise the level of the dump by several feet in some areas. It was decided then to bring the old dump down to the proper grade by bulldozing the excess and moving it to a new area. This procedure is something I would never again advocate. The area involved was comparatively small, but the problem was large. The entire neighborhood became overwhelmed with noxious fumes; the odors were unbearable and lasting. The highway department workers had to wear masks while working, but the masks did not even help. The neighbors were upset, and the town offered to house them in area motels until the trash moving process was completed, but most went to stay with friends and relatives. I truly can't imagine what the situation would be like if the decision were ever made to opt for a complete removal of waste from this site. At least, it would be lengthy and unbearable. And this hits on, essentially, what my comment would be. I support the proposed alternative with one exception, and that is: Removing the waste from the named hot spot, the SSDA1. There's no evidence -- the dump has been closed for nearly thirty years. There's no evidence that there's any of these contaminants from this particular area that have leached into the aquifers. I don't see a reason for disturbing that waste. I think it would be a mistake. Other than that, I do support the plan. Thank you.

MR. GAGNE: Thank you, Mr. Wallace. Mr. Langdon, Tom Langdon.

MR. LANGDON: Mr. Gagne, Ms. Silva, I come to you tonight in three capacities, really: One, as a resident; one, as a member of the town council; and also as Secretary of the State's Superfund Reform Commission. And I'd just like to address a few issues with regard to the landfill.

I think it's fair to say that the council's efforts in this regard have been motivated by two primary concerns, and those are: Protecting the health of the citizens of Southington, and implementing, as quickly as possible, a plan for remediation of this site.

As a member of the council I view my role as representing the entire community, all aspects of the community. And I believe the remediation plan currently proposed, with one exception, strikes an appropriate balance between protecting the public health and implementing a workable, cost-effective and immediate plan for remediation of the site.

While I think it is of the utmost importance to move forward with the remediation efforts, I don't want to trivialize the costs of remediation to the citizens of Southington.

The cost of this project impacts Southington in two primary ways: First, the town's percentage share in the remediation costs, which will be reflected in our tax rate; and secondly, by impacting businesses in town which are PRPs. These businesses will get hit twice: Once from their percentage share of the remediation; secondly, from the increase in tasks the town must levy to pay for its share. And even possibly a third time. If they are PRPs in the solvents recovery site, they may be liable under both -- at both solvents recovery and at the landfill. So there are some financial impacts that I think need to be taken into consideration. And I ask that you do take these into consideration, not -- when you look at the remediation efforts and weigh the costs and benefits, but not sacrificing public health issues.

The final issue I'd like to address involves particularly the SSDA site. And there seems to be a debate as to whether it would be more beneficial to dig this material up and place it in lined cells, or to leave it where it is and monitor the ground water contamination levels to ensure that these materials are not acting as a perforential (phonetic) source. The RI/FS has indicated that these sources are not a major cause of the ground water contamination at this point. And from public -- from a public health perspective it seems it might be better to leave these items in the ground, if there's no risk to the public in leaving them in place, and if we can bate the problem by capping the area and preventing any seepage into the ground water, while posting no risk to the public by digging them up, this approach appears to be sound from a public health perspective.

I'd just like to say that I'm encouraged to see that after seven years of study and the expenditure of millions of dollars of tax payers' money, we're finally moving with the remediation. And I hope that your agency will take steps to allow this process to begin quickly.

I'd also like to read just a quick statement from Maureen Tempkin (phonetic), who was not able to be here this evening, but she sent this over to my office this afternoon and asked that I read it.

"Dear Ms. Silva: As a resident of Southington and current member of the Southington Town Council, I am deeply concerned about the safety and welfare of our community. I have always taken a rather active role in issues facing our town and have carefully monitored Southington's involvement in our two Superfund sites. Although our town has spent millions of dollars on legal fees and studies, no money has yet been spent on any clean-up or containment of the Old Turnpike site. After seven years, EPA has finally presented the proposed plan to begin the containment of pollution at the old landfill. This plan is the result of millions of dollars of tax payer money, numerous studies and consultations. Certainly, no plan is perfect in every regard. We will never achieve a plan with universal approval. However, the time for inaction and further study has come to an end. The proposed plan must be adopted an implemented as soon as possible. We must finish this process of endless debate and discussion and begin to address the containment of on-site pollutants. We owe our community nothing less. Further prolongation of this extensive procedure will serve only to add to our already exorbitant legal rates. It is my hope that with your agency's help Southington can begin to -- can begin the road toward finally dealing with the contaminates at the Old Turnpike site." And that's signed by Maureen Tempkin who's also a member of the council.

MR. GAGNE: Thank you, Mr. Langdon. Ms. Triano.

MS. TRIANO: Mr. Gagne, Ms. Silva, I'm Victoria Triano. I'm on the town council, but more importantly, I'm a resident of Southington. This letter has been forwarded to you, Ms. Silva, but, for the record, I'd like to read it in very quickly and then just make a few comments on my own. It's concerning the remedial action for the Old Southington Landfill.

"Dearest Silva: We are pleased that the investigation of the conditions at the Old Southington

Landfill Superfund Site has been completed and that the Environmental Protection Agency has issued a proposed clean-up plan that addresses potential health concerns related to the site. The removal of the buildings, capping of the entire site, and placement of a gas collection system are prudent measures to implement despite their cost. The Town of Southington, the other PRPs, EPA and the Connecticut DEP have worked diligently and cooperatively with this project for many years. Throughout this time their highest priority has been to protect the health of Southington residents and workers on the site. Their efforts have led to the EPA plan presented at this hearing: A reasonable plan which considers the extensive data which has been generated. We wish too personally, and in our capacity as state representatives, take this opportunity to commend the parties on having completed the very complex and difficult task of identifying appropriate remedies for this site. It is our hope that additional suggestions presented at this public hearing will be considered. Sincerely, Ann Diandro (phonetic), Dennis Cleary (phonetic), and Angela Fusco (phonetic)," our state representatives. And, as I said, you will be getting a copy of this. I did want to keep it in the -- at the -- formally in the hearing.

I would just like to add something. We have spent a great deal of money, as you know and as my colleagues have mentioned, five million dollars so far, and not a stone has been taken away, not one bit of water has been cleaned. It's time for action. And my personal feeling, after I've read the material and looked at it, is that a cap would suffice on the SSDA1 spot.

You know, my concern -- and whenever we talk about -- one of the things that the residents have said over and over to me, not out of concern for themselves, but of concern for their children and their concern for their health, and -- and certainly that is a fear. But after I've considered the data, I feel that if -- that if we cap this with a lining, the liner as has been indicated, we could move on from this point comfortably, knowing that our children are safe, and that our town can move on and start the remediation process. Thank you very much.

MR. GAGNE: Thank you Ms. Triano. Ed Malczyk. Did I pronounce that right, Ed?

MR. MALCZYK: Yes. I'm also a member of the town council, and I've got a letter that I'd like to read in on behalf of Jim Bergeram (phonetic), who was another member of the town council, and was two years ago. It's a letter to Ms. Silva.

"Though I cannot attend tonight's hearing on the proposed remedial action plan, the plan for the Old Southington Landfill Superfund Site, I have asked that this statement be read into the record. It is being provided in my capacity as current town council member and a past chairman. Because of my years of involvement on the council, I have had considerable familiarity with the investigatory work which has taken place at this site over the past seven years at a cost of more than five million dollars to the town and its tax payers as well as other parties. The town must attend to the safety and health of its citizens and its environment. Over the last seven years, the town and parties undertaking these investigations have worked cooperatively with the EPA and the state to assess what, if any, problems exist at the site. The town's interests in protection its community is clearly evidenced by its involvement in these investigations. However, we, as others, have experienced enormous frustration with the complexity of the administrative process and the large expenditures money and time that accompany it. And we are very frustrated that little of the five million dollars has actually been spent to remediate the site. While we realize the remedial alternative proposed by the EPA's plan will result in expenditures of even larger sums of money, the development of the plan moves us" to that much -- "moves us that much closer to actually addressing potential risks to our community. The cap, the gas collection system and the ground water monitoring are important steps to safeguard our community. At the same time, however, the extensive studies demonstrated that ground water treatment is not necessary to protect our residents. State and local programs put in place before the landfill was ever a Superfund site will keep people from drinking ground water from this aquifer. Residents in the area are on municipal water, none of which is drawn from this aquifer. Municipal well number five has been concreted and the diversion rights given back to the state. These are just a few of the reasons that the huge costs of ground water treatment is not warranted without further study. The town recognizes the enormous financial burden placed on its tax payers by the RI/FS that will" continue to remediate -- that can -- "that will continue as remediation goes forward. Many of our local businesses will be impacted because of their involvement as potentially responsible parties. The town knows that its people must be protected, but it also knows" that alternatives that provide little if any protection -- I'm sorry, that -- that cannot risk -- I'm sorry, let me read that again. "The town knows that its people must be protected, but it also knows that it cannot ask its residents and tax payers to support remedial alternatives that provide little, if any, protection. When all of the costs associated with the remedy the EPA has suggested are added up, they will be in excess of twenty-five million dollars. In addition, we have another Superfund site within our boarders, for which many members of our business community have responsibility as well. The continued viability of our businesses" and an ongoing concern for -- "is an ongoing concern of the council" and is -- "as is protecting the health of our community. The plan which EPA developed incorporated an extensive evaluation of potential risks and technologies to address them. The whole Superfund process is centered around this analysis which is designed to be very conservative. That analysis shows that the elements of the plan I have just discussed adequately protect our community. On behalf of the town I appreciate the opportunity to present these comments. Sincerely, Jim

Bergeram (phonetic)."

I've also been on the town council now for twelve years and during the last eight years. I'm sure you must be aware of the fact that every time we make a budget decision this is -- this has been something that has been hanging over our head. We haven't spent any money on education, on police and fire protection; on anything that -- that hasn't had the consideration of what the enormous costs of cleaning up this site are. We're also concerned, obviously, with the health and safety of our citizens. And now that we are at a point to remediate the site, we are most anxious to have this money go into remediation. It's time that we do -- we -- we have reviewed the site -- this -- we've reviewed the plan for remediation -- remediation, we support the plan that the EPA has proposed for remediation, and now we want to see the remediation done so that we can get on the with process of doing all of our budgets with a knowledge of exactly what the costs are going to be for the next generation. Thanks. I'm, again, Ed Malczyk, town council.

MR. GAGNE: Thank you, Mr. Malczyk. Mr. McPeak

MR. MCPEAK: Good evening. I have

comments that relate to several different areas of the project, which include treatment of ground water from waste from the landfill, ground water classification, Black Pond, off-site migration and future, public involvement. I'll read questions from each of those areas in succession, comments rather.

"Comment number one" --

A VOICE: Speak into the microphone, please.

MR. MCPEAK: "The project should not be divided into two operable units designed to address waste material within a landfill and ground water separately. Both the waste material and the ground water should be addressed simultaneously as soon as possible. There is no reason to conduct an entire new RI/FS for ground water. Although there are some factors about ground water contamination that have not been fully answered, such as how far off the site the contamination extends, the existing data clearly indicates that significant ground water contamination exists at" the downgrade -- "at and down-gradient of the site. In addition, the preferred remedy includes leaving a significant volume, about one hundred thousand cubic yards, of highly contaminated material in ground water beneath the cap. Therefore, ground water should be addressed as part of the current remedy and should not be delayed while another RI/FS is conducted. The ground water migrating from the site should be collected and treated."

"Comment number two. The proposed remedy will leave approximately thirty percent of the waste in contact with the local ground water. The proposed approach will allow a continued leaching of contaminates into the ground water. This is not acceptable with a plan that thus far calls for no treatment of that migrating, contaminated ground water. Neither does this plan directly address the treatment of the majority of the source of material creating the problems" in -- "which is in contact with the ground water. A plan which would treat the waste directly by using combined, off-site disposal and possible air sparging (phonetic) and soil vapor extraction or other soil treatment technologies would be more appropriate. The EPA has stated in their RI comments that the natural flushing approach will take even longer than the estimated in the RI/FS. This approach would render the local aquifer useless for an almost indefinite period. It would be more effective to treat the waste material directly using the alternate direct techniques, rather than indirectly in the ground water. This approach would make ground water treatment more effective and successful."

"Comment number three. The remedial investigation did not satisfactorily address the possibility of high contaminate concentrations adjacent to area SSDA2 beneath the parks and recreation building. Contamination in this area may be in contact with the ground water. This possibility is strengthened by the fact that contaminate concentrations in well B304 immediately down-gradient from SSDA2 are higher than those in well B302 which is immediately down-gradient from SSDA number 1. The possibility is further strengthened by the consistent presence of volatile gases in the parks and recreation building."

"Second category: Ground water classification. Insufficient research has been conducted by the Connecticut DEP and EPA regarding the classification of ground water at the site. The local aquifer was reclassified from a GA area to a GB area in the recent past. This reclassification process should be reviewed to verify that the GB classification is justified and was performed in accordance with all state regulations and requirements. Current EPA policies indicates that, quote, "'Institutional controls shall not substitute for active response. Active response would include restoration of ground water to beneficial use.'" Based on these criteria, it appears most appropriate for the local aquifer to be classified as a GB -- GA area to insure, quote, "'restoration to beneficial use.'"

"Black Pond. No information has been provided which demonstrates that contaminates will not leach from the landfill back into Black Pond if the additional soil pressure of capping material is added to the top of the landfill. The extent of waste material beneath Black Pond has not been sufficiently delineated. This must be done to insure that all of it is removed from the pond prior to capping the landfill, if this is the selected alternative. Waste and potentially contaminated sediment will be stirred up during excavation of waste along the shore of Black Pond. The plan must address measures which will" take -- "which will minimize this threat of contamination."

Final question on the Black Pond. "After completion of the remediation additional testing of Black Pond should be connected to ensure unrestricted access is acceptable and protective of human health and the environment."

"Off-site migration. An ecological risk assessment was conducted; however, it only concerned" itself -- "concerned the site itself, Black Pond and the adjoining wetlands. No evaluation has been conducted regarding the impact of the ground water contamination which has and will continue to migrate off-site on down stream areas, such as the river. Future investigations should specifically address the potential impact of ground water contamination on the Quinnipiac River."

And the final category, "Future public involvement. The EPA should establish its schedule for having public meetings on a quarterly basis, regardless of what has or has not happened during that quarter, so that the public is kept informed. In addition, a community advisory council should be created so that the community can participate in the preparation of some reports, rather than just being able to review them after they're prepared, so that the community concerns are addressed. For example, the community should be given the opportunity to provide direct input into the community health and safety plan, the site restoration plan, and planning for its site security, and traffic." Thank you.

MR. GAGNE: Thank you, Mr. McPeak. Tom

Kavan.

MR. KAVAN: Good evening, Almerinda, Dennis.

MR. GAGNE: Is that on?

MR. KAVAN: Can you hear me; is this on; now is it on?

MR. GAGNE: Can you hear him back there. Okay. Sorry about that.

MR. KAVAN: I'm going over to the other one.

MR. KAVAN: Ms. Silva, Mr. Gagne, my name's Tom Kavan. I live on Regine Road, next to the site. And I have some comments that I would like to make in regards to your remediation plan.

I'd like to preface it by referring to the Old -- in my comments I'm going to refer to the old landfill, Southington Landfill, as "the site."

We need more testing of solid wastes, metals and chemicals in the northeast section of the pond, shore line and the wetlands of the site. We need more methane testing in all homes surrounding the site, including all means that methane can travel, not just those homes and businesses located on the site. We need further investigating of clean-up methods us at similar sites so that we can pursue all our options, not just the ones that have been proposed. I don't want OU1 to be done without OU2 being done at the same time. The cap alone without addressing the surface and the ground water would only be a cover-up not a clean-up. Furthermore, I feel as though the cap alone would create a greater health risk of exposure from contaminants to those residents that remain near the site, since EPA's plan is to bury contaminates from SSDA1 under the cap. I'm very upset that so many good families are seeing their properties values decline as a result of this site. I feel we are being forced to accept the proposed method of clean-up that is not a true clean-up, and that not enough research has been done to investigate other methods at similar sites. Why is this site referred to as a landfill when it is a hazardous waste site? The EPA, the DEP and the PRPs should stop minimizing the seriousness of this site. Do they do this to hold down the costs on the clean-up? The contaminates have been there for fifty-plus years. Another year for a better solution can't hurt. Fifteen million dollars is a lot of money to spend for a partial solution. Put the money to better use to insure our safety and our health and to create a larger buffer zone between the residents and the contamination. Don't rush into this until there's a total agreeable solution. We need continuous communication efforts to get access to information from the EPA to better understand the problems that exist at the site and to guarantee public input into the agency's remediation and future use decisions.

Thank you.

MR. GAGNE: Thank you, Mr. Kavan. James Delahunty.

MR. DELAHUNTY: Hi, Dennis. I'm James Delahunty, and I live on Old Turnpike Road about forty feet from the site. And I'm not a public speaker.

On June 14th, 1994, the EPA proposed a clean-up plan for the Old Southington Superfund Site. Although I don't agree with this plan, because it's cover-up, not a clean-up, I do agree with the EPA that all residents and businesses should be removed and relocated from this site.

A few of my concerns are. One. Excavating hazardous waste from SSDA1, and relocating it to a different area of the Superfund Site is extremely health hazardous to the community. If this hazardous material must be excavated, it must be removed from the site, for obvious health reasons. People living near the site must be relocated during this very hazardous operation.

Two. After capping a Superfund site treatment of the contamination -- contaminated soil and ground water on this site is almost impossible. If the contaminated ground water is not treated now, capping this toxic waste site will come back to haunt us in the future.

Three. Restructuring the culvert has advantages and disadvantages. One of the advantages -- one of the benefits of opening the culvert would be to allow water from Black Pond to flow through the open culvert and lower the level of Black Pond. This will help determine the eastern and northern boundaries of the Superfund site. The disadvantages of this will also expose citizens that live around the Superfund site to the toxic contamination that is uncovered by -- the water, the pond water. Also, the pond water coming through the open culvert could bring toxic contamination to areas west of the site.

Four. The proposed plan does not include testing for methane migration off-site of the -- off-site of the site. By capping this site, methane and other gas could be pushed outside of the current boundaries endangering residents. The EPA stated that the community influence of this proposal must play a crucial role in coming up with a plan that everybody can live with. I believe the people most affected by this toxic waste Superfund site should have the most input into the type of clean-up plan that's selected. The community's opinion should be considered in making a final plan. Meetings between the EPA and the citizens living near the site should enable the community to have more say into what type of clean-up plan is selected. I encourage the EPA to delay the decision until a clean-up plan that we all can live with is agreed on.

In closing, I know it costs a lot of money, but I know if the town council lived where I live, they wouldn't accept this plan.

MR. GAGNE: Thank you, Mr. Delahunty. Terry Delahunty.

THE COURT REPORTER: Could you get that from him, because I definitely need a copy of that to transcribe it?

MR. GAGNE: Okay.

THE COURT REPORTER: If it's written, if you could get that.

MR. GAGNE: Mr. Delahunty, could we have a copy of your statement. Thanks a lot.

MS. DELAHUNTY: Hi, I'm Terry Delahunty.

Old Turnpike Road in Southington.

"The Old Southington Landfill operated from 1920 to 1967, accepting millions of gallons of industrial waste and municipal trash, include household chemicals, lead paint, oil, plastics, pesticides, varnish, and a variety of other cancer-causing substances."

"In 1984 the EPA placed the site on its national priority list, qualifying it for the Superfund program."

"Today the EPA and the PRPs are trying to minimize the hazards at the Old Southington Landfill by chopping the site to pieces. There are the northern and southern areas, and two semi-solid areas known as SSDA1 and 2."

"Now, if this isn't bad enough, the treatment for the contamination is also -- operable units one and two. Enough is enough. This is one Superfund site that's treated that way."

"To spend sixteen million dollars capping the site without treating the contaminated ground water is not acceptable to the community. Treatment of the contaminated ground water must be addressed at this time. Once the cap is in place, on-site treatment of contaminated ground water will be almost impossible."

"It is estimated that there are over one hundred thousand cubic yards of waste located below the water table. This contamination will continue to leach into the ground water unless the plan to treat the contamination is implemented now."

"The contaminated plume will only get larger, costing more, and taking longer to clean-up. Risks to human health and ecology risk will be extensive."

"To prevent waste from below the water table from further contaminating the ground water, the EPA's proposed plan calls for SSDA1 to be dug up from one spot only to be buried at another. We are adamantly opposed to this plan."

"First, excavating this highly hazardous waste will place residents in extreme health danger. Exposure to the contaminated the -- and VOCs is a very real hazard. One hundred percent safety cannot be guaranteed."

"Second, bearing this toxic mess back into the site will not eliminate the health hazard, but place residents at further risk by not removing this extremely contaminated material from the site. Any number of things can go wrong with the cell, now and in the future, jeopardizing the lives and health of the community."

"The proposed plan does not require any special treatment of SSDA2; however, the data indicates that a significant amount of contamination is below the water table. Won't this contamination further pollute the ground water? Alternatives methods of treatment for both semi-solid disposal areas should be considered. Digging up highly toxic waste from below the water table only to bury it again above the water table, yet leaving highly toxic waste below the water table in a different area, capping the site to slow down continuous ground water contamination, but not treating the contaminated ground water."

To the local community EPA's proposed plan doesn't make much sense the health and safety of our families and our neighbors are at stake. We need to be to better informed. We want to participate in decision making and not just review reports after they are prepared. The concerns of the community must be answered. We need to proceed with caution before a sixteen-million-dollar disaster is made. Thank you.

MR. GAGNE: Thank you, Ms. Delahunty. Mr Jeffrey Otis.

MR. OTIS: My name is Jeffrey Otis. I live on Regine Road, a couple hundred yards from the Old Southington Landfill Site.

Most of my comments would reflect much of what's already been said, but I think the first thing I would like to say is that the record reflect that all of the town officials who have spoken, have spoken as PRPs, and really do not reflect the community in and around the landfill site. And I think that should be taken into account when you're reviewing their comments. They spoke frequently of financial burden and hardships. The residents within that area are suffering that as well in lost property values. If they tell is the health issues are fine, and we are to accept that, which we don't, but if it were, we are still being harmed in a financial way. There's no consideration being given to us for that. The plan calls for a process that will not clean-up that site for hundreds of years. If you bury that SSDA1, which we have been told contains four hundred and thirty thousand parts per million, that's forty-three percent, off highly toxic waste, that is not going to breakdown in a, self-contained lined pit. Twenty, thirty, fifty, a hundred years from now, when that pit deteriorates and all of that leaches out, you're going to have the same problem all over again. This plan starts out by calling for a proposed clean-up and a limited source control at the Old Southington Landfill Superfund Site. And when you read this, they refer frequently to "clean-up," and yet, not one bit of waste or water is cleaned, treated, disposed of; nothing. They talk about, in the end, "cost benefit." There is no cost benefit to what they are doing. We look at the sixteen million and what we're left with is nothing. To treat the plan in two parts makes no sense. The fact is it's probably never going to be revisited in any serious way. There will be some monitoring. In time, if you remove a little bit of this, nature will clean up that water and we will be left with a -- a mess. And that's all I have to say.

Thank you.

MR. GAGNE: Thank you, Mr. Otis. Mr. Sean Egan.

MR. EGAN: My name is Sean Egan. I'm a resident of the Town of Southington, and I'm also a former chairman of the board of finance of Southington, having served on the board from 1982 to 1991. And I, during the course of that time, saw how cost built up in investigating and reviewing the alternatives that were being proposed. And certainly, I and other members of the board at that time, were continually frustrated by the costs of those -- of those investigations and reviews. But it seems now we have an alternative -- an alternative which I support -- which, although extremely costly -- somewhere between fifteen and twenty-five million dollars, whatever number you want to believe -- is a way to at least cap the site, monitor the site, and also have the assurance that the ground water will not be utilized. So therefore, once again, I support this alternative, and I support it on behalf of a sense of fairness to all the citizens. Given the fact that this will be a budget item that will be suffered by all the citizens of Southington, we need to get to an alternative that hopefully is fair to those who live around the site, but also fair to all the citizens that will have to bear the cost of this. Thank you very much.

MR. GAGNE: Thank you, Mr. Egan. Mary Ann O'Brien.

MS. O'BRIEN: Good evening, Mr. Gagne and Ms. Silva. My name is Mary Ann O'Brien. I live at 106 Regine Road.

My comments tonight are: A suggested remedy for clean-up at the Old Southington Landfill, which has been proposed by the EPA is what is commonly referred to as -- as proven technologies. These proven technologies are only proven failures that will create a bigger mess than they are meant to clean-up. We are requesting the use of new, innovative technologies at the Old Southington Landfill Toxic Waste Site. We are asking that the EPA consider new technologies and allow the community full participation in clean-up decisions.

Secondly, ground water must be included in the remedy now. We do not want to spend another eight to ten years studying ground water. This is not only cost prohibitive, but could and should be incorporated into the suggested remedy now.

In addition, digging up and consolidating a highly contaminated hot spot and placing this toxic waste in a lined cell within the landfill is both unacceptable and unreasonable.

This chemical waste must be removed and transported off site. The proposed plan does not address off-site migration of the methane gases. This is absolutely despicable, considering the proximity of the surrounding residents.

We ask that the EPA delay the record of decision until a complete and long-term solution can be mutually agreed upon amongst all the interested residents; after all, it's our health and safety that is being compromised; not the money being spent.

Communication between all parties is critical if we are to focus on the primary issue.

And that is the solution. Thank you.

MR. GAGNE: Thank you, Ms. O'Brien. Marie Tuccitto.

MS. TUCCITTO: Good evening. Marie Tuccitto, resident.

Let's see. There will be no benefit to the environment or public health if we just cover up our problem. The ground water must be addressed now. Sixteen million dollars could easily mean thirty-two million or even sixty-four million. A landfill clean-up in region two recently went from twenty million to fifty million to seventy-five million, in addition to the original fifty million, so the twenty million ended up costing a hundred and twenty-five million dollars. Don't let that happen here. Pratt will write-off their losses and benefit from that; GE will write-off their losses and benefit from that. The people can't write-off their losses. Everything that we've every worked for is tied up in our property. With the stigma of living next to two

Superfund sites, we've lost more than half of the equity in our homes. That's gone. We'll never get it back. It's a ripple effect also. No one wants to bring kids knowingly to a hazardous waste area, and that is as it should be. No businesses will come. We're going to pay forever in taxes, in lost property value, in diminished health and quality of life. Since we are stuck here, please listen to us and help us, and work with us, rethink what you are doing, look for other options, they have to be out there. We don't want you to waste our money for a cover-up. We want a safe clean-up. We want a larger buffer zone. Spend the money where it belongs, on the people, the victims; compensate them, please. Do the right thing.

Thank you.

MR. GAGNE: Thank you, Ms. Tuccitto. Judy Lange.

MS. LANGE: Good evening.

"My name is Judy Lange, and I live just three houses to the east of the designated Old Southington Landfill Superfund Site. A sizable portion of my own backyard property consists of wetlands associated with Black Pond. Is it any wonder, then, that I have considerable fears about the risk to my health and safety, currently, during remediation, and in the future? Is it any wonder that I feel helpless and hopeless in my ability to move away from this toxic waste dump without incurring great financial losses to myself and my other half. I realize that my fate is to remain stuck here, with the stigma of living near a much-publicized Superfund site, along with my health fears and financial losses, while I watch a once beautiful view of the landscape from my darkened sun porch being devastated into ugly, unnatural mounds of dirt, complete with gas vents and chain-link fences. Because of this, I feel it necessary to speak out on some of the issues that so directly concern me. My first issue of concern is the EPA's decision to divide up the so-called clean-up activities into two separate, operable units; that is, capping up of the landfill, Superfund site OU1; and addressing the ground water remediation, OU2. I feel that both issues should be addressed together in this RI/FS. According to Ann Marie Burke, at the informational hearing on June 14th, 1994, the biggest health risk for both carcinogens and non-carcinogens is from the ground water. So how can you propose a remediation plan without addressing the ground water? The current data clearly indicates that significant ground water contamination exists at and down-gradient of the site. The preferred remedy would also leave a large volume of contaminated material in contact with ground water under the cap. Once the cap is constructed it would be much more difficult to implement any remedial technologies for the ground water. Why should you just construct a cover-up, or containment, as you call it, now, when you could include more investigation and data collection on the ground water, as well as looking into other technologies, to clean-up and not just cover-up, so that both operational units could be incorporated into one RI/FS? What about pump and treat, air sparging, bio-remediation and soil vacuuming extraction? It seems that you, the EPA, threw out consideration of these technologies early-on without fully evaluating then. Once that cap is constructed without addressing, the ground water, our neighbor is doomed to have that toxic waste here forever. Our neighborhood will always have this stigma that with possible spread of contamination through ground water to the Quinnipiac River. You yourselves don't know for sure how much contamination is present above and below the water table so why should you spend thirteen or fourteen million dollars on a remedy that does not address both issues when you could spend a little more time, do a few more studies and come up with other options that could combine both operational units into one RI/FS? I, for one, would like to see more investigation into a real, long-term clean-up, rather than a cap cover-up to ensure future generations of a cleaner environment. The PRPs have already spent seven years on an RI/FS for this site, so why not spend a little more time and do it right? Combine OU1 and OU2 to have a more comprehensive RI/FS.

Another matter of concern to me is the health and safety of the people who are directly living on or working on this site. Their emotional stress and anxiety must be horrendous. I know, and I only live near the site. I feel that you should make every effort to get the PRPs to settle with these people and move them off the site as soon as possible to end their nightmares. For that matter, EPA should consider providing a larger buffer zone by buying out a few more residents living close to the site. A larger buffer zone would help eliminate even more risks during final remediation.

Still another issue is the excavation of SSDA1 and the removal of the contaminated materials to an impermeable lined cell under the cap. Why not just remove and incinerate the contaminants to ensure a real clean-up? What if the lined cell ruptures or cracks in years to come? Why not solve the problem now and not just pass it on to future generations? The risks to those of us living here during excavation are very real. I would also like to read about more concrete precautions which will be taken during this time frame, such as monitoring of vapors, evacuation precautions, et cetera. Sampling and monitoring should be done during excavation, not only on the western side of the site, but also on the eastern and northern sides to ensure the safety of remaining residents.

Still another area of concern is Black Pond itself. Quote, "Landfill material, including petroleum-like and sludge-like waste was detected under two feet of sediment between Black Pond." That's from the Connecticut DEP, 593. In the EPA Environmental News, 594, it is stated that "Waste found along the shore of Black Pond will be excavated and placed under the cap." It is my understanding that Black Pond, on the west side, used to be lower So that, in actuality, the extent of waste material beneath the pond is not even actually known. Looking at figure two in the RI/FS report, "The eastern extent of waste into the pond has never been established."

This directly concerns me and others who live on the eastern side of the pond. Maybe the pond could be drained down somewhat so that additional investigation could be done before coming up with a design for remediation of the site. In fact, many of the boundaries should be more accurately delineated around and within the site.

As far as future use of the site, I find it hard to really comment yet, until I can see what, if any, changes are made to the preferred alternative due to comments made during this public comment period. Future use should be determined by how much clean-up rather than just plain cover-up is undertaken. Surplus stresses reduction of toxicity, mobility or value through treatment wherever possible. And I think more could be done along these lines.

In closing, it is my -- in conclusion, it is my understanding that the EPA has no requirements to hold public hearings or to solicit public comment after the ROD is signed, that means that we, the community, most directly effected by this ROD, will be in the dark about what is happening or will happen. I therefore request that we be kept informed about such things as health as safety plans, traffic plans, and explanation when we feel it necessary. The EPA should establish meetings that set times, perhaps quarterly, to keep us informed. I would also like to request that we be able to provide direct input into the community health and safety plan, site restoration and construction management. We are the people who have to live here and endure all this, so we should be allowed input in this area.

Thank you for your time.

MR. GAGNE: Thank you. Robert Seibel.

MR. SIEBEL: Good evening. Boy, she is a tough act to follow. My name is Robert Seibel. I live on Regine Road, three houses to the east and on the same side as Black Pond. The wetlands associated with the pond are right in our backyard. I have much at stake health-wise and financially with the clean-up proposed by the EPA. Therefore, I would like to have my comments added to the site administrative record.

First of all, I think the relocating of the two residents and the five businesses currently on the site should be carried out as soon as possible. This will serve to protect the health and safety of the people on top of the now defunct Superfund site.

Next, I think the EPA should pause, take a deep breath, and put on their thinking caps; not force one on us. They have given us five choices: Do nothing; or four variations of caps, all of which do nothing to address ground water contamination. This sound like a great generic fix for a normal landfill, but not for a Superfund site where thousands of gallons of toxic industrial waste were dumped.

It seems to me that with all the time spent on testing and planning, you could have arrived at a solution that would help alleviate the problem, not just sweep is under the rug.

I think of any form of remediation should address the ground water contamination. Isn't this important issue, the one that put this location on the Superfund list to begin with? How can you put off the ground water problem where a site abuts a pond and the run-off drains into a nearby river. If you succeed in getting one of these caps, is it wise to start punching holes in the impermeable geo-composite layer to implant some half-baked afterthought?

Since some boundaries are not defined and others are loosely defined, I think a larger buffer zone should be established. This could be done by purchasing more homes which would make more sense than temporarily relocating residents for their health and safety during excavation.

The idea of excavating SSDA1 and placing the contents in a lined cell on-site seems to make our neighborhood the tomb of the unknown toxic forever. If you're going to dig this area up, couldn't this be incinerated off-site in an effort towards cleaning this mess up? Once this cap is in place our fate is sealed forever.

Wouldn't it make more sense and serve the PRPs and the citizens of Southington better to spend fifteen million dollars on us by waiting? Scaled-down forms of remediation could be experimented with until the most cost effective plan becomes evident. In this way all the parties could benefit by cost savings on clean-up, having a cleaner area in which to live, and maybe some day see our homes gain back their value.

I invite anyone skeptical of my assessments to come stand on my back deck any time of day and observe the serene view of nature then imagine what it will be like to look at a bald mound with a chain-link fence around it with a junkyard on the other side.

In closing, I urge you to please relocate all buildings on the site as soon as possible, please address ground water contamination in all plans of remediation, please define boundaries more clearly and set up buffer zones, please take the contents of SSDA1 off site, and please rethink the cap idea, so we might clean this area up, not entomb it forever. Thank you.

MR. GAGNE: Thank you, Mr. Seibel. Ms. Leslie DeLeo.

MS. DELEO: My name is Leslie DeLeo. I'm a home owner living at 49 Amanda Lane, within several hundred yards of the Superfund site. I would like express my concerns over the recent EPA proposal regarding the Old Southington Landfill Superfund Site. I'm not convinced that spending fifteen point four million dollars on clay capping is the solution. We should explore other options to see what makes the most sense and might work the best, and then we should test these options to make sure they work before we implement anything. We need to treat the contaminants, not cover them up. In addition, ground water treatment should be considered part of the first phase of the clean-up plan. And I use this word "clean-up" very lightly, as no clean-up is being done and to my knowledge will not be done. Ground water contamination should be addressed now, not in a separate plan.

As part of the of the EPA's proposed plan an area of approximately five hundred to a thousand cubic yards of highly toxic industrial waste, known as the SSDA1, is to be removed from its current location on this site and placed in a lined cell in another location on the site. This makes no sense to me whatsoever. If these contaminants are going to be removed from their existing location, then take them off the site altogether, don't put them back. And during the removal of these highly toxic contaminates who will guaranty the safety of the surrounding residents? What kind of health risks will we all be taking while these contaminants are being removed from the soil? Those working at the site will be protected; what about us? Can anyone honestly expect the houses in the area to sell? We all thought we were making investments into ours' and our childrens' future. After all, that's what buying real estate is all about. We are now asking ourselves how much money will we lose, rather than anticipating any kind of gain on your real estate investment.

In closing, I would just like to say, why not spend the fifteen point four million dollars wisely, look at viable alternatives, reach agreements with all interested parties and work on a complete solution together? Thank you.

MR. GAGNE: Gary Wilson. My name is Gary Wilson, I work for Environmental Science &

Engineering. We are the consultant that prepared the RI/FS, and I was the project manager for the development of the RI/FS. I just have some very quick and general comments.

In general, the PRPs support the remedy that the EPA is recommending. We have some concerns which we're putting into written comments. We've heard some things here tonight that we'd like to respond to fairly quickly.

The PRPs have always been willing, and, I hope, have spent a great deal of time speaking with the residents, and we're hearing some concerns about technical questions, PRPs. I want to make it clear that we'll be willing to sit down and talk with people further on what we feel the technical issues are and how we view them compared to how they view them. We just want to make that clear.

A few general comments. The idea of a cap on the site is an appropriate remedy for a couple of reasons. Number one, this is a landfill, it may be a mixed-waste landfill, but it is a landfill; by such nature, it has to -- heterogeneous. The idea of excavating the whole landfill or trying to treat the whole has been demonstrated to be imprudent and impractical because of the size. Basically what's led to the presumed -- presumptive remedy that EPA's come out with. The backup on that is -- is demonstrated the problem seen at other sites. For that reason we feel that a cap is reasonable. And a cap will not prevent ground water remediation in the future. It's been demonstrated in other sites. We can't go back in. We support the OU1, OU2 because the impact of the cap will do a couple of things. Number one, it will reduce infiltration and will change the hydraulics of the aquifer. Number two, it will allow us time to study what those impacts are and to do a more efficient design should a treatment system be necessary. Why is that important? Because ground water treatment on this site would be enormously expensive. Anything you can do to make that design the most efficient design possible benefits everyone because it creates a lower cost of the treatment. Therefore we support OU1, OU2. OU1 will get part of the problem situated by dealing with the human health issues, by getting a cap on the site and dealing with the methane issue.

Again, we welcome any comments from the public and we will sit down with you at any time and discuss the technical merits.

Thanks for the opportunity.

MR. GAGNE: That's the end of the people who gave me cards wishing to comment. Is there anything else that would like to comment? Yes, sir. Come over to this microphone over here. That one doesn't appear to be working. State your name and spell your name too, please?

MR. DICKENSON: I'm Henry Dickenson from 687 Old Turnpike Road. I've been there since 1951. I saw this dump about half as big as this room at that time. And, of course, then in a few years it got real big. Well, I'm going to tell you that I saw fifty gallon drums dumped there and they disappeared in the mud. Now, they went down forty or fifty feet. So those things are encased in solid mud, and I don't think you're going to find a led-lined casing any where that's any better than what they're in right now.

And another thing is: Black Pond and the old swamp hole over on Meriden Water Bay Road and Meadow Wood are all connected underground by the same underground water. You drain one and the other one goes down. Everybody that's been in this neighborhood any length of time knows that. Now, if they start to dig this stuff up, they're going to have to dig that by hand because if they run into a barrel and bust it, it's going to go into all the ground water and you're going to pollute every one of those streams around there. So I think the best thing to do is to leave it right where it is.

And as far as capping that thing, that's just like putting something on a bomb shell. You're going to cap all that gas in there, after a while it's going to build up and it's going to blow that thing wide open because of all that heat you're going to generate by putting a cap on there. That don't make no sense either.

I think the best way is to make a buffer strip so that the people living in the area will be safe. Thank you.

MR. GAGNE: Thank you. Jonas -- is it Gillis?

MR. GILLIS: That's right. I'm living farther away from the site. And I'd like to express, in general terms, how I feel about what you're proposing to do.

I'm a retired scientist. I worked for twenty-five plus years in a laboratory, and I know how you are learning by experiments, by mistakes and successes. No doubt EPA has --

A VOICE: Speak into the microphone

MR. GILLIS: No doubt EPA has failed in their corrective measures, no doubt they have successes or neutral results. No doubt you have failed in your efforts in other Superfund sites, which are -- may be closed, of various history and various types.

One of which comes to my mind immediately is Love Canal in Buffalo. I lived not far away from that area, about a hundred miles, but it was quite an interest for us living in Syracuse. And it was a very heavy contamination by chemicals, occidental chemicals. There's no doubt you learned about it. You learned about ground water over there, you found out about gas formations over there, you learned about health effects, too, because that tragedy occurred about twenty-five years ago. No doubt data exists on these aspects.

Therefore, I urge EPA, just look to the -- what you did; your successes and your failures; and what you can apply intelligently to our site, specifically, specifically and intelligently. You can use any techniques you want, but I think -- you can use computer modeling and everything. But I feel that the best modeling is learning from mistakes and successes. Therefore, I urge you to go to your other sites where you so-called did work, and do it, apply everything directly as possible and most -- to fashion our site in Southington. So that's one comment I have.

The other comment I'd like to address is the assessment of the cost in a most economical and most rational fashion because whatever we have over there we know what we have and we can say that this is the source, this is the culprit who did it. I'm using wrong word. Party that did it. This means that if you have chemical contamination it means that we have certain parties responsible for that. Therefore, any cost assessment which is done finally, probably using various legal entanglements and so on, should be done on scientific factual basis because I don't think we can assess Town of Southington for chemical contamination which became specifically from General Electric or Pratt & Whitney. Therefore, any borings, any estimations of these chemicals, any cost which specifically deals with the removal and isolation of these sites should be specifically expressed in terms of cost, and that cost should be directly sent to the responsible parties, thus removing the Southington tax payers from unnecessary burden from which they are just the victims. Like what we are doing in the traditional system. We find who did the crime, we charge that individual with the crime, and he pays for that crime.

MR. GAGNE: Thank you. Is there anyone else. Sir.

MR. TUTTLE: My name is Joseph Tuttle.

MR. GAGNE: Tuttle?

MR. TUTTLE: T-U-T-T-L-E. I brought copies of what I --

MR. GAGNE: Step a little closer to the microphone.

MR. TUTTLE: Copies of what I have to go over tonight have been sent to Ms. Silva and Mr. Ralvo (phonetic), so it won't probably be necessary to copy them.

If you will bear with me, if you were here last week or at the last meeting, I brought forth three pages of an alternate plan of remediation. I'm going to have to go over that for the benefit of those who were not here. And I have expanded it considerably from that point.

First and foremost, let me say what my credentials are, if you will. I'm a professional mechanical engineer. My college majors were chemistry and biology. The first three pages of this following article constitute the suggested alternate plan for treatment of the contamination at the site, and were presented at the June 14th, 1994 public meeting for the consideration of the concerned public and the EPA by myself.

The purpose of that meeting, so stated, was to solicit public proposals, to solicit public input on the EPA's proposal. A second public hearing was scheduled, that which is taking place tonight.

According to the EPA Environmental News, as released to the general public on May 23rd, 1994, the EPA intends to discuss their approach, not as a total plan, but in phases. This is to be the first phase.

In other excerpts from the same publication, they say the EPA plans to spend fifteen point four million dollars to, quote, "Place a synthetic cap over the landfill to prevent rain water from filtering through the soil and further contaminating the ground water. Digging up and consolidating a highly contaminated hot spot of soil eight to ten feet below the surface and placing it in a lined cell within the landfill." What is not stated is that the base of the so-called hot spot is approximately two feet below the surface of the water table. Can you visualize what would happen? What kind of a soup would be released in that open excavation during the work?

In the next paragraph, number four, we see that, in quote, "The EPA will address the ground water contamination in a separate plan sometime after the current plan has been finalized." They do not have a plan ready to address the ground water contamination as a part of the project. Perhaps they are afraid of that soup that they will stir up. Good sensible planning should address the whole, not just the part.

On page twelve to thirteen of their newsletter they outline the risks we would be exposed to and re-exposed to while their project is ongoing.

And on page twenty they tell us that they will spend nearly three years designing and constructing the project; will monitor the whole mess for thirty years; and expect to relocate the businesses and homes for one point seven, six million dollars, a figure, like the others that is very likely to be far underestimated.

Is there another way that will address the ground water quality and offer site remediation as well as a new and better approach to sites such as this? I think so. We have several unique assets in the site area that can be used for an alternate approach.

We know the ground water level to be a hundred and fifty feet above sea level at the surface of Black Pond gradually moving downward to the west under Old Turnpike Road, toward the Quinnipiac River Basin. We know that the hot spot, so-called, is eight to ten feet below the surface of the landfill. At well site B4 the base level of possible hazardous material is placed at one hundred, forty-seven point ninety-nine feet above sea level. From the GZA studies in volume one of the revised draft of remedial investigation. These studies are in the Southington Library for anyone to see. The EPA supervised these studies. GZA map figure four sets the ground water level here at a hundred and forty-six feet above sea level; slightly below the hot spot base. But let's assume that it can climb to a hundred and fifty feet in times of heavy soil saturation. How can we keep the ground water level and prevent the ground water plume from carrying contaminants westward? If we could lower the ground water level five feet and reverse the westward migration of the ground water plume in a controlled manner, we would be on the way to a different solution. But how? Let us look at the map provided by the EPA on page seven -- and anyone who wants to see it, I'll show it to them after -- of their newsletter while I outline a different approach. If we could install a barrier along the east edge of Old Turnpike Road from the out-flow stream to just south of Solomon Casket and then eastward for approximately four hundred feet down to a level just under a hundred and forty-five feet above sea level, then dredge the out-flow stream to maintain a surface water level of one hundred, forty-five feet to the wetlands southwest of Lori-Kaba, this would lower the level of Black Pond to a hundred and forty-five feet, the plume would be reversed, and the hydraulic pressures of Black Pond and its sources would no longer move westward under the landfill.

Genetically engineered bacteria designed to digest the volatile and semi-volatile organic compounds should be introduced into the pond, the out-flow stream and the wetland destination. Since the wetland has been shown to have a surface level of a hundred and forty-two point six feet, there will be a gradient of approximately three and a half feet, making this a practical approach. The approach using genetically engineered bacteria to digest hydrocarbons was shown to be a practical reality in the wake of the

Exxon Valdez spill in Alaska.

Let us go further. To prevent the wetland from filling to a level that would frustrate the plan it might be necessary to reactivate old town well number five to the rear of Lori Lock and pump at controlled levels to sustain the result of what we have done so far.

Where to pump the water. Certainly not into the town sewer. But to the north and east of well number five is another wetland into which we must introduce further supplies of engineered bacteria along with the flow of water from well number five. The eventual out-flow of our bio-remediated water would be through Dickerman's pond, so-called, on Maple Street in Plantsville which is probably already receiving part of the present plume. By the time the remediated water reaches the dam at Maple Street and travels under Plantsville to the Quinnipiac in existing conduits it should be pretty clean. In times of heavy precipitation, if the level of vocs and semi-vocs should rise slightly, it will be counteracted by the heavy flows of the Quinnipiac and sparge the vocs and svocs in the cataracts of the river. I oppose the capping of the site since the only way to assure its eventual decontamination is to let nature flush the contaminants away slowly. If we look at the site and its flora it is evident from the exuberant growth of the trees and other vegetation that nature and photosynthesis are already in the process of converting the carbonaceous building blocks of life into innocuous forms. We should introduce as much woody vegetation as possible into all areas of the site to slow the rain water permeation and encourage conversion of the carbonaceous compounds in the soil.

As to soil gas remediation. All landfills create soil gases as a product of the breakdown of the material therein. Chief among these is methane gas. It is possible to install Radon mitigation systems or other passive ventilation systems in the existing buildings which will not only remove Radon contamination -- not addressed by the EPA but probably should have been -- but will remove methane contamination on a continuous basis from the industrial buildings as a bonus. This could be done at a cost between one and two dollars per square foot of building. Automatic gas monitors can be installed in the exhausts at very reasonable figures. This could provide the EPA with an ongoing test data. The cost to operate such systems is very small being only the cost of power to operate small fans.

Let's assume that there should be some scepticism in regard to the approach of providing digestion of the vocs and svocs via bio-remediation. The idea of lowering the ground water level by way of dredging the out-flow stream should be pursued to remove the hydraulic pressure on the ground water under the landfill site. The water in Black Pond is generally agreed to as not being polluted. There are no three-eyed fish or two-headed fish in there. They seem to be in good order. The water, instead of going into Black Pond, is coming from Black Pond and going under the site. Therefore, movement of the upper levels of source water should not pose any environmental problem. Since sources of landfill pollution there will be -- pardon me -- since the ground water table will then fall out of the major sources of landfill pollution, there will be additional time to test the results of this procedure, to assess its value, and then judge the feasibility of other features of the new proposal that I have made

MR. GAGNE: How much longer is your statement, Mr. Tuttle?

MR. TUTTLE: Much longer?

MR. GAGNE: Yes.

MR. TUTTLE: Well, I have a few more pages.

MR. GAGNE: Okay.

MR. TUTTLE: Do you want to hear it or not?

A VOICE: Yes.

MR. TUTTLE: At this point, before we discuss the characteristics of the so-called pollutants it is important that we consider the overall subsurface geological character of the and the surrounding area.

Volume one, page twenty-three of the cited studies states, in paragraph four, "Ground water flow is noted by Warzyn to be generally west toward the Quinnipiac River at a hydraulic gradient of about .004. Black Pond does not appear to be a significant ground water discharge point but rather a depression which intersects the water table. It is easy to misinterpret this data. It does not mean that Black Pond is not a ground water source; it means that Black Pond is not a significant recipient of possible contaminant discharge. Indeed, Black Pond and its sources are the major sources of hydraulic pressure on the westward-moving ground water.

Volume two of the cited studies by GZA

show a possible depth of thirty feet below the surface of refuse and fill. Maybe not all of this is hot spot, but there is a enough material if it is all dug up to create a small mountain atop the landfill. Underlying all this is peat down to bedrock. There is a large glacial kettle, as it has been referred to, underlining the area. This is, in effect, a deep hole scoured into the bedrock to a depth of twenty or more feet below sea level, two hundred feet or more below the surface of Black Pond and some of the surrounding area to the north. A million years from now it will possibly be a pocket of coal. There are a number of these kettles in the area. Black Pond, Lily Pond, Kettle Pond and the former Cartwheel Pond, now only a memory due to development.

It is generally agreed that the local area is at the southern end of the last Ice Age glacier. As the Ice Age came to an end and the glacier retreated northward, the melting process released the cobbles and boulders carried along the ice. If you look at the ridge to our west and consider West Peak, a still active volcano at that time, remembering that Southington, Plainville and points north were in the bed of an enormous river, it is possible to reconstruct the formation of the kettle holes.

Whirlpools created in this river by eddy currents from water flowing around the volcano-carried boulders and cobbles, round and round, scouring what we know today as kettles holes. Bowls cut into the bedrock. Some disappeared, covered by sediments; others remained to the end of the era becoming peat bogs. In pre-revolutionary times a major source of iron was cobbles of ore dredged from peat bogs. The ore was what remained from some of those cobbles responsible for scouring the kettles. Black Pond, in my memory and that of other long-time residents, was much deeper than present studies indicate. Siltation from storm water discharge and area development are probably responsible and may need to be addressed in the future.

peat bogs are ultimately reservoirs of carbonaceous materials. Primordial pits would be a good description for them. Much of what we are dealing with in terms of pollutants are carbon compounds. They are, in reality, probably the most significant of those contaminants named by the studies done at the site and constitute the reason for the shutdown of well number five.

Volume one, page twenty-nine of the cited GZA studies lists some of the elements and compounds as well as alkalinity/acidity characteristics of samples from the landfill and area immediately adjacent to it.

Before we deal with the list mentioned, let us look at the glossary beginning on page thirty of the EPA Newsletter of May 23rd.

Arsenic is listed as a toxic metal used to make insecticides, as it once commonly was, also to make medicines. Wow. Is it possible that there may be some beneficial uses for this horrible element? A component of semi-conductors, such as gallium arsenide, without which today's computers would not be possible. And for hardening other metals. Its unique ability to enhance the surface tension of other metals can impart desirable qualities to its alloys. The EPA lists it as a carcinogen. Indeed, some arsenic compounds carelessly misused could be dangerous, so can automobiles. Would you be willing to give up your automobile because more people die each year because of their misuse of some arsenicals? Used properly, as is the case with the compounds of many other elements, there are benefits. Just how toxic is it? It is a known fact that in areas around Mount Etna in Italy some of the principal water supplies contain sufficiently dissolved arsenicals to kill or sicken people not indigenous to the area, and yet the local people are able to survive and become tolerant of it.

Barium is listed as a poisonous, yellow-white earth metal, and so forth. Yet Barium compounds are indispensable in medical x-ray technology as an essential element of gastrointestinal diagnosis. One of the problems of the people connected with these studies is that they think they are the only ones on earth competent to determine what can be used for the benefits of mankind. In a panic they are willing to ban whole categories of things beneficial to mankind because it might, if exposed to doses beyond the imagined probability, develop a tumor [sic.]. They do not give us credit for common sense.

Benzene is and has been known to be a dangerous hydrocarbon, an item not occurring naturally but synthesized in a laboratory. Those who study organic chemistry, as I did in class nearly fifty years ago, were told of its potential dangers. We also knew the difference between Benzene and Benzine, a flammable cleaning fluid and Naphtha-like fuel in its own right, as well as an additive to other fuels. Benzene is not a lab-synthesized product, but a product of the distillation or cracking of petroleum. The EPA seems to confuse the two or at least ignore the one. Benzene can also be used as a fuel additive, and though its ether-like fumes can be toxic its very high energy potential can be beneficial as a fuel additive. Because it is composed of only carbon and hydrogen, it can totally oxidize in combustion, yielding water vapor as a result. Any improperly burned fuel insufficiently oxidized can result in toxic monoxides. Gasoline is an example, as is coal and some other commonly used fuels.

Beryllium is one of the items cited. It's an elemental metal. While toxic in its pure form, if found in a landfill, can almost certainly be found to be alloyed with copper, and in this form is relatively stable. Beryllium imparts to copper the ability to become hard enough to be used as corrosion resistant springs easily hardened at temperatures lower than needed to cook some foods. It has many uses in aerospace and other strategic defense fields. It is true that finely divided Beryllium copper is hazardous to breathe, but the fact is well known in industry and protection to the worker is routinely provided where needed.

Chromium is listed by the EPA as a carcinogen. Even those people nearly totally ignorant of chemistry will be perplexed by this. Does this mean that we can no longer polish the chrome-plated surfaces of our automobiles or kitchen appliances? Chromium, because of its nobility in the electromotive series has long been used to protect against corrosion. Because it can form a very hard protective surface on other metals, it has other beneficial uses. Chromic acid dips are used to enhance the corrosion resistance of other plated metals. Perhaps there are some salts of Chromium which are toxic, and which, if fed to a cancer-prone rat might give it a tumor, but call me a skeptic.

Vanadium --

MR. GAGNE: Excuse me, sir. Are you going to go through every contaminate that is listed?

MR. TUTTLE: Excuse me.

MR. GAGNE: Are you going to go through every contaminate that was listed in the study?

MR. TUTTLE: I have to lay the ground work. There's only just a little bit more. You know --

MR. GAGNE: We have other people here who are waiting to comment.

MR. TUTTLE: I understand you do.

MR. GAGNE: And it's getting late.

MR. TUTTLE: Do you want me to stop?

VOICES: Yes.

MR. TUTTLE: All right. I'll get to -- well, all right. Let me get to something a little hotter than this.

I would rate the chlorinated hydrocarbons number six, seven, eighteen and nineteen, as the most serious of all the pollutants. All the molecules -- let me come up with the items that they have here. There are four chlorinated hydrocarbons. Basically just to short things down -- these people have already read this thing. They don't really seem to care what we do. Three of the four chlorinated hydrocarbons, which are the most serious pollutants in there, are, of a specific gravity, heavier than water. One is lighter than water. If you lower the ground water level, what will happen is that those hydrocarbons or chlorinated hydrocarbons which are heavier than water will settle down into the peat bog and become coal a million years from now. The one, ethylchloride, that is lighter than water, if it comes out in this stream, will be evaporated, for the most part, and that which is not evaporated and which is dissolved in the water -- it's an infinitesimal amount -- will be degraded by ultraviolet light.

Let me say this in short. They don't want to hear what I want to say. They've seen it already. But the important thing to me is that you're better off to leave it alone. You're really better off to leave it alone. Lower the ground water and stop pushing the water through the pollutants. Let it settle into the peat bog, and let the water go out by opening up the stream. You'd be far better off in the long run and you won't create a lot more pollutant, and save yourself a lot of money.

MR. GAGNE: Thank you, Mr. Tuttle. I want to assure everybody that Mr. Tuttle has submitted his comments in writing and they will be thoroughly addressed by the agency.

We had one other person up back.

MR. KOGUT: Dan Kogut, resident. These comments will be brief.

MR. GAGNE: How do you spell your last name, please?

MR. KOGUT: K-O-G-U-T.

I'm not clear; it's really not clear to me what the long -- the best long-term option is for the Old Southington Landfill. But what is clear to me is that there are two sides out here: There's a side that is definitely for the cap, and there's a side that is saying let's slow things down. And this saddens me because I know the citizens from both sides. And unless we can get the citizens that are saying, Go ahead with the cap, to possibly swap their homes with the citizens that are saying, Let's slow down and take a look at the options, I'm not sure what we can do. If I can get John and Ed and Vicki and Ann to possibly swap their homes with Tom and Jim and Terry and Leslie and Bob, Mary Ann, maybe something could be worked out. But barring that, if that cannot be done, which I don't think it can be -- and if anybody wants to, we can talk about it -- but if that can't be done, it would seem prudent to me that the best solution would be to possibly slow it down, get the two sides together to talk, they're both local, maybe we can get the town and the citizens to actually sit down, and over the course of the next six months, possibly get a dialogue together, and probably come up with some long-term solution, so we don't have an us-against-them, we can have just, you know, an "us" here. Thank you.

MR. GAGNE: Thank you, Mr. Kogut. Is there anyone else that would like to comment? Well, as I stated earlier, the comment period has been extended until August 13th, and we'll continue to accept written comments until that time. The mailing address is in the proposed plan, page four, which there are extra copies up at the back of the room. And if you have any comments or questions about commenting, please contact Almerinda Silva or Leo Kaye (phonetic), who's the community relations specialist, their phone numbers are also listed in the back of the proposed plan.

I want to thank everybody for taking the time to come here and comment tonight. And I declare this hearing closed. Thank you.

(Hearing adjourned at 8:50 p.m.)

CERTIFICATE OF REPORTER

I, Jonathan P. Lodi, a Commissioner of Deeds duly commissioned and qualified in and for the State of Connecticut, do hereby certify that the foregoing seventy-six pages is a true and accurate record to the best of my knowledge and belief.

IN WITNESS THEREOF, I have hereunto set my hand this 27th day of July, 1994.

Jonathan P. Lodi

Jonathan P. Lodi
Commissioner of Deeds

My commission expires: 2/16/95

ATTACHMENT C

Written Comments Received During the Public Comment Period

By Joe Tuttle, a PRP. Dated, June 21, 199

ALTERNATE PLAN OF REMEDIATION, OLD SOUTHINGTON LANDFILL

The first three pages of the following article constitute a suggested alternate plan for treatment of the contamination at the site and were presented at the June 14th, 1994 Public Meeting for the consideration of the concerned public and the EPA by Joseph E. Tuttle, a Southington resident.

The purpose of the meeting, so stated, is to solicit public input on the EPA proposal. A second public hearing will take place on July 12, 1994 at the same location, (De Paolo Junior High School.)

According to EPA Environmental News as released to the general public May 23, 1994 the EPA intends to discuss their approach not as a total plan but in phases, this to be the first phase. (See paragraph one, page one.)

Other excerpts from the same publication:
Paragraph 3, page one: The EPA plans to spend $15.4 million dollars to: "Place a synthetic cap over the landfill to prevent rainwater from filtering through the soil and further contaminating the groundwater."Digging up and consolidating a highly contaminated Hot Spot' of soil 8 to 10' below the surface and placing it in a lined cell within the landfill."

What is not stated is that the base of the so called 'Hot Spot' is approximately 2.01 feet below the surface of the water table. Can you visualize what would happen? What kind of a soup would be released in that open excavation during the work?

In the next paragraph (#4) we see that " The EPA will address the groundwater contamination in a separate plan sometime after the current plan has been finalized!"
They do not have a plan ready to address the groundwater contamination as a part of the project! Perhaps they are afraid of that soup they will stir up. Good sensible planning should address the whole, not just the parts.

On page 12-13 of their newsletter they outline the risks we would be would be exposed and re-exposed to while their project is ongoing.

On page 20 they tell us they will spend nearly three years designing and constructing the project: will monitor the whole mess for thirty years and expect to relocate the businesses and homes for 1.76 million dollars, a figure, like the others that is very likely far underestimated.

Is there another way that will address the groundwater quality and offer site remediation as well as a new and better approach to sites such as this? I think so. We have several unique assets in the site area that can be used for

an alternate approach.
We know the groundwater level to be 150' above sea level at Black Pond gradually moving downward to the West under Old Turnpike Road toward the Quinnipiac River Basin. We know that the 'Hot Spot', so called, is 8 to 10 feet below the surface of the landfill. At wellsite 'B4' the base level of possible hazardous material is placed at 147.99 feet above sea level (From the GZA studies in Volume 1 of the Revised Draft of Remedial Investigation. These studies are in the Southington Library for anyone to see. The EPA supervised the studies.) GZA map Figure 4 sets the groundwater level here at 146 feet (approx) above sea level; slightly below the 'Hot Spot' base. But let's assume that it can climb to 150 ' in times of heavy soil saturation. How can we keep the groundwater level and prevent the groundwater plume from carrying contaminants westward? If we could lower the ground water level 5' and reverse the westward migration of the ground water plume in a controlled manner we would be on the way to a different solution. But how? Let us look at the map provided by the EPA on page 7 of their newsletter while I outline a different approach. If we could install a barrier along the East edge of Old Turnpike Road from the outflow stream to just South of Solomon Casket and then eastward for approximately 400' down to a level just under 145' above sea level, dredge the outflow stream to maintain a surface water level of 145' to the wetland southwest of Lori-Kaba, lowering the level of Black Pond to 145' the plume would be reversed and the hydraulic pressures of Black Pond and its sources would no longer move westward under the landfill..
Genetically engineered bacteria designed to digest the volatile and semivolatile organic compounds should be introduced into the pond, the outflow stream and the wetland destination. Since the wetland has been shown to have a surface level of 142.6' there will be a gradient of approximately 3 1/2' making this a practical approach. (The approach of using genetically engineered bacteria to digest hydrocarbons was shown to be a practical reality in the wake of the Exxon Valdez spill in Alaska.) Let us go further. To prevent the wetland from filling to a level that would frustrate this plan it will be necessary to re-activate the old Town well #5 to the rear of Lori Lock and pump at controlled levels to sustain the results of what we have done so far. Where to pump the water? Certainly not into the Town sewers. To the North and East of well #5 is another wetland into which we must introduce furthersupplies of engineered bacteria along with the flow of water from well #5. The eventual outflow of our bio-remediated water would be through Dickerman's Pond, so called, on Maple Street in Plantsville, which is probably already receiving part of the present plume. By the time the remediated water reaches the dam at Maple street and travels under Plantsville to the Quinnipiac in existing conduits it should be pretty clean. In Times of heavy precipitation of the level of vocs and semi-vocs should

rise slightly it will be counteracted by the heavy flows of the Quinnipiac and sparge the vocs and svocs in the cataracts of the river. I oppose the capping of the site since the only way to assure its eventual decontamination is to let Nature flush the contaminants away slowly. If we look at the site and its Flora it is evident from the exuberant growth of the trees and other vegetation that Nature and Photosynthesis are already in the process of converting the carbonaceous building blocks of life into innocuous forms. We should introduce as much woody vegetation as possible into all areas of the site to slow rainwater permeation and encourage conversion of the carbonaceous compounds in the soil.
SOIL GAS REMEDIATION: All landfills create soil gases as a product of the breakdown of the materials therein. Chief among these is methane gas. It is possible to install Radon mitigation systems in the existing buildings which will not only remove possible Radon contamination (not addressed by the EPA, but probably should have been) but will remove methane contamination on a continuous basis from the industrial buildings as a bonus. This can be done at a cost of between one and two dollars per square foot of building. Automatic gas monitors can be installed in the exhausts at a very reasonable figure. This could provide the EPA with ongoing test data. The cost to operate such systems is very small being only the cost of power to operate small fans.

Addenda: Let's assume there should be scepticism in regard to the approach of providing digestion of the vocs and svocs via bio-remediation. The idea of lowering the groundwater level via dredging the outflow stream should be pursued to remove the hydraulic pressure on the groundwater under the landfill site. The water in Black Pond is generally agreed to as not being polluted. Therefore movement of the upper levels of source water should not pose any environmental problem. Since the ground water table will then fall out of the major sources of landfill pollution there will be additional time to test the results of this procedure to assess its value and then judge the feasibility of other features of the new proposal I have made.
Attached is a copy of the EPA site map with overmarkings of water table heights.
Also to be attached to this letter at a later date is additional data to support my proposal as well as a list of authoritative sources.

Joseph E. Tuttle,
Southington Resident.

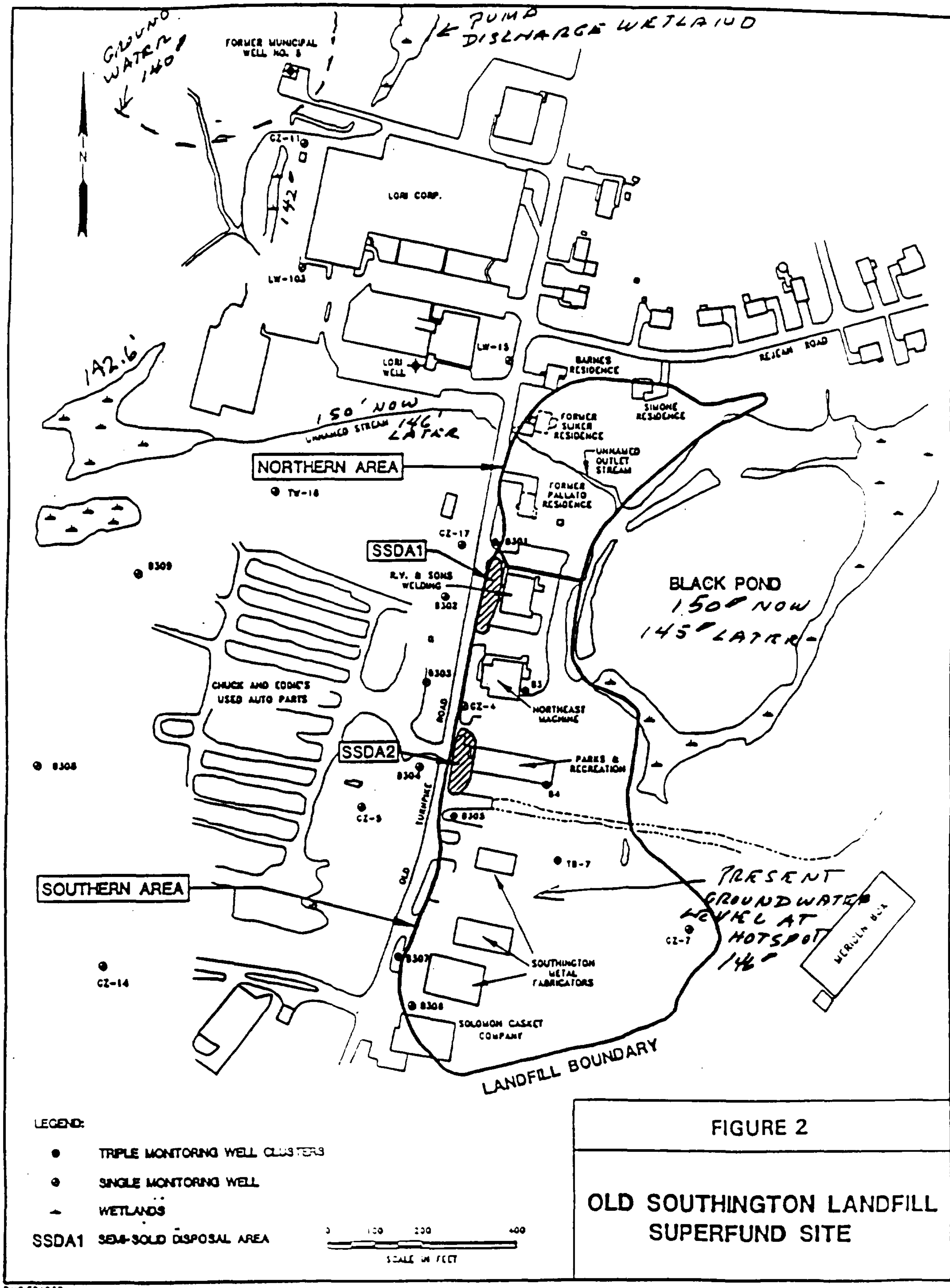

FIGURE 2

OLD SOUTHINGTON LANDFILL SUPERFUND SITE

At this point, before we discuss the characteristics of the socalled pollutants it is important that we consider the overall subsurface geological character of the site and the surrounding area.

Volume 1, page 23 of the cited studies states in paragraph 4 " Groundwater flow was noted by Warzyn to be generally west toward the Quinnipiac River at a hydraulic gradient of about .004. Black Pond does not appear to be a significant groundwater discharge point but rather a depression which intersects the water table." It is easy to misinterpret this data. It does NOT mean that Black Pond is not a groundwater source. It means that Black Pond is not a significant recipient of possible contaminant discharge. Indeed Black pond and its sources are the major source of hydraulic pressure on the westward moving groundwater.

Volume 2 of the cited studies by GZA: Maps, Figure 20 and 21. Cross section AA' through point N5 shows a possible depth of 30 feet below the surface of refuse and fill. Maybe not all this is the Hot Spot but there is enough material if it is all dug up to create a small mountain atop the landfill. Underlying all this is peat down to bedrock. There is a large glacial "Kettle" as it has been referred to underlying the area. This is, in effect, a deep hole scoured into the bedrock to a depth of 20 or more feet below sea level (200 feet or more below the surface of Black Pond and some of the surrounding area to the north. A million years from now it will possibly be a pocket of coal. There are a number of these kettles in the area. Black Pond, Lily Pond, Kettle Pond and the former Cartwheel Pond now only a memory due to development.

It is generally agreed that the local area is at the southern end of the last Ice Age glacier. As the Ice Age came to an end and the glacier retreated northward the melting process released the cobbles and boulders carried along in the ice. If you look at the ridge to our west and consider West Peak, a still active volcano at that time, remembering that Southington, Plainville and points north were in the bed of an enormous river it is possible to reconstruct the formation of the kettle holes. Whirlpools created in this river by eddy currents from water flowing around the volcano carried boulders and cobbles round and round scouring what we know today as kettle holes. Bowls cut into the bedrock. Some disappeared covered by sediments others remained to the end of the era becoming peat bogs. In pre revolutionary times a major source of iron was cobbles of ore dredged from peat bogs. The ore was what remained of some of those cobbles responsible for scouring the kettles. Black Pond, in my memory and that of other long time residents was much deeper than present studies indicate. Siltation from stormwater discharge and area development are probably responsible and may need to be addressed in the future.

Peat Bogs are ultimately reservoirs of carbonaceous materials (Primordial pits would be a good descriptive for them.) Much of what we are dealing with in terms of pollutants are carbon compounds. They are, in reality probably the most significant of those contaminants named by the studies done at the site and constitute the reason for the shutdown of well #5.

Volume 1, page 29 of the cited GZA studies lists some of the elements and compounds as well as alkalinity/acidity characteristics of samples from the landfill and area immediately adjacent to it.

Before we deal with the list mentioned let us look at the glosary beginning on page 30 of the EPA Newsletter of May 23rd and consider some of the items listed therein.

Arsenic is listed as a toxic metal used to make insecticides (as it once commonly was.), MEDICINES!(Wow! is it possible that there may be some beneficial uses for this horrible element?), a component of semi-conductors (such as gallium arsenide, without which today's computers would not be possible) and for hardening other metals (Its unique ability to enhance the surface tensions of other metals can impart desirable qualities to its alloys.) The EPA lists it as a carcinogen. Indeed, some Arsenic compounds, carelessly misused can be dangerous. So can automobiles. Would you be willing to give up your automobile because more people die each year because of their misuse than from the misuse of some arsenicals? Used properly (as is the case with the compounds of many other elements there are benefits.) Just how toxic is it? It is a known fact that in areas around Mount Etna in Italy some of the principal water supplies contain sufficient dissolved arsenicals to kill or sicken people not indigenous to the area and yet the local people are able to survive and become tolerant of it.

Barium is listed as a poisonous yellowish-white earth metal etc. Yet Barium compounds are indispensible in medical X-ray technology as an essential element of Gastro-intestinal diagnosis. One of the problems of the people connected with these studies is that they think they are the only ones on earth competent to determine what can be used for the benefit of mankind. In a panic they are willing to ban whole categories of things beneficial to mankind because it is possiblethat a rat bred to be cancer-prone in the first place might,if exposed to doses beyond the imagined probability, develop a tumor. They do not give us credit for common sense

Benzene is and has been known to be a dangerous hydrocarbon, an item not occuring naturally but synthesized in a laboratory. Those who study organic chemistry as I did in class nearly fifty years ago were told of its potential dangers. We also knew the difference between Benzene and

Benzine, a flammable cleaning fluid and Naphtha like fuel in its own rite as well as an aditive to other fuels. Benzine is not a lab-synthesized compound but a product of the distillation or cracking of petroleum. The EPA seems to confuse the two or at least ignore the one. Benzene can also be used as a fuel additive and though its ether-like fumes can be toxic its very high energy potential can be beneficial as a fuel additive. Because it is composed of only carbon and hydrogen it can totally oxidize in combustion, yielding water vapor as a result. Any improperly burned fuel, insufficiently oxidized can result in toxic monoxides. Gasoline is an example, as is coal and some other commonly used fuels.

Beryllium, an elemental metal, while toxic in its pure form, if found in a landfill can almost certainly be found alloyed with copper and in this form is relatively stable. Beryllium imparts to copper the ability to become hard enough to be used as corrosion resistant springs easily hardened at temperatures lower than needed to cook some foods. It has many uses in the aerospace and other strategic defense fields. It is true that finely divided beryllium copper is hazardous to breathe but the fact is well known in industry and protection to the worker is routinely provided where needed.

Chromium is listed by the EPA as a carcinogen. Even those people nearly totally ignorant of chemistry will be perplexed by this. Does this mean we can no longer polish the chrome plated surfaces of our automobiles or kitchen appliances? Chromium, because of its nobility in the electromotive series has long been used to protect against corrosion. Because it can form a very hard protective surface when plated on other metals it has other beneficial uses. Chromic acid dips are used to enhance the corrosion resistance of other plated metals. Perhaps there are some salts of chromium which are toxic and which, if fed to a cancer-prone rat might give it a tumor but call me a sceptic.

Vanadium is a light grey metal of the phosphorous group, malleable, soft and ductile without whose properties steel would be little more than iron. It has the unique property of being both basic and acid like a buffer compound. One look at the alloying elements of all commonly used steels finds the use of vanadium in various amounts almost universal. Perhaps in its pure form it is or can be toxic but as found in a landfill it will almost surely be from the rusting and breakdown of steel and in impure and compounded form in the process of again becoming ore.

Nickle is also listed as a carcinogen by the EPA. This is almost like listing the very act of living as being a carcinogen. It is used as a protective plating because of its resistance to corrosion and breakdown. It is a principal

component of stainless steel which is relatively inert except when exposed to strong hot acids in the lab. EPA calls it a carcinogen. Throw away all your coins above a penny! They might give you cancer!
The point of some of these admittedly sarcastic comments is to show how the EPA makes use of the general public's ignorance of complex chemistry to create an element of panic. Most of those substances which are dangerous have been known to be so for many years and competent chemists have long since devised means of protection in their use. In truth the use of some of the chlorinated hydrocarbons had come about through the prohibition of the less noxious but flammable cleaning agents through the means of government promotion in its usual interfering manner of protecting us from ourselves. Like many of the things foisted upon us by the government bureau cracy the cure is worse than the problem they saved us from and infinitely more expensive.
If the EPA would really wish to involve themselves in something of long term benefits to society they might promote grants to foster activity in research to further develop the group of plactics we once depended upon which were derived from cellulose , a vegetable product. Intensive research in this field could result in biodegradeable, readily incinerated plastics made from renewable resources. We once depended on products like rayon, cellophane, cellulose acetate and other such plastic products. Instead we now concentrate on plastics made from petroleum which make instant trash that is proving to be beyond our means to recycle and or degrade. Our oceans are becoming garbage dumps full of floating pieces of discarded plastics. Concentrating efforts to return to some of the old plastics and improve them would provide American jobs and stretch the use of non-replaceable petroleum resources until we find a way to use Hydrogen as a fuel or develop light, powerful batteries for our vehicles. EPA should be devoting its efforts in these fields instead of crucifying American business with its ex-post facto laws in defiance of the Constitution.

On page 6, paragraph 2 I mentioned some of the elements and compounds as well as the alkalinity/ acidity characteristics of samples from the landfill and area immediately adjacent to it. Volume 1, page 29 of the GZA studies shows a summary list of the chemistry of samples taken from the landfill as found in concentrations greater than might be expected in the surrounding soil.
In order to cover what I consider characteristics of those items I consider important to the alternate plan I have outlined I have assigned numbers to them:
1)Alkalinity, 2)Ammonia, 3)Barium, 4)Benzene, 5)Chloride 6)Chlorobenzene, 7)Chloroethane, 8)Color, odors, MBAs, 9)Cyanide, 10)Diethyl phthalate, 11)Dissolved solids, 12)Ethyl benzene, 13)Iron, 14)Magnesium, 15)Sodium, 16)Specific conductance, 17)Sulfate,

18)Trans 1,2-dichloroethylene. 19)Trichloroethylene, 20)Toluene, 21)Vinyl chloride, 22)Xylene, 23)Zinc.

Some of these we have already discussed, some are vague inconsequential items. Here we are going to condider certain of the characteristics of the more serious items and develop a scenario of what will happen if the alternate plan proposed by me is pursued and the pollutants allowed to move in reverse along the water table as outlined.
Important to what I will outline are two things: First is the weight of a potential pollutant in relation to water (Whether it is light enough to float on water, or whether it is heavy enough to settle out or to have water float on it.) Second is the relative solubility of the potential pollutant in water. A third factor of some limited importance here is a phenomenon called capillary attraction. Its importance disappears as pollutants move out of the landfill into the current of the outflow stream but become important again when we consider the EPA's proposed remedial action.

Let us discuss the vocs and semivocs first. They fall into two categories: 1) the hydrocarbons and 2) The chlorinated hydrocarbons. The terms voc and semivoc refer to the volatility of the compounds. Volatility is a measure of their vapor pressure or relative ability to evaporate into and be carried away by the air.

I would rate the chlorinated hydrocarbons #'s 6, 7, 18 and 19 as the most serious of the pollutants.
All molecules have weight. The weight of the molecules of all compounds are benchmarked to the weight of water which has a specific gravity of 1. The specific gravities of all the compounds we are considering are either greater or less than that of water. If a compound has a specific gravity less than that of water and is not soluble or only mildly soluble in water it will float on water. Conversely if the same characteristics are true of a compound whose specific gravity is heavier than water, then water can float on it or it will settle out dropping through the water table because of the effects of gravity. The effects of capillary attraction can slow this fallout when in sand or gravel
Pollutant #6, Chlorobenzene is 1.1 times as heavy as water and is only slightly soluble in water. Freed from the effects of capillary attraction in open water it will settle out into the peat of the kettle hole to eventually become coal.
Pollutant #18, Trans 1-2dichloroethylene weighs 1.5 times as much as water and though slightly more soluble than its predecessor all that is not already dissolved will also fall out into the peat pit.
Pollutant #19, Trichloroethane weighs 1.5 times as much as water, and is only mildly soluble in water. The undisolved material will go the same way.
Pollutant #7 Chloroethane is only .9 times as heavy as water

is mildly soluble in water, will float atop water, can be considered volatile and will evaporate from the surface of the stream to be carried away, except for the small amount remaining in solution.
Those vocs and semi-vocs remaining in solution are to be digested by bio-remedial action in the open water of the pond, the stream and the wetland.

Now let's discuss some of the other pollutants , considering some of their chemical characteristics.
Pollutant #10 Diethyl Phthalate can be discounted pretty easily since it is insoluble in water, weighs 1.12 times as much as water and will settle out of the water easily and completely via gravity.
Pollutant #21 Vinyl Chloride, freed from the sand of the landfill will dissipate into the air rapidly since its natural form is that of a gas, only slightly soluble in water.
Pollutant #22 Xylene is a colorless liquid, insoluble in water, weighs less than .9 times as much as water, will float on the surface of the stream and rapidly evaporate to the atmosphere.
Pollutant #4 Benzene weighs 5.5 times as much as water. What is not already in solution will settle out of the stream into the underlying peat. The balance is subject to digestion.
Pollutant #12 Ethyl Benzene is only mildly soluble in water, weighs only .87 times as much, will float out on the water and evaporate at first opportunity. As with the others, what little is in solution will be subject to digestion.
Pollutant #20 Toluene is only mildly soluble and lighter than water (.87). It too will float out with the water to evaporate at the first opportunity.
#13 Iron, #14 Magnesium and #23 Zinc all of which are metals do not pose any real threat. #3 Barium and #15 Sodium have probably already reacted with other items to become relatively benign salts. #9 Cyanide, if it has not already done so has already reacted with some of the metals to purify them and in the process become inactive. The same is true of the sulfates (#17) which also will react with the metals to produce relatively benign salts or ores.
You can readily see why I am opposed to capping the landfill area to prevent the penetration of precipitation. Having freed the landfill of the hydrological pressure from the pond the only other source to gradually flush contaminants out for natures treatment will be precipitation.

Let us now consider the effects of the EPA's proposed, preferred method of remedy. If it were even possible to successfully raise the components of the 'Hot Spot' and then lay down a rubber like sheet of gigantic proportions on which to base their so called cell it is not possible to obtain such a sheet in one piece. It would have to be joined in sections. Each seam would be subject to being cemented in a

in a dirty, gravelly environment. There will almost certainly be voids and open areas to allow the entry of water via capillary attraction even if the cell is above the water table. Once water is admitted to the so called impermeable cell it will become subject to reaction from the forces of nature even if capped with bentonite intended to form a cover of "hardpan". Each time the level of frost in the ground penetrates to a depth into the cell the integrity of such a cell is subject to being compromised further. Consider, if you will what happens when salted water penetrates a concrete highway to the level of the steel reinforcements. Oxides are formed which are of so much greater volume than the steel they expand with such force that they spall the concrete and create potholes in our bridges. Water in freezing is capable of cracking the strongest rock. It is my belief that the same things will gradually take place in the lined cell. They must think so too or they would not be providing vents to exhaust gases that would not be formed in a dry cell. The only sure way to bury something and have it not invaded by groundwater is to use a soldered lead coffin.
The idea of capped and lined cells has not been in use long enough to be proven to be truly effective on a long term basis and most certainly would not be effective in a situation with a continuing variable water table and its accompanying variable hydraulic pressure. The cell would be subject to bloating like a dead body lying in the sun.

I have some definite ideas as to the construction method of the barrier I proposed to be installed along the eastern edge of Old Turnpike Road that I believe will provide the desired results at a relatively reasonable figure and will present them upon request with a design if necessary.

Bibliography: Volumes 1 and 2 of the Revised Draft of Remedial Investigation (The GZA Studies and their maps) as found in the Southington Public Library.

Chemical Engineers' Handbook, Third edition. Mc Graw Hill Book Co. Inc.

Webster's Collegiate Dictionary, Fifth Edition. G&C Merriam Publishers.

The EPA Environmental News of May 23, 1994

This summary has deliberately tried not to be so technical that it cannot be understood by the general public and has in it some areas of oversimplification but in general is based on sound laws of chemistry and nature and if carried out by competent professionals with the aid of able chemists and biologists could provide a new and better approach to remedial action at the Old Southington Landfill. Admittedly, not all sites have the unique characteristics of ours and therefore the approach is not universal. Hopefully it will stimulate the EPA to adopt the attitude of considering each site as unique and designing individual and innovative solutions instead of trying to treat all sites with a single "formletter" style of treatment.

Respectfully submitted,
Joseph E. Tuttle
June 20, 1994

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JUN 29 1994

June 27, 1994

Ms. Almerinda Silva
Remedial Project Manager
U.S. Environmental Protection Agency,
Region I
Waste Management Division (HEC-CAN 6)
JFK Federal Building
Boston, MA 02203

RE: Proposed Cleanup on Old Southington Landfill

Dear Ms. Silva:

Pursuant to the comprehensive Environmental Response, Compensation and Liability Act and regulations pertaining thereto, these comments are directed to the limited source control plan proposed by the EPA on May 23, 1994, and which was the subject of a public hearing on June 16, 1994 in the Town of Southington. This office represents the residents of the Town of Southington whose properties are on the landfill superfund site: Mr. Morrill Barnes, Mrs. Laurie Barnes, Mr. Mark Simone and Mrs. Nancy Simone. In addition, this office represents Mr. and Mrs. William Pallatto who were formerly residents on the site but whose property has been acquired by the PRPs.

Medical Monitoring

As part of the remediation of the site, it is requested that medical monitoring be undertaken of the present and past residents who have been in contact with potentially contaminated soil, air and water. We request that the cost of past and future medical monitoring be imposed upon the PRPs in accordance with recent court decisions, in view of findings concerning the landfill wastes, surface soil, landfill gases, surface water and sediment composition of Black Pond.

The above-mentioned parties have lived on the site for over eight years. Our clients' houses are bordered by Black Pond and are located in the Northern portion of the site which preliminary information indicates was for the disposal of various solid wastes which were subject to burning, producing PAHs, a type of semi-volatile organic compound. According to surface soil samples, SVOCs were detected in a large number of samples collected across the site. These were allegedly mostly PAHs. These residents have established gardens on their property and have eaten vegetables and fruits grown on their property. In

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addition, their children have played in the soil and they have actively taken part in gardening and other activities around their homes.

As to the landfill gases, it is known that there was methane which has been detected on their properties but not in their homes. The forces that bring the methane to the surface, will most likely also bring with the gases other contaminates which have not been as yet measured. The effect of these contaminates upon the bodies of the residents is not known.

The ground water analysis is to take place in the second phase. Since these residents have been exposed to the contaminates in the landfill and the pipes leading to the water supply have been in the soils, there has been no adequate testing with regard to the effects of any contamination in the soil upon the drinking water and there have been no tests as to whether ground water has evaded the drinking supply, either through openings in the pipes or at the source which is the deep wells of the Town of Southington. Since adequate studies have not been made as to the size of the ground water plumes and the direction of flow, it is possible that the contaminates located throughout the landfill site could have affected these residents as well as other residents of the town of Southington.

Although other preliminary studies indicated that the surface water at Black Pond was completely safe and there was no aquatic damage, the Plan admits that the VOC and SVOC levels have been above the MCLs in surface water samples collected from Black Pond and from its outlet streams. In addition, the levels of certain metals have exceeded the state and federal standards. Our clients, their children and grandchildren have played, fished and used Black Pond as a recreational facility over the years. They have eaten fish caught in the pond and have swam and boated on the water, which necessarily gave rise to contact with the contaminated water and in some cases ingestion. Likewise, the sediment samples collected from Black Pond show the VOCs and PAHs at levels above background concentration. PCBs from the contaminated landfill site were found in the sediments even though the PCBs may not be under the property of our clients. Concentrations of metals were found to be above the background safe levels. Based upon the above reports and the State of Connecticut health investigation of the site, which showed preliminary but inconclusive higher levels of bladder cancer in the area and a great psychological fear in the residents of the town, it is submitted that a medical monitoring plan be instituted immediately, especially for those residents who have

COHEN & CHANNIN
ATTORNEYS AT LAW

been in contact with the contaminants on the site as mentioned above.

Medical surveillance is an effort to achieve early detection of a latent disease, which detection could lead to a more successful treatment and better chances for survival and less pain and suffering. The residents have shown the requisite factors that would give rise to the need for medical surveillance: 1) they have been exposed to a hazardous substance; 2) the potential for injury has been shown both by reports of the EPA and the State of Connecticut health department; and 3) medical literature and medical examinations have shown a need for early detection and treatment. Since the extent of the exposure is significant and the encompasses all aspects of the contamination of the site, the PRP's should include as part of the remedial plan, a comprehensive medical surveillance program for such length of time and in such detail as would be established by reputable occupational medicine centers such as the University of Connecticut Medical School and/or the Yale School of Medicine.

Ground Water Remediation

While the Ground Water investigation and remediation is scheduled for a Phase II approach to the site. It is recommended that that phase be undertaken immediately as the effects of the groundwater upon the health of the individuals exposed should be determined as soon as possible. In addition, the completion of the site and the subsequent groundwater remediation may disturb or alter the capping and delay the final cleanup. Although we agree that the capping of the site to prevent additional rainwater from permeating the landfill is necessary, this action can be taken along with necessary containment procedures for groundwater so as to prevent continuation of the contaminates from entering the groundwater and expanding the plume.

A reply to these comments would be appreciated when all comments are received and the EPA makes its finding. This office would be willing to present evidence concerning the need or desirability of medical monitoring.

Very truly yours,

COHEN & CHANNIN

Robert B. Cohen
RBC.2275/tec

6 Village Road
Southington. CT 06489
10 July 1994

Almerinda Silva
Project Manger
Mailcode HECCAN6
JFK Federal Building
Boston, MA 02203

Dear Sir or Madam,

Respectufully request that the following comments relative to clean-up of the former landfill Superfund Site on Old Turnpike Road in Southington, Connecticut be made a matter of record.

First, I strongly object to the fact that the government has seen fit to treat those people who used the landfill, in the years when it was available for dumping purposes, as "law breakers". In the mid 1960's I served on the Southington Board of Selectmen, the then administrative body for the Town, and, as a part-time official, assisted in maintaining the dump site. The Old Turnpike dump (or landfill reclamation area as it was later called - guess that sounded better) was run in accordance with then-accepted rules and practices; wastes were separated, compacted and covered daily with the view towards reclaiming the land for park or industrial purposes. The more than 300 people who have been cited for violations and are being forced to bear the burden of the clean-up (along with the taxpayers of the Town) broke no laws. It is quite obvious that these people are now being involved because the government chose to punish them by instituting "retroactive laws". In a sense, the EPA and others are making a declaration that something which was legal at the time has now been retroactively declared illegal. Could the government now pass a law saying that those who failed to utilize current auto anti-pollution measures at a time when none existed be punished because what was then legal has suddenly become illegal? I think not.

Many clean up options are, apparently, being considered. The EPA seems to advocate that some type of cap be used to cover the site. Apparently it is felt that the cap would prevent surface waters from penetrating the surface and creating further leachate which could damage the underground drinking water supply. This would involve removing existing buildings from the site. There are also proposals by neighbors of the site to remove homes and also spend many millions of dollars to completely remove all hazardous materials from the site. I disagree with all of these proposals. The "cap" isn't going to have any affect on the existing underground materials which would, because of their very liquid nature, tend to leach in a downward direction - and attempting to thoroughly remove the dump in it's entirety would, I believe, create more problems than it would solve. Were hazardous materials confined to just one area of the site it might be possible. Such is not the case.

Back in the mid-1960;s - about 1964, I believe - the landfill had reached capacity and we (the Board of Selectmen) secured a lease from an adjoining landowner so that we might extend the dump site as a temporary measure while attempting to find another site. Because of the restricted space and prior to the availablility of additional land, we were forced to raise the level of the dump by several feet in some areas. It was then decided to bring the old dump down to the proper grade by bulldozing the excess and moving it to the new area. This procedure is something I would never again advocate The area involved was comparatively small but the problem was large. The entire neighborhood became overwhelmed with noxious fumes - the odors were unbearable. The highway department workers had to wear masks while working and even the masks didn't help that much. Neighbors were naturally upset and we offered to house them in area motels until the trash moving process was completed. Most went to stay with friends or relatives. I truly can't imagine what the situation would be like if the decision were ever made to opt for a complete removal of waste from this site. At the least it would be lengthy and unbearable.

There has been reference made to a "hot spot" within the confines of the dump. This "hot spot" is, I believe, an isolated accumulation of toxic residue which was put there by the now defunct Solvents Recovery Service. Mr. Harry Bock, our highway superintendent at the time, (about 1963 or 1964, I believe) came to a meeting of the Board of Selectmen one Wednesday afternoon and said that SRC was dumping sludge in the area and he wanted them to discontinue this dumping immediately. He said that the type of residue being dumped would not "break down" in a hundred years and would be harmful. I really didn't know whether we could legally keep them from dumping this sludge but we called in a Mr. Ball, who was in charge of SRC and told them to stop. They did. Mr. Bock had bulldozed a pit on the dump site so as to isolate and contain the sludge and this, I believe, is the area of the "hot spot."

The dump has been closed for almost thirty years and, other than a naturally occurring methane gas which can be controlled, there has been no evidence of any surface "bubbling" or any indication of the release of toxic materials. Any use of affected aquifers has been discontinued and no one is, apparently, in any immediate danger of being affected by the contents of the landfill. Naturally, we can and should maintain constant vigilance through extensive monitoring to maintain awareness of any possible health hazards.

Monies spent in attempting to remove the contents of the landfill might be better spent on providing free city water supplies to those who might be adversely affected by any leachate in the future. We could probably supply water to all of the surrounding towns for a small portion of the monies being contemplated for the cleanup.

We all realize that the problem is there and even though it is covered up, it's not going to go away. However, any massive and/or untried or unproven methods of resolving the problem may simply create even greater problems to be passed along to our children.

Truly yours.

James A. Wallace Sr.

James A. Wallace, Sr.

Robert McVeagh

Dc 5

Oral Public Comments
for
Old Southington Landfill
To be presented orally to EPA on July 12, 1994

Treatment of groundwater and wastes in the landfill

The project should not be divided into two operable units designed to address waste material within the landfill and groundwater separately. Both the waste material and the groundwater should be addressed simultaneously as soon as possible. There is no reason to conduct an entire new RI/FS for groundwater. Although there are some factors about groundwater contamination that have not been fully answered, such as how far off-site the contamination extends, the existing data clearly indicates that significant groundwater contamination exists at and downgradient of the site. In addition, the preferred remedy includes leaving a significant volume (about 100,000 cubic yards) of highly contaminated material in groundwater beneath the cap. Therefore, groundwater should be addressed as part of the current remedy and should not be delayed while another RI/FS is conducted. The groundwater migrating from the site should be collected and treated.

The proposed remedy will also leave approximately 30% of the waste in contact with the local groundwater. The proposed approach will allow the continued leaching of contaminants into the groundwater. This is not acceptable with a plan that, thus far, calls for no treatment of that migrating contaminated groundwater. Neither does this plan directly address the treatment of the majority of the source material in contact with the groundwater creating the problem. A plan which would treat the waste directly by using combined off-site disposal and possible air sparging with soil vapor extraction or other soil treatment technologies would be more appropriate. The EPA has stated in their RI comments that the natural flushing approach will taken even longer than estimated in the RI/FS. This approach would render the local aquifer useless for an indefinite period. It would be more efficient to treat the waste material directly using the alternate direct techniques rather than indirectly in the groundwater. This approach would make groundwater treatment more effective and successful.

The remedial investigation did not satisfactorily address the possibility of high contaminant concentrations adjacent to SSDA-2 beneath the Parks and Recreation Building. Contamination in this area may be in contact with groundwater. This possibility is strengthened by the fact that contaminant concentrations in well B304 (immediately downgradiant from SSDA2) are higher than those in well B302 (immediately downgradiant from SSDA-1). The possibility is further strengthened by the consistent presence of volatile gasses in the Parks and Recreation Building.

Groundwater Classification

Insufficient research has been conducted by the CT DEP and the EPA regarding the classification of groundwater at the site. The local aquifer was reclassified from a GA area to a GB area in the recent past. This reclassification process should be reviewed to verify that the GB classification is justified and was performed in accordance with all state regulations and requirements. Current EPA policy indicates that "institutional controls shall not substitute for active response" which includes restoration of groundwater to beneficial use. Based on these criteria it appears most appropriate for the local aquifer to be classified as a GB/GA area to "ensure restoration to beneficial use."

Black Pond

No information has been provided which demonstrates that contaminants will not leach from the landfill back into Black Pond if the additional soil pressure of capping material is added to the top of the landfill.

The extent of waste material beneath Black Pond has not been sufficiently delineated. This must be done to ensure alll of it is removed from the pond prior to capping the landfill.

Waste and potentially contaminated sediment will be stirred up during excavation of waste along the shore of Black Pond. The Plan must address measures which will be taken to lminimize this spread of contamination.

After completion of the remediation, additional testing of Black Pond should be conducted to ensure unrestricted access is acceptable and protective of human health and the environment.

Off Site Migration

An Ecological Risk Assessment was conducted. However, it only concerned the site itself, Black Pond and the adjoining wetlands. No evaluation has been conducted regarding the impact of groundwater contamination which has and will continue to migrate off-site on downstream areas such as the river. Future investigations should specifically address the potential impact of groundwater contamination on the river.

Future Public Involvement

The EPA should establish a schedule for having public meetings on a quarterly basis, regardless of what has or has not happened during that quarter, so that the public is kept informed. In addition, a Community Advisory Council should be created so that the community can participate in the preparation of some reports, rather than just being able to review them after they are prepared, so that community concerns are addressed. For example, the community should be given the opportunity to provide direct input into the community health and safety plan, the site restoration plan and planning regarding site security and traffic.

Statement of James
Delahunty

ALMERINDA SILVA, REMEDIAL PROJECT MANAGER

US ENVIRONMENTAL PROTECTION AGENCY, REGION 1

WASTE-MANAGEMENT DIVISION (HEC-CAN 6)

JFK FEDERAL BUILDING

BOSTON, MASS. 02203

JULY 12, 1994

ON JUNE 14, 1994, THE EPA PROPOSED A CLEAN-UP PLAN FOR THE OLD SOUTHINGTON LANDFILL SUPERFUND SITE.

ALTHOUGH I DON'T AGREE WITH THIS PLAN, BECAUSE IT'S A COVER-UP AND NOT A CLEAN-UP, I DO AGREE WITH THE EPA THAT ALL OF THE RESIDENTS AND BUSINESSES SHOULD BE REMOVED AND RELOCATED FROM THE SUPERFUND SITE.

A FEW OF MY CONCERNS ARE:

1. EXCAVATING HAZARDOUS WASTE FROM SSDA1 AND RELOCATING IT TO A DIFFERENT AREA OF THE SUPERFUND SITE IS AN EXTREME HEALTH HAZARD TO THE COMMUNITY. <u>IF</u> THIS HAZARDOUS MATERIAL MUST BE EXCAVATED, IT MUST BE REMOVED FROM THE SITE. FOR OBVIOUS HEALTH REASONS, PEOPLE LIVING NEAR THE SITE MUST BE RELOCATED DURING THIS VERY HAZARDOUS OPERATION.

2. AFTER CAPPING A SUPERFUND SITE, TREATEMENT OF THE CONTAMINATED SOIL AND GROUNDWATER ON SITE IS ALMOST IMPOSSIBLE. IF THE CONTAMINATED GROUNDWATER IS NOT TREATED NOW, CAPPING THIS TOXIC WASTE SITE WILL COME BACK TO HAUNT US IN THE FUTURE.

3. RESTRUCTURING THE CULVERT HAS ADVANTAGES AND DISADVANTAGES. ONE OF THE BENEFITS OF OPENING THE CULVERT WILL BE TO ALLOW WATER FROM BLACK POND TO FLOW THRU THE OPENED CULVERT AND LOWER

THE LEVEL OF BLACK POND. THIS WILL HELP DETERMINE THE EASTERN AND NORTHERN BOUNDRIES OF THE SUPERFUND SITE. THE DISADVANTAGE IS THIS WILL ALSO EXPOSE CITIZENS LIVING AROUND THE SUPERFUND SITE TO THE TOXIC CONTAMINATION UNCOVERED BY LOWERING THE POND LEVEL. ALSO THE POND WATER COMING THRU THE OPENED CULVERT COULD BRING TOXIC CONTAMINATION TO AREAS WEST OF THE SITE.

4. THE PROPOSED PLAN DOES NOT INCLUDE ~~MONITORING~~ Testing FOR METHANE MIGRATION OUT-SIDE OF THE SITE. BY CAPPING THE SITE, METHANE AND OTHER GASES COULD BE PUSHED OUTSIDE OF THE CURRENT BOUNDRIES, ENDANGERING RESIDENTS.

THE EPA STATED THAT COMMUNITY IMPUT ON THIS PROPOSAL WILL PLAY A CRUCIAL ROLE IN COMING UP WITH A PLAN EVERYONE CAN LIVE WITH. I BELIEVE THE PEOPLE MOST AFFECTED BY THIS TOXIC WASTE SUPERFUND SITE SHOULD HAVE THE MOST IMPUT INTO WHAT TYPE OF CLEAN-UP PLAN IS SELECTED. COMMUNITY OPINION SHOULD BE CONSIDERED WHEN MAKING A FINAL PLAN. MEETINGS BETWEEN THE EPA AND CITIZENS LIVING NEAR THE SITE SHOULD ENABLE THE COMMUNITY TO HAVE MORE SAY INTO WHAT TYPE OF A CLEAN-UP PLAN IS SELECTED.

I ENCOURAGE THE EPA TO DELAY THE ROD UNTILL A CLEAN-UP PLAN "WE CAN ALL LIVE WITH" IS AGREED ON.

THANK YOU,

JAMES DELAHUNTY

393 OLD TURNPIKE ROAD

PLANTSVILLLE, CT. 06479

Preface: I am going to refer to the Old Southington Landfill as the "site".

WE NEED: More testing of solid wastes, metals, and chemicals in the NORTHEAST section of the pond shoreline and the wetlands of the site.

WE NEED: More METHANE testing in all homes surrounding the SITE INCLUDING ALL MEANS THAT METHANE CAN TRAVEL, not just those homes and businesses located on the SITE.

WE NEED: Further investigating of CLEAN UP methods used at similar sites so that we can pursue all our options, not just the ones that have been proposed.

I DON'T WANT: Ou 1 to be done without Ou 2 being done at the same time. The cap alone without addressing the surface water and the ground water would only be a COVERUP not a CLEANUP. Furthermore, I feel as though the cap alone would create a greater health risk exposure from contaminants to those residents that remain near the SITE, since EPA 's plan is to bury contaminants from SSDA1 under the cap.

[redacted] I am very upset that so many good families are seeing their property values decline as a result of the SITE.

I feel we are being forced to accept a proposed method of cleanup that is not a true cleanup and that not enough research has been done to investigate other methods at similar sites.

Why is this SITE referred to as a landfill when it is a HAZARDOUS WASTE SITE? EPA, DEP and the PRP's should stop minimizing the seriousness of this SITE. Do they do this to hold down costs on the cleanup?

The contaminants have been there for fifty plus years, another year for a better solution can't hurt.

Fifteen million dollars is a lot of money to spend for a partial solution. Put the money to better use to insure our safety and our health and to create a larger buffer zone between the residents and the contamination. Don't rush into this until there is a total agreeable solution!

We need continous communication efforts to get access to information from the EPA to better understand the problems that exist at the SITE and to guarantee public input into the agency's remediation and future use decisions.

Thomas and Cara Kavan
61 Rejean Road
Southington,Ct. 06489

409 Hitchcock Road
Southington, CT 06489
12 July 1994

Almerinda Silva
Project Manager
United States Environmental Protection Agency
JFK Federal Building
Mail Code HEC-CAN6
Boston, MA 02203

RE: Old Southington Landfill Proposed Remedial Action Plan

Dear Ms. Silva:

As a resident of Southington, and a member of the Town Council I have been intimately involved with the issue facing us this evening - the Old Southington Landfill Superfund site. I think it is fair to say that the Town Council's involvement in this project is motivated by 2 primary concerns - protecting the Health of the citizens of Southington, and implementing as quickly as possible a plan for remediation of the Superfund site. As a member of the Town Council, I view my role as one which involves looking after all aspects of the community. I believe the remediation plan currently proposed, with one exception, strikes an appropriate balance between protecting the public health and implementing a workable, cost-effective, and immediate plan for remediation of this site.

While I think it is of the utmost importance to move forward with remediation efforts, I do not mean to trivialize the cost of remediation to the citizens of the Town of Southington. The cost of this project impacts Southington in two ways, first, by the Town's percentage share in the remediation costs, which will be reflected in our tax rate, and secondly, by impacting businesses in town which are PRPs. These businesses will get hit twice - once for their percentage share of remediation, and secondly through the higher taxes the Town must levy to pay its share (and, possibly, a third time if they are a PRP in the Solvents Recovery site). I ask that you take into consideration not only the benefits of proposed remediation efforts, but also the costs involved, and weigh these two factors before additional burdens are levied on the citizens of Southington.

One final issue I would like to address involves the SSDA material. There seems to be a debate as to whether it would be more beneficial to dig this material up and place it in lined cells, or to leave it where it is and monitor groundwater contamination levels to ensure these materials are not acting as a perferential source to groundwater contamination (the RIFS indicates they are not a major cause of groundwater contamination). From a Public Health perspective, it seems it might be better to leave these materials in the ground, since there is no risk to the public in leaving them in place. If we can abate the problem by capping this area, thereby preventing seepage into the groundwater, while posing no risk to the public, this approach appears more sound from a public health perspective.

I am encouraged to see that after seven years of study and the expenditure of millions of dollars of taxpayers money, we are finally moving forward with remediation. I hope that your agency will take the steps to allow this process to begin quickly.

Very Truly yours,

THOMAS P. LANGDON

TPL:es

Town of Southington

Town Council

ANDREW J. MEADE, Chairman
VICTORIA TRIANO, Vice Chairperson
KEVIN R. DALY
THOMAS P. LANGDON
EDWARD M. MALCZYK
MICHAEL A. ROSSI
MAUREEN P. TEMCHIN
JAMES M. VERDERAME
JAMES A. WALLACE, JR.

Town Manager

JOHN WEICHSEL
203-276-6200
FAX 203-628-8665

July 11, 1994

Ms. Almerinda Silva
Regional Project Manager
Region I
Environmental Protection Agency
JFK Federal Building
Mail Code HECCAN6
Boston, MA 02203

Re: *__Proposed Remedial Action Plan for the Old Southington Landfill Superfund Site__*

Dear Ms. Silva:

In my capacity as Chairman of the Southington Town Council, I would like to express my appreciation for the opportunity to submit these comments on the Proposed Remedial Action Plan (the Plan) for the Old Southington Landfill Superfund Site (the Site) on behalf of the Town. The parties which have performed the investigations at this Site have expended more than $5 million over the last seven years. To date very little of that money has been spent on remediation. It is appropriate that the focus and funding shift now to cleaning up the Site. The RI/FS process has been a lengthy, frustrating, and expensive one for the Town, its citizens, and all parties involved and we are glad that it is finally over and that a remedy has been identified that will protect the health of Southington residents and the environment.

As the Town's governing body, the Council must represent the interests of all its citizens, a task which carries with it the mandate to protect their health and safety. This is not a task which the Town takes lightly. Our willingness to work with EPA to investigate the Site and to expend large sums of money to do so is evidence of our commitment. EPA developed and designed the Plan specifically to protect our citizens. The proposed cover for the landfill and the collection system for gases being generated by decomposition of landfill waste will ensure that people do not come in contact with waste materials. People living on the Site or owning businesses there will be relocated.

The price tag for these measures and the groundwater monitoring that accompanies them is high. We estimate it to be in excess of $25 million once all of the costs are calculated. Nevertheless, it is important that these steps be undertaken

We also applaud EPA's decision not to require groundwater treatment or containment but to first undertake further investigations regarding the efficacy of the cap. Fortunately, local and State regulations bar use of the groundwater in this area as a drinking water source. Requiring expenditures of at least an additional $25 million to contain the water in this aquifer would provide little benefit to the community or the environment and would not be prudent.

The prudent course of action is to properly cover and vent the site, install the necessary additional monitoring equipment and evaluate, under EPA's auspices, the success of this work. The Town of Southington has been and will continue to ensure that issues of concern to its residents are considered as remediation goes forward.

While the Town must work to protect our citizens' health, we must also be aware of the enormous burden remediation required by this Plan will have on our taxpayers and on the business members of our community targeted as potentially responsible parties. Those businesses face not only paying a share of the remediation costs, but also having their taxes raised. Especially in these recessionary times, these impacts on our business community could be far-reaching.

We may not agree with the lack of fairness inherent in Superfund, the administrative red tape that greatly inflates the costs of the process, or the staggering enormity of the remedial costs, but we must work to further the goal of protecting our citizens' health. The Town believes that the Proposed Plan provides appropriate safeguards for our community.

Thank you for your attention.

Sincerely,

Andrew J. Meade
Chairman
Town Council
Town of Southington

SCHETTINO AND TEMCHIN
ATTORNEYS AT LAW
176 North Main Street
Southington, CT 06489
(203) 620-9850
FAX (203) 628-0019

PLEASE REPLY TO Southington

July 12, 1994

JOSEPH E. SCHETTINO, JR.
EARL M. TEMCHIN
MAUREEN PLATT TEMCHIN *

* RESIDENT ATTORNEY - SOUTHINGTON

North Haven Office:
Sturbridge Commons - Brighton House
250 State Street, B-1
North Haven, CT 06473
North Haven (203) 288-8200
FAX (203) 288-0193

Almerinda Silva
Project Manager
United States Environmental Protection Agency
JFK Federal Building
Mail Code HEC-CAN6
Boston, MA 02203

Re: The Old Southington Landfill Superfund Site Proposed Remedial Action Plan

Dear Ms. Silva:

As a resident of Southington and current member of the Southington Town Council, I am deeply concerned about the safety and welfare of our community. I have always taken a rather active role in issues facing our town and have carefully monitored Southington's involvement in our two Superfund sites.

Although our town has spent millions of dollars on legal fees and studies, no money has yet been spent on any clean up or containment on the Old Turnpike site. After seven years, EPA has finally presented a proposed plan to begin the containment of pollution at the old landfill. This plan is the result of millions of dollars of taxpayer money and numerous studies and consultations.

Certainly no plan is perfect in every regard. We will never achieve a plan with universal approval. However, the time for inaction and further study has come to an end. The proposed plan must be adopted and implemented as soon as possible. We must finish this process of endless debate and discussion and begin to address the containment of on-site pollutants. We owe our community nothing less. Further prolongation of this extensive procedure will serve only to add to our already exorbitant legal bills.

It is my hope that with your agency's help, Southington can begin the road toward finally dealing with the containments at the Old Turnpike site.

Sincerely,

Maureen P. Temchin

Maureen P. Temchin

THE PIKE REALTY COMPANY, INC.

597 Old Turnpike Road

Plantsville, Ct. 06479

July 14, 1994

Almerinda Silva, Remedial Project Manager
U.S. Environmental Protection Agency
Waste Management Division (HEC-Can 6)
JFK Federal Building
Boston, MA 02203

Dear Ms. Silva,

Please consider the current commercial property owners especially unique in the Old Southington Landfill Superfund ... that they be afforded the same rights and privileges given to the current residential landowners. The properties were sold to the general public after the landfill was closed and soil capped. The current residential owners were not cited as Potential Responsible Parties (PRPs) due to an Environmental Protection Agency (EPA) policy. In this special case the current commercial landowners, who were cited as PRPs solely on the basis of current land ownership and not for their contribution to the landfill, should be treated in the same way as home owners.

The burden, be it psychological or financial, of your citing the current commercial property owners as PRPs because they purchased their property through "dumb luck" is not morally fair. A small business owner can not sustain such a burden in today's market place. There are approximately 45 jobs within the old landfill area that can easily be lost to the town of Southington and state of Connecticut. A policy decision relieving the current commercial property owners as PRPs would go a long way in reducing the anxiety this superfund site is causing.

Very truly yours,

THE PIKE REALTY COMPANY

J.S. Needham

JSN/hf
File:EPA
cc: Senator Dodd
Senator Leiberman
Representative Johnson
Governor Weicker

RECEIVED
JUL 20 1994

State of Connecticut

GENERAL ASSEMBLY

STATE CAPITOL
HARTFORD, CONNECTICUT 06106

June 20, 1994

Ms. Almerinda Silva, Remedial Project Manager
U.S. Environmental Protection Agency
Waste Management Division
J.F.K. Federal Building
Boston, MA 022023

Re: Proposed Remedial Action Plan for the Old Southington Landfill Superfund site

Dear Ms. Silva:

We are pleased that the investigation of the conditions at the Old Southington Landfill Superfund Site has been completed and that the Environmental Protection agency has issued a proposed cleanup plan that addresses potential health concerns related to the site. The removal of the buildings, capping of the entire site, and placement of a gas collection system are prudent measures to implement despite their cost.

The Town of Southington, the other PRPs, EPA and the Connecticut DEP have worked diligently and cooperatively on this project for many years. Throughout this time, their highest priority has been to protect the health of Southington residents and workers on the site. Their efforts have led to the EPA plan presented at this hearing, a reasonable plan which considers the extensive data that has been generated. We wish to personally, and in our capacity as State Representatives, take this opportunity to commend the parties on having completed the very complex and difficult task of identifying appropriate remedies for this site.

It is our hope that additional suggestions presented at this public hearing will be considered.

Sincerely,

Ann P. Dandrow   Dennis H. Cleary   Angelo M. Fusco

APD:DHC:AMF/mlb

Doc 3

RECEIVED
AUG - 3 1994
CT WASTE ...

August 1, 1994

Ms. Almerinda Silva
United States Environmental Protection Agency
Region 1
John F. Kennedy Federal Building
One Congress Street
Boston, Massachusetts 02203-2211

Dear Ms. Silva

Reference: Old Turnpike Road/Southington Landfill Superfund Site

After reviewing the EPA remediation proposal for the above landfill, and having attended the two public hearings that were held at Depaolo Jr. High School, Southington, I strongly oppose the remediation proposal and believe that it is far outreaching any possible contamination that exists on this site today. I have heard remarks of contaminated water, contaminated land, methane gas, but to date nobody has been able to document any harm that has occurred from this abandoned landfill.

As a property owner on this site, I would **strongly** recommend that the site be left alone as I believe your proposal will not bring any satisfaction to the immediate neighborhood, in particularly Rejean Drive and its close proximity.

As a taxpayer in the Town of Southington, I believe that a the expenditure that will be mandated by the Town of Southington should be brought to a referendum to see how the people feel about the senseless dollars that will be required to clean up this abandoned landfill.

Please accept this letter as a formal notice that there shall be no more monitoring, testing, or trespassing on this site located at 477 Old Turnpike Road until an agreement between the property owner and the three known polluters is reached regarding the possible liability of the clean up on this site.

Sincerely

Harold L. Charette
Jo Ann M. Charette
87 Melisa Court

Almerinda Silva, Remedial Project Manager
U.S. Environmental Protection Agency, Region 1
Waste Management Division (HEC-CAN 6)
JFK Federal Building
Boston, Mass. 02203

AUG - 8 1994

Dear Almerinda,

We are writing to provide our comments on EPA Region 1, Superfund Program, Old Southington Landfill Site, Southington, Ct., Proposed Plan, dated May 1994.

As you may be aware, our concerns are numerous and varied. Our comments will be both general and specific, concerning the Proposed Plan and other issues we feel are relevant to Site cleanup.

CONCERNS AND COMMENTS

Page 1, Par. 6;

EPA and CT DEP "additional data must be collected and studies performed to properly evaluate and select a complete groundwater remedy."

comment Exactly what additional data is needed and how much longer will it take? Studies have been conducted to determine the nature of contamination for 11 years, why hasn't the correct data been obtained? Is the primary reason for not treating the groundwater at this time due to PRP threatened withdrawal? If groundwater contamination poses significant risk to human health (page 13), why isn't the EPA insisting on groundwater clean up NOW?

Page 2, Par. 2;

"The presumtive remedy for CERCLA municipal landfill sites relates primarily to containment (capping)."

comment We feel this is the wrong remedy for this site. No mention of toxic industrial waste is made in this statement. Additionally, waste will not be contained at this site, due to continued groundwater contamination and spread of the contaminated plume.

Page 4, Par. 2;

"EPA's choice of a limited source control remedy for this operable unit will be issued in a Record of Decision for the site in September 1994."

comment We urge the EPA to delay the ROD untill a complete clean up package is selected. We are also requesting additional meetings with the EPA to inform residents of progress made.

Page 9, Par. 1;

"The northern area of the landfill was primarily used for disposal of wood, and construction-type debris such as glass, bricks and asphalt."

comment Test boring TB140 has mixed sanitary and bulky waste with cable and wire. Test boring TB131 has material listed as landfill with a petroleum sheen and slight odor. Test borings TB122 and TB133 have refuse. It seems that the above reports indicate waste other than construction debris is located in the northern area.

Elevated levels of VOC's, metals, and pesticides were found in some of the test borings in the northern area of the site. Drillings with high PID readings (TB131, TB140, TB140A) were not tested. Please explain this to us.

Page 9, Par. 1;

The northern area "subsurface soils contain varying levels of PAHs."

comment As we live less than 40 feet from the site, this is a major concern for us. All of the identified cantaminants pose a risk to human health or the environment. Many are carcinogens. On site work will disrupt and expose subsurface soils. Dermal contact and inhalation of toxins could occur.

Page 9, Par. 2;

The southern area's subsurface soil has "a wide variety of contaminants including VOCs, SVOCs, and metals. Pesticides were also detected."

comment See page 9, par. 1 comment

Page 9, Par. 3;

SSDA1 and SSDA2 "contain high levels of VOCs and SVOCs."

comment See page 9, par. 1 comment

Page 9, Par. 4,5 and 6

Surface soils at the site are contaminated with VOCs, SVOCS, PAHs, Pesticides and metals.

comment As VOCs "evaporite to the air" (page 34), we are concerned about the quality of air we are and will be breathing. Another concern we have is that fugitive dust is contaminated with any or all of the toxins found in the surface soil. This is a constant worry. Every time the wind blows, we wonder what it is carrying.

Page 9, Par. 7;

"landfills commonly generate gas (approximately [illegible] methane, 40% carbon dioxide)."

comment What is the other 10%?

Page 10, Par. 1;

"Pressure build up may cause gases to migrate through soils and potentially escape to the surface."

comment On May 5, 1994 residents living near Old Southington Landfill met with personnel from the CT DPHAS and ATSDR to receive answers on questions about landfill gas migration. In an undated document titled "Proposed additions to OSL PAH in bold" the section titled "conclusions" par. 2 stated "Explosive gases may be migrating into storm sewers or buried utility lines that lie on or adjacent to the landfill. The northern extent of landfill gases has not been completely characterized. Sufficient data does not exist to eliminate the possibility of landfill gases migrating into the homes on the north side of Rejean Road." When does the EPA plan to check this? As the complete analysis of landfill gases remain unclear (50% methane, 40% carbon dioxide, 10% ??) we are more than a little concerned about this hazard. In addition to the fact that our homes could "explode" at any moment, we have the worry of toxic gases "migrating through soils and potentially escaping to the surface" for us and our children to breath. When will the EPA do something, after someones home explodes or after a child is diagnosed with cancer? Additionally the ATSDR recommended additional in home monitors for the homes without them. Has anything been done about this?

Page 10, Par. 2;

"Testing to detect combustible gases were conducted at 110 locations. High levels of these gases were recorded at about 55 test locations."

comment At about 55 locations? What is the exact number?

Page 10, Par. 2;

"Most of the high readings were detected in the southern of the landfill."

comment What are the exact numbers in the north and south areas?

Page 10, Par. 4;

"Soil gases were measured for the presence of specific VOCs at 23 locations."

comment VOCs were detected at 7 locations in the northern area and an undisclosed amount in the southern area of the Site. Two of the VOCs detected are Benzene and vinyl chloride. Both are carcinogens and are "dissipating into the atmosphere" we breath. What measures are being taken to protect residents?

page 11, Par. 1;

"The groundwater sampling results indicated that metal concentrations exceeding background levels. Many of these metals were also found to exceed MCLs in several wells."

comment Metals exceeding MCLs include:

Barium	poisonous metal
Beryllium	cancer-causing metal
Chromium	cancer-causing metal
Mercury	highly toxic
Nickel	carcinogen
Thallium	highly toxic

The results of the metals alone should be enough to warrent immediate remediation of the groundwater.

Page 11, Par. 2;

"VOC and SVOC levels ranged from below to slightly above MCLs in surface water samples collected from Black Pond and it's outlet stream. Antimony, cadium, lead and thallium levels were each exceeded.

comment Any amount exceeding Maxium Exposure Levels is not acceptable. Residents lives and health are at stake, not just some insignificant numbers and words on paper. Exposure to surface water can and probably does occur every day.

page 11, Par. 3;
"Levels of metals detected in surface water samples were also compared to federal AWQC standards that are set to be protective of aquatic life. Copper, lead and zinc concentrations exceed these standards."

comment For some unknown reason, people fish in the pond. Adequate precautions should be taken to protect residents from the hazards of eating fish contaminated with toxic metals.

Page 11, Par. 4;
"Sediment samples collected from Black Pond and it's outlet stream contain VOCs. SVOC analysis indicates the presence of PAHs at levels exceeding background concentrations. PCBs were also found. Concentrations of metals, including lead, mercury and vanadium were higher than background levels."

comment Exposure to sediment is probably a frequent occurance. People fishing in Black Pond or the stream stand in the water. Anyone, especially children, can step into or play in the water and sediment of the pond and stream. VOCs, SVOCs, PAHs, PCBs, lead, mercury and other metals are detected in an easily accessable area. Who is protecting residents? This area is not being addressed in the "Preferred Alternative".

Page 11, Par. 5;
"The water table at the landfill varies from about 2 to 34 feet below the ground surface....All material in SSDA2 is located above the water table."

comment The data indicates that a significant concentration source is below the water table at SSDA2. Based on Plate 3-5, the water table is approximately 16 feet below land surface at TB-114. Table 4-17 states that subsurface soil was collected at TB-114 at a depth of 20 to 23.8 feet below land surface. Also boring logs from TB-101, TB-103 and TB-112 refer to "solvent odor, petroleum smell and oily soil."

Page 11, Par. 6;
"Groundwater contaminates migrating from the landfill flow westerly under Old Turnpike Road."

comment Groundwater flow is to the west and north. As information on groundwater flow to the north is limited, contaminated groundwater migration is unknown.

Page 12, Par. 1;
"The northern area was primarily used for disposal of wood and construction type debris."

comment See page 9, par. 1 comment

Page 13, Par. 2;
"An evaluation of the risks associated with potential exposure to subsurface soil was not conducted because EPA is selecting the presumptive remedy of contaniment for this municipal landfill. Consequently, direct exposure to subsurface soils will be prevented."

comment The presumptive remedy chosen by the EPA will be the cause of exposure to subsurface soils, not the prevention. No sane person would dig in the landfill, however EPAs remedy will do just that. Exposing residents to toxic contaminants by dermal contact and inhalation. Additionally not all of the contaminated areas surrounding the site will be capped. Therefore, anyone wishing to dig a hole (for any reason) will be exposed to the contaminated subsurface soil.

Page 13, Par. 3;

"Residents and urban impacts could include, street runoff containing oil, PAHs and metals that drain into Black Pond. Residential use of paints, solvents, oil, gasoline, pesticides and other chemicals may also impact Black Pond if surface runoff occurs from areas where these chemicals may have been spilled."

comment Although residential impact may contribute to the contamination of Black Pond, it is hardly worth mentioning considering the millions of gallons of toxic industrial waste and other toxic substances that are being left on site.

Page 14, Preferred Alternative SC6: Limited Source Control #2

"Excavating and consolidating discrete semi-solid materials from SSDA1 and placing it back into the southern part of the landfill within a lined cell to prevent wastes below the water table from further contaminating the groundwater."

comment Page 20 analysis of this procedure states that all discrete materials as well as a two foot buffer zone around and below the zone will be excavated. Boring logs from TB-134 indicate that landfill debris is 31 feet below the surface soil. Records also state that the water level in this area is at 11 feet. If my math is correct, this means excavation of material from 22 feet below the water table (including 2 foot buffer zone). TB-134 is just slightly north of SSDA1 has petroleum sheen at a depth of 10 feet. As there isn't a clear definition of this "hot sopt" boundry, how will the two foot buffer zone be determined? How will excavation 22 feet below water level be done safely?

"The estimated volume of the SSDA1 discrete material is 500 to 1,100 cubic yards". Definite delineation of the area is unclear. How was this figure arrived at

** "After excavation, these materials would be consolidated and placed in a lined cell beneath the cap. The lined cell would be located above the water table and would have an impermeable liner and a leachate collection system."

It is my understanding that the purpose of the "Impermeable cell" is to prevent leachate. Why do you need a "leachate collection system"? Is any cell 100% guaranteed? What will prevent the cell from cracking or tearing from ground movement?

** "Because SSDA1 is located next to Old Turnpike Road, the road would be closed off during excavation to allow sufficient space for construction equipment and to prevent exposure to VOC emission."

Rejean Road is in a residential neighborhood with children and pets. We do not want heavy traffic and tractor trailers on this street. Where will the traffic be routed?

Construction equipment is loud, noisy and smelly. What measures will be taken to minimize the nuisance? Also, the vibrations from this equipment may unsettle landfill material and gases. How will this be monitored? How will residents be protected?

Exposure to VOCs is a very real possibility. EPA is protecting motorists whose exposure time would be minimal by rerouting the traffic. What will be done to protect the residents, who spend the majority of thier time in the area. The logical solution would be relocation.

** "Controls to be implemented to minimize potential worker and off-site population exposure to contaminated dust and VOC emission include watering of the excavation, covering spoil piles with plastic sheeting, access limitations and compliance with a health and saftey plan.

Watering the excavation!! Covering spoil piles with plastic sheeting!! We're not talking about a pile of wood chips. This is highly toxic material. To treat residents with such little regard is criminal. If this toxic mess must be excavated, the local residents should be relocated. Further measures to protect the population must be taken. The excavated toxic material must be fully contained in an air tight container, to prevent "exposure to contaminated dust and VOC emission". This toxic material must then be removed from the site in an air tight sealed container, not buried back on site in a cell that may or may not be impermeable.

Since this area is an extreme danger to the health and saftey of the population, access limitation must be more than a yellow exclusionary tape around the work area.

Air monitoring during this entire operation must be continual. Monitoring must be done while work is in progress and during shut-down. Every precaution that can be taken, should be taken to assure residents that VOC emission is not a danger to human health.

Page 15, Preferred Alternative SC6: Limited Source Control #3
Constructing a single-barrier cap over the northern part of the landfill and a RCRA Subtitle C cap on the southern part of the landfill "to reduce the amount of water entering the Site waste."

comment Page 15 #2 "Waste found along the shore of Black Pond would be excavated and placed underneath the cap."

We are concerned about excavating any area of the landfill. As stated earlier, this will be the cause of exposure to toxic material, not a preventive measure.

Boring logs for TB-135 and TB-132 indicate that mixed sanitary waste, bulky waste and landfill debris is in excess of 25 feet deep on the western side of Black Pond. How will this toxic waste be excavated and placed underneath a cap? Won't disruption of this toxic material be a hazard to human health? What will prevent more material from leaching out, if this volume of debris is removed?

Toxic landfill debris and industrial waste are located on all borders of the landfill. The minimum height added due to cap construction is 4-5 feet. The cap requires sloping for surface water run-off. How can an additional height of 4-5 feet be added to the very edge of the landfill (to cover all of the contaminants) and still be sloped? How will a cap have the desired result on this site?

People living near a landfill that has been capped have stated that capping does not work. The cap has cracked and is the cause of pollution to a near by lake. The sole purpose of a cap is to prevent inflitration of surface water through contaminated soil. The effectiveness of the cap is greatly diminished, or made useless, when it cracks.

Page 15, Preferred Alternative SC6: Limited Source Control #4 "Installing a gas collection and treatement system to prevent gas build up under the cap and to collect the landfill gases (and treat them if necessary)."

comment As stated earlier, ATSDR and Ct DHAS are concerned that landfill gases may have migrated off-site. This plan only addresses landfill gases that are on site.

Page 15 #3 "The system may consist of either passive or active venting and subsequent treatement of landfill gas, as necessary."

We are adamantly opposed to any venting of gas into the atmosphere. There are children living a few feet from the site, emitting toxic gases is not permissable to the local residents. No treatement is 100% safe. What would this type of system look like, smell like or would it be noisy? We are concerned about the health and saftey of our families and friends. Any emission from the landfill can be toxic. Even small amounts of some toxins can be deadly.

Page 15, Preferred Alternative SC6: Limited Source Control #5
"Developing a health and Saftey plan"

comment Neighbors near the site would like to have an imput into this plan. We feel that our health, saftey and welfare are at risk. Workers on site have the protection of "space suits", while we and our children remain unprotected. We also feel that local doctors and health institutions should be advised that extensive and hazardous construction is being undertaken in the area and the types of contaminants that will be exposed.

Page 15, Par. 11;
"Reconstruction of the culvert that currently acts as the outlet from Black Pond."

comment As the culvert will essentially bring pond water through the contaminated landfill, underneath the cap, what would happen if the culvert were to leak?

Page 16, Par. 1;
"The northern portion of the site could be developed into a passive recreational area, such as a park with benches."

comment As our home has a birds-eye view of the site, we are opposed to a barbed wire fence with orange day-glow signs posted all over it. However, access to the site, by non-authorized personnel should be prevented at all [illegible] will play in the area. They will dig just because they have been told not to. The site will be exposed to vandalism. The integrity of the cap will be compromised. The health and saftey of anyone walking in this recreational area will be in danger.

Page 17, Par. 4;

"Waste that is located below the water table will continue to leach contaminants "

comment This speaks for its self. For a total cost of $16,035,000 we still have continual leaching of toxic material.

Additional concerns we have are:

1. Why did you stop at TB-15 when determining the landfill boundry? Test borings TB-14 and TB-15 show high PID readings and wood.

2. How was the north-western boundry determined? No testing was done north of TB-13 in front of residential houses. Test boring TB-13 has high PID readings and refuse.

3. When deciding that 2/3 of solid waste is above ground water, what boring information did you use?

4. When testing north of Rejean Road TBG-20 shows high PAHs and other organics. Information that I have shows that the town may have used that area for part of the dump.

5. When testing on the landfill, were any plastic lined pits found? Information indicates that Solvents Recovery may have used them for disposal of slush. If they have been located, what plans are there to treat them? If not, what what plans are there to locate them?

6. When testing north and east of the Superfund site, why were samples held for 7 or more days befor testing?

7. GZA lab. sample reports show Acetone and Methylene Chloride in test boring TB-13, TB-15 and TB-18. They do not show on ESE reports. Why is that?

8. Table 3-1 shows test borings TB-137 and TB-137A as a solid waste cell. What does this mean and why isn't it listed in any other report?

9. Test boring TB-75A shows waste was located 15 feet below surface soil. Yet, in test borings TB-8, TB-9 and TB-12 the end of the boring was at 14 feet. Why did you stop before waste material depth?

10. "Removal of all residential and commercial structures from the site" will be required for capping of the landfill. No where in the EPA alternative is it stated that all vegetation (including every tree, shrub and bush on site) must also be removed. How will this be accomplished? Will the roots be removed? Will this pull up contaminated soil? Will the area be enclosed to prevent contaminated dirt from disbursing? The procedure must be fully explained to residents before any removal is done. The very thought of living less than 40 feet from the site when this work is done terrifies us.

11. As all structures must be removed, what will happen to the existing utility and sewer hook-ups? Landfill gases follow the route of least resistance. The abandoned utility lines would be a perfect avenue for gas migration. Landfill gases could enter cracks in the services and migrate to homes off site. The sewer and utility lines must be removed and not just disconected and capped.

Old Southington Landfill
Ad Hoc Potentially Responsible Party Group

August 12, 1994

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Remedial Project Manager
U.S. Environmental Protection Agency
Waste Management Division (HEC-CAN6)
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RE: Comments on Proposed Cleanup Plan
Old Southington Landfill Superfund Site

Dear Ms. Silva:

These comments are submitted by the ad hoc Potentially Responsible Party ("PRP") Group for the Old Southington Landfill ("OSL") Superfund Site (the "Site"). These comments address the Environmental Protection Agency's ("EPA") Proposed Cleanup Plan (the "Plan") for the referenced project, issued by EPA on May 23, 1994.

I. EPA'S PROPOSED REMEDY FOR OSL OPERABLE UNIT 1 ("OU 1") IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

A. EPA's proposed remedy is founded on sound technical data that were presented in the Remedial Investigation and Feasibility Study (RI/FS).

The PRPs commend the EPA for its efforts in producing a comprehensive Plan that appropriately addresses all potential health and environmental concerns presented by the contaminants at the Site. EPA's proposed remedy for OU 1 includes fencing, relocation of residences and businesses located on the Site, excavation/relocation of discrete materials from semi-solid disposal area one ("SSDA 1"), installation of a gas collection system, and capping. The PRPs support the majority of the proposed remedy. However, as discussed below, the PRPs question the technical feasibility and benefit to human health or the environment of disturbing materials in SSDA 1.

The Plan represents the culmination of an extensive investigation and selection process, a process which is described in detail in the RI/FS. In turn, the RI/FS is the result of over six years of field work, data collection and analysis, and report preparation. The RI/FS, which cost more than $4 million, involved the installation of nearly 60 groundwater monitoring wells and over 100 soil borings, extensive groundwater hydraulic measurements, and comparison of numerous remedial options, including the use of computer simulations. Throughout the investigations, the PRPs, EPA, and Connecticut Department of Environmental Protection ("CTDEP") have maintained regular communications concerning investigations of the Site. These included discussing and developing the Scope of Work prior to initiation, reviewing data gathered from investigations, interpreting the technical data, and preparing interim deliverables. As a result of this technical effort, the Plan, which forms the framework for the next two phases of work (i.e., the remedial design and remedial action), is based on a thorough understanding of Site conditions.

B. The cap and gas collection proposed by EPA are consistent with the policy set forth in EPA's Municipal Solid Waste Landfill Presumptive Remedy Guidance.

The remedial actions described by EPA in its guid document, Presumptive Remedy for CERCLA Municipal Landfill Sites, are primarily designed to contain a landfill mass and collect and/or treat landfill gases. The remedial alternatives proposed by EPA for Operable Unit 1 ("OU 1") (capping and collection and venting of landfill gases) are EPA's prototypic approaches to meet these design goals. EPA's prototype was developed after a close examination of the remedial goals and appropriate strategies to address those goals at numerous CERCLA municipal landfill sites across the country.

CERCLA landfills typically contain large volumes of heterogeneous municipal waste co-disposed with commercial waste, as is the case at the Site. Based on its evaluation of analogous municipal mixed waste sites throughout the United States, EPA has determined that containment through capping is the appropriate response action at these sites to address human health and environmental concerns. EPA's findings are grounded in part on the fact that large volumes of heterogenous wastes spread over acres of landfill area rarely are conducive to massive excavation projects to relocate such wastes. Such excavation projects, which frequently involve very large volumes of potentially hazardous solid, semi-solid and liquid materials, not only are cost prohibitive, but also do not make sense from a health and environmental protection standpoint. Activities involved in the excavation, movement and management of excavated materials, and the subsequent disposal or incineration of such materials, almost always present much greater environmental and health risks than the original landfills themselves.

The remedial alternatives of capping and gas collection are containment strategies designed to eliminate the potential for exposure to contaminated soils and to minimize or prevent build up of landfill gases under the cap, which might impair its performance. As is the case at many other CERCLA landfill sites, EPA has determined that capping and gas collection system alternatives are protective of human health and the environment for the Site after evaluating data from all media of concern and assessing the potential risks posed by contaminants characterized during the RI/FS process. In addition, the gas collection system may have ancillary beneficial effects. Changes in concentration gradients created by this system will translate into diminished VOC mass within the body of the waste, especially in the vadose zone. This in turn could create a concentration gradient between soil and groundwater which would cause groundwater contaminants to diffuse into unsaturated pore spaces, where the gases would be collected by the venting system .

The removal of residential and commercial structures currently located on the Site is appropriate and necessary for the installation and long-term integrity of the cap. A proper cap and gas collection system for the Site simply cannot be designed and installed around the existing structures.

Notwithstanding a number of comments by area property owners during the public comment period on this matter, it is not necessary or appropriate from an environmental or health protection standpoint to remove or relocate structures that are not located on the Site. First, the existence of any residential or commercial structures in the area around the Site will not affect the design and installation of the cap for the Site. Second, the cap and gas collection system will eliminate any potential risks that might exist to occupants of such buildings by eliminating the possibility of contacts with landfill wastes or gases. The "buffer zone" suggested by area residents during the comment period is not relevant to any factors inherent in the RI/FS evaluation process. Third, the cost of any such removal or relocation efforts would be high, and would be unnecessary and arbitrary because there are no identifiable risks to human health or the environment. Accordingly, there is no basis or, to our knowledge, precedent for the removal or relocation of structures located adjacent to or in the vicinity of the Site.

II. THE PORTIONS OF THE SITE REFERRED TO AS THE DISCRETE AREAS OF SEMI-SOLID DISPOSAL AREA NUMBER ONE ("SSDA 1") DO NOT WARRANT SPECIAL CONSIDERATION, AND SHOULD NOT BE EXCAVATED

The PRPs disagree with the EPA's proposal to excavate discrete materials from SSDA 1 as part of OU 1. The materials that EPA proposes to excavate do not constitute a "hot spot" under EPA guidance documents or proposed Superfund reform legislation. Moreover, these materials should not be excavated because excavation presents numerous logistical and worker health and safety problems, and could potentially be prohibitively expensive. Each of these issues is discussed below.

A. SSDA 1 materials do not constitute a "hot spot" as defined by EPA guidance, and should not be excavated.

The remedy suggested by EPA treats certain discrete materials in SSDA 1 as areas that should be excavated. Guidance issued by the EPA in 1991 and 1993 addresses the presumptive remedy for landfills, a remedy which involves leaving all landfill wastes in place under an impermeable cap. This EPA guidance also describes less common situations where additional remedial alternatives should be evaluated to address certain areas of waste at a landfill, even though a cap is to be installed, in order to protect against actual or potential threats that they pose to human health or the environment. EPA guidance refers to these areas that may require special attention as "hot spots."

EPA's guidance regarding these "hot spots" provides as follows:

> Hot spots that are appropriate for excavation and removal should be in discrete, accessible locations of a landfill where a waste type or mixture of wastes presents a principal threat to human health and the environment. The area should be large enough so that remediation will significantly reduce the risk posed by the overall site and small enough to be reasonably practicable for removal and/or treatment.

In its guidance, EPA states that if certain questions can be answered in the affirmative, it is likely that special treatment of hot spots is warranted. The questions framed in EPA guidance are as follows:

1. Does evidence exist to indicate the presence and approximate location of waste?
2. Is the hot spot known to be a principal threat waste?
3. Is the waste in a discrete, accessible part of the landfill?
4. Is the hot spot known to be large enough that its remediation will reduce the threat posed by the overall site but small enough that it is reasonable to consider removal?

The application of this guidance, and the above-referenced criteria, to the Site demonstrates that the discrete materials in SSDA 1 do not qualify as a "hot spot." Extensive investigatory work was performed during the RI/FS to assess the significance of the materials in SSDA 1. For example, thirty-eight soil samples were collected from SSDA 1. The levels of constituents that were detected in all but two of the 38 samples collected from SSDA 1 were similar to the quantitative levels detected throughout the southern portion of the Site. Moreover, with the exception of two areas of discrete materials, the materials in SSDA 1 are not significantly different in type or appearance from the rest of the southern portion of the Site.

One area of visually discrete material ("Material B") consists of a milky white substance which averages eight feet in thickness and extends approximately 80-90 feet in a north-south direction, and approximately 20-25 feet in the east-west direction. Evidence of Material B was discovered in only three borings. The other area of discrete material, "Material A", is brown in appearance and contains some volatile organic compounds ("VOCs"), and is much smaller and more localized. Evidence of Material A was discovered in only one boring (B402) at a thickness of about 8 inches. Material A was not encountered in any of the other 14 borings within SSDA 1. Based on locations of borings around B402, Material A extends no more than a fifteen foot diameter around B402. Material A is located well above the water table. Similarly, Discrete Material B is located almost entirely in the unsaturated zone.

Downgradient groundwater quality data clearly indicate that the discrete materials from within SSDA 1 are not acting as major, preferential sources of contamination to groundwater. Constituents of the type found in Material B do not show up in any downgradient groundwater samples. In addition, although constituents of the type found in Material A have been detected in groundwater downgradient of the southern portion of the Site, these constituents have not been found in groundwater immediately downgradient of SSDA 1, or in a sample from just below the water table in the single boring in which Material A was detected. In sum, there is no reliable evidence of vertical leaching of Material A to the groundwater.

Accordingly, the discrete materials in SSDA 1 do not pose principal threats to groundwater. The removal of these materials would not significantly reduce the overall risk posed by the Site and would provide minimal benefit with respect to EPA's evaluation criteria as set forth in its guidance concerning the identification and handling of hot spots.

An analysis of the discrete materials in SSDA 1 under EPA guidance also shows that such areas do not constitute a hot spot. Only question one from the EPA guidance materials quoted above can be answered in the affirmative. Questions two, three and four, based on the data presented in the RI, cannot be answered in the affirmative for the OSL Site. First, the discrete materials in SSDA 1 are not a "principal threat" when considered with the Site as a whole. Second, they also are not readily accessible due to their depth below the surface of the landfill, and their location proximate to Old Turnpike Road. Finally, these materials do not act as preferential or larger sources of contaminants to groundwater than the contaminants in the rest of the southern portion of the landfill. Accordingly, removal of the discrete material from SSDA 1 would not reduce the potential threats posed by the overall Site.

In addition to the fact that the discrete materials in SSDA 1 do not constitute a principal threat, and thus need not be excavated, these materials also would be very costly to address in the fashion prescribed by the EPA's Plan. The costs of excavating the SSDA 1 areas are excessive in view of the absence of benefit to human health or the environment from such excavation. As a result, the excavation remedy suggested by EPA is arbitrary and unreasonable.

Finally, evaluations performed during the FS demonstrated that the composite-barrier cap that would be placed over the entire southern portion of the Site would further isolate the discrete materials within SSDA 1. It also would eliminate or significantly reduce any leaching of contaminants that might occur not only from the discrete materials but also from the remainder of SSDA 1.

B. <u>SSDA 1 would not require excavation under proposed 1994 legislative changes to Superfund codifying EPA "hot spot" guidance.</u>

Legislation proposed for the reauthorization of Superfund would statutorily recognize "hot spots" and would codify approaches to their remediation. Currently, as discussed above, hot spots are dealt with by EPA exclusively in guidance documents. For the most part, the proposed legislation parallels EPA's existing guidance. However, certain aspects of the proposed legislation go beyond the hot spot guidance discussed earlier in these comments. For example, the proposed legislation recognizes additional situations in which a final containment remedy may be preferable to a remedy requiring treatment. This is specifically identified to be the case at landfills. A final containment remedy may be chosen in one of two scenarios, (1) for small hot spots and (2) for high volume or large area hot spots. Although the latter scenario is not relevant, the first scenario is directly applicable to the Site.

The 1994 legislative proposal envisions that a final containment remedy that does not include excavation of a hot spot is appropriate under circumstances where the hot spot is:

> small relative to the overall volume of waste or contamination being addressed, and the hot spot is not readily identifiable and accessible, and without the presence of the hot spot containment would have been selected as the appropriate remedy... for the larger body of waste or area of contamination in which the hot spot is located.

Applying these criteria to conditions at the Site, SSDA 1 itself is small relative to the overall Site volume. The discrete materials identified by the EPA within the SSDA 1 for excavation represent a subset of SSDA 1 and are estimated to total 600 to 1,500 cubic yards. EPA estimates total Site volume in excess of 300,000 cubic yards. Accordingly, this criterion is clearly met.

The second criterion is that the hot spot not be readily identifiable or accessible. At the Site, based on soil boring information, discrete materials within SSDA 1 appear to be identifiable based on visual characteristics, but are not readily distinguishable by chemical characteristics. Moreover, accessibility is problematic for SSDA 1. The materials are located fairly deep in the landfill (up to 13 feet deep), with a small volume of the discrete material occurring below groundwater level. This fact alone makes access to these materials more difficult. In addition, SSDA 1 lies in close proximity to Old Turnpike Road. Excavation of the discrete material and EPA's suggested surrounding buffer zone could be technically complex because of the necessity to ensure the structural stability of the road. The analysis of accessibility should take into consideration not only the ability to physically come in contact with the materials in question but also the relative ease of doing so and the problems encountered in the process.

As discussed above, the third criterion is satisfied for this Site because of the presumptive remedy that has been adopted and employed by EPA for CERCLA municipal landfill sites. Capping of the Site and collection of landfill gases would have been selected even if SSDA 1 materials did not exist.

Though the criteria discussed for small hot spots are currently not the law, the proposed language clearly indicates Congress' and the EPA's latest thinking on these important subjects, and therefore should be taken into account in the generation of an appropriate Plan for this Site. Congress clearly is working with EPA to make Superfund more workable, efficient, and cost and time effective. The proposed statutory language was drafted in this spirit and should be looked to for guidance in regard to the remedy for this Site.

C. <u>Excavation of SSDA 1 would be difficult logistically; could potentially be very costly; and, could pose significant and unwarranted risks to workers.</u>

As discussed above, because SSDA 1 is not a hot spot, the special treatment proposed by EPA is not appropriate. However, even if SSDA 1 is deemed to be a hot spot, EPA should recognize the significant worker safety and cost issues presented by the excavation proposal for SSDA 1. Notwithstanding the description of excavation plans for SSDA 1 in the EPA Plan, and the $1.6 million estimate for completing such work, experiences with extensive excavation projects from other analogous Superfund sites point to the likelihood of worker safety and logistical problems with the excavation proposal for SSDA 1 that could be considerably underestimated by the Plan.

The McColl Superfund Site ("McColl") in Fullerton, California is a case in point. McColl provides an illustrative case history of the unanticipated logistical problems and exorbitant costs which can be associated with undertaking a "hot spot" removal. In June 1990, EPA performed a trial excavation of approximately 137 cubic yards of waste at McColl. As at this Site, VOCs were present at McColl. The approach taken by EPA at the McColl site has been detailed and evaluated in a government report, "Demonstration of a Trial Excavation at the McColl Superfund Site", a copy of which is included as <u>Appendix A</u>.

The cost bases for the excavation alternatives in the RI/FS report for the Site was an estimate of $26 per ton for excavation activities. At McColl, the cost of excavation was $526 per ton. This differential at McColl appears to have resulted in large part from measures taken to address the potential excavation-related risks, e.g., building a ventilated enclosure over the area to be excavated, and the inherent logistical problems arising from such measures. The differential also is attributable in part to the fact that project efficiencies, including but not necessarily limited to worker productivity, were greatly reduced at McColl. To this point, the report notes that the excavation of soil at McColl required double and triple handling.

The hazards to workers wearing protective gear, including reduced mobility under often slippery conditions, also are significantly higher for these types of projects. This hazard potential is further magnified by the necessity for use of heavy equipment in a relatively small, confined area.

If EPA were to require the same protocols and procedures during the excavation of SSDA 1 that it did at the McColl site, the hazards associated with the project could be increased very significantly, and the costs of addressing the Material A and Material B in SSDA 1 likely could exceed $8 million.

D. <u>If excavation of Material A or Material B in SSDA 1 ultimately is required, EPA's Plan should anticipate and address other issues and factors</u>

As indicated above, excavation of SSDA 1 is neither necessary nor appropriate. However, should the Plan ultimately require such excavation to occur, the following other issues and factors should be addressed or taken into account by EPA in its final remediation plan:

Delineation of Discrete Material - The precise delineation of material to be removed from SSDA 1 must be based on visual differentiation of the material. This delineation should include a well-defined, discrete buffer zone around visually distinct materials. Due to the spatial distribution of various contaminants in SSDA 1 specifically, and the southern portion of the Site generally, differentiation of discrete SSDA 1 materials on the basis of constituent levels is not technically possible. The spatial distribution of Constituents of Potential Concern is extremely variable and unpredictable and the levels of constituents in most samples from within SSDA 1 are similar to those detected elsewhere throughout the southern portion of the Site. In effect, delineation based on any method other than visual characteristics would result in the unintended and inappropriate requirement that the entire southern portion of the Site be excavated. In addition to the prohibitively exorbitant costs of such a massive excavation project, such an undertaking would be completely inconsistent with EPA guidance on remediation of municipal landfills.

Flexibility in Implementation of Remedy - EPA's preference at this time appears to be to relocate any materials excavated from SSDA 1 into a lined cell under the cap somewhere in the southern portion of the Site. The EPA should retain flexibility in the ROD to allow for other methods of handling and isolating these materials. For example, EPA should encourage employment of value engineering in the design of any excavation and relocation program, the location, design, and construction of any waste cell liner or cap, and the management of waste leachate. Final decisions on the disposition of this material should be made during the design phase, based on the technologies available at that time.

III. EPA'S SELECTED REMEDY SHOULD CONTAIN PERFORMANCE STANDARDS, NOT SPECIFIC DESIGN REQUIREMENTS, TO ALLOW FOR DESIGN FLEXIBILITY AND TO ENCOURAGE VALUE ENGINEERING

The PRPs recommend that EPA identify and mandate the remedy for the Site through the identification of performance standard goals, instead of specifying design details. The specification of performance standards allows for the use of lower cost, but equivalent or better, performing technologies as they become available. This "value engineering" approach is the best way to avoid overly specific directives that might result in the inadvertent and inappropriate exclusion of effective and efficient remedial design and implementation methods.

Several important examples of parts of the proposed remedy which would benefit from this performance standard approach are described below:

Cap Details - The Plan describes specific cap designs, setting specifications for particular details of the design. The remedy should focus on performance standards, such as permeability requirements for given layers of the cap, or for the cap system as a whole. This will allow for flexibility during the design to use those materials which may be available near the Site (i.e., clays) in place of geomembranes or to use newly-developed products which are not now on the market (i.e., new geosynthetics or membranes).

Waste Along Black Pond Shoreline - The Plan requires excavating wastes from along the Black Pond shoreline and consolidating them under the cap. The objective is to assure that, following installation of the cap, these wastes are isolated from Black Pond. Although excavation and consolidation may prove the most efficient means to achieve the objective, it should not be the only remedy considered during design. For example, it may be more feasible and effective to have the cap extend over the shoreline, thus isolating the waste mass from the Pond. Other alternatives may also be feasible and the final Plan should remain flexible enough to allow consideration of all alternatives that would meet the Plan's objectives.

Outlet Culvert From Black Pond - The Plan specifies reconstruction of the existing culvert beneath Old Turnpike Road. Reconstruction of the culvert now appears to be the most feasible method of re-establishing an adequate connection between Black Pond and the downgradient wetlands. However, the final Plan should maintain the flexibility to achieve this objective by an equally effective method which might be developed during the design phase. For example, other potential discharge mechanisms could include a pump system or siphon flow system. The optimal location for the discharge point may not be the existing culvert. Early aerial photographs show that prior to the development of the northern portion of the landfill, the discharge point from Black Pond was not in the current location. Alternatively, depending on the final design of the remedy, an enhanced connection between Black Pond and the wetlands may not be as vital and desirable as it appears at this time.

Gas Collection/Control System - In addition to advances in materials, advances in landfill gas management and control techniques may allow engineers to provide innovative solutions once empirical data, such as landfill gas volume and quality, become available. The Plan purports to prescribe a specific gas control technology. Flexibility in the final Plan would allow for consideration of the most innovative technologies available at the time of design. An example of the lack of flexibility in the Plan is the specification of individual gas collection wells with surface hook vents. A subsurface collection system connecting much, if not all, of the system to a single discharge point might be much more efficient. The most effective and efficient final design for the system cannot be determined, and thus should not be specified, at this time. Rather, these decisions should be made during the design phase.

The vagaries of a Superfund site like the Site, which involves substantial volumes of commingled wastes, make necessary a flexible final remediation plan. Such a plan will encourage efficient and effective decision-making, and will assist in the design and implementation of a remedy that is as protective as possible from the standpoint of both human health and the environment.

IV. OPERABLE UNIT 2 ("OU 2")

EPA has the responsibility to consider all comments regarding its Plan, and the opportunity to amend the Plan in light of significant comments. One of the portions of the Plan that could be affected by such comments is the administrative process by which EPA will implement the remedial alternatives selected. For example, as indicated in Section IV(C) of these comments, EPA may determine that a focused feasibility study or interim record of decision approach is more appropriate than the two operable unit approach proposed in the Plan. Accordingly, the PRPs are providing comments on the scope and implementation of OU 2.

A. <u>The PRPs agree that groundwater remediation is not necessary.</u>

The PRPs concur with the EPA in its decision that groundwater remediation is not warranted at this time. The reasons for the PRPs' concurrence are detailed in the three sections below.
As indicated in the RI/FS Report, the groundwater beneath and emanating from the Site has been extensively studied and characterized. Based on the RI/FS work, there is no current or future risk to human health or the environment from constituents in groundwater. Due to local and state institutional controls, the groundwater from the Site is not and cannot be used for drinking water purposes. Moreover, the groundwater from the Site is not adversely affecting area surface water bodies, including wetlands in the vicinity of the Site and the Quinnipiac River basin. Because there are no such human health or environmental risks, the benefits of groundwater remediation at this Site are far outweighed by the complications and potential impacts of operating a treatment system, and the exorbitant costs of such a system.

Another reason that the PRPs agree with a current remedy that does not include a groundwater remedy relates to the cap proposed as part of OU 1. The installation of the cap will dramatically affect the hydraulic conditions in the aquifer beneath the Site. These effects should be studied and taken into account in analyzing groundwater conditions and alternatives as part of the preparation of a report for OU 2.

<u>Groundwater is not used for a drinking water supply</u>. Human health is not impacted by constituents in groundwater because groundwater is not currently used and may not be used in the future for drinking. Institutional controls already in existence, including stringent controls at both the State and local levels, prevent the use of groundwater from the aquifer below and downgradient of the Site. The PRPs have previously provided the EPA with substantial documentation regarding each of these issues. Please refer to the attached letter from Carol Lear, Respondents' Project Coordinator to Almerinda Silva and Julie Taylor dated March 8, 1991 for more complete information and a more detailed discussion of these important issues. This letter appears in <u>Appendix B</u> to this letter.

Groundwater is not adversely affecting surface waters. Surface water bodies, including area wetlands and the Quinnipiac River basin, also are not being adversely impacted by groundwater from the Site. Surface water bodies which, based on their proximity to the Site, could potentially be impacted by contaminants in the groundwater include Black Pond, various wetlands within the Study Area, and the Quinnipiac River. Black Pond is upgradient of the Site and, as demonstrated in the RI, acts as a major recharge to groundwater. Therefore, contaminants in groundwater beneath and downgradient of the Site do not impact Black Pond. Surface water sampling performed during the RI confirms this fact.

Wetlands are present only in areas that are either upgradient of the Site, or significantly downgradient of the Site. As demonstrated by data collected during the RI and the subsequent ecological risk assessment, the upgradient wetlands, which are present primarily in the vicinity of Black Pond, have not been affected by the landfill. Contaminants in groundwater downgradient of the Site are present only in the deeper portions of the aquifer. Shallow groundwater, which might under certain circumstances discharge to such wetlands, is free of significant contaminants. This is consistent with the downward gradients in groundwater as it moves west, as measured during the RI. Likewise, even at deeper portions of the aquifer, the levels of contaminants are generally below levels typically expected to impact aquatic plants or animals. Therefore, data developed during the RI do not indicate the likelihood of adverse impacts to wetlands, resulting from groundwater from the Site.

The Quinnipiac River is located approximately one-half mile downgradient (west) of the Site. Groundwater flow, moving west, ultimately either intersects the Quinnipiac River or the regional southward basin flow beneath the River. The 7Q10 flow within the Quinnipiac River is approximately 1000 gallons per minute (gpm). Groundwater flow within the aquifer moving west from the Site has been estimated, based on data presented in the RI, to flow at approximately 500 gpm. The Quinnipiac River is the surface manifestation of the Quinnipiac River Basin aquifer; the River actually is in contact with the aquifer below it. The River Basin flows in a general southerly direction, while the River meanders above it. Groundwater from the Study Area aquifer moves west until it becomes influenced by the River Basin and slowly turns southerly. At that time, the Study Area aquifer becomes mixed and diluted by the River Basin aquifer. Direct groundwater discharge to the River, therefore, is not likely to occur.

It is important to note that, even if groundwater discharged directly to the River without dilution, the levels of contaminants migrating from the Site would not adversely affect the river ecosystem. Only relatively low levels of chlorinated VOCs have been observed at monitoring wells B303 and B309, the most westerly monitoring wells downgradient of the Site. Because the Site closed in 1967, and because such wells are downgradient and under the influence of regional groundwater flow (e.g. mixing and dilution have occurred), concentrations measured at these downgradient wells are indicative of the steady state condition in the aquifer. Assuming that groundwater from the Site does directly discharge to the River, and that the levels of VOCs in wells B308 and B309 do not decrease before reaching the River (an extremely conservative assumption), the concentrations of those constituents would nevertheless not be detectable in the River. This absence of detectable constituents would be a function of the low levels of contaminants migrating from the Site and the relatively large volume of river water with which such constituents would mix.

The River is classified C/B, indicating a degraded condition upgradient as well as downgradient of the Study Area. The impact of groundwater contaminants on the River or its basin, if any, would be minor because, as stated above, the concentrations in the groundwater downgradient of the Site are low and considerable additional dilution and mixing occur at the River basin.

<u>Groundwater remediation would not be effective at this Site, and could in fact have detrimental effects</u>. As explained above, because groundwater from the Site is not adversely affecting human health or the environment, treatment of that groundwater is not necessary or appropriate. For a number of reasons, any treatment system employed at the Site also would be problematic from an operational and effectiveness standpoint. Moreover, a treatment system could actually increase health and environmental risks.

First, as described in more detail in the RI/FS and in previous PRP technical comments to the EPA, pumping and treating groundwater from the aquifer beneath and downgradient of the Site would not be particularly effective. As demonstrated by the RI activities, migration of contaminants from the Site likely has reached steady state conditions. Commonly specified remedial design objectives such as pumping and treatment for the purpose of containment, contaminant mass reduction, or aquifer restoration will at best will yield inefficient and mixed results. The underlying aquifer is a high yielding aquifer of glacial ice-contact and outwash (consisting of a mixture of sand, silt and gravel) deposits. The complex fabric of these deposits and sorptive nature of the contaminants in the dissolved phase of the plume, combined, result in little likelihood of successful remediation as defined by the objectives noted below.

EPA recognizes that factors such as the characteristics of the Site make any pump and treat remedy designed to achieve contaminant mass reduction or aquifer restoration unlikely to succeed. EPA notes that, in general, older contaminant plumes are more difficult to remedy and that chances for success diminish greatly if the aquifer is not hydrological homogenous and if the contaminants are relatively insoluble with a high affinity for sorbing to aquifer material (USEPA, RS Kerr Laboratory). While substantial groundwater modeling has been performed, the real timeframe for remediation are not easily predicted by modeling. This is particularly of concern at this Site due to recently understood phenomena. Simplifying assumptions used in groundwater models often lead to underestimates of timeframes and tend to over-estimate the efficacy of pump and treat remedies. Common groundwater models such as advection/dispersion contaminant transport models use as a retardation co-efficient, a laboratory-derived value, to describe sorption process. This approach assumes that local equilibrium of the contaminant mixture occurs between the aquifer skeleton and the pore water. However, by making these implications, the enormously important rate-limiting sorption/desorption effects are not considered (Goltz and Oxley, 1990). Gilliham in 1982 showed that common linear retardation and advective dispersion models seriously underestimate the volume of water that would be removed from an aquifer in order to reduce the contaminant to low levels.

Another simplifying assumption which leads to underestimated cleanup times is that almost every site has erratic and imperfectly known contaminant sources; at this scale of observation, these factors combine with poorly defined dissolution kinetics and lead to restoration uncertainty far greater than predicted by groundwater models. (Sudicky, 1989; Sudicky and Huyakorn, 1991). Other phenomena, such as intragranular diffusion, that have particular importance at this Site occur at the said grain scale and within the granular material of aquifers and have only recently been studied. Understanding these phenomena may explain why pump and treat data deviate from that predicted by simple models. (Brusseau and Rao, 1989, 1991).

Second, as discussed in the FS, a groundwater treatment system for the Site would merely exchange one waste for another by removing very small amounts of contaminants from a contaminated groundwater medium and creating significant quantities of hazardous wastes in the form of treatment residuals that must be stored, managed, transported and disposed of. A large quantity of wastes would be produced at the Site due to the very large volume of groundwater that would have to be treated, and the sequential treatment system that would be necessary to remove constituents of concern from the groundwater.

Table 1 in Appendix C of this letter presents a comparison of the volume of wastes that would be removed from the groundwater, and the volume of wastes that would be generated in the form of treatment residuals, for each of the groundwater alternatives analyzed in the FS. This analysis demonstrates that the operation of a groundwater extraction treatment system at the Site would result in the generation of as much as 4450 pounds of hazardous waste per day, while removing only 5.29 pounds per day of VOCs and semi-volatile organic compounds ("SVOCs") from the groundwater. Each of the groundwater treatment alternatives evaluated in the FS would generate significantly more waste than would be removed from the groundwater which, as discussed above, is not and cannot be used for drinking water purposes. This waste would have to be transported through the communities around the Site to disposal facilities that may be significant distances from the Site.

Third, a treatment system at the Site would likely result in the contamination of large quantities of clean groundwater that would be drawn into areas affected by the Site. Moreover, the treatment process could cause contaminants to spread into previously unaffected areas. These factors would further diminish the effectiveness and appropriateness of any groundwater treatment system.

Fourth, discharge into the Quinnipiac River of the large volumes of groundwater that would be removed from the Site aquifer and treated could alter the physical and biological profile of the River. No other suitable discharge alternative exists locally to handle the volume of groundwater that would require disposal. This volume is estimated to be up to half of the flow of the Quinnipiac River.

Post-Cap Monitoring - The installation of the cap over the Site will prevent further infiltration of precipitation through the landfill waste mass and will have significant impacts on groundwater hydraulics. Post-cap monitoring will provide data useful to determine the impacts of the cap on groundwater quality and the effects on groundwater hydraulics, including flow rates and water levels beneath and downgradient of the Site. This monitoring will provide empirical data relative to the effect of natural flushing of existing constituents in groundwater, the reduced contribution of constituents to groundwater due to the installation of the cap, and the effect on downgradient groundwater quality.

B. A remedy that does not involve treatment of groundwater at the Site is consistent with other EPA RODs and policies, and with the mandates of CERCLA

Prior Records of Decisions ("RODs") from Region I demonstrate that groundwater treatment is not appropriate for all Superfund sites where groundwater contamination has been identified. Under circumstances similar to those at this Site, where contaminated groundwater does not pose a threat to either human health or the environment, Region I has selected remedies at CERCLA sites on a case-by-case basis which required no action with respect to groundwater. A brief summary of some of these RODs, including RODs from the Darling Hill, Shaffer Landfill, Western Sand and Gravel, and Mottolo Pig Farm Superfund sites, appears in previous correspondence from the PRPs to EPA.

In addition, the selection by EPA of a remedial alternative for OU 2 that does not involve extraction and treatment of groundwater beneath the Site would be consistent with CERCLA, the cleanup requirements of the National Contingency Plan, and other EPA policies and guidance under CERCLA. For example, CERCLA provides that, under appropriate circumstances, EPA may select a remedial action that does not attain applicable or relevant and appropriate requirements ("ARARs"), e.g., maximum contaminant levels that might be considered ARARs. 42 U.S.C. § 9621(d)(4)(C). This provision also appears in the NCP. 40 CFR § 300.430(f)(1)(ii)(C). Moreover, the NCP explicitly contemplates that EPA's program goals, under appropriate circumstances, may be met without the implementation of active response measures involving the restoration of groundwater. 40 CFR § 300.430(a)(1)(iii).

The NCP details a number of situations under which it is appropriate to waive ARARs. For example, an ARAR may be waived if compliance with the requirement will result in greater risk to human health or the environment than other alternatives. 40 CFR § 300.430 (f)(1)(ii)(C)(2). As indicated in these comments, the potential benefits of groundwater extraction and treatment at the Site may be significantly outweighed by the potential environmental and health concerns associated with the extraction and treatment of groundwater and handling of treatment residuals. Due to the particular characteristics of the Site and its environs, potential adverse impacts may be best minimized through the selection of a remedy that avoids these potential hazards.

ARARs also may be waived by the EPA if compliance with the requirement is technically impracticable from an engineering perspective, or if an alternative remedy will achieve a standard of performance that is equivalent to that required under the otherwise applicable ARAR. 40 CFR § 300.430(f)(1)(ii)(C)(3) and (4). These waiver criteria are particularly relevant to the Site. The technical issues associated with extracting, treating, and disposing of the large volumes of groundwater that would be necessary in order to possibly realize significant and permanent improvements in groundwater quality are enormously complex, and probably cost prohibitive. Treatment of these volumes of groundwater, when compared to the tenuous value of benefits resulting from such treatment, may be illogical, infeasible and indefensible from a health and environmental standpoint.

Moreover, as explained in previous sections of these comments, a remedy that does not involve treatment of groundwater that is not being used for drinking water purposes, and that is not creating or contributing to environmental or health hazards, would provide an alternative that is equally or more effective from a performance standard standpoint as a groundwater treatment alternative.

C. A new, separate RI/FS is not necessary for OU 2.

EPA's Plan suggests that a new, separate RI/FS will be necessary for OU 2. In response to comments regarding its Plan, EPA may determine that an alternative administrative approach is more appropriate than the two operable unit approach proposed in the Plan. For example, such an approach might consist of a focused feasibility study ("FFS"), interim record of decision ("ROD"), or other similar process. The PRPs agree with a number of comments from Southington residents made during the public hearing regarding the Plan to the effect that a separate RI/FS is not necessary or appropriate for OU 2. The substantial information collected during the RI/FS, together with any supplemental data collected after installation of the cap, render the costs and delays associated with a new RI/FS unnecessary. As an alternative, a focused feasibility study ("FFS") or interim ROD approach would be more efficient and appropriate for this Site.

Either an FFS or interim ROD approach would take into account the existing RI/FS data and any supplemental data gathered during post-cap monitoring to evaluate remedial alternatives based on conditions following installation of the cap. While there are areas of the groundwater contaminant plume that have not been defined to the fullest extent possible, there is a substantial amount of data and other information available for the Site which can be used to determine the potential impacts of various contaminants on the groundwater from the Site.

Data collected during the RI has been used to clearly define the aquifer beneath and adjacent to the Site, both as to groundwater quality and hydraulics. Likewise, the RI has fully evaluated the hydraulic interaction and impact of Black Pond relative to groundwater. Groundwater flow patterns in the aquifer have been determined from an analysis and synthesis of a significant body of data collected over a six year period. Based on an analysis of the hydraulics of the aquifer, generation of groundwater quality data, and evaluation of the properties of the constituents of primary concern at the Site, constituent transport mechanisms have been evaluated to determine the groundwater migration patterns for those constituents. These evaluations have been fully presented in the RI/FS.

The data collected during the RI also has been used to fully define the north-south boundaries of the deep groundwater plume, which contains low levels of chlorinated VOC, moving west from the Site. Concentrations decrease significantly over the 300-500 feet between wells B304, B305, and B307, and the most westerly wells (B308 and B309). The westerly path of the plume will carry it ultimately to the Quinnipiac River basin (~3500 feet west of B308) and the Quinnipiac River acts as a natural westerly boundary. It is noteworthy that, for the area west of wells B308 and B309, there is increasing potential for impacts from other sources of contamination. Numerous documented upstream sources of contaminants contribute to the degraded condition of the River The complexity of that system is such that definition of a plume would be infeasible.

Finally, extensive studies of the Site and its environs have confirmed that, because there are no groundwater receptors present, adverse impacts to human health in the area between the Site and the Quinnipiac River are extremely unlikely. Additional studies concerning these issues thus are not necessary.

The post-cap monitoring will provide the data needed to proceed under an FFS or interim ROD approach in determining appropriate remedial measures for OU 2. Therefore, the need for further investigation in groundwater downgradient of the Site is not warranted.

Once again, the PRPs commend EPA for its work in producing a proposed remediation plan for the Site that meets the human health and environmental protection objectives of the Superfund program. Thank you for your consideration to our comments concerning this important plan.

Respectfully submitted,

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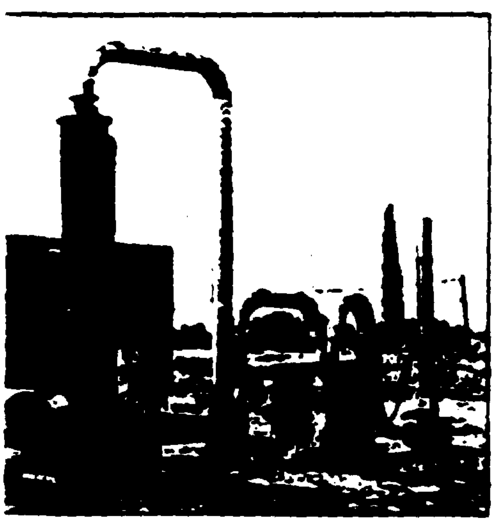
EPA

Demonstration of a Trial Excavation at the McColl Superfund Site

Applications Analysis Report



SITE
SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION

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Section 1

Executive Summary

Introduction

Region IX of the U.S. Environmental Protection Agency (EPA), in cooperation with EPA's Air and Energy Engineering Research Laboratory (AEERL) and EPA's Superfund Innovative Technology Evaluation (SITE) Program, and with assistance from the California Department of Health Services (DHS), conducted a trial waste excavation project at the McColl Superfund site in Fullerton, California.

In the early to mid-1940s, the McColl site was used for disposal of acidic refinery sludge, and in 1982, it was placed on the National Priorities List (NPL). The McColl waste is known to release volatile organic compounds (VOCs) and sulfur dioxide (SO_2) whenever disturbed. Since 1984, the entire site has been covered with soil in an attempt to minimize atmospheric emissions of VOCs and SO_2.

In February 1989, EPA and DHS issued a proposed plan for the McColl project that named thermal destruction, either on or off site, as the preferred remedy. Important components of this remedy are the excavation and waste-handling activities that must occur as a precursor to thermal destruction or any other remedy that would involve ex-situ treatment of the waste. Region IX determined that the trial excavation was necessary to ascertain if the McColl waste could be excavated with conventional equipment without releasing significant amounts of VOCs and SO_2 into the surrounding community. The trial excavation was also necessary to define the treatment needed, if any, to improve the handling characteristics of the waste as a precursor to thermal destruction. A summary of the SITE demonstration at the McColl site is presented in Appendix B.

Objectives

The objectives of the trial excavation at the McColl Superfund site were as follows:

1. To excavate approximately 100 yards of waste to assess waste-handling characteristics and to determine if any treatment is required to improve handling characteristics as a precursor to thermal destruction.
2. To determine the atmospheric emissions resulting from the excavation activities.
3. To assess the degree of SO_2 and total hydrocarbons (THC) emissions control achieved through the use of an enclosure and an enclosure exhaust treatment system.
4. To determine the emission levels for SO_2 and VOCs at the fenceline of the McColl site as an indicator of impacts on the local community.
5. To assess the effectiveness of vapor-suppressing foam.
6. To assess potential problems that might occur during excavation.

Conclusions

Based on the goal and objectives of the project, EPA believes that the trial excavation was successful and that significant information was obtained that will be useful in the design phase of the full-scale remediation. The conclusions reached were as follows:

- Excavation under an enclosure is technically feasible.
- Excavation and waste-handling activities are not feasible without an enclosure equipped with an exhaust treatment system.
- Existing technologies can be used to treat SO_2 and THC emissions generated by excavation activities.
- Waste material was successfully treated to improve its handling characteristics so it could be easily processed into a thermal destruction unit if desired.
- Workers were able to perform excavation and treatment of the waste material at McColl while wearing Level B or Level A personal protective equipment (PPE) within the enclosure.

- The trial excavation had no significant adverse impacts on the surrounding community.

- The vapor-suppressing foam did not perform as well as expected in controlling SO_2 and THC emissions within the enclosure and therefore cannot be relied upon exclusively to control emissions during activity-related disturbances of waste.

Design of Air Emission Control Technologies

System designs prepared for full remediation of the 12 sumps at the McColl Superfund Site call for the use of the excavation and fugitive emission control systems evaluated during the McColl trial excavation. The general workflow for the scenario evaluated calls for waste to be excavated from one sump under an enclosure (with dimensions of 120 ft wide by 300 ft long by 60 ft high) and loaded into rolloff bins for transport by truck to the storage facility. Backfill operations take place simultaneously at a second sump under a second enclosure. At the same time, a third enclosure is erected on the next sump to be excavated. In this manner, excavation and backfill operations proceed continuously to provide feed material to the final treatment system. Storage operations take place under a fourth enclosure (with dimensions of 120 ft wide by 240 ft long by 57 ft high).

The use of an enclosure for excavation and backfill operations requires that the larger sumps be excavated in two or more steps, which results in re-excavation of a portion of these sumps. Overall, approximately 25% more material must be excavated when the enclosure is used than would be required without the enclosure. Assuming the final treatment operations process a nominal 100 tons/day of contaminated material plus additives, the time required to excavate the entire volume of material at the McColl site is estimated to be approximately 6.4 yrs, based on 300 operating days/yr. Evaluation of waste-specific excavation rates indicates that excavation operations are not the rate-limiting step under this treatment scenario. Under the requirement that workers inside the enclosures operate in Level B PPE, calculations indicate that excavation operations could produce an average of about 160 tons/day of contaminated material over an 8-hr operating period and about 235 tons/day over a 12-hr period.

For waste excavation at the McColl site, SO_2 will be the primary contaminant of concern and the basis for the air ventilation system design. A system has been designed to maintain SO_2 exposure for Level B-equipped workers at or below 50 ppm. This SO_2 level was selected as a reasonable compromise between the Immediately Dangerous to Life and Health (IDLH) level of 100 ppm and the Permissible Exposure Limit (PEL) level of 2 ppm. This level was selected by EPA for conceptual design purposes only. It is recognized that the actual acceptable level of emissions within the enclosure will be dictated by OSHA regulations and any applicable or relevant appropriate requirements (ARARs). The 50-ppm concentration limit, together with projections for "upper reasonable" SO_2 emission flux rates and extent of waste surface areas exposed result in the specification of a 130,000 acfm ventilation airflow rate for the excavation enclosure; 27,000 acfm for the backfill enclosure; and 32,000 acfm for the storage enclosure.

Air pollution control devices (APCDs) have been designed to remove contaminants from the ventilation air before this air is released to the atmosphere. Each APCD train consists of a 35,000-acfm wet scrubber for SO_2 and particulate matter (PM) emissions control, three 12,000 acfm modular GAC units operating in parallel for THC/organics emissions control, and associated fan, blower, and ducting systems. For full-scale remediation, the air delivery system will be arranged to provide a continuous flow of fresh air past workers in high-emission areas. In addition, the exhaust system will be designed to capture emissions close to their sources to minimize the amount of contaminants that escape into the general enclosure volume. This approach will require that flexible, movable exhaust and air-supply ducting be extended from the enclosure walls to areas within the enclosures. In addition, the ducting should be fitted with hoods to maximize emissions capture. Based on the air ventilation requirements and the APCD size limitation, four APCD trains will be required for the excavation enclosure and one APCD train each will be required for the backfill and storage enclosures.

Economic Analysis

The cost for full excavation of all contaminated material at the McColl site with the systems described in the preceding paragraphs was estimated to be $69.2 million, which translates to a cost of $593/ton of in-place waste. This cost assumes that equipment is purchased at the start of remediation; the estimated cost to lease equipment over the 6.4-yr remediation period would be approximately 7% higher. The break-even time period between the purchase equipment option and the lease equipment option is about 3 yrs. These estimated costs include waste excavation, waste storage, and fugitive emissions controls; however, they do not include the final waste treatment and disposal systems or pretreatment systems.

The largest components of the estimated costs are labor (22%), supplies/consumables (21%), equipment (12%), and utilities (11%). Most of the cost items are directly influenced by the amount of time required for remediation. These cost estimates reflect a 6.4-yr remediation period, based on a final treatment processing rate of 100 tons/day. Excavation rate calculations indicate that excavation operations are not the rate-limiting step under this scenario and that remediation activities could be accomplished in less time, which would reduce overall costs.

Specification of the SO_2 limit within the enclosure dictates the size, and hence the cost, of the air ventilation system and APCD equipment. For the design examined, the marginal costs for fugitive emission control are slightly more than twice the costs for excavation without such control.

Section 2

Introduction

This section presents information about the Superfund Innovative Technology Evaluation (SITE) Program, discusses the purpose of this Application Analysis Report, and provides a list of key personnel who may be contacted for additional information.

Purpose, History, and Goals of the SITE Program

In response to the Superfund Amendments and Reauthorization Act of 1986 (SARA), the EPA's Office of Solid Waste and Emergency Response (OSWER) and Office of Research and Development (ORD) established a formal program called the SITE Program to promote the development and use of innovative technologies to clean up Superfund sites across the country. The primary purpose of the SITE Program is to enhance the development and demonstration of innovative technologies applicable to Superfund sites so as to establish their commercial availability.

The SITE Program comprises four major elements:

- Demonstration Program
- Emerging Technologies Program
- Measurement and Monitoring Technologies Program
- Technology Transfer Program

The objective of the SITE Demonstration Program is to develop reliable engineering performance and cost data on selected technologies so that potential users can evaluate each technology's applicability to a specific site compared with the applicability of other alternatives. Demonstration data are used to assess the performance and reliability of the technology, the potential operating problems, and approximate capital and operating costs.

Technologies are selected for the SITE Demonstration Program through annual requests for proposal (RFPs). Proposals are reviewed by EPA to determine the technologies with the most promise for use at Superfund sites. To qualify for the program, a new technology must have been developed to pilot or full scale and must offer some advantage over existing technologies. Mobile technologies are of particular interest.

Once EPA has accepted a proposal, the Agency and the developer work with the EPA Regional Offices and State agencies to identify a site containing wastes suitable for testing the capabilities of the technology. The developer is responsible for demonstrating the technology at the selected site, and is expected to pay the costs to transport, operate, and remove the equipment. The EPA is responsible for project plan[illegible] sampling and analysis, quality assurance and quality [illegible] preparing reports, and disseminating information.

The Emerging Technology Program of the SITE Program fosters further investigation and development of treatment technologies that are still at the laboratory scale. The third component of the SITE Program, the Measurement and [illegible]toring Technologies Program, provides assistance in the development and demonstration of innovative measurement and monitoring technologies.

In the Technology Transfer Program, technical information on technologies is exchanged through various activities that support the SITE Program. Data from the Demonstration Program and existing hazardous waste remediation data are disseminated in an effort to increase awareness of alternative technologies available for use at Superfund Sites.

SITE Program Reports

The results of each SITE demonstration are incorporated in two documents: the Technology Evaluation Report and the Applications Analysis Report. The Technology Evalua[illegible] Report provides a comprehensive description of the demon[illegible]tion and its results. This report is intended for engineer[illegible] performing a detailed evaluation of the technology for a specific site and waste situation. The purpose of these technical evaluations is to obtain a detailed understanding of the performance of the technology during the demonstration and to ascertain the advantages, risks, and costs of the technology for the given application. This information is used to produce conceptual designs in sufficient detail to enable the preparation of preliminary costs estimates for the demonstrated technology.

The purpose of the Applications Analysis Report is to estimate the Superfund applications and costs of a technology based on all available data. The report compiles and summadesign and test data, and other laboratory and field applications of the technology. It discusses the advantages, disadvantages, and limitations of the technology. Estimated costs of the technology for different applications are based on available data on pilot- and full-scale applications. The report discusses the factors, such as site and waste characteristics, that have a major impact on costs and performance.

The amount of available data for the evaluation of an innovative technology varies widely. Data may be limited to laboratory tests on synthetic wastes or may include performance data on actual wastes treated at the pilot or full scale. The conclusions regarding Superfund applications that can be drawn from a single field demonstration are also limited. A successful field demonstration does not necessarily ensure that a technology will be widely applicable or fully developed to the commercial scale. The Applications Analysis attempts to synthesize whatever information is available and draw reasonable conclusions. This document will be very useful to those considering the technology for Superfund cleanups, and it represents a critical step in the development and commercialization of the treatment technology.

Key Contacts

Additional information on the demonstration of trial excavation at the McColl Site or the SITE Program can be obtained from the following sources:

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Section 3

Technology Applications Analysis

This section addresses the applicability of the waste excavation/processing and emission control technologies to remediate various sites contaminated with wastes similar to those of the McColl Superfund Site in Fullerton, California. The evaluation of the technology's effectiveness and its applicability to other potential cleanup operations is based primarily on the results of the SITE demonstration, which are presented in the Technology Evaluation Report (EPA 1990). The data generated during this SITE demonstration will be used to aid in the design of an effective air emission control system to potentially be used during the full-scale remediation of McColl and other similar Superfund sites.

Technology Description

Excavation at the McColl site presented unique problems because of the high potential for the release of sulfur dioxide and volatile odorous compounds contained in the waste. As a means of avoiding the potential impact of air emissions on the nearby community, the following measures were implemented during trial excavation:

- Use of an enclosure operated under negative pressure
- Use of vapor-suppressing foam
- Operation of an SO_2 scrubber
- Operation of an activated-carbon-bed adsorber

The trial excavation was conducted within a temporary enclosure from which air was exhausted through a sodium-hydroxide-based wet scrubber and an activated-carbon-bed adsorber to reduce air emissions of sulfur dioxide and organic compounds. Foam was used in an attempt to suppress atmospheric releases from the raw waste during excavation, storage, and processing. The air exhaust was monitored for total hydrocarbons (THC) and sulfur dioxide (SO_2) before and after the air emission control system. The air was also monitored for THC and SO_2 along the site perimeter to determine the potential impact of air emissions on the nearby community. A detailed description of the technology is presented in Appendix A.

Conclusions Reached During SITE Demonstration at the McColl Site

The overall goal of the trial excavation at the McColl site was to obtain information on excavation and waste-handling activities to support the selection of thermal de[illegible]uction or any other remedy that would involve excavation [illegible]ivities as a portion of the preferred remedial action and to [illegible] in the design of this remedy after its selection in a Record of Decision (ROD). Of particular interest was whether the McColl waste could be excavated with conventional equipment without having significant adverse impacts on the surrounding community.

Based on the goal and objectives of the project, [illegible] believes that the trial excavation was successful and that [illegible]nificant information was obtained that will be useful in the design phase of the McColl remediation process. The res[illegible] the trial excavation, which are discussed in the Technology Evaluation Report (EPA 1990), are summarized in Appendix B. Conclusions and observations pertaining to the trial excavation are presented below:

- More than 130 solid yd^3 of waste material from Sump L-4 was excavated with conventional excavation equipment without significant adverse impacts on the community.

- Excavation under an enclosure is technically feasible.

  The enclosure used during the trial excavation was successfully operated at or near negative pressure, which allowed for emissions generated during the excavation activities to be processed through an enclosure exhaust treatment system consisting of a sodium-hydroxide wet scrubber and an activated-carbon-bed adsorber.

  Although unexpected problems during the trial excavation impeded the ability to excavate under the enclosure, EPA believes that these problems can be resolved by engineering practices during the design of the final remediation. The most important impediment to the trial excavation was the higher-than-expected THC and SO_2 emissions within the enclosure. These higher-than-expected emissions nece[illegible]sitated upgrading the personal protective equipment for the workers within the enclosure from Level B to Level A protection (completely enclosed chemical-resistant suit with supplied air).

- The SO_2 emissions generated during the excavation activities can be effectively treated (up to 99% removal efficiency) with existing technologies. The high SO_2 emissions entering the sodium-hydroxide wet scrubber were efficiently treated to less than 1 ppm throughout the trial excavation. The removal efficiencies were greater than 95% during most of the trial excavation and actually reached as high as 99%.

- The THC emissions generated during the excavation activities can be effectively treated (up to 90.7% removal efficiency) with existing technologies. Although the THC emissions were not controlled as effectively as expected (greater than 90%) with activated carbon, the removal efficiency ranged from 40 to 90.7% throughout the trial excavation. The EPA believes that the less-than-expected removal efficiencies can be corrected during the design phase of the final remediation. Based on other experiences with activated carbon, this is considered an appropriate technology for removal of organics.

- The waste material was successfully treated to improve its handling characteristics so it could be easily processed into a thermal destruction unit if desired.

- Lower airflow rates through the activated carbon unit increased the THC removal efficiencies. This result supports the theory that residence time is a critical factor in the ability of activated carbon to remove organic compounds in an airstream.

- The vapor-suppressing foam did not perform as anticipated in controlling SO_2 and THC emissions within the enclosure, and its use cannot be relied upon exclusively to control emissions during activity-related waste disturbances.

  Visual observations and dynamic-condition calculations indicate that the vapor-suppressing foam was not as efficient as expected in controlling emissions from activities related to excavating and processing the waste.

  Visual observations indicated that the foam chemically reacted with the McColl waste, which inhibited its ability to form a vapor-suppressing seal on the waste. This reaction caused the foam to change color (from yellow to red and orange) and to disintegrate before forming a seal on the waste.

  Dynamic-condition calculations indicated that the effectiveness of the vapor-suppressing foam ranges from 50 to 80%, depending on the activity and the compound of concern.

  Excess water introduced into the enclosure through the foaming activities had a significant impact on operations within the enclosure. The excess water made the ground surface slippery for both workers and equipment.

- The trial excavation had no significant adverse impacts (i.e., exceedance of health-based levels established in the McColl Contingency Plan) on the surrounding community.

  Based on observations by personnel during the trial excavation, the noise level related to the excavation and treatment activities was minimal. At no time during the trial excavation were the health-based levels (established in the McColl contingency plan for SO_2 and THC) exceeded at the fence-line monitoring stations. Although a small number of odor complaints were received during the trial excavation period, they were not excessive. Most of the complaints were received after the trial excavation/treatment activities were completed for the day, and may not have been related to the excavation/treatment activities.

Applicability of Air Emission Control Technologies

Many Superfund sites in the United States have problem[s] similar to those at the McColl site–i.e., the generation of toxi[c] air emissions during waste excavation and transportation tha[t] may affect both site workers and residents of adjacent communities. Appendix C presents a list of current CERCLA site[s] where the emission control technologies used at McColl sit[e] may be applicable. This section discusses the general applicability and performance of air emission control technologies which were used during the trial excavation at the McColl site.

Wet Scrubber

A wet scrubber system is based on the principle of mas[s] transfer (called diffusion) in which the gaseous effluent strea[m] containing the contaminant to be removed is brought int[o] contact with a liquid in which the contaminant will dissolve. The concentration gradient between the two phases is established and diffusion occurs. The mass transfer rate at whic[h] absorption occurs depends on the amount of liquid surfac[e] exposed. It is a function of the liquid recirculation rate, th[e] packing size and shape, and distribution of the liquid over th[e] packing support plates.

Packed scrubbers are designed with either crossflow o[r] countercurrent flow. In the crossflow packed scrubber, th[e] airstream moves horizontally through the packed bed and i[s] irrigated by scrubbing liquor flowing vertically downwar[d] through the packing. This scrubber is efficient in removin[g] noxious gases, entrained liquid particles, and dusts. The ga[s] stream in the countercurrent-flow packed scrubber moves upward in direct opposition to the scrubbing liquid stream, which moves downward through the packing.

Countercurrent flow is advantageous in that the gas stream with higher concentrations of contaminants contacts the spent liquor at the inlet of the packing, and the fresh liquor coming in at the outlet of the packing contacts with the least contaminated gas. This process drives the gaseous contaminant into the scrubbing liquid. When absorption is accompanied by chemical reaction, this advantage no longer exists because the gas phase equilibrium becomes zero.

A large interfacial area is required for the liquid to absorb gas contaminants effectively. Providing a packing medium over which the liquid is spread allows a greater area of contact to be achieved. Not only is a large area required, but continued liquid surface renewal is essential for efficient absorption. These characteristics are provided by commercially available packings.

An important feature of the scrubber unit is the design of the recirculation tank. Acting as a basin, this tank catches the effluent from the scrubber and provides additional time for the reactions to occur. The rate of recirculation is based on the chemical kinetics or treatment time required for each of the gas contaminants to react with the provided reagents in their respective stoichiometric quantities.

Reagent usage and concentrations are based on the contaminants in the effluent gas. The gas contaminant treatment time or residence time must be considered to determine adequate column capacity and the optimal liquid-to-gas flow ratio.

One of the advantages of an absorption system is a removal efficiency in excess of 99%. This not only results in low emission rates, but also allows recovery of the material for reuse in the process. Wet scrubbers have relatively small space requirements and are low in capital cost and energy consumption. The reagent-handling system, however, can substantially increase the maintenance cost of the system. There are also some disadvantages. For example, particulate matter in the gas stream may cause fouling and pluggage of the packing, and the blowdown stream must be treated and disposed of in an environmentally acceptable manner.

Wet Scrubber Performance During Trial Excavation at McColl Site

During the trial excavation, a countercurrent-flow, packed-bed, wet scrubber that used a mixture of sodium hydroxide (NaOH) in water was used to control SO_2 emissions. This scrubber was designed to achieve an outlet SO_2 concentration of 2 ppm on a continuous basis, assuming that the average inlet SO_2 concentration would be about 10 ppm and the maximum inlet SO_2 concentration would be 200 ppm. The data gathered during excavation show that the 2-ppm outlet SO_2 concentration limit was met with few exceptions. One exception was a 50-min period on June 13 when the scrubbing liquor pH was inadvertently allowed to drop to 2.9, well below the specified control range of 10 to 13. During this period, the outlet SO_2 concentration rose to a 5-min average maximum of 12 ppm. The achievement of the outlet SO_2 design criterion was especially impressive in light of the high inlet SO_2 concentrations experienced during a large portion of the operation.

As a result of these high inlet and low outlet concentrations, the SO_2 removal efficiency of the scrubber was higher than expected. For the operating days on which daily average SO_2 inlet concentrations were above 10 ppm, the daily average SO_2 removal efficiencies were always above 95%. On many of these days, SO_2 removal efficiencies exceeded 99%.

The normal operating range for the scrubber liquor pH was established at 10 to 13 by the scrubber manufacturer prior to the trial excavation. It was noted, however, that operation near the high end of this range often caused excessive foaming of the scrubber liquor near the bottom of the packed tower, which subsequently resulted in an overflow of liquor out through the inlet duct and into the filter box. In light of the high SO_2 removal levels demonstrated by the scrubber, the decision was made to reduce the pH operating range to 7 to 10. This change eliminated the liquor foaming and overflow problem, while consistently low outlet SO_2 concentrations were maintained.

The only other operational problem encountered with the SO_2 scrubber was occasional restrictions in the tower that caused low ventilation airflow. The first episode occurred on June 15 and was diagnosed as excessive solids passing through the filter (upstream of the scrubber) and building up in the scrubber packing. The low airflow conditions were relieved by blowing down the scrubber liquor, washing down the packing, and increasing the frequency of filter inspections and changes. The filter system used during the trial excavation was a low-efficiency, field-fabricated system that relied on residential furnace filters as the filter medium.

The second episode of low airflow occurred on July 11. The solids content of the scrubber liquor at this time was much lower than during the first episode. Inspection of the packing balls through the lower access port showed that many contained a buildup of black, soot-like material that appeared to be composed of very fine particulate matter. Experiments revealed that the airflow could be returned to normal levels by decreasing the liquor recirculation flow rate from its normal range of 15 to 20 gal/min to near 5 gal/min. The outlet SO_2 concentration remained low even at the lower liquor recirculation flow rate; therefore, this rate was maintained for the duration of the program.

At the conclusion of operations, the scrubber was shut down and opened at the top cone and the bottom access port for inspection. At the top of the scrubber, the mist eliminator pad was clean and free of any buildup. The packing balls at the top of the scrubber were in a similar condition. At the bottom of the scrubber, packing balls near the access port were found to be partially obstructed with the previously described black buildup plus a white crystalline material speculated to be crystallized sodium hydroxide. Together, the combined solids filled approximately 25% of the volume of these packing balls. After the first 6 in. of balls were removed from the lower access port, however, it was clear that the packing balls in the center of the tower were free of significant buildup. The air-distribution grid at the bottom of the packed tower was also free of solids buildup. Thus, the cause of the second incident of low ventilation airflow could not be identified. All other portions of the scrubber were in good working order at the completion of program operations.

With respect to a final remediation scrubber, one change recommended as a result of trial excavation operations would be the installation of a high-efficiency, industrial, particulate-collection device upstream of the scrubber. This device should be designed to capture both large and fine particles (e.g., diesel engine emissions) to a high degree and thereby prevent the buildup of solids in the scrubber liquor and packing material. In addition, an automatic pH control system should be added that will maintain the desired pH range by the addition of caustic soda, as opposed to the manual system used during the trial excavation.

Carbon Adsorption

Adsorption is a phenomenon that occurs when a gas or vapor is brought into contact with a solid substance, which results in the gas or vapor (called adsorbates) being collected on the surface of the solid. This is a result of surface forces acting on solids, gases, vapors, and dispersed material. The magnitude of these forces depends on the nature of the solid surface and the type of molecules in the fluid. The adsorbing solid (or adsorbent) is generally an extremely porous material with large internal surfaces. Adsorption may occur on the solid surface alone. It may also be accompanied by chemical reaction (so-called chemisorption). In the chemisorption process, gases or vapors form actual chemical bonds with the adsorbent surface groups.

In a typical full-scale adsorption system, before entering the adsorber, the gas stream from the emission source is passed through a filter to remove entrained moisture droplets. Multiple adsorber vessels are generally provided for on-line regeneration of the bed material. Gas will flow through one vessel, where VOCs are removed, while the other vessel is regenerated or on standby. Regeneration of the bed is achieved by passing a hot inert gas such as low-pressure steam through the unit in reverse direction. The bed is then dried and cooled by passing air through it. Dissolved VOCs are generally condensed in a shell and tube heat exchanger. The VOCs can be recovered by simple decantation (in the case of water-insoluble materials) or by distillation (in this case of water-soluble VOCs).

Activated carbon is one of the most versatile of the solid adsorbents. For a physical adsorption, activated carbon is limited to high-molecular-weight and nonpolar adsorbates. Activated carbon can be specially treated with compounds of transitional elements or chemicals to enhance the adsorption capability for polar and low- molecular-weight gases or vapors.

The performance of a carbon adsorption system depends on the following conditions:

- Type of activated carbon
- Concentration of the adsorbates
- Temperature
- Humidity
- Gas flow rate and velocity.

The various sources and manufacturing processes used in making activated carbon produce different grades of activated carbons. An activated carbon with many pores big enough for gas molecules to enter is very important for effective adsorption. A steeper slope in the adsorption isotherm creates a higher rate of adsorption. A higher rate of adsorption utilizes the adsorbent more efficiently.

Carbon has an affinity for nonpolar molecules because of the differences in their ionic structure. Compounds such as hydrocarbons and most organic sulfur compounds (except H_2S) are adsorbed by carbon. This attraction makes carbon beds excellent adsorbers of VOCs. Carbon's affinity for water vapor in high-relative-humidity gas streams and sulfur compounds, however, will reduce the life of the bed, which results in higher operating costs for regeneration of the carbon.

Although the relative humidity of an emission stream may be high, there are methods that can reduce these effects and extend the life of the carbon bed. One such method is to mix the gas streams with lower-relative-humidity ambient air. This process will lower the cost of carbon regeneration by extending the life of the beds, but it will result in an increased expenditure for capital equipment and higher power consumption due to the larger gas volume through the system. An alternative method of reducing the relative humidity in the emission stream involves cooling and condensing the water. This can be accomplished in a shell and tube heat exchanger. The gas stream would then be reheated to a temperature corresponding to the desired relative humidity.

Carbon adsorbers are available in packaged units containing all the necessary equipment. They are available in many different sizes and configurations up to 100,000 scfm and can be custom-designed for any application.

Fuel and power costs are minimal, and a high VOC removal efficiency (99%) can be attained with low inlet concentrations. Wastewater produced from regeneration of the carbon bed may contain organic compounds that will require treatment prior to disposal.

Carbon Adsorber Performance During Trial Excavation At McColl Site

During the trial excavation, a granular activated-carbon bed was installed after the wet scrubber. Two types of granular activated carbons were used in the carbon adsorber to remove hydrocarbon pollutants from the ventilation airstream. The first was a coal-based carbon that was used during the first 9 days of excavation operations between June 7 and 15. The coal-based carbon was replaced with a coconut-based carbon that was used during the remaining operation period until system shutdown on July 18, for a total of 32 operating days.

For an assessment of the performance of these carbons, the hydrocarbon removal efficiencies associated with the maximum 5-min average inlet THC concentrations were calculated and compared over time for the two carbon types. These data show that the average daily hydrocarbon removal efficiency for the coal-based carbon ranged from 61.8% (fresh carbon) to 49.4% over a 9-day period. For the coconut-based carbon, average hydrocarbon removal efficiency ranged from 90.7% (first full day of operation on new carbon) to 58.4% over the first nine days of operation. By comparison, the performance of the coconut-based carbon was slightly superior to that of the coal-based carbon with respect to both initial activity and activity over a 9-day period.

For the remainder operating period with the coconut-based carbon, average hydrocarbon removal efficiency declined from 78.1% on June 26 to 24.2% on July 18. The exception to this trend was an increase in average removal efficiency from 55.9% on July 10 to 71.6% on July 11. During other short-term periods on those days, hydrocarbon removal efficiencies reached 93% on July 10 and 92% on July 11. The high removal efficiencies on July 11 corresponded closely to the periods of low airflow rates measured on this day; after the airflow rate was returned to normal levels (by adjustment of the scrubber recirculation rate), the hydrocarbon removal efficiencies decreased. Although no airflow rate data are available for July 10, the hydrocarbon removal efficiency data suggest that the flow rate was also low on this day.

Post-operative inspection of the activated carbon unit showed no visible damage to or buildup on the spent carbon particles. Water corrosion was evident on the steel rollers at the bottom of the accumulator cabinet, however. It is unlikely that this water came in the form of carryover water droplets from the wet scrubber because the scrubber mist eliminator packing was in good condition at the end of operations and the knock-out pot (installed between the scrubber and the carbon unit) showed very little water accumulation when checked regularly. A more likely source of water was air moisture condensation on the inside of the accumulator cabinet during the cool nighttime and early morning hours. The air entering the cabinet was no doubt saturated after passing through the packed-bed scrubber. Contact of this saturated gas with cold cabinet walls would be sufficient to cause water condensation and accumulation. Such condensation and accumulation were noted on the top inside panel of the accumulator cabinet during periodic field inspections. The presence of water in the carbon unit was also supported by the hard black powdery deposits found on the fan vanes and housing after operations were completed. These deposits were likely formed by the combination of moisture and attrited fine pieces of carbon from the activated carbon unit.

The presence of moisture in the carbon unit helps to explain the lower-than-expected hydrocarbon removal performance of this system during the trial excavation. The design specifications for this system were 95% THC removal. The inlet THC concentration, however, was much higher than expected because of the low vapor-suppression effectiveness of the foam. Nevertheless, the manufacturer of the carbon unit still expected performance levels to be above 90% removal. Moisture condensation onto carbon particles with subsequent reduction in active surface area still appears to be the most likely explanation for less than design performance. This explanation is consistent with the gradual loss of carbon THC removal efficiency observed over time, as well as the increase in removal efficiency that occurred when the airflow rate was significantly reduced on July 10 and 11.

Several options would be available to eliminate moisture condensation problems for a final remediation activated-carbon unit. These include installation of an air dryer upstream of the carbon unit to lower scrubbed ventilation air moisture content, use of a dry scrubber in place of the wet scrubber used for the trial excavation, adding insulation/heaters to the accumulator cabinet, and operating a duct heater upstream of the carbon unit to maintain ventilation air temperature above the stream's dewpoint.

Vapor-Suppressing Foam

Aqueous, nondraining, air foams, i.e., stabilized [illegible]s (developed by 3M Company) are useful for control of un[illegible]able vapors and particulates such as those found at some industrial sites (cement factories, mines, etc.), at waste sites accepting hazardous materials (e.g., California Class I or II sites), or National Priority List sites during remediation activities. The products work by forming a protective barrier over a source of vapor or particulate emissions. They are sprayed onto an area and form a tough, continuous, foam layer as they "cure" in place. For time periods of at least several days, these foams provide nearly total elimination of emissions of organic chemical vapors such as benzene, trichloroethylene, cyclohexane, etc., and complete control of particulates and dust.

Vapor-suppressing foams are made by combining a foaming agent (FX-9162) and a "stabilizer" (FX-9161) with water and air, using an eductor system, and spraying this solution through an air-aspirating nozzle. Each agent is proportioned into the water line at a concentration of 6%. The foam "sets up" (makes the transition from a fluid to a flexible solid foam) in about 2 minutes.

It is also possible to use the foaming agent without the stabilizer for temporary vapor suppression. For example, during the remediation of a volatiles-containing waste site, temporary foam could be used to cover the hazardous waste as it is being excavated. Stabilized foam could be used to cover trucks after they are loaded, excavation surfaces that are temporarily inactive, and the entire workface overnight or th[illegible] weekends.

Depending on the nozzle type chosen and the products used, foams of various expansions can be made. (Expansion = Volume of foam ÷ Volume of unfoamed liquid). Foams of low expansion (4:1 to 8:1) provide the best control of many VOCs. In cases of extremely toxic emissions, low-expansion foams are recommended. A fog nozzle, such as those used by many fire departments, produces foam in this expansion range when FX-9161 and FX-9162 are used, each at 6% in water.

In some field situations, highly irregular surfaces make a somewhat higher foam expansion a more practical choice. The Boots and Coots medium-expansion nozzle or a foam tube such as that made by Elkhart can be used to produce foams in the 8:1 to 20:1 expansion range when FX-9161/FX-9162 are used.

A new 3M product, FX-9164 Penetrant, was developed specifically to control dust and particulate matter. When FX-9164 is combined in water with FX-9161 Stabilizer, the liquid sprayed from the nozzle thoroughly wets essentially any type of dust or particulate and then gels to form a solid, flexible mass not easily disturbed by wind. FX-9164 is proportioned at a 1% concentration and FX-9161 at a 6% concentration into the water line. These products work best with a fog nozzle and are applied as a liquid (not as a foam).

The effectiveness of stabilized foam as a vapor-suppressing medium is influenced by foam variables such as formulation, foam depth, expansion ratio, and age, as well as the nature of the particular hazard. Laboratory and field tests were conducted with aqueous stabilized foam to investigate the effects of foam variables and the nature of the hazard on vapor suppression performance (Alm et al., 1987). The following trends were noted:

- For a period of days, the percentage suppression of hydrocarbons did not change significantly. In a 12-day laboratory experiment with cyclohexane and a 7-day field trial with JP-5 fuel, the suppression was greater than 97%, even after the foam had dehydrated to form a membrane.
- With high-polarity VOCs such as acetone and MEK, suppression was in the 90 to 100% range for the first several hours, decreased to the 80 to 90% range after 10 hours for foam application weights of at least 0.62 g/cm². The higher polarity allows these VOCs to diffuse faster than other hydrocarbons through the aqueous matrix of the foam.
- In general, vapor-suppression properties of stabilized foams were not greatly affected by variation in concentration of the FX-9162 foamer and FX-9161 foam stabilizer components. Some improvement in suppressing acetone vapors was noted when FX-9161 stabilizer concentration was doubled from 6% to 12%, whereas a slight decrease in suppression of cyclohexane vapor was noted when the FX-9162 foamer concentration was increased.
- The application weight of stabilized foam used should be determined by the nature of the hazard. Lowering the application weight of 4:1 expanded foam from 0.62 to 0.31 g/cm² did not significantly hurt performance on cyclohexane; however, doubling the application weight of stabilized foam from 0.62 to 1.24 g/cm² on acetone cut emissions by more than 50%.
- Both laboratory and field tests showed that vapor suppression performance was affected by the foam expansion ratio, particularly with nonpolar VOCs such as cyclohexane. Thus, increasing the air content of foam to improve coverage should be practiced only after careful consideration.

Foam Efficiency Evaluation During Trial Excavation At McColl Site

During trial excavation, two types of water-based foam supplied by 3M Corporation were selected: a temporary foam that is effective for up to about an hour, and a stabilized foam that is effective for at least a day. The earlier reported foam effectiveness values were based on measurements of emissions from stationary samples of waste (i.e., static conditions) with and without foam application. No data were available on the ability of the foam to control emissions during actual excavation operations (i.e., under dynamic conditions).

Field Use of Foam During Excavation

During excavation, temporary foam was sprayed manually on freshly excavated waste material or initially on stored material. Stabilized foam was then sprayed on all waste surface areas at the end of each work day. The overall qualitative assessment of the foam vapor suppressants used during this trial was that they were not as effective as expected. This assessment was based on visual observation of the foam, which disintegrated and neither adhered well to the raw wastes nor formed a cohesive film. The foam appeared to react with the highly acidic waste and sometimes turned from greenish yellow to deep red. Moreover, total hydrocarbon and sulfur dioxide concentrations of the airstream in the enclosure exhaust control system were higher than expected, primarily because the foam failed to control them. When stabilized foam was placed on the waste at the end of a period of activity, air concentrations slowly decreased. This decrease, however, was partially due to no fresh waste being excavated and exposed and partially due to a constant flow of ambient ventilation air sweeping across the enclosure, which had the effect of reducing concentrations, to an equilibrium level. In an effort to increase the effectiveness of the stabilized foam, the concentration of stabilizer was increased. The intent was to double the stabilizer concentration. Analytical data from 3M indicated the concentration increased from 9.6 to 10.5%. Although the increase in the foaming strength increased the foam's effectiveness, it did not solve the existing problems.

Foam Use During Mud Excavation and Movement

No significant SO_2 emissions were observed for either mud excavation or movement; small increases in THC concentrations were recorded during these operations. The latter were likely due both to THC emissions from operating equipment with diesel engines and to emissions from mud waste. Because of the limited number of comparison periods and the low emission levels recorded for excavation with and without foam, no substantial conclusions can be drawn regarding foam-control effectiveness.

Foam Use During Tar Excavation and Movement

For tar excavation, the use of low-strength (9.6%) foam resulted in a 73% reduction in the average SO_2 change rate* and a 65% reduction in the average THC change rate. Other factors being equal, the concentration change rate is directly proportional to the waste emission rate. During the tar movement periods, both low- and high-strength (10.5%) foams were applied. Use of low-strength foam during tar movement operations resulted in a 50% reduction in the average SO_2 change rate and a 55% reduction in the average THC change rate. Increasing the foam concentration to higher strength (10.5%) resulted in a 79% [illegible]on in the average SO_2 change rate and a 73% reduction [illegible] average THC change rate. No data are available for [illegible]tion with high-strength foam.

Fo[illegible]ring Char Excavation and Movement

[illegible] the high emissions expected and observed during c[illegible] and movement, these operations were always c[illegible] foam being applied. As a result, no data are av[illegible] char operations without foam and, hence, no levels of [illegible]trol effectiveness can be established. The data do sho[illegible]ever, that foam-controlled average SO_2 and THC conce[illegible]tion change rates were higher for char excavation than for tar excavation.

With respect to char movement, average SO_2 concentration change rates were 23% lower with high-s[illegible]) than with low-strength foam (9.6%). [illegible] change rates were 35% lower with high-strength foam than with low-strength foam.

Problems Related to Foam Application

The traction difficulties encountered by the wheel-mounted loader on the muddy floor of the enclosure were due to the chemical breakdown of temporary and stabilized foam caused by the char and tar wastes and the accumulation of purge water from stabilized foam applications. At the completion of [illegible]lized-foam applications, foam and water had to be purged from the delivery lines to prevent the foam from setting up in the system; purging was not required after temporary foam applications. The foam breakdown and purge water accumulation resulted in a layer of mud and foam 6 to 12 in. deep on the floor. Besides making traction difficult for the loader, the mud also prevented the free movement of tar and waste bins about the enclosure (because of sinking) and made personnel footing quite uncertain.

For the trial excavation, the problem was addressed by substituting a track-mounted Bobcat for the wheel-mounted loader. Because of the Bobcat's smaller bucket size, this change reduced the waste-moving productivity of operating personnel. In addition, personnel took more care in directing the stabilized-foam purge water into 55-gal drums rather than onto the enclosure floor.

If foam application is retained for a full-scale remediation, it may be necessary to devise a drainage system around waste-handling areas to drain off accumulated water. In addition, portable blowdown tanks should be located near foaming operations to catch purge water and to remove it periodically from the enclosure. Depending on the success of these systems, track-mounted equipment may be required for material-handling operations.

A more effective vapor-control system would be des[illegible] to address these concerns in the full-scale remediation. Alternative formulations for foam should be investigated, especially those that contain chemical bases and have the potential for chemically bonding with the surface of the acidic McColl waste. Alternatively, other vapor-suppression systems should be evaluated, including the use of lime or limestone slurry such as that applied to suppress dust in coal mines.

Even with improvements, however, the vapor-suppression system cannot be expected to provide complete control of waste emissions because of the dynamic conditions of waste excavation and movement. Maintaining pollutant concentrations inside the enclosure between the Immediately Dangerous to Life and Health (IDLH) and Permissible Exposure Limit (PEL) levels will require a larger air-ventilation system. This means a larger fan, air pollution control devices (APCDs), and associated ducting. By generating a higher airflow rate, the larger ventilation system would provide more frequent turnover of the air inside the enclosure and hence lower pollutant concentrations.

Enclosure Structure

For Superfund sites, where a fugitive air emission problem exists, an enclosure structure can be very effective during the excavation and transportation of waste. The enclosure ventila

* [illegible] rate is the rate at which SO_2 concentration increases over time.

$$\text{Chg. rate} = \frac{\text{Conc. of } SO_2 \text{ at end of activity (ppm)} - \text{Conc. of } SO_2 \text{ at start of activity (ppm)}}{\text{Time elapsed (min)}}$$

tion air will be routed through an emission-control system to prevent the escape of significant air emissions into the area surrounding the excavation zone.

During the trial excavation at the McColl site, a rigid-frame, PVC-covered enclosure structure was erected over part of the L-4 Sump prior to the start of excavation. The enclosure proved to be effective in preventing the escape of air emissions during excavation.

Problems Related to Enclosure Structure

The enclosure created a confined work space in which temperatures were approximately 20°F above the outdoor temperature. During the trial excavation, diesel engines were operated on the trackhoe, backhoe/loader, Bobcat, and pug mill. The emissions inside the enclosure resulting from these engines directly contributed to work stoppages due to low visibility, and high THC levels. The exhaust gases from diesel engines add heat, particulate matter, and hydrocarbon species to the enclosure air (SO_2 contributions were no doubt small because of the low sulfur content in diesel fuel).

The high emission levels of SO_2 and THC measured for the tar and char waste materials during the trial excavation caused work stoppages. These were due to health and safety concerns, and interference with equipment steering and braking systems. Since the ventilation air flow rate was fixed, this system was not able to provide enough fresh air to keep pollutant concentrations below design levels.

Other Equipment

For the full-scale remediation, one approach would be t[o use] electric engines instead of diesel engines. The pug mill c[ould] have been equipped with an electric engine for the trial exc[ava]tion had the electrical demand requirements not exceede[d the] available supply on site. Further work should be conducte[d on] the size of the pug mill required for full-scale remediation [and] the associated power requirements. It also may be possib[le to] use an electrically powered gantry crane system inside [the] enclosure to move the material and to excavate some or all o[f the] waste materials.

If diesel engines on some of the operating equipment can[not] feasibly be eliminated for the full-scale remediation, a syst[em] for directly venting the engine exhaust to the APCDs should [be] investigated. It may be possible to suspend movable duct[ing] from the enclosure ceiling and to connect it to engine exhau[st.] Such ducting would directly transport exhaust gases to [the] APCD system without their entering the enclosure air. T[his] approach would be easiest to accomplish on equipment t[hat] does not move about much within the enclosure (e.g., a pug m[ill] or trackhoe). For more mobile equipment, it might be mo[re] feasible to direct exhaust gases through a filter, a carb[on] canister, and a water cooler system mounted directly on t[he] machine. This approach would probably require freque[nt] changing of the filter media, carbon, and water to maintain [its] effectiveness.

Section 4
Design Analysis

The excavation and fugitive emission control systems evaluated during the McColl trial excavation have been used in system designs prepared for the excavation operations, air ventilation system, and air pollution control devices (APCDs) associated with a commercial-size site remediation effort. These designs illustrate how these systems could be applied to a site where the excavation or handling of wastes would result in the release of significant fugitive emissions that could pose a potential health risk to nearby communities. In the example scenario, system designs are developed for full remediation of the 12 sumps at the McColl Superfund site in Fullerton, California.

The scope of the remediation activities evaluated in this analysis includes excavation of waste and associated material under a rigid-frame enclosure, backfilling of the excavated sump under a second enclosure, erecting a third enclosure on the next sump to be excavated, and transport of the waste material to an onsite storage facility consisting of a fourth stationary enclosure erected over a concrete pad. The fugitive emission control systems include vapor-suppressing foam application units, air ventilation systems for each enclosure, the APCDs required to reduce emissions of SO_2 and THC in the ventilation air to acceptable levels, an APCD emissions monitoring network, and a perimeter ambient air monitoring network. The scope does not include the final waste treatment and disposal systems or pretreatment systems.

The general workflow calls for waste to be excavated from one sump under an enclosure and loaded into rolloff bins for transport by truck to a storage facility consisting of a stationary enclosure. Backfilling operations will take place simultaneously at a second sump under an enclosure. While excavation and backfilling operations are proceeding under the first two enclosures, a third enclosure will be erected on a third sump. After excavation operations are completed on the first sump, the excavation equipment and crew will be moved to the third sump to begin its excavation. Backfill equipment and crews will move to the second sump to complete its backfill. Following completion of backfill operations, the backfill enclosure will be disassembled and reassembled on the next sump (or sump section) to be excavated. This sequence will be repeated until all sumps on the site are completely excavated and backfilled.

This arrangement has the advantage of allowing continuous excavation operations to provide feed material to the final treatment system. It is, however, only one of several feasible scenarios for the excavation of waste at the McColl site.

Design of Excavation Operations

Overall Excavation Rate

The maximum digging depth required to remove all waste and potentially contaminated soil at the McColl site is 55 feet. The sump requiring this depth of digging, identified as R-2, is approximately 144 ft wide and 144 ft long. The widest enclosure routinely available from Sprung Instant Structures is 130 feet. The use of such a structure on large sumps such as R-2 requires the performance of the excavation in two or more steps, which necessitates re-excavation of some of the sumps. The use of a larger, specially engineered enclosure that would allow excavation of the entire sump under one enclosure was also examined; however, the high cost of the larger enclosure and APCD system exceeded the excavation cost savings that would result.

The general excavation procedure for a standard-sized enclosure is illustrated in Figures 4-1 through 4-3. The north half of Sump R-2 will be excavated in the first step. As shown in Figure 4-1, equipment and personnel will descend to a depth of 24 feet in the first excavation pass; the remaining material will be removed in the second pass. Because of the potential for cave-ins, the sides of the sump above the 24-ft level must be sloped in accordance with OSHA requirements in 29 CFR, Chapter XVII, Subpart P. It is assumed that the soil and mud at the site will fall into the Type C category and require the maximum slope of 1.5 foot horizontal-to-1.0 foot vertical (1.5H/1.0V). Because the lower portion of the waste material will be hard char, which formed stable vertical walls during the trial excavation, it is assumed that this material can be excavated during full remediation and that the vertical sides will remain intact while exposed. A slope of 0.5H/1.0V is specified for the contaminated soil below the waste to provide a stable support base for the unexcavated waste above the waste. Figure 4-1 shows that a 120-ft wide enclosure is required to perform this excavation, which allows for at least 10 ft of clearance on both sides of the pit for personnel movement.

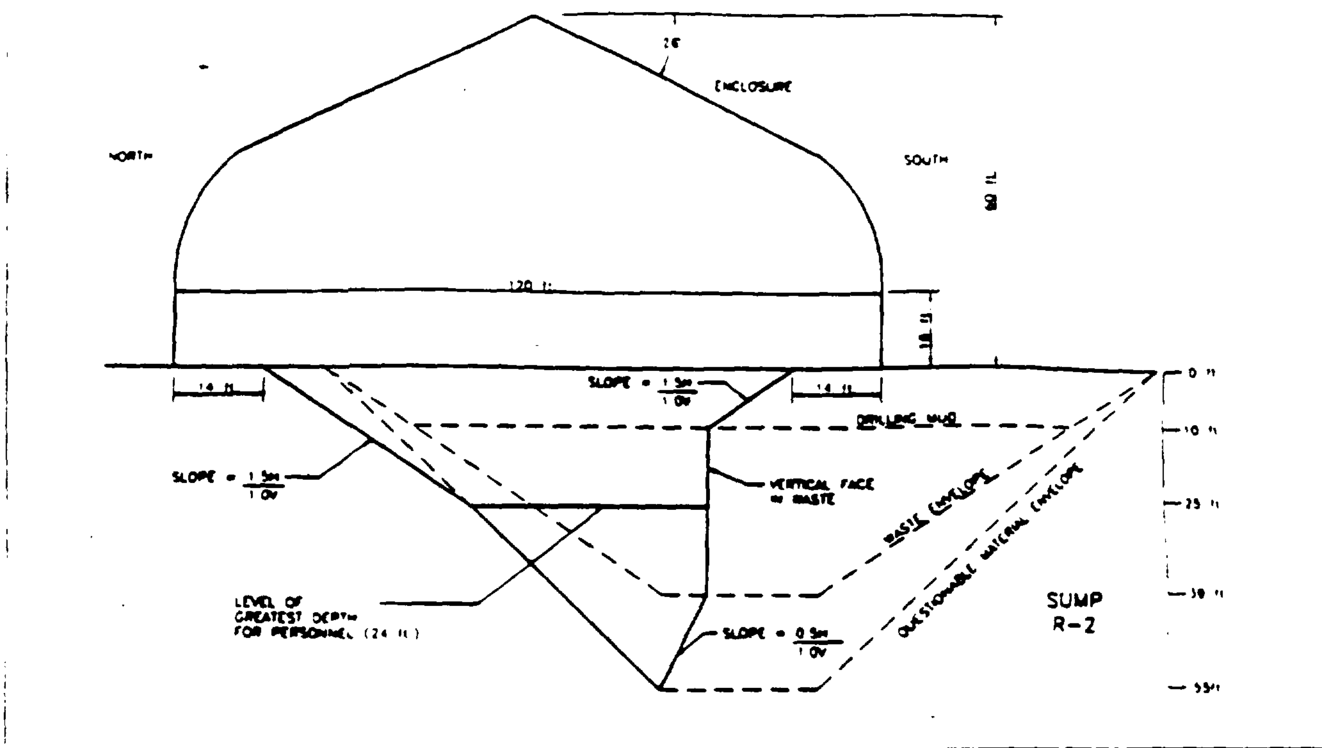

Figure 4-1. Excavation of North Half of Sump R-2.

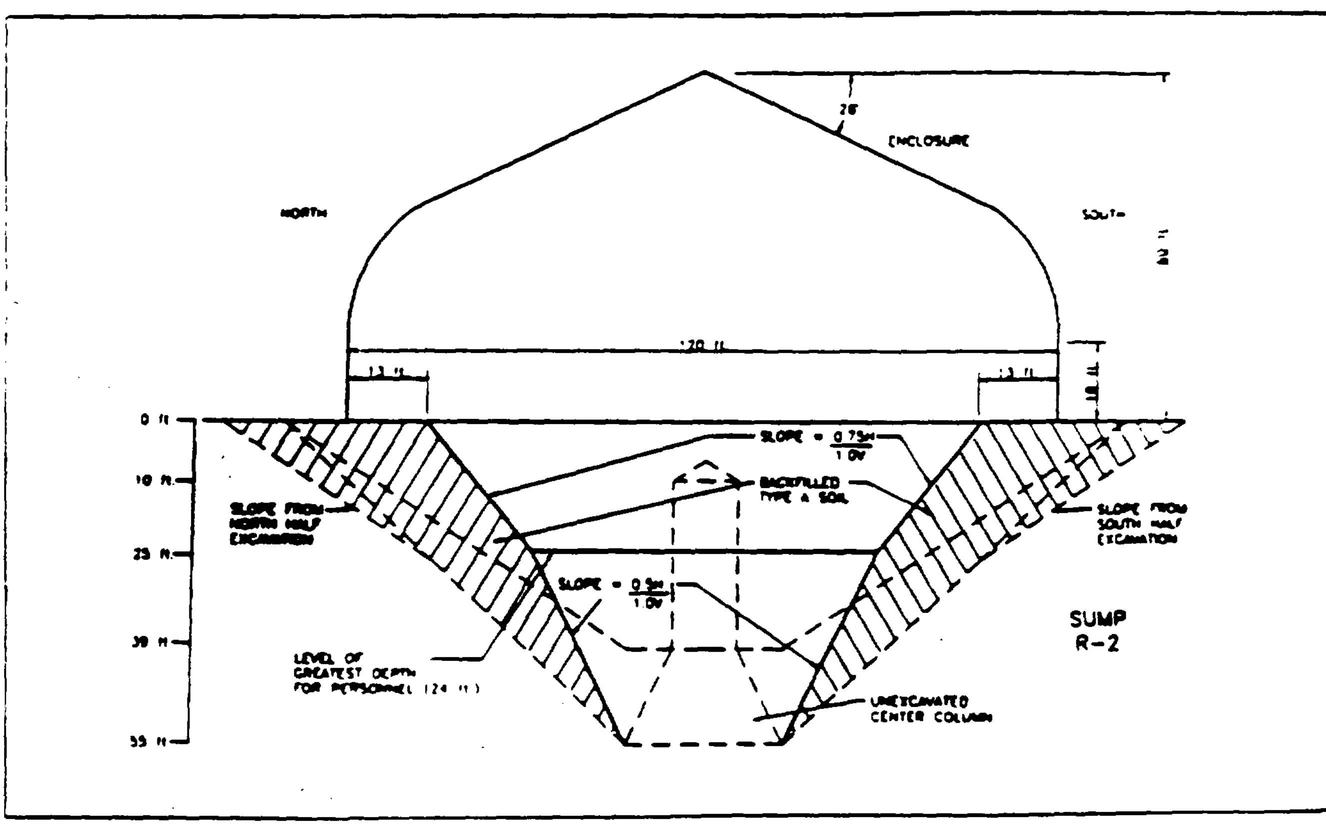

Figure 4-2. Excavation of Center Column in Sump R-2.

After the north half of the sump has been excavated, the pit will be backfilled and the enclosure moved to allow similar excavation of the south half during the second step. As shown in Figure 4-2, however, a column of unexcavated material will be left in the center of the sump after Step 2 is completed. For this center column to be excavated with the same size enclosure, it will be necessary to backfill the north and south halves of the sump with Type A soil (cohesive soils such as clay) as defined by OSHA. This will allow the center column to be excavated with sides sloping at 0.75H/1.0V (above the 24-ft level) instead of 1.5H/1.0V. After excavation of the center column material in the third step, the sump will be backfilled with clean soil for the final time. The three placements of the enclosure structure on Sump R-2 corresponding to the three excavation steps are diagrammed in Figure 4-3.

This excavation approach requires double- or triple-handling of a significant amount of material. Excavation of Sump R-2 will require the most rehandling of material of any of the sumps because of its depth. The number of enclosure placements and the amount of material that would have to be re-excavated for the remaining sumps at McColl being remediated by this technique have been evaluated; the results are summarized in Table 4-1. As shown, the smaller and shallower sumps require only one enclosure placement, whereas the larger and deeper sumps may require as many as seven placements for complete remediation. The estimated total amount of material to be handled with this approach is 151,700 yd^3, which is 25 ... greater than the in-place volume of waste, contaminated soil, and sump cover.

A major assumption in this analysis is that excavation operations will proceed at a pace consistent with feeding approximately 100 tons of material per day to a pretreatment or final treatment system. About 90% of this feed material would be contaminated, and the balance would consist of addi... such as lime or cement. The final treatment devic... operate 6 days/week. Excavation operations would ... place 6 days/wk, 50 wk/yr, which allows 2 wk/yr for over... maintenance/downtime. A second assumption is that the onsite storage facility will accommodate up to 1 week's supply of contaminated materials.

The overall time required for complete excavation of all 12 waste sumps at McColl is based on the assumed final treatment feed rate of 90 tons of waste per day, the bulk density of excavated waste, and the total amount of contaminated material (both in-place material and material that becomes contaminated during re-excavation operations). As shown in Figure 4-1, the total excavation volume expected at McColl is 151,700 cubic yards bank measurement (cybm) versus an in-place volume of 121,200 cybm, which results in a re-excavation volume of 30,500 cybm. Based on materials handling experience at the trial excavation, it is estimated that as much as one-third of this

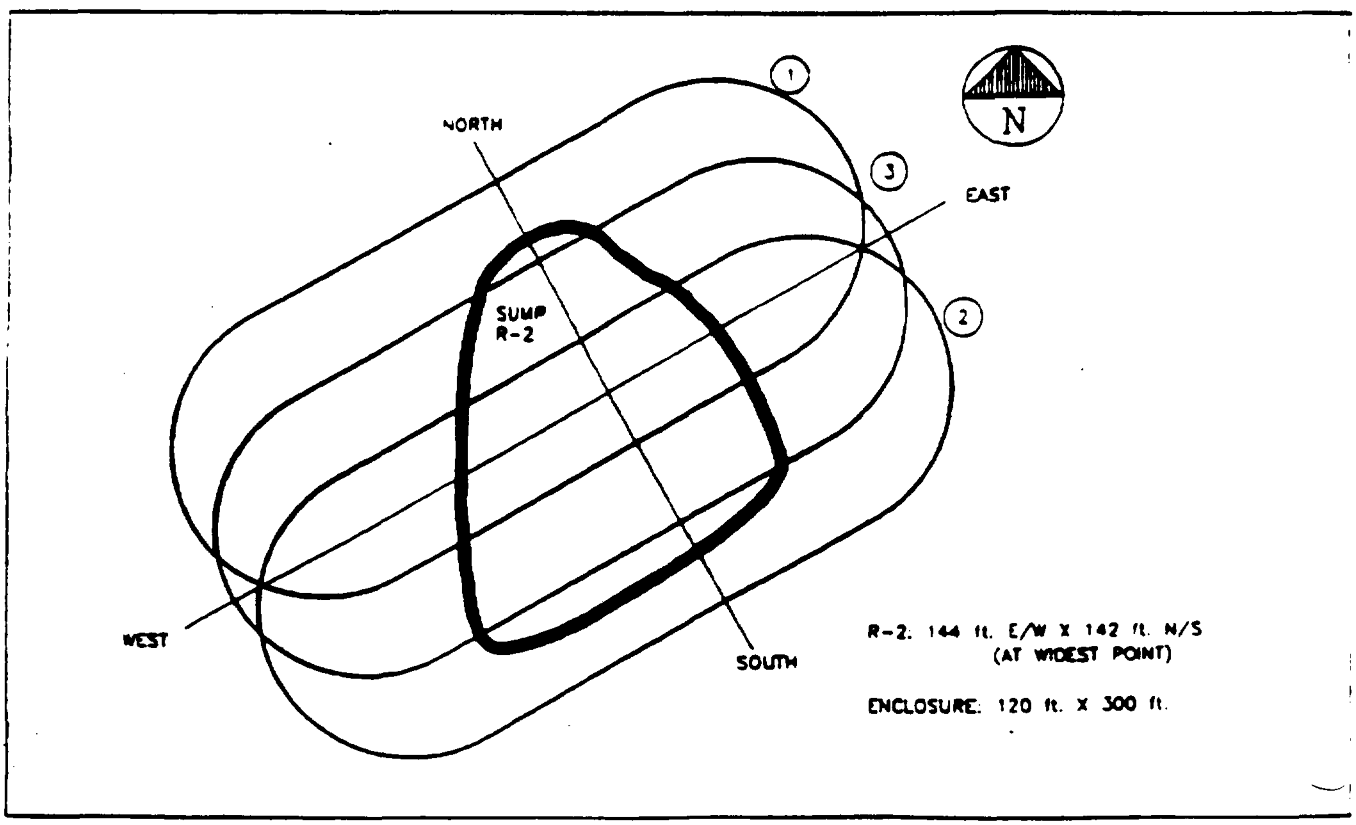

Figure 4-3. Positioning of Enclosure on Sump R-2.

Table 4-1. Planning Results for Excavation Under an Enclosure at McColl.

Sump	Number of Enclosure Positions	Depth[a] ft	Length x Width[b] ft	In-Place Volume[c], yd³	Re-Excavation Volume[d], %	Total Excavation Volume, yd³
Los Coyotes Area						
L-1	4	31	272 x 151	13,800	18.4	16,300
L-2	2	35	163 x 125	10,500	18.4	12,400
L-3	2	37	142 x 118	12,500	13.2	14,100
L-4	1	33	128 x 76	6,200	0.7	6,600
L-5	1	45	97 x 66	5,700	6.7	6,100
L-6	1	35	118 x 65	8,400	2.2	8,600
Ramparts Area						
R-1	4	28	144 x 132	8,800	7.2	9,400
R-2	3	55	144 x 142	9,800	144.9	21,100
R-3	2	31	161 x 142	6,800	5.9	7,200
R-4	2	30	146 x 116	7,300	10.0	8,000
R-5	2	35	170 x 87	11,800	23.3	14,500
R-6	7	45	234 x 148	19,600	39.8	27,400
TOTALS	31	—	—	121,200	—	151,700

[a] Depth of contaminated material.
[b] Length and width of sump at grade level.
[c] Based on CH2M-Hill (1989)
[d] Volume to be excavated in excess of in-place volume (including covers) as a results of material re-handling.

Table 4-2. Total Excavation Quantities and Material Types (cybm)

Material Type	In-Place Volume[a]	Reexcavation Volume	Total Volume
Waste	72,600	—	72,600
Designated	2,000	—	2,000
Questionable	22,500	10,200	32,700
Clean	24,100	20,300	44,400
TOTALS	121,200	30,500	151,700

[a] Based on CH2M-Hill (1989)

overexcavated material could become contaminated as a result of contact with other contaminated waste during backfilling and re-excavation. Table 4-2 summarizes the estimated quantities of the various materials to be excavated on the basis of this assumption and the SROA estimates of in-place materials.

The waste material in Table 4-2 was further segregated into mud, tar, and char based on the relative quantities of these materials encountered in the trial excavation. These quantities are shown in Table 4-3, in which bank measurement volumes (equivalent to in-place volumes) are converted to loose measurement volumes based on the material bulking factors measured during the trial excavation. The total estimated loose measurement excavation volume of 209,690 yd³ consists of 143,690 yd³ of contaminated material and 66,000 yd³ of clean material.

As discussed, the overall objective of the waste excavation operations will be to supply 90 tons/day of contaminated material to final treatment operations. An overall bulk density of 89 lb/ft³ was estimated for the composite stream of McColl contaminated material by using the methodology illustrated in Table 4-4. Thus, 90 tons/ day of contaminated material corresponds to 75 cubic yards loose measurement (cylm)/day of excavated material. Based on the ratio of clean-to-contaminated material shown in Table 4-3, 35 cylm of clean material must be excavated for every 75 cylm of contaminated material, on average. Thus the overall excavation rate required to supply 90 tons/day of contaminated material to final treatment will be (75 cylm + 35 cylm =) 110 cylm/day.

At an average excavation rate of 110 cylm/day, the time required to excavate the entire volume of material at the McColl site (i.e., 209,690 cylm) is estimated to be 1906 operating days. Total site excavation operations would be completed in approximately 6.4 years for the 300 days/year operating scenario discussed earlier.

Waste-Specific Excavation Rates

The feasibility of operating at an overall excavation rate of 110 cylm/day was evaluated by calculating waste-specific excavation rates and applying a factor to reflect the use of Level B personal protective equipment (PPE) for personnel working

Table 4-3. Conversion of Bank Measurement Volumes to Loose Measurement Volumes

Material Type	Total Volume, cybm	Bulking Factor	Total Volume, cylm	Percent of Total Material	Percent of Contaminated Material
Waste - Mud	13,070	1.5	19,610	9.4	13.7
Waste - Tar	10,160	1.2	12,190	5.8	8.5
Waste - Char	49,370	1.2	59,240	28.3	41.4
Designated	2,000	1.5	3,000	1.4	2.1
Questionable	32,700	1.5	49,050	23.4	34.3
Clean	44,400	1.5	66,600[a]	31.8	NA
TOTALS	151,700	—	209,690[a]	100	100

[a] Ratio of clean-to-contaminated material is 66,600/143,090 = 0.465.

Table 4-4. Bulk Density of Composite Contaminated Material Stream (Basis: 100 ft³ of contaminated material, loose measurement)

Material Type	Volume[a], cflm	Bulk Density[b], lb/cflm	Weight, lb
Mud	13.7	84	1,151
Tar	8.5	33	281
Char	41.4	74	3,064
Designated	2.1	120	252
Questionable	34.3	120	4,116
TOTALS	100	—	8,863[c]

[a] cflm = cubic fe... oose measurement.
[b] Based on tria... avation measurements.
[c] 8863 lb/100 f... 9 lb/ft³ composite stream bulk density.

within the enclosur... backhoe of the type expected to be required for this c... he following average speeds apply (Church 1981):

- Drag sp... - 91 ft/min
- Hoist sp... n
- Swing-re... 3.0 revolutions/min
- Loading... g constant - 0.13 min.

Based on the c... contaminated material reported in the SROA, the averag... excavation depth of the McColl sumps is near 37 feet. The a... erage effective excavation depth will be one-half this value, ... 18 feet. An average dumping height of 15 feet was assumed for the excavation spoils pile and bucket length. An average swing-return angle of 120 degrees was assumed for the trac... hoe during excavation operations. Based on these estimates, ... excavation cycle time of 1.02 minutes was calculated by t... methodology shown in Table 4-5. This cycle time would a... y to the excavation of overburden, mud, and tar. A cycle t... of 1.60 minutes was assumed for char excavation because more time will be required for milling out of this harder material by using the bucket (Church 1981).

Based on trial excavation results and recommendations in Church (1981), the dipper factors* (i.e., cubic yards bank measurement/cubic yards bucket capacity) assumed were 0.46 for overburden and mud and 0.66 for char and tar. The backhoe bucket capacity for full-scale remediation operations is expected to be nea 3 yd³.

For typical excavations of rock or soil, operations proceed for an average of approximately 50 min/hr (Chu... The anticipated use of Level B personal protectiv... (PPE) for the McColl excavation is expected to re... overall production efficiency as low as 25% of typica... ciencies, or an average of 12.5 minutes of excavation p... operating hour. This information, plus the factors cited in the preceding paragraph, were used to estimate excavation rates for individual waste types, as follows:

$$\frac{12.5 \text{ min/oper. h} \times 0.46 \text{ cylm/yd}^3 \text{ bucket capacity} \times 3.0 \text{ yd}^3 \text{ bucket/load}}{1.02 \text{ min/load}} = 16.9 \text{ cybm/oper. h}$$

Applying the trial excavation bulking factor of 1.5 yields an excavation rate of 25.4 cylm per operating hour. This excavation rate applies to overburden and mud excavation. The s... procedure, but with different values for the dipper fac... time, and bulking factor, was used to calculate excava... of 29.1 cylm/h and 18.6 cylm/h for tar and char exca... respectively.

A typical day will likely involve the excavation of only one type of waste. Based on the preceding waste-specific excavation rates (which incorporate Level B PPE effects), the following operating times can be estimated directly for the five major types of contaminated materials to achieve the target average daily excavation volume of 110 cylm:

* Dipper factor is inversely proportional to bulking factor (bulking factor for overburden and mud is 1.5 and that for char and tar is 1.2).

Table 4-5. Excavation Cycle Time

Operation	Rate	Distance	Cycle Time, min
Loading and dumping	Constant	Constant	0.13
Hoisting within pit	60 ft/min	19 ft	0.32
Swinging	3.0 rpm	120°	0.11
Hoisting above grade	60 ft/min	15 ft	0.25
Returning and lowering to grade	3.0 rpm	120°	0.11
Lowering within pit	190 ft/min	19 ft	0.1
TOTALS			1.02

- Mud - 4.3 operating hours
- Tar - 3.8 operating hours
- Char - 5.9 operating hours
- Designated or questionable - 4.3 operating hours

For a composite daily waste stream, the calculations in Table 4-6 indicate an average of 4.8 hr of excavation operations would be required to meet the target volume of 110 cylm/day.

These system design considerations indicate that excavation of contaminated materials at the McColl site can be readily accomplished at rates sufficient to supply a final treatment system operating at 100 tons/day. Calculations indicate that excavation operations could produce an average of nearly 160 tons/day of contaminated material over an 8-hr operating period and nearly 235 tons/day over a 12-hr operating period (the maximum period for daylight operations).

Air Ventilation System Design

The design of the air ventilation system for the enclosure is predicated on the emission rate of contaminants within the enclosure and the specified limit for contaminant air concentrations. For the waste at the McColl Superfund Site, SO_2 will be the primary contaminant of concern in light of the high emission rates noted during the trial excavation and the concentration levels required to protect worker health. The ventilation air system has been designed to maintain worker SO_2 exposure (on an 8-hr time-weighted average) at or below 50 ppm. This level is chosen as a reasonable compromise between the IDLH level of 100 ppm and the PEL level of 2 ppm because workers inside the enclosure will be wearing Level B PPE. This level was selected by EPA for conceptual design purposes only. It is recognized that the actual acceptable level of emissions within the enclosure will be dictated by OSHA regulations and any applicable ARARs. This 50-ppm maximum SO_2 concentration, together with the SO_2 emission rate, defines the ventilation air requirements within the enclosure. For this discussion, design of the ventilation system for the excavation enclosure will be considered first, followed by the designs for the backfill and storage enclosures.

Excavation Enclosure Ventilation System

At the McColl site, waste is expected to be excavated via a backhoe operating within the pit at the working face. Excavated waste will be loaded onto a spoils pile near the working face to allow the backhoe to work at maximum efficiency. A front-end loader will pick up waste from the spoils pile and carry it to the truck-staging area near one end of the enclosure. The loader will load the waste directly into a truck's waste container (most likely a 40-yd³ rolloff bin). After the rolloff bin is full, a layer of stabilized foam will be applied to the top surface and a tarp will be placed over the container to control emissions during transport and storage. The truck will then leave the excavation enclosure via a vehicle air lock and transport its load to the storage area.

Emissions of SO_2 within the excavation enclosure will come from two major source types: dynamic waste surface areas and static waste surface areas. Dynamic surface areas are those where the waste is being actively moved or disturbed. Static areas are those where the waste is exposed but is not being moved or subjected to regular disturbances. The dynamic waste areas will include the moving/disturbed areas associated with the working face, spoils pile, rolloff bin, backhoe, and loader buckets. Based on the trial excavation experience, no foam will be applied to these areas for vapor suppression because the effectiveness of foam is limited under dynamic conditions and

Table 4-6. Operating Time Requirements for Excavation of Composite Waste Stream (Basis: 110 cylm of excavated material, average daily volume)

Material Type	Volume, %	Volume, cylm	Excavation Rate, cylm/opr. hr	Required Operating Hours
Mud	9.4	10.3	25.4	0.41
Tar	5.8	6.4	29.1	0.22
Char	28.3	31.1	18.6	1.67
Designated	1.4	1.5	25.4	0.06
Questionable	23.4	25.7	25.4	1.01
Clean	31.7	34.9	25.4	1.37
TOTALS	100.0	110.0	—	4.75

because of other problems (such as slippery surfaces) related to its use. Static areas within the enclosure will consist of all other areas of exposed contaminated materials that are not actively involved in the excavation operations. Stabilized foam will be applied to these areas to suppress emissions. Based on the trial excavation experience, an average suppression efficiency of 70% is assumed to be achievable for these static areas by reapplying stabilized foam every 3 days.

Previous investigations at the McColl site indicated that SO_2 (and THC) emissions from contaminated materials occur in two forms: 1) as higher-level "puff" emissions generated immediately following waste disturbances, and 2) as lower-level steady-state emissions generated after puff emissions have subsided (Radian 1982). The duration of the puff emissions is on the order of 30 seconds to 1 minute, whereas measurements indicate that steady-state emissions may continue indefinitely. Based on data from the previously cited field investigations, "upper reasonable" SO_2 emission flux rates at McColl were estimated to be 47,000 mg/m²-min for puff emissions and 1000 mg/m²-min for steady-state emissions. These rates are characteristic of the upper range of the rates measured, but they do not include rates that were significant "outliers."

There will be four sources of puff emissions within the excavation enclosure, all associated with waste disturbance or movement operations. The first source will be at the excavation working face. The greatest source of puff emissions will be the char waste at the site because it accounts for the greatest volume of vapor-releasing material and has been associated with very high SO_2 emission levels (as measured during the trial excavation and previous field-study flux chamber measurements). Based on the preceding excavation operations discussions, the cycle time for char excavation is expected to be near 1.6 minutes. This implies an average of nearly 38 buckets per operating hour, assuming that operations continue uninterrupted for an hour. Based on bucket dimensions, the exposed surface area of the working face is estimated to be near 2 m².

The second source of puff emissions will be the deposit of excavated material by the backhoe onto the spoils pile near the working face. The frequency and the exposed area for puff emissions will be the same for this operation as for excavation because the same equipment will be involved.

The third puff emission area will be the pickup of waste material off the spoils pile by the loader. The frequency of disturbances by the loader is expected to be about 23 buckets/hour for a 5-yd³ loader working in conjunction with a 3-yd³ backhoe. The surface area of disturbed waste will be approximately 3.5 m², based on typical loader bucket dimensions.

The fourth area of puff emissions will be the deposit of waste by the loader into a rolloff bin. Because the same equipment will be used for this operation as for waste pickup from the spoils pile, the disturbance frequencies and areas will also be the same.

For design purposes, the maximum SO_2 emissions likely to be emitted at any time during planned operations must be considered. Therefore, puff emissions are assumed to persist for a full minute and to occur simultaneously within the enclosure. Overall SO_2 puff emissions from dynamic waste areas were estimated by summing the disturbance areas and frequencies just discussed and applying the upper reasonable emission flux rate:

$$E_{dp} = 47{,}000 \text{ mg } SO_2/\text{min}\cdot\text{m}^2 \text{ (38 buckets/h x 1 min/bucket x 2 m}^2 \text{ x 2}$$

$$\text{+ 23 buckets/h x 1 min/bucket x 3.5 m}^2 \text{ x 2) x 1 g/1000 mg x 1 h/60 min}$$

$$= 246 \text{ g } SO_2/\text{min}$$

Steady-state SO_2 emissions will be generated from both foam-controlled surfaces and uncontrolled surfaces. The uncontrolled surfaces correspond to the dynamic operations for which foam will not be used; after puff emissions have subsided, these areas will continue to emit SO_2 at the lower steady-state rate. These dynamic waste areas will include the following:

- Bin Area - The surface area of a 40-yd³ rolloff bin (with dimensions of 21.8 ft by 7.4 ft) will be approximately 22 m² after allowing for a 1.5 bulking factor.
- Excavation Spoils Pile - The spoils pile is assumed to have a working volume of 40 yd³ arranged in a cone with a diameter of 20 ft and a height of 10 ft, corresponding to an exposed area of 62 m² after bulking.
- Loader and Backhoe Buckets - The loader and backhoe buckets are estimated to contribute 4 m² and 2 m², respectively, to the uncontrolled steady-state emission area (in addition to their roles in generating puff emissions).

The total uncontrolled steady-state emission area is estimated to be 90 m². Steady-state SO_2 emissions from these areas will be generated at the following rate:

$$E_{dss} = 1{,}000 \text{ mg } SO_2/\text{min}\cdot\text{m}^2 \text{ x 90 m}^2 \text{ x 1 g/1000 mg}$$

$$= 90 \text{ g } SO_2/\text{min}$$

Controlled steady-state SO_2 emissions will be generated from static waste surfaces to which vapor-suppressing foam has been applied. The maximum estimated static area corresponds to the contaminated area that will be exposed at the completion of the first excavation pass in Sump R-2. For this sump, material will be excavated to the 24-ft level during the first excavation pass. The contaminated area exposed at this point will consist of a 14-ft vertical wall and the floor of the pit, which will be in the shape of a semicircle with a 40-ft radius. The vertical wall will have a width of approximately 122 ft at the top and 91 ft at the bottom. The combined area of these two surfaces will be near 372 m². The steady-state SO_2 emissions from these surfaces will be reduced by approximately 70% by the application of stabilized foam, which yields net static area steady sta emissions of:

$$E_{t,as} = 1{,}000 \text{ mg } SO_2/\text{min-m}^2 \times 372 \text{ m}^2 \times (1.0 - 0.7) \times 1 \text{ g}/1000 \text{ mg}$$

$$= 112 \text{ g } SO_2/\text{min}$$

The overall maximum SO_2 emission rate within the enclosure, E_t, will be the sum of the individual rates estimated in the preceding three equations. Thus the overall emission rate is estimated as 246 + 90 + 112 = 448 g SO2/min, or 7.4 g SO2/sec. This will be a maximum emission rate because it assumes that all component emissions occur at the same time and at maximum levels, which is not likely to occur in actual practice. The air ventilation system design should be based on this maximum potential SO_2 emission rate, however.

The air ventilation flow rate will be a function of the overall SO_2 emission rate, defined earlier, and the maximum allowable SO_2 concentration within the enclosure. For the purposes of this design, a maximum allowable SO_2 concentration of 50 ppm within the enclosure has been selected as a reasonable compromise between the IDLH level of 100 ppm and the PEL of 2 ppm. This level was selected by EPA for conceptual design purposes only. It is recognized that the actual acceptable level of emissions within the enclosure will be dictated by OSHA regulations and any applicable ARARs.

Under steady-state conditions, the mass of SO_2 leaving the enclosure with the ventilation air will be equal to the mass of SO_2 being emitted within the enclosure:

$$E_t = 50 \text{ ppm} \times F$$

or

$$F = E_t / 50 \text{ ppm}$$

where F is the ventilation air flow rate. Where the total SO_2 generation rate is 448 g/min, the required ventilation air flow rate to maintain enclosure air concentration at 50 ppm or below is given by:

$$F = \frac{448 \text{ g } SO_2/\text{min} \times 1 \text{ lb } SO_2/454 \text{ g } SO_2}{50 \text{ lb-mole } SO_2/10^6 \text{ lb-mole air} \times 64 \text{ lb } SO_2/\text{lb-mole } SO_2 \times \text{lb-mole air}/359 \text{ scf}}$$

$$= 110{,}700 \text{ scfm}$$

or

$$= 110{,}700 \text{ scfm} \times (460° + 115°F)/(460° + 32°F)$$

$$= 129{,}400 \text{ acfm at } 115°F$$

The calculated air ventilation flow rate was rounded up to 130,000 acfm, which will be sufficient to maintain SO_2 concentrations within the excavation enclosure below 50 ppm, even during periods of maximum SO_2 generation rates. During periods of lower SO_2 generation rates, the concentrations within the enclosure will be below 50 ppm if the ventilation system is maintained at the specified air flow rate.

Backfill Enclosure Ventilation System

During backfill operations, clean soil will be trucked into the backfill enclosure and moved into position by a front-end loader. A vibrating roller will be used to pack the backfilled soil. Backfill operations are expected to cause negligible disturbance of waste surfaces; therefore, puff emissions are also expected to be negligible. A wall of contaminated material, however, will be fully exposed at the start of backfill operations, which will emit SO_2 at the steady-state rate reduced by the application of foam.

For design purposes, the largest wall of contaminated material will be exposed at the start of backfilling of Sump R-2. This wall will be approximately 124 ft at the top, 26 ft at the bottom, and 45 ft high, with a total surface area of 314 m². The estimated static area steady-state SO_2 emission rate was calculated in the same manner as used for the excavation enclosure:

$$E_{t,as} = 1000 \text{ mg } SO_2/\text{min-m}^2 \times 314 \text{ m}^2 \times (1.0 - 0.7) \times 1 \text{ g}/1000 \text{ mg}$$

$$= 94 \text{ g/min}$$

Since there will be no puff emissions or uncontrolled steady-state emissions in the backfill enclosure, total SO_2 emissions will be equal to the calculated static area steady-state emissions.

The maximum allowable SO_2 concentration within the backfill enclosure will also be set equal to 50 ppm. The air ventilation requirement for this enclosure was calculated in the same manner as for the excavation enclosure:

$$F = \frac{94 \text{ g } SO_2/\text{min} \times 1 \text{ lb } SO_2/454 \text{ g } SO_2}{50 \text{ lb-mole } SO_2/10^6 \text{ lb-mole air} \times 64 \text{ lb } SO_2/\text{lb-mole } SO_2 \times \text{lb-mole air}/359 \text{ scf}}$$

$$= 23{,}300 \text{ scfm}$$

or

$$= 23{,}300 \text{ scfm} \times (460° + 115°F)/(460° + 32°F)$$

$$= 27{,}200 \text{ acfm at } 115°F$$

As with the excavation enclosure, if the air ventilation system operates at the same rate, SO_2 concentrations inside the backfill enclosure will decline as the sump is backfilled and the exposed waste area is reduced. The SO_2 concentrations will also be lower in smaller sumps, where the exposed waste surface area will be less than that estimated for Sump R-2.

Waste Storage Enclosure Ventilation System

Like backfill operations, waste storage operations will be characterized by steady-state emissions from controlled static waste areas (with negligible puff or uncontrolled steady-state emissions). The requirement to maintain 1 week's supply of contaminated material for feed to final treatment can be accommodated by 17 rolloff bins with approximate 40-yd³ capacities. The surface area of the contaminated material in these bins will be covered with foam and a tarp.

The total waste-emitting surface area of the bins in the storage area at full capacity will be near 374 m², based on the bin dimensions and bulking factor cited earlier. Based on the same estimating procedures shown earlier, the total SO_2 emission generation rate within the storage enclosure was estimated to be 112 g SO_2/min. This emission rate translates to air ventilation requirements of 32,400 acfm to maintain SO_2 concentrations within the enclosure below 50 ppm.

Design of Air Pollution Control Devices

This section considers the design of major components of the ventilation air pollution control trains. Each train will consist of a wet scrubber for control of SO_2 and particulate matter (PM) emissions, a granular activated carbon (GAC) unit for control of hydrocarbon/organics emissions, and an associated fan, blower, and ducting system. The equipment designs for each train will be identical. For illustration purposes, the discussions that follow focus on the APCD trains for the excavation enclosure.

Wet Scrubber System

The wet scrubber system design will be comparable to the NaOH-based scrubber system used during the trial excavation. An NaOH-based scrubber system is advantageous in this application because its considerable buffering capacity allows it to accommodate wide swings in SO_2 inlet concentrations while maintaining high SO_2 removal rates and low outlet concentrations. The largest NaOH-based wet scrubber manufactured by Interel Corporation, the supplier of the trial excavation scrubber, is rated at 35,000 acfm.* This unit, Interel Model GW 300, includes 10 feet of packing, a 950-gal sump, an automatic pH control, an automatic sump level control, an automatic blowdown system, a mist eliminator, and 300 gal/min recirculation pump. The unit is constructed of high-density polyethelene, as was the trial excavation scrubber. The Model GW 300 is designed to achieve greater than 95% SO_2 removal and greater than 90% PM removal when operated according to specifications.

The scrubber tower will be filled with 2-in.-diameter plastic packing balls, which provide a high mass transfer coefficient and yet operate at a pressure drop in the range of 2 to 5 inches of water across the bed. The high-void-space design of the packing material allows the scrubber to accomplish PM removal at air loadings of up to 2000 mg/m³ without plugging. The highest PM loading expected among the excavation, backfill, and storage enclosures will be less than approximately 120 mg/m³.

For accommodation of the specified total air ventilation flow rate of 130,000 acfm, four Interel Model GW-300 scrubbers will be required for the excavation enclosure, each operating at an average of 32,500 acfm. One scrubber unit will be required for each of the backfill and storage enclosures operating at the average air ventilation flow rates specified. Each APCD train will have one wet scrubber unit.

Granular Activated Carbon System

The THC adsorption performance of the GAC unit used during the trial excavation was less than the level expected based on other similar applications. This lower-than-expected performance was believed to be due primarily to moisture condensation within the carbon bed, which reduced the effective activated carbon surface area. For avoidance of such problems during full-scale remediation, it is recommended that a small gas burner be installed in the ducting between the wet scrubber and the GAC units that is capable to raising the temperature of the air stream by 20° F. This is a common saturation approach temperature difference used in industrial applications to avoid condensation while allowing for the natural variability of industrial operations.

For operation in the South Coast Air Quality Management District, the burner should be designed to fire natural gas. Heat balance calculations indicate that a burner firing approximately 700 ft³/h (or 700,000 Btu/h) of natural gas will be sufficient to raise the temperature of the scrubber effluent air by 20°F. Downstream of the natural gas burner, the total gas flow rate will be increased from 32,500 acfm at the inlet to the scrubber to about 35,200 acfm as a result of natural gas combustion and saturation of the air stream with water in the scrubber. Assuming that the wet scrubber operates near 100°F during the summer months, the temperature of the gas entering the GAC unit will be 120°F.

The largest GAC modules available from TIGG Corporation, the supplier of the trial excavation GAC unit, are rated at 12,000 acfm.** Three such units (TIGG Model N-12000) will be required to operate in parallel for each scrubber to match the

* Personal communication from P. Briscoe, Interel Corporation, to E. Aul, Edward Aul and Associates, Inc., April 10, 1991.
** Personal communication from J. Sherbondy, TIGG Corporation, to E. Aul, Edward Aul and Associates, Inc., March 22, 1991.

scrubber flow rates. A fourth module will be added to allow change-out of spent carbon without shutting down the entire train. Each unit will be a radial-flow module similar in design to the unit used during the trial excavation. Inlet gases flow downward through a vertical cylindrical distributor in the center of the unit and then flow outward through an annular carbon bed to an accumulator cabinet that collects the gases and directs them to a downstream fan. The pressure drop across the three parallel GAC modules is expected to be in the range of 5 to 8 inches of water. Each cannister will hold approximately 5100 lb of activated carbon, for a total of 15,300 lb of carbon on-stream per train. At 12,000 acfm, the gas residence time in the carbon beds will be near 0.8 second. This design, in connection with the previously discussed gas burner, should consistently provide at least 90% removal of THC in the inlet gas stream.

One of the key parameters affecting the operation of carbon adsorbers is the amount of adsorbate (THC emissions in this case) captured on the carbon beds. This factor determines the makeup rate for fresh carbon and the spent carbon generation rate, both important economic parameters. For a given set of operating conditions, the maximum (or equilibrium) amount of adsorbate captured on the bed is a function of the inlet concentration and can be calculated from an adsorption isotherm of the form (Vatavuk 1990):

$$m_e = ap^b$$

where m_e = lb adsorbate/lb adsorbent at equilibrium

p = partial pressure of adsorbate in gas stream (psia)

a, b = isotherm parameters.

The isotherm parameters are particular to the adsorbate, type of carbon, and adsorption temperature and are best determined in the laboratory under representative conditions. For design purposes, however, the adsorption isotherm parameters for the mixture of hydrocarbons expected from excavation operations can be estimated by using a representative organic species such as toluene. Toluene was selected because it has nearly the same molecular weight as the average molecular weight of the THC mixture. For toluene adsorption on 4x10 mesh carbon at 77 °F, the values of a and b are 0.551 and 0.110, respectively. The inlet concentration of THC during excavation operations is estimated to be 14.2 ppm, which corresponds to 2.08 x10^{-4} psia. Substituting this value into the preceding equation with the appropriate isotherm parameters yields:

$$m_e = 0.551(2.08 \times 10^{-4})^{0.110}$$

$$= 0.217 \text{ lb adsorbate/lb carbon}$$

In actual practice, the amount of adsorbed carbon is not allowed to reach the equilibrium level because the bed's adsorption capacity would be exhausted at this point and the outlet concentration would quickly rise to the inlet level. For avoidance of this type of adsorbate breakthrough, carbon beds are typically allowed to operate until they reach 50 to 75% of equilibrium loading. Using the 75% level for design purposes implies that the maximum loading of carbon for the excavation ventilation air system will be 0.217 x 0.75= 0.163 lb adsorbate/lb carbon.

During nonoperating hours, the THC concentration of the ventilation air is projected to fall quickly to less than 1 ppm. At this low level, only minimal THC adsorption would be expected in the carbon-beds even if the enclosure is ventilated continuously. Thus, the useful life of carbon-bed modules will depend primarily on the duration of excavation operations.

Based on the calculated maximum loading rate, the useful life of the carbon-bed adsorbers for the four excavation enclosure APCD trains (each with 15,300 lb of carbon in three parallel N-12000 adsorbers) is about 435 operating hours. The previously discussed operating scenario for excavation calls for approximately 5 hours of excavation per day, or 30 hours per week. On this basis, a fresh charge of 15,300 lb of carbon would provide design-level THC adsorption for approximately 100 days, which implies that one spent GAC module should be changed out for a fresh carbon module every 33 days. Annual requirements for fresh carbon and for the disposal of spent carbon will be slightly more than 53,000 lb/year.

Ducting System, Blower, and Fan

A ducting system will be provided to exhaust ventilation air from the enclosure and to supply fresh makeup air. An induced-draft (ID) fan will be located at the end of the exhaust ducting to draw air from the enclosure and through the wet scrubber and GAC modules. A forced-draft (FD) blower at the end of the inlet ducting will push fresh air from outside the enclosure to points inside. Exhaust ducting must carry ventilation air containing dust from excavation operations. For medium- to high-density dust, a gas velocity of about 4,000 ft/min is recommended (Vatavuk 1990). At this velocity, a duct diameter of approximately 3 ft is required to accommodate 32,500 acfm of airflow. The diameter of the inlet ducting will also be specified as 3 ft to provide portability within the enclosure.

To increase the effectiveness of the air ventilation system the air delivery system will be arranged to provide a continuous flow of fresh air past workers in high emission areas (e.g., the working face). The exhaust system will also be designed to capture emissions close to their source to minimize the amount of contaminants that escape into the general enclosure volume. This requires that exhaust and air supply ducting be extended from the enclosure wall to areas within the enclosure, as illustrated in Figure 4-4. On the supply side, air will be drawn from the atmosphere by a blower operating outside the enclosure and directed into the enclosure through fixed ducting (outside the enclosure) and movable ducting (inside the enclosure). The movable ducting inside the enclosure will be positioned near the high-emission working areas so that fresh air will flow past workers, preferably in the workers' breathing zone. The ducting inside the enclosure will be made of lightweight plastic or similar material that will allow the ducting to be flexible and easily moved for optimum positioning.

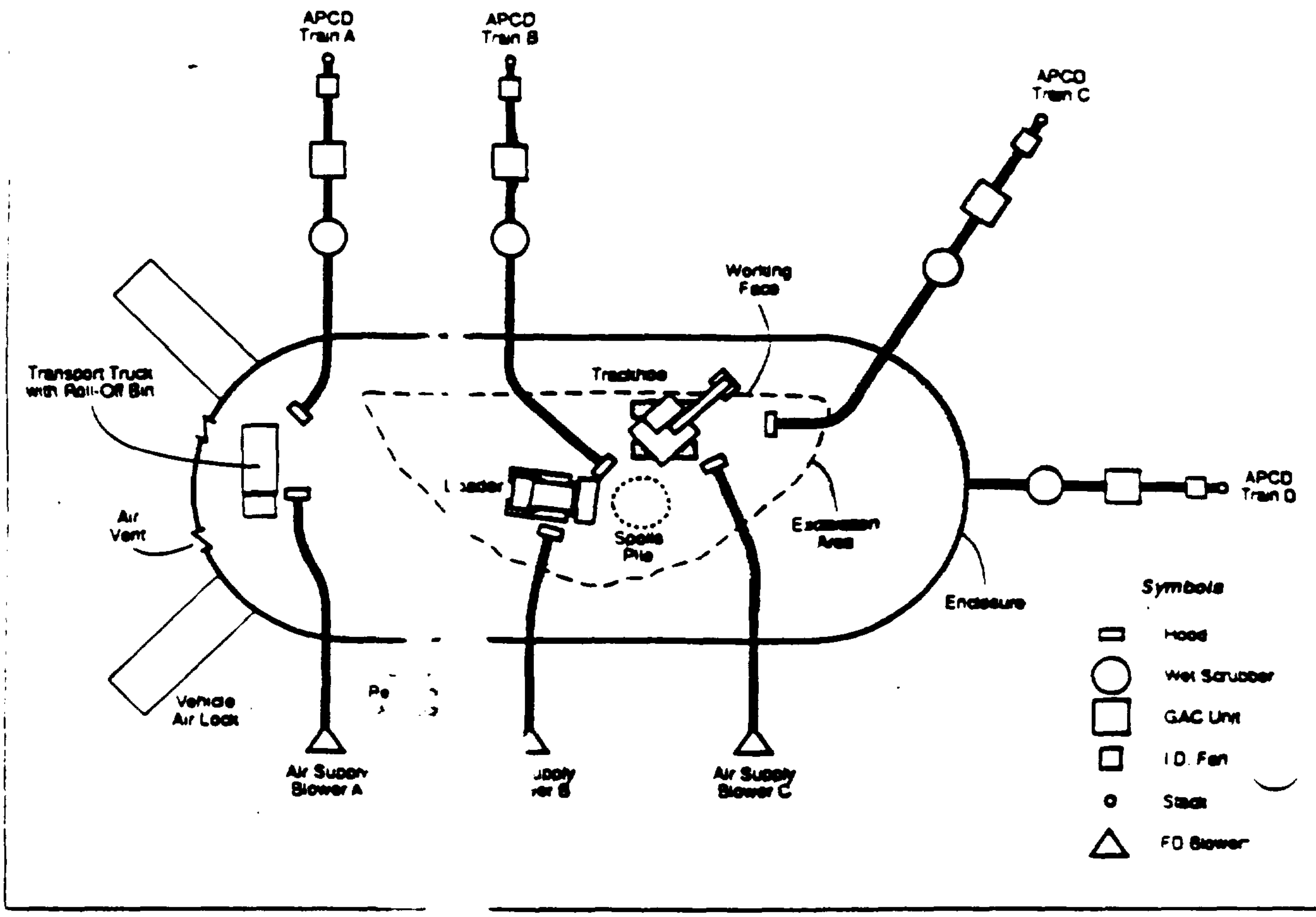

Figure 4-4. Air Ventilation System Sche… …r Excavation Enclosure.

In a similar manner, exhaust ducting … l extend within the enclosure to allow placement near ma… emission sources. This ducting will also be made of fle… …ic and light-weight material to facilitate movement and plac… …nent near sources. A hood will be required at the end c… e… h duct to maximize emissions capture. Based on ACGIH recommendations, a capture velocity of 500 ft/min at the face of the hood is specified for this operation (McDermott 1985). This corresponds to a square hood with dimensions of 8 ft by 8 ft for the ventilation flow rate of 32,500 acfm per train. A similar hood, equipped with baffles, is recommended for the a… -supply ducting so that air velocities near workers are not hi… … enough to cause significant dusting or unstable working conditions. The total length of exhaust ducting is estima… … to be 300 ft for each train, which includes 150 ft of fixe… stainless steel ducting outside the enclosure (to connect the scrubber, GAC unit, and fan) and up to 150 ft of flexible duc…ing inside the enclosure. Air-supply ducting would also requ…re up to 150 ft of flexible ducting inside the enclosure but o…ly about 50 ft of fixed, carbon-steel ducting outside the en…losure to reach blowers.

The air ventilation system for the excavation enclosure calls for four trains of 32,500 acfm airflow each. It is recommended that three of these trains be positioned in the manner described in the preceding paragraph so that fresh air is supplied and contaminated air is exhausted locally near the excavation working face, the spoils pile, and the truck-staging area. The fourth system would exhaust air from the general enclosure volume and maintain a slight negative pressure within the enclosure to minimize/eliminate air leakage from inside the enclosure to the outside. This general arrangement is illustrated in Figure 4-4.

In the design of the FD blower, consideration must be given to the volume of air to be delivered and the pressure drop in the ducting to be overcome. The maximum volumetric flow rate for fresh air is specified as 35,000 acfm for each train. For a 3-ft-diameter duct, this flow rate corresponds to an air velocity of about 4950 ft/min. The pressure drop through the ducting can be estimated as follows (Vatavuk 1990):

$$\Delta P = 1.38 \times 10^{-7}(Q^{-0.5})(V^{2.5})$$

where ΔP = static pressure loss (inches water/100-ft duct)

Q = Volumetric flow rate of gas (acfm)

V = Gas velocity (ft/min)

For the air supply system,

$$\Delta P = 1.38 \times 10^{-7}(35{,}000^{-0.5})(4{,}950^{2.5})$$

$$= 1.3 \text{ in. water/100-ft duct}$$

The pressure drop across 200 ft of air supply ducting would be about 2.6 in. water. An additional pressure drop of 1 in. water is allowed for ducting fittings, elbows, baffles, and related obstructions, which brings the total estimated pressure drop in the air supply ducting to 3.6 in. water.

A motor specified for the blower must have sufficient horsepower to turn the blower at required speeds. Horsepower requirements for motors of this type are determined by the following equation:

$$BHP = 0.0001575 \times Q \times \Delta P/n$$

where BHP = motor brake horsepower (HP)

n = motor efficiency

A blower developing a static head of 3.6 in. of water and supplying 35,000 acfm of air will require approximately 40 HP when operating at a typical efficiency of 50%:

$$BHP = 0.0001575 \times 35{,}000 \times 3.6/0.5$$

$$= 40 \text{ HP}$$

For the exhaust ducting of each APCD train, a fan must be able to draw a maximum of 35,000 acfm from inside the enclosure and through the scrubber, GAC unit, and associated ducting. The maximum pressure drop in this train is estimated to be 20 in. of water, based on specifications for individual equipment pieces and the trial excavation experience. Available fan curves for an ID radial-blade centrifugal fan indicate that a fan with a wheel diameter of about 60 in. will be required (Vatavuk, 1990).

The horsepower requirement for a motor of this type is calculated in the same manner as discussed for the blower. For a fan drawing 35,000 acfm of air and overcoming 20 in. of water pressure drop, a motor of approximately 220 HP will be required.

Section 5

Economic Analysis

Introduction

The objective of this economic analysis is to estimate the cost of a commercial-size site remediation effort using the excavation and fugitive emission control systems evaluated during the McColl trial excavation. This evaluation illustrates how these systems could be applied to a site where excavation or handling of wastes would result in the release of significant fugitive emissions that could pose a potential health risk to nearby communities. In the example scenario, costs are estimated for full remediation of the 12 sumps at the McColl Superfund site in Fullerton, California.

Costs have been estimated for the full excavation of all contaminated material at the McColl site, which consists of an estimated 72,600 yd^3 of waste (consisting of mud, tar, and char, as discussed in Section 3), 2000 yd^3 of designated material, and 22,500 yd^3 of questionable material (CH2M-HILL 1989). Designated materials are soils directly adjacent to the wastes [illegible] the Federal or State hazardous waste criteria, based on an analysis of soil borings. Questionable materials are soils exceeding the background chemical concentration levels, but not qualifying as designated. An additional 22,500 yd^3 of clean soil forming sump covers also must be excavated. This makes a total of 121,200 yd^3 of in-place material to be excavated during full remediation.

The scope of the remediation activities examined in this analysis includes excavation of waste and associated material under a rigid-frame enclosure, backfilling of the excavated sump under a second enclosure, erecting a third enclosure on the next sump to be excavated, and transport of the waste material to an onsite storage facility consisting of a stationary enclosure erected over a concrete pad. The fugitive emission control systems include vapor-suppressing foam application units, air ventilation systems for each enclosure, the APCD used to reduce emissions of SO_2 and THC in the ventilation air to acceptable levels, an APCD emissions monitoring network, and a perimeter ambient air monitoring network.

This scope does not include the final waste treatment and disposal systems or pretreatment systems. Such systems as offsite disposal in a RCRA landfill, onsite thermal treatment (e.g., incineration), or offsite thermal treatment, among others, have been considered for this site; however, are not included in the scope of the economic analysis. The costs of such systems, as well as the costs of integrating such systems with the excavation and storage approaches considered, would have to be added to the costs developed in this analysis to arrive at an estimate for full remediation and disposal.

Depending on the final waste treatment option selected, the specification of one week of storage capacity may or may not be appropriate. For onsite treatment options such as incineration, the one-week storage capacity would be desirable to allow treatment operations to continue if excavation operations were temporarily slowed or halted. For offsite treatment options, the capacity probably would not be needed.

Conceptual designs have been developed for the excavation/backfill/storage operations, air ventilation systems, and air pollution control systems, as discussed in Section 4. Based on these designs, costs for major equipment items such as the enclosures, foam delivery trailers, SO_2 scrubbers, and GAC units were provided by their respective manufacturers/suppliers. Two costing options were evaluated for acquisition of equipment for excavation, backfilling, storage, and enclosure movement: 1) leasing of the equipment (costs based on literature data) and 2) purchase of equipment (costs provided by equipment suppliers). Cost estimates for minor equipment were based on literature cost data. All costs have been adjusted to a July 1990 basis and to an Orange County, California, location by using historical cost indices. This design and costing methodology is consistent with an order-of-magnitude estimate as defined by the American Association of Cost Engineers, which has an accuracy of plus 50 to minus 30%.

Results of the economic analysis and apparent trends are as follows:

- The estimated costs of waste excavation and storage at the McColl site range from \$69.2 million (for the purchase option) to \$74.3 million (for the lease option), or from \$593/ton to \$637/ton. The marginal costs for fugitive emission control are nearly twice the costs of excavation without such control.
- These costs reflect a remediation duration of 6.4 years, based on a specified final treatment processing rate of 90 tons/day of contaminated material. Excavation rate calculations indicate that excavation operations are not the rate-limiting step under this

scenario but that remediation activities could be accomplished in less time, which would reduce overall costs.

- Specification of the SO_2 concentration limit within the enclosure dictates the size and cost of the air ventilation system and APCD equipment.

Basis for Process Design, Sizing, and Costing

The basis for system process designs, equipment sizing, and cost estimates are provided in the following subsections, arranged according to the 12 cost categories specified by the SITE program. As discussed earlier, these costs encompass the waste excavation, backfilling, storage, and fugitive emission control systems, but they do not include systems for final treatment of excavated wastes. Detailed discussions of design analysis for excavation/backfill/storage operations, air ventilation systems, and air pollution control systems are presented in Section 4. Relevant design information that impacts cost estimates is summarized in the following subsections.

Site Preparation Costs

Based on the trial excavation experience, the enclosures will be placed on approximately level surfaces to ensure a good seal at the bottom: this minimizes outleakage of contaminated air during excavation/backfill operations. Although the supplier, Sprung Instant Structures, Inc., has indicated that legs can be added to accommodate slopes, level surfaces are preferred from the standpoint of worker safety and equipment performance. Because the McColl site terrain is characterized as gently rolling, a limited amount of clearing and grading will be required to provide level surfaces above and around the 12 sumps. In addition, connections must be installed for electric power, water, and natural gas from a point near the entrance of the site to the three major sump areas (i.e., Upper Ramparts, Lower Ramparts, and Los Coyotes) as required for operation of the APCD systems. Costs of these site preparation activities have been extrapolated to full scale from the costs incurred during the trial excavation (EPA 1990). Costs have also been added for providing a new equipment decontamination station, a personnel decontamination trailer, an office trailer, and a security check station. These costs are based on estimates from equipment suppliers.

Permitting and Regulatory Costs

Because McColl is a Superfund site, it is assumed that no Federal or State permits will be required. Nevertheless, it is recommended that project officials coordinate their activities closely with Federal OSHA, State OSHA, and other State and local regulatory groups.

Equipment Costs

Equipment required for this project can be divided into five general areas: excavation, backfill, storage, air ventilation system, and foam application. For excavation operations, a Caterpillar 245, or equivalent, track-mounted hydraulic backhoe with a 14.5-ft stick and a 3-yd3 bucket is expected to be used. This backhoe would have a 31-ft maximum depth of cut for an 8-ft level bottom and a maximum reach of 46 ft at ground level (Caterpillar Tractor 1985).

In addition to the track-mounted backhoe, other major equipment pieces required for excavation operations are a 6-yd^3 track-mounted, front-end loader and two off-highway trucks capable of hauling 40-yd^3 rolloff bins. Backfilling of clean soil is accomplished with a 5-yd^3 wheel-mounted loader operating at the borrow area and a 5-yd^3 track-mounted loader, a 10-ton tandem roller, and two off-highway 50-ton capacity dump trucks operating inside the enclosure. A total of 24 rolloff bins are included in the storage equipment costs (EPA 1990). Other supporting equipment required for excavation and backfill operations include a fuel and lube truck, a mechanics and welding truck, a water wagon, a crew truck, a pickup truck, a forklift, and compressors to provide air for the Level B supplied-air respirators. Costs for this supporting equipment are included in the excavation equipment category. Information regarding estimated lease and purchase costs for these equipment items is summarized in Table 5-1.

The air ventilation system consists of several equipment components. A blower provides fresh air to selected areas inside the enclosure to minimize worker exposure to air contaminants and to promote air mixing within the enclosure. A packed-bed scrubber operating on exhaust ventilation air from the enclosure is designed to remove 95% of the incoming SO_2 by reaction with sodium hydroxide. A small gas burner is specified in the ducting between the scrubber and GAC unit to raise the temperature of the air stream by 20°F to avoid potential moisture condensation on the GAC. After the gas burner, three modular GAC units operating in parallel are used to reduce total hydrocarbon emissions by 90% before the air is vented to the atmosphere. Ventilation air is drawn from the enclosure and through the scrubber and GAC units by an induced-draft fan capable of overcoming an estimated 20 in. of water pressure drop. A summary of specifications and costs for the APCD equipment is provided in Table 5-2.

The largest sodium-hydroxide-based scrubber module available from Interel is rated at 35,000 acfm capacity.* Thus, four such modules will be required for the excavation enclosure, whereas only one module would be required for the backfill and storage enclosures. Although the use of four APCD trains for the excavation enclosure complicates operations from the standpoint of the operation and movement of the systems, the smaller size is desirable to maintain portability around the

*Personal communication from P. Briscoe, Interel Corporation, to E. Aul, Edward Aul and Associates, Inc., July 17, 1990.

Table 5-1. Lease and Purchase Costs for Excavation, Backfill, and Storage Equipment and Enclosure Movement[a]

Quantity	Equipment	Lease Cost[b], $/month	Purchase Cost[c], $
	Excavation operations		
1	Track-mounted backhoe, 3-yd^3	23,600	571,300
1	Track-mounted loader, 3-yd^3	10,500	301,400
2	Off-highway trucks, 40-yd^3	26,100	818,600
1	Fuel and lube truck	3,900	170,400
1	Mechanics and welding truck	3,900	170,400
1	Water wagon	3,900	170,400
1	Crew truck	1,700	19,100
1	Pickup truck	560	16,900
1	Forklift, 10-ton	3,600	85,200
1	Air compressor	1,010	32,300
	Backfill operations		
1	Track-mounted loader, 5-yd^3	10,500	301,400
1	Wheel-mounted loader, 5-yd^3	10,500	230,200
1	Tandem roller, 10-ton	2,100	86,500
2	Off-highway trucks, 40-yd^3	26,100	818,600
	Storage operations		
24	Rolloff bins, 40-yd^3	280	210,200
	Enclosure movement		
1	Articulated boom lift, 500-lb	11,400	82,200
1	Truck-mounted crane, 10-ton	7,500	192,600
2	Rolling tower scaffolding, 20-ft	600	2,600

[a] All costs are adjusted to July 1990 and Orange County, California, site.
[b] Source: Means (1990).
[c] Sources: Personal communications from E. Hooks, Caterpillar - Gregory Poll Equipment Co., August 23, 1991; W. Wilkerson, D&J Trucks, Inc. August 23, 1991; B. Bergstrom, Hyster Co., June 19, 1991; and M. Nelson, Prime Equipment Co., June 12, 1991, to E. Aul, Edward Aul & Associates, Inc.

site as the enclosures are moved. In addition to the six operating APCD trains, a seventh train will be purchased as an onsite backup unit.

The largest GAC modules available from TIGG are rated at 12,000 acfm.* Three such units will be required to operate in parallel for each scrubber to match the scrubber flow rates. A fourth module will be added to allow change-out of spent carbon without shutting down the entire train.

A trailer-mounted foam application system supplied by Boots & Coots will be used to apply vapor-suppressing foam to exposed static waste surfaces in the three enclosures. This system includes a water tank, a stabilizer tank, a foam tank, a proportioning system, and a diesel-powered booster pump sized to provide up to 500 ft^2 of double-strength stabilized foam per minute. A nitrogen cap system is also incorporated to prevent deterioration of the stabilizer by air or moisture during operation and recharging. A separate foam trailer will be required for each of the enclosures, plus a spare trailer as onsite backup. As in the trial excavation, the trailers will be operated outside the enclosure to supply foam via hoses for application to waste surfaces inside the enclosure. The cost of purchasing each trailer is approximately $35,000.** Another $5,000 per unit has been added for hosing and nozzles.

A final category of equipment is the equipment required to erect and then teardown the rigid-frame enclosures to be positioned over sumps during excavation and backfilling operations. Based on the trial excavation experience and discussions with representatives of Sprung Instant Structures, this equipment will include two 20-ft rolling scaffolding towers, a gas-powered lift with an articulated boon capable of reaching to 60 ft, and a 10-ton truck-mounted crane.

Startup and Fixed Costs

The major cost items included in this category are the three excavation and backfill enclosures, the APCD monitoring network, and the perimeter monitoring network. The excavation and backfill enclosures are each 120 ft wide by 300 ft long by 60 ft high. These width and length requirements are based on detailed excavation planning for the 12 sumps at McColl. As in the trial excavation, the enclosure structures consist of aluminum support members covered by a PVC skin. Each enclosure includes two 60-ft-long air lock tunnels that will allow vehicle entry and exit with a minimum of outleakage of air from inside the enclosure. Two additional smaller air locks are provided for personnel entry and exit.

*Personal communication from J. Sherbondy, TIGG Corporation, to E. Aul, Edward Aul and Associates, Inc., March 22, 1991.

**Personal communication from B. Smith, Boots & Coots, to E. Aul, Edward Aul and Associates, Inc., April 2, 1991.

Table 5-2. Air Ventilation System Specifications and Costs

Component/Specifications	Estimated Cost[a]
Air supply blower 35,000-cfm throughput 4 inches water pressure drop 40-hp motor	$18,000
Air supply ducting 3-ft diameter 50 ft of carbon steel (exterior) 150 ft of FRP with hood (interior)	$24,700
SO_2 scrubber 35,000-cfm throughput 2 to 5 inches water pressure drop 10-ft packed bed 300-gpm recirculation pump Automatic controls for pH and sump level Blowdown pump Reagent metering pump Mist eliminator HDPE construction	$120,000
Induced-draft fan 35,000-cfm throughput 20 inches water suction pressure 220-hp motor	$20,900
Reagent storage tank 550-gallon capacity FRP construction	$1,800
Blowdown wastewater storage tank pump 2000-gallon capacity FRP construction 220-gpm transfer pump	$6,700
Duct burner 20°F temperature rise 1 million Btu/h heat input	$5,000
GAC adsorber modules 3 operating modules, 1 spare 12,000-cfm throughput each 5 to 8 inches water pressure drop 5100-lb carbon each 0.8-second gas residence time	$80,000
Air exhaust ducting 3-ft diameter 150 ft of 316 SS (exterior) 150 ft of FRP with hood (interior)	$136,600
TOTAL EQUIPMENT COSTS	$413,700

[a] Costs are for equipment only and do not include freight and installation costs.

The fourth enclosure for storage is smaller; it measures 120 ft wide by 240 ft long by 57 ft high. Because of the heavy vehicular traffic and potential requirement to move rolloff bins inside, the enclosure is erected over a 6-in. pad of 3500-psi reinforced concrete. Installed costs for the pad are estimated to be $6.24/ft² (Means 1990). The estimated costs for the three excavation and backfill enclosures are $1,242,500 each, as supplied by Sprung Instant Structures; costs for the storage enclosure are estimated to be $510,250.* Delivery costs to the site would be negligible because McColl is only 40 miles from Sprung's Fontana, California, operations office. Startup costs also include costs for four closed-circuit television systems to monitor operations within the enclosures, as was done during the trial excavation.

A perimeter monitoring network is called for in the McColl Community Safety/Contingency Response Plan for continuous monitoring of SO_2 and THC in the ambient air around the site during remediation. The network consists of seven stations on the perimeter of the site and three stations at interior locations, each equipped with an SO_2 analyzer, a THC analyzer, calibration equipment, and strip chart recorders. Each of

*Personal communication from C. Spitzka, Sprung Instant Structures, Inc., to E. Aul, Edward Aul and Associates, Inc., July 17, 1990.

these stations will be housed in a climate-controlled 8 ft by 24 ft office trailer. A meteorological station is also specified to measure and record data for windspeed, wind direction, and temperature. Four data acquisition systems are required for data storage and manipulation. Total costs for the system, including installation, are estimated to be $864,500 (Radian 1983).

A similar network will be operated to monitor and record the emissions reduction performance and outlet emissions for the six APCD trains operating on the site. For each train, an SO_2 analyzer will determine SO_2 concentrations in the ventilation air entering the scrubber and exiting the stack; a THC analyzer will determine THC concentrations entering the GAC unit and exiting the stack. System support hardware and housing analogous to that for the perimeter network will be required for the APCD network. Both networks will be connected to a central control station via buried communication cables. Total installed costs for the APCD network are estimated to be $471,400 (Radian 1983).

Labor Costs

As discussed in Section 4, remediation activities would be conducted on a schedule of 6 days/wk and 50 wk/yr. [illegible] ating labor would include equipment operators for the [illegible] hoe, track-mounted loader, two wheel-mounted loade[illegible] dem roller, four trucks, and a fuel/lube truck. Five other [illegible] and a mechanic would be required for excavation [illegible] nd storage operations. Tear-down, movement, an[illegible] the excavation and backfill enclosures will req[illegible] laborers, a crane operator, and a Sprung technic[illegible] r approximately 30 days per move. In additio[illegible] agement personnel would include a site mana[illegible] tions supervisors, and a safety officer.

One team of two laborers would be required t[illegible] te the excavation foam application trailer; a second te[illegible] of two laborers would operate the backfill and storage traile[illegible] because of their more intermittent operation. A part-time [illegible]pervisor would also be required to oversee the foam trailer [illegible]perations and maintenance.

Combined labor requirements for the perimeter and APCD monitoring networks consist of three technicians, [illegible] data analyst, a quality assurance technician, a part-time meteorologist, and a part-time supervisor.

Supplies and Consumables

A major consumable for excavation, backfill, [illegible] storage operations would be Level B safety gear. Costs for [illegible] gear for 15 persons are estimated to be $180/person pe[illegible] based on the trial excavation experience (EPA 1990). [illegible] fill clay (i.e., Type A soil) for Sump R-2 is expected to hav[illegible] delivered cost of around $4/ton (Means 1990).

A second major consumable for these operations will be vapor-suppressing foam. Based on experience from the tr[illegible] excavation and discussions with the foam trailer supplier, 5 [illegible] of foamer and 10 gal of stabilizer are expected to be required to cover 1200 ft² of static waste surface with a foam layer of 3/4- to 1-in. thickness.* It is assumed that the foam will have to be reapplied every 3 days to undisturbed surfaces so as to maintain an overall average vapor-suppression effectiveness of 70%. The costs for 3M-brand foamer and stabilizer solutions are approximately $21/gal and $42/gal, respectively (3M Compan[illegible] 1990).

The air ventilation system will require makeup sodium hydroxide, which is available as a 50 weight percent solution in water at a cost of around $0.20/lb.,** and replacement activated carbon at a cost of around $1.00/lb.*** As discussed in Section 4, it was assumed that the carbon is allowed to reach 75% of equilibrium loading before being replaced with new virgin carbon.

If excavation and backfill equipment pieces are purchased, it will be necessary to provide fuel and lubricants on a regular basis for this machinery. Total costs for these items are based on a diesel fuel price of $1.30/gal and typical hourly consumption rates for equipment operated under expected conditions (Caterpillar 1985). Fuel and lubricant costs are not included under the lease option because these costs are typically included in the monthly lease rate.

Utilities Costs

The only significant utilities required for waste excavation and storage are associated with the air ventilation [illegible] These are electricity for the blower, an induced-draft scrubber circulation pump, and natural gas to be burned i[illegible] induct burner located between the scrubber and GAC unit. [illegible] costs of $0.10 per kilowatt-hour for electricity and $4.00 [illegible] million Btu for natural gas are used in the analysis.

Effluent Treatment and Disposal Costs

A wastewater effluent stream will be generated by the SO_2 scrubbers because of the need for periodic purging of collected sulfur and dust. This wastewater will be disposed of as a hazardous waste, as the ventilation air may contain hazardous constituents. Calculations indicate that SO_2 generation rates and the desire to maintain outlet SO_2 gas concentrations at or below 2 ppm will be controlling factors in determining the wastewater purge frequency and amount. These factors dictate that the blowdown rate for each excavation APCD train will be near 280 gal/operating day; blowdown rates for the backfill and storage APCD trains will be lower because of lower SO_2 generation rates. At these blowdown rates, the solids content of the wastewater will be near or below 3 weight percent, which is acceptable from the standpoints of pumpability and disposal.

*Personal communication from B. Smith, Boots & Coots, to [illegible] Aul, Edward Aul and Associates, Inc., April 8, 1991.

**Price quotation from Holchem Inc., Orange, CA, June 8, 1[illegible]90.

***Personal communication from J. Sherbondy, TIGG Corp[illegible]ation, to E. Aul, Edward Aul & Associates, Inc., March 22, 1991.

It is assumed that wastewater will be collected from individual APCD trains and held in a central storage tank on site. Wastewater will be picked up at the site on a weekly basis and transported to a RCRA-certified disposal facility. In 1990, costs per shipment for this service were $0.55/gal plus $350 for transportation and $200 for analytical services, which are included in the Analytical Costs category.*

Residual and Waste Shipping, Handling, and Treatment Costs

Disposal costs will also be incurred for spent activated carbon. Like scrubber wastewater, spent carbon must be disposed of at a RCRA-permitted facility. Because of land-ban restrictions, it is expected that the spent carbon will be disposed of by incineration at a cost of about $1.20/lb (Ensco 1991). Analytical costs are estimated at $500/sample and are included in the Analytical Costs category.

Analytical Costs

Analytical costs for wastewater and spent carbon were discussed previously. In addition, wastewater analysis costs of $200/sample have been allowed for two water- runoff events per year. Finally, general analytical costs of $500/day are allowed for waste, soil, and groundwater samples in the absence of a site sampling and analysis plan.

Facility Modification, Repair, and Replacement Costs

Equipment maintenance costs have been estimated for the air ventilation systems and foam-application trailers. In both cases, annual costs for maintenance labor and materials were estimated to be 4% of the purchase cost of operating equipment (spare units excluded). No maintenance costs are included for excavation, backfill, storage, and enclosure movement equipment under the lease option, as these costs are reflected in their lease rates. Under the purchase option, annual maintenance costs are estimated as 4% of purchase costs.

Decontamination/Demobilization Costs

Based on the trial excavation experience, decontamination costs are estimated to be approximately $1700 per major equipment piece (EPA 1990). It is assumed that equipment will be decontaminated an average of 12 times during the remediation effort for maintenance or change-out. In addition, costs to recontour the site (after excavation/backfill) to prevent water accumulation and erosion are included at a rate of $4.50/yd³ yard (Radian 1983). It is assumed that a soil volume equivalent to 20% of the total contaminated site volume will require recontouring. Demobilization costs are included in equipment mobilization costs.

Results of Economic Analysis

Itemized costs estimated for waste excavation, waste storage, and fugitive emission controls for the McColl Superfund site are summarized in Table 5-3. The quantity of contaminated material to be removed at this site totals 97,100 yd³ or 116,700 tons. As shown in the table, total estimated costs for the purchase equipment option, including project contingency and management, are $69.2 million, which translates to a cost of $593/ton removed. The purchase equipment option has lower overall estimated costs than the lease equipment option – $74.3 million, or $637/ton. The higher costs of fuels/lubricants and maintenance under the purchase option are more than offset by the lower costs for equipment over the projected 76-mo remediation period. Based on these factors alone, the break-even time period for the lease option and purchase option is slightly over 3 years. The largest components of the estimated purchase option costs are labor (22%), supplies/ consumables (21%), equipment (12%), and utilities (11%). All other categories account for less than 10% of overall costs.

The impact of fugitive emission controls on overall costs can be estimated by adding the costs for site preparation (without utility hookups), costs for site decontamination/demobilization, and those costs (i.e., equipment, labor, supplies/consumables, analytical, and maintenance) specifically associated with waste excavation, backfill, and storage. For the purchase option, costs for these items total approximately $23 million, based on the information in Table 5-3. Thus, the addition of fugitive emission control systems raises overall costs by nearly $46 million, or a factor of 2.0.

Most of the cost items in the Table 5-3 are directly influenced by the amount of time allowed for remediation. Setting the overall excavation rate at 90 tons/day of contaminated material for feed to final processing results in a projection of 6.4 years for complete remediation of the site. Calculations of excavation rates based on equipment cycle times and the assumption of 25% overall work efficiency due to Level B protective equipment indicate that excavation and backfill operations are not limiting in this case (see Section 4 for details). The overall time required for remediation, and hence costs, would be reduced if the final treatment processing rate were increased.

The specification of the SO_2 limit within the enclosures dictates the size and cost of air ventilation systems. At the 50-ppm SO_2 limit, equipment costs for the ventilation systems are estimated to be $3.9 million, or 5.6% of total costs. Costs for equipment of this type often follow the "0.6 power rule" as throughput or capacity is increased (i.e., costs increase in proportion to the ratio of capacities raised to the 0.6 power). Using this relationship, ventilation system costs are projected to increase to approximately $10 million for an SO_2 limit of 10 ppm and to $27 million for an SO_2 limit at the 2 ppm PEL level. At the latter limit, nearly all the costs for Level B safety equipment ($5.1 million) could be deleted. The increase in size and/or number of APCD trains, however, would significantly

*Personal communication from S. Browning, Asbury Environmental Services, to E. Aul, Edward Aul and Associates, Inc., July 25, 1990

Table 5-3. *Estimated Costs for Waste Excavation, Waste Storage, and Fugitive Emission Control.*[a]

	Item	Lease Option, $	Purchase Option, $
1. Site Preparation	Clearing/grading	58,600	58,600
	Electric/water/gas hookups[b]	293,900	293,900
	Equipment decon. station	22,800	22,800
	Personnel decon. trailer	70,000	70,000
	Office/security trailers	21,100	21,100
	Subtotal	466,400	466,400
2. Permitting and Regulatory		0	0
3. Equipment	Excavation equipment	5,984,000	2,356,000
	Backfill equipment	3,735,200	1,436,600
	Storage equipment	510,700	210,200
	Foam trailers[b]	160,000	160,000
	Air ventilation system[b]	3,851,500	3,851,500
	Enclosure erection/tear-down[b]	747,500	277,400
	Subtotal	14,988,900	8,291,700
4. Start-up/Fixed Costs	Three Excavation/backfill enclosures[b]	1,878,100	1,878,100
	One Storage enclosure/pad[b]	686,800	686,800
	APCD monitoring network[b]	508,600	508,600
	Perimeter monitoring network[b]	864,500	864,500
	Subtotal	3,938,000	3,938,000
5. Labor Costs	Excavation	3,852,400	3,852,400
	Backfill	1,968,600	1,968,600
	Storage	1,051,600	1,051,600
	Enclosures[b]	412,500	412,500
	Foam application[b]	2,278,000	2,278,000
	Air ventilation system[b]	1,461,100	1,461,100
	APCD monitoring network[b]	2,540,800	2,540,800
	Perimeter monitoring network[b]	1,579,800	1,579,800
	Subtotal	15,144,800	15,144,800
6. Supplies and Consumables	Safety equipment	5,154,300	5,154,300
	Fuel/lubricants	0	1,249,300
	Backfill clay	38,000	38,000
	Foam chemicals[b]	2,925,200	2,925,200
	Sodium hydroxide[b]	751,400	751,400
	Activated carbon[b]	2,699,900	2,699,900
	APCD monitoring network[b]	348,000	348,000
	Perimeter monitoring network[b]	1,112,400	1,112,400
	Subtotal	13,029,200	14,278,500
7. Utilities	Air ventilation system[b]	7,480,800	7,480,800
	APCD monitoring network[b]	122,300	122,300
	Perimeter monitoring network[b]	147,800	147,800
	Subtotal	7,750,900	7,750,900
8. Effluent Treatment/Disposal	Scrubber wastewater[b]	3,801,000	3,801,000
9. Residual/Waste Disposal	Spent activated carbon[b]	2,626,900	2,626,900
10. Analytical Costs	Wastewater[b]	63,700	63,700
	Spent carbon[b]	88,200	88,200
	Runoff water analyses	5,200	5,200
	General site samples	954,500	954,500
	Subtotal	1,111,600	1,111,600
11. Equipment Maintenance	Foam application system[b]	26,800	26,800
	Air ventilation system[b]	841,100	841,100
	Excavation equipment	0	600,300
	Backfill equipment	0	307,400
	Storage equipment	0	53,500
	Enclosures[b]	653,500	724,200
	Subtotal	1,521,400	2,553,300
12. Site Decontam./Demob.	Decontaminate field equipment	160,000	160,000
	Re-contour site	85,800	85,800
	Subtotal	245,800	245,800
13. Contingency (10%)		6,462,500	6,020,900
14. Project Management (5%)		3,231,200	3,010,400
TOTAL ESTIMATED COSTS		**74,318,600**	**69,240,200**

[a] Quantity of waste excavated = 116,700 tons; Volume of waste excavated = 97,100 cubic yards.
[b] A marginal cost item associated with fugitive emission control.

complicate the logistics of moving the enclosures and associated ventilation equipment around the site.

The operating costs associated with the use of activated carbon for THC control are estimated as $2.7 million for replacement virgin carbon and $2.6 million for spent carbon disposal. Given these significant costs, it may prove less expensive overall to regenerate the spent carbon thermally on site. Such a system would have higher initial equipment costs but lower operating costs. Other emissions associated with the regeneration process, such as nitrogen oxides and particulates, should also be evaluated, however. As an alternative to activated carbon systems for THC control, some sites may also consider thermal or catalytic incineration.

Foam chemicals also represent a significant fraction of the costs of supplies/consumables. In the full remediation plan, foam usage has been reduced over the trial excavation experience by specifying that only stabilized foam be used on static waste areas and that temporary foam not be used on dynamic areas. Officials of 3M Company have indicated that improved foam performance might be achieved by further experimentation with application techniques and foam formulations. For the final remediation plan, other vapor-suppressing systems may also merit consideration, such as a lime slurry that dries on contact or the "shotcrete" system used in mining operations for wall stability and dust control. Any increase in the degree of vapor suppression will directly reduce the size and cost of required ventilation systems.

In the full remediation plan, it has been assumed that the excavation and backfill enclosures will have to be torn down and reerected each time the enclosures are moved. For smaller enclosures, Sprung Instant Structure officials have indicated that structures can be moved via wheels or a crane without tearing them down. The feasibility of moving larger structures in this manner will be determined during the fall of 1991 at a site in the Southwest, where a similar large structure will be used for remediation of a hazardous waste site.*

Several site-specific factors that have influenced the estimation of costs for excavation and fugitive emission controls for the McColl site should be considered when extrapolating designs and costs to other sites. First, the depth, width, and length of contaminated sumps largely determine 1) the size of the enclosure required for excavation, 2) the number of enclosure movements, and 3) the amount of material that must be reexcavated. For other sites, a detailed excavation plan should be developed that takes these factors into consideration.

Second, SO_2 emissions from the McColl waste are higher than those for hydrocarbon or other species and, combined with the toxicity characteristics of SO_2, determine the ventilation rate required for the enclosure to protect worker health. If SO_2 emissions are not significant, emissions of specific hydrocarbon species (e.g., benzene) would dictate the size of the ventilation equipment and the associated capital and operating costs.

Finally, because this site is located in Southern California, no provisions have been added for freeze protection of equipment such as the scrubber and foam application systems. In colder climates, such provisions will add to the cost of equipment and to operational complexity.

Conclusions and Recommendations

Conclusions

The design and economic analyses performed for the McColl Superfund site indicate that excavation of waste under an enclosure for control of fugitive emissions is technically feasible and is expected to cost around $69 million (1990), or $593/ton. The addition of the enclosures and other fugitive emission control systems increases the cost of excavation, backfill, and storage by an estimated factor of 2.0.

Total remediation costs are most sensitive to the overall processing rate of the final treatment system. This rate effectively determines the time required in the field for remediation and, hence, the costs of remediation. Excavation and backfill costs are also sensitive to the geology of the contamination, especially the depth, length, and width of areas to be remediated. Ventilation/APCD system costs are sensitive to the emission limits set for hazardous species within the enclosure.

Recommendations

It is recommended that EPA use the excavation rate as the limiting factor for remediation time instead of the final processing rate when investigating the costs for waste excavation and storage. Also, the feasibility and costs of using thermal regeneration of activated carbon instead of replacement/disposal should be investigated as a means of reducing operating costs for THC control. In the same vein, the use of thermal or catalytic incineration should be evaluated for THC control as an alternative to activated carbon adsorption. Finally, research should be conducted on alternative foam formulations and on the use of lime slurry and shotcrete systems for the suppression of vapors from acidic refinery sludge wastes such as those present at the McColl site.

*Personal communication from J. Fisher, Sprung Instant Structures, Inc., to E. Aul, Edward Aul and Associates, Inc., April 25, 1991.

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Appendix A
Description of Technologies

Several measures were implemented during excavation operations to ensure that these operations did not create a public health impact. These measures were aimed at controlling air emission releases from the operations, which represented the only potential source of impact expected. The measures implemented for this purpose were as follows:

- Use of enclosure structure
- SO_2 scrubber
- Activated carbon unit
- Use of vapor-suppressing foam

Waste processing technologies planned during this program consisted of size reduction by crushing the char and mud wastes and tar solidification by using cement and fly ash mixtures.

Enclosure and Exhaust Air Control System

Excavation Enclosure

A rigid-frame, PVC-covered enclosure structure was erected over part of the L-4 sump and adjoining land prior to the start of excavation. Before its erection, the site was graded to provide a smooth, level area. The enclosure, supplied by Sprung Instant Structures and shown in Figures A-1 and A-2, was nominally 60 ft wide by 157 ft long and 26 ft high at the center. The white opaque PVC cover was 26 mils thick and impervious to gaseous emissions. The lower edge was covered by 12 to 18 in. of soil along the ground level to prevent air leakage. Translucent panels located along the roof peak allowed light to enter. Personnel entry was through an airlock door, which minimized fugitive emissions during entry. Equipment was moved inside the enclosure through a sliding door that was 14 ft high and 9 ft 5 in. wide.

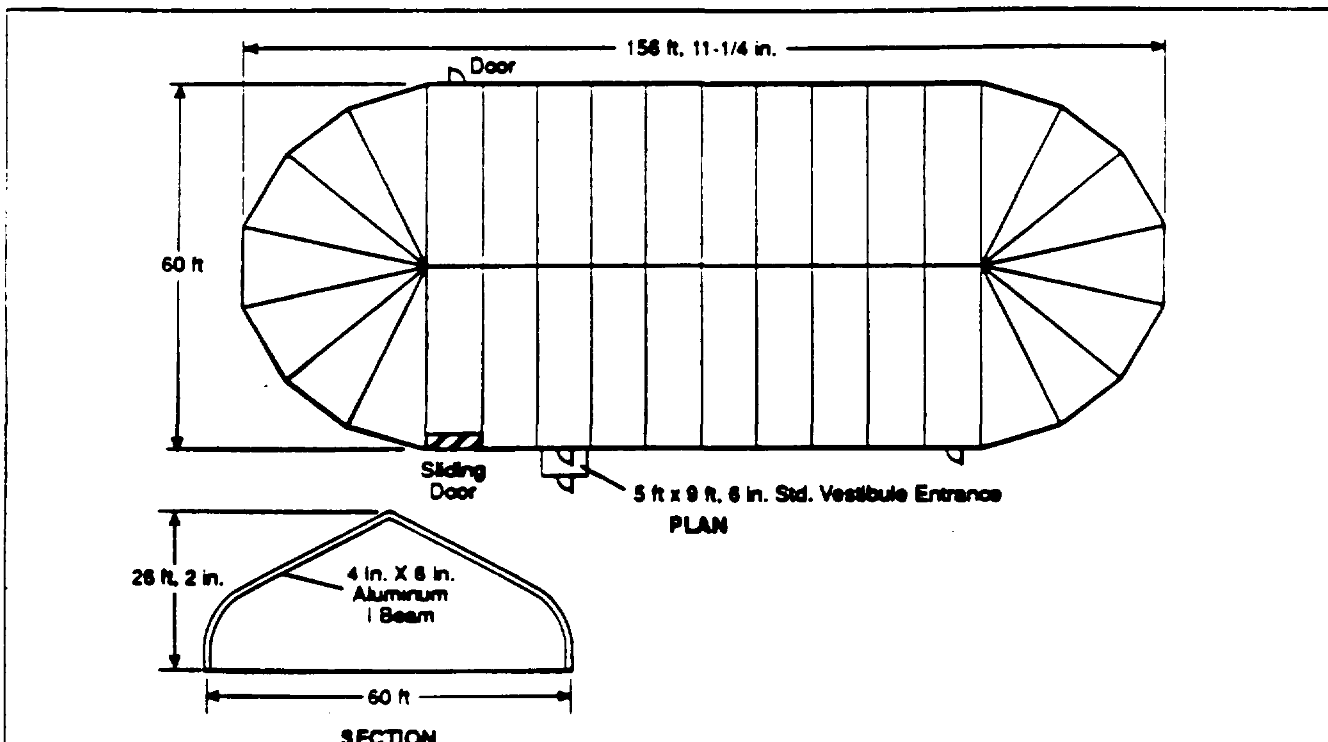

Figure A-1. Enclosure Plan and Section.

View from east side.

View from west side showing air emission con rol system and monitoring trailer.

Figure A-2. Excavation Site Enclosure.

The volume of the enclosure was approximately 192,000 ft^3, and air was drawn through the building at a rate of approximately 1000 ft^3/min. This air entered the building through five small, adjustable, slot-type air vents and was exhausted through three dampered openings along the west side of the building. This exhaust system provided an air turnover rate of about 7 air changes per day and maintained a slight negative pressure of about 0.005 inch of water inside the enclosure. This ventilation air rate was based on maintaining the SO_2 level in the enclosure below 100 ppm. This was in turn based on an estimated SO_2 release from the exposed waste and a 95% reduction in these releases by use of foam suppressants.

The enclosure proved to be very effective in preventing the escape of any air emissions and was quite satisfactory even though it created a confined work space in which temperatures were approximately 20°F above the outdoor temperature.

Air Emission Control System

The enclosure ventilation air was routed through an emission control system consisting of a wet scrubber and an activated carbon bed in series, followed by a fan and vent stack, as shown in Figures A-3 and A-4. The basis for the design of the air control system is discussed in detail in the Technology Evaluation Report.

Wet Scrubber

A counterflow, packed-bed, wet scrubber that used a mixture of sodium hydroxide (NaOH) in water was used to control sulfur dioxide emissions. The system was designed for a nominal gas flow rate of 1000 ft^3/min at 100°F and a maximum outlet SO_2 concentration of 2 ppm. The maximum inlet SO_2 concentration was estimated to be 200 ppm; therefore, the required control efficiency was 99%. A maximum pressure drop of 10 inches of water was specified. The scrubber selected, based on Figure A-3 these specifications, was supplied by Interel Corp. in Englewood, Colorado. The specifications for the actual scrubber and fan are shown in Table A-1, and the scrubber cross-section is shown in Figure A-5.

In operation, scrubber liquid was initially maintained at a pH of 10 to 13. When considerable scrubber liquor foaming was encountered at this pH level, the pH was reduced to the 7 to 10 range after operation showed that the high SO_2 removal could be maintained in this range without foaming. The nominal liquor recirculation rate of 20 gpm provided a liquor-to-gas ratio (L/G) of 20 gal/1000 ft^3/min.

Activated-Carbon Bed

For the reduction of VOC emissions, a granular activated carbon bed was installed after the wet scrubber. A knockout chamber was inserted between the scrubber and carbon bed to trap any liquid carryover from the scrubber. Specifications for this adsorber called for a 95% minimum removal of total organics at a flow rate of 1000 ft^3/min at 100°F and a pressure drop not to exceed 5 in. of water.

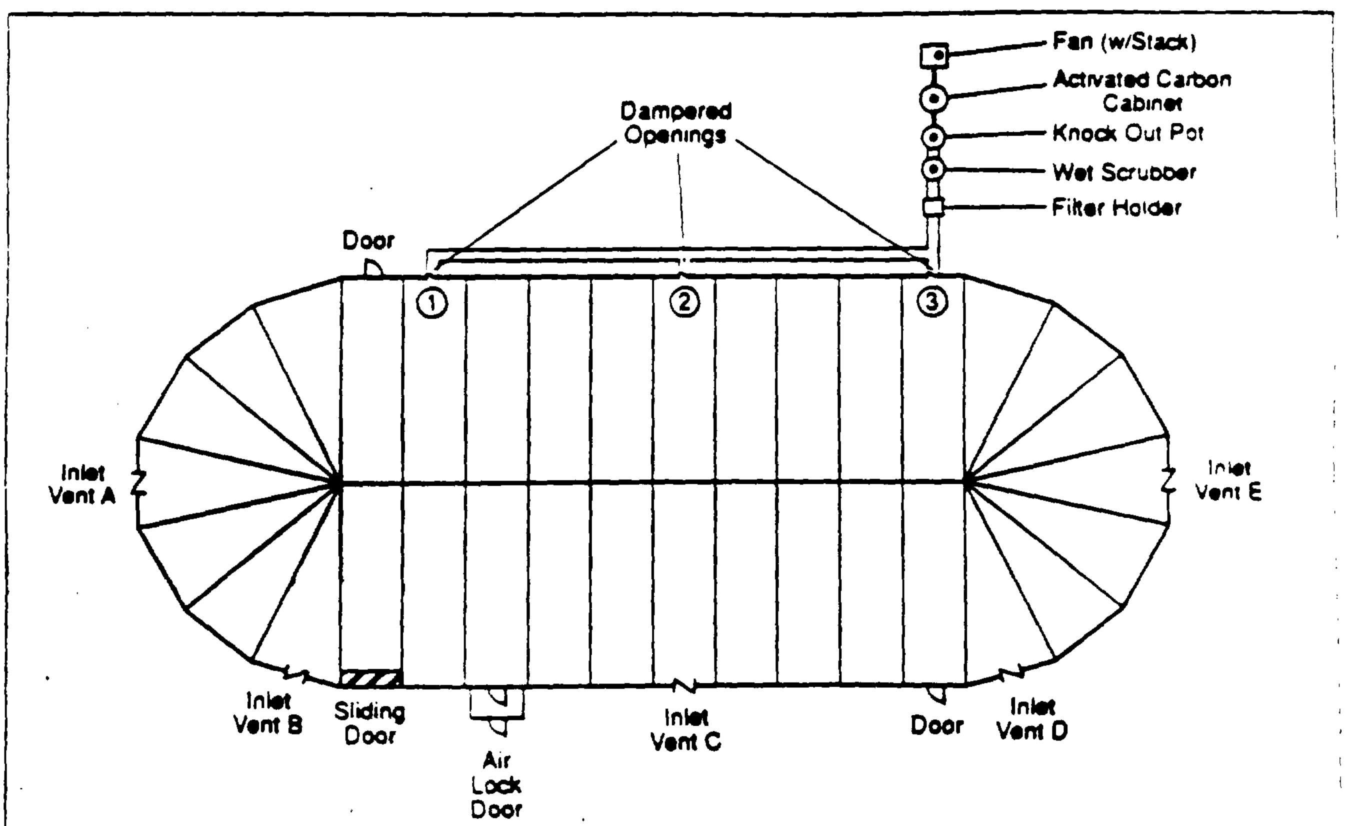

Figure A-3. General Arrangement of Ventilation Air Cleaning Equipment.

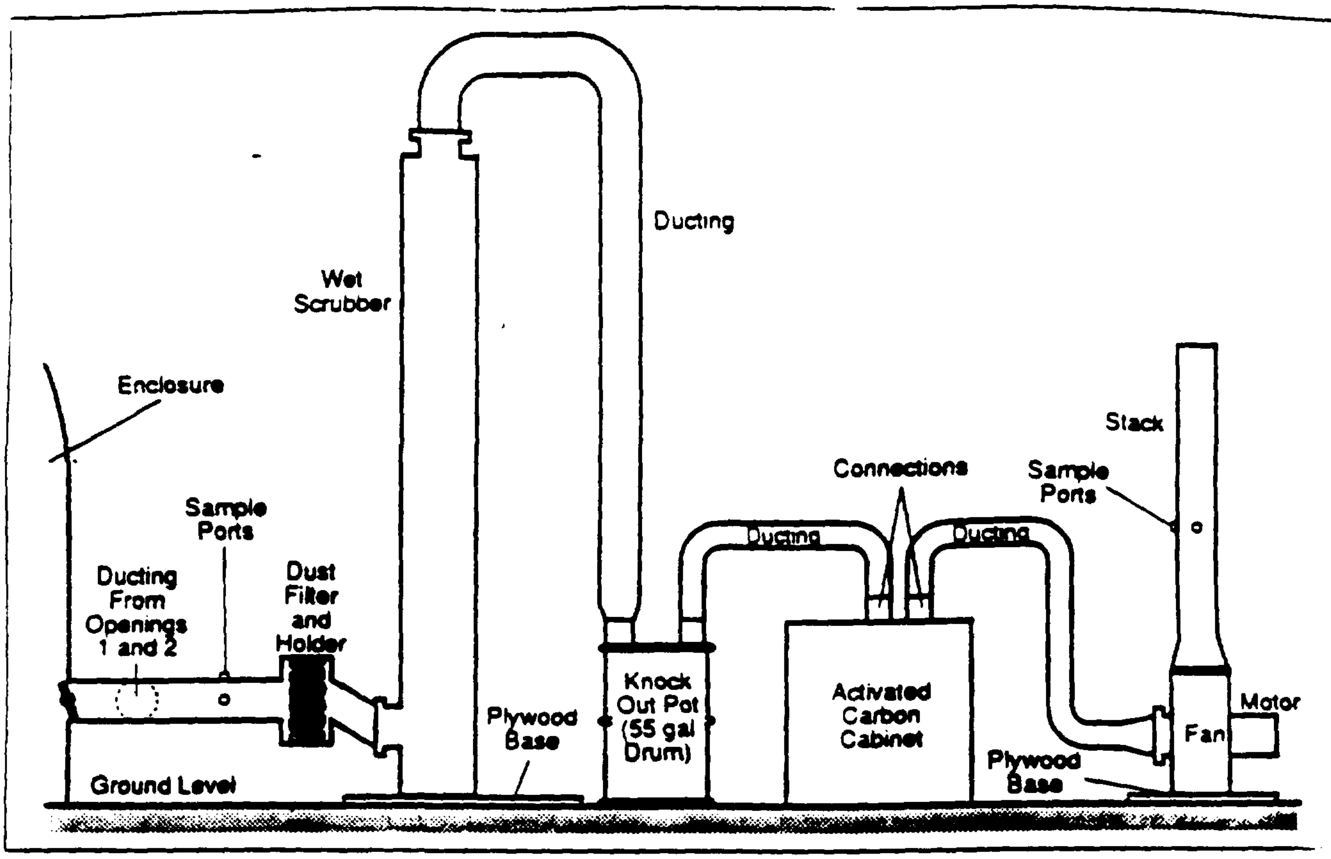

Figure A-4. Ventilation Air Cleaning Equipment and Ducting Layout.

The radial-flow, packed-bed, carbon adsorber selected was NIXTOX Model 1500 from TIGG Corp. in Pittsburgh, PA. Specifications for this unit are shown in Table A-2.

Foam Vapor Suppressants

Two types of water-based, commercially available foam supplied by 3-M Corporation were selected for this study: a temporary foam that is effective for up to about 1 hr, and a stabilized, more permanent foam that is effective for at least 1 day. These foam reagents are mixed with water and sprayed onto the waste through a hand-held nozzle. The temporary foam is a mixture of 6% concentrate and 94% water, and the more permanent foam is produced by adding a 6% concentration of stabilizer to the temporary foam mixture. The foam was generated in a self-contained, trailer-mounted system (Boots & Coots Model 100) outside of the enclosure and pumped through a hose that passed under the enclosure's edge to an air-aspirating nozzle. The temporary foam was sprayed on freshly excavated waste surfaces in the excavation pit and on waste in storage areas. Stabilized foam was sprayed on all exposed waste after each day's work was completed. According to 3M, 200 gal of foam concentrate (FX 9162) and 200 gal of foam stabilizer (FX 9161) are required to form a 1-in.-thick layer over 1 acre of surface, or about 0.9 gal/100 ft^2. The properties of the two types of foam used in this work are shown in Table A-3.

Waste Treatment Techniques

Tar Treatment

Because of its viscous nature and size (as excavated), the tar was expected to require some type of solidification and size reduction before it could be fed to a thermal destruction system. The two solidification agents most widely used with hazardous waste are portland cement and lime-based pozzolana (Arniella 1990). In addition to providing stabilization, these agents were expected to reduce the acidity of the low-pH tar to mitigate SO_2 emissions during processing. Both of these agents were evaluated during the McColl tar treatment operations.

Pozzolana is a material that contains aluminum and silica and that hardens at ambient temperatures in the presence of lime and water (by itself, however, it displays no cementing reactions). The two most common pozzolanic materials are fly ash and cement kiln dust. Fly ash from a nearby powerplant was used for the McColl tests because it was readily available (cement kiln dust is itself considered a hazardous material in California and therefore more difficult to transport and use). The chemical and physical properties of the fly ash and portland cement delivered to the McColl Site are summarized in Table A-4.

Excavated tar was combined with portland cement, fly ash and water in a pug mill, both to mix these materials and to reduce

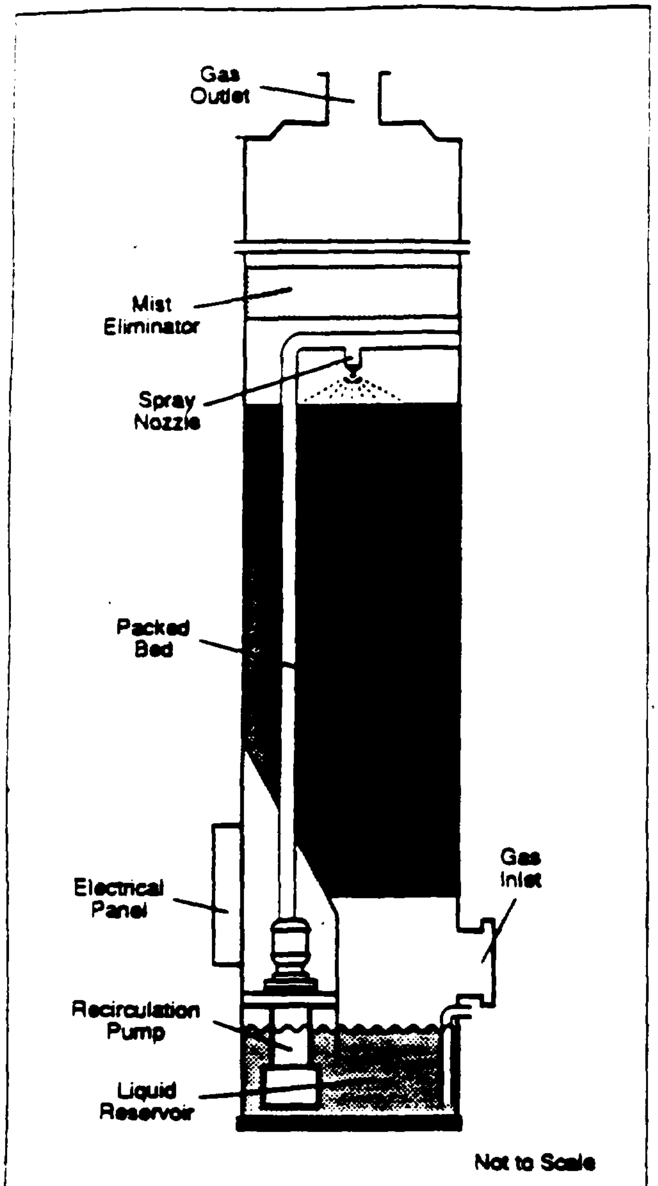

Figure A-5. Scrubber Cross Section.

Table A-1. Scrubber and Fan Specifications[a]

Scrubber	
Scrubber size	GWX 1200
Design flow rate	1200 ft^3/min
Diameter	24 inches
Sump capacity	190 gallons
Circulation rate	25 gal/min
Pump motor	1.5 hp
Type of packing	2-inch hollow spheres
Packing height	11 feet
Scrubber overall height	17 feet
Type of mist eliminator	Chevron
Empty weight	650 lb
Operating weight	2350 lb
Purchase price	$22,600
Fan	
Material of construction	Steel
Corrosion-resistant coating	Polyurethane
Gas flow rate (standard air density)	1200 ft/min
Static pressure (Neg./Pos.)	20 inches WG
Motor rating	7.5 hp
Purchase price	$2,200

[a]Supplied by Interel Corp. 5/14/90.

Table A-2. Specifications for Carbon Bed Adsorber[a]

Flow rate, max.	1500 ft^3/min
Temperature, max.	350°F
Connections	7-in. duct
Diameter/height	32-in./44-in.
Adsorbent fill	300-lb virgin TIGG 5C 0410 (coal-based)
Minimum contact	0.4 second
Shipping weight	475 lb
Materials of construction	Coated mild steel with 316 stainless steel screen
Purchase price	$2450 FOB plant (including initial carbon fill)
Lease payment per month	$700
Virgin TIGG 5C 0410, per fill	$600

[a]From TIGG Corporation, 3/3/90.

the size of the tar lumps. The pug mill used for this project (Figure A-6) was a Barber Green Mixer (Model 848) that reportedly was built during the 1950s. At one end of the mill, tar, cement, and fly ash were charged into a small feed hopper with a capacity of approximately 1.2 yd^3. The material moved down through the hopper and flowed onto a moving belt. The clearance between the bottom of the hopper and the belt was almost 8 in. The belt transported the material to the head of the pug mill, where water was added manually. The mill consisted of two shafts fitted with short heavy paddles that rotated in the opposite inward direction (from the bottom to the top) in an open half cylinder. The mixing/conveying action of the paddles pushed the material from the head of the mill to its tail, where the mixed material fell into a small product hopper (approximately 2-yd^3 capacity). The hopper, in turn, emptied directly onto the ground. The feed belt and paddle shafts were powered by a 175-horsepower diesel engine.

The pug mill cylinder was approximately 10 ft long, 45 in. wide, and 27 in. deep, which corresponds to an overall volume of 5.1 yd^3. The paddles were 7 in. long and 4 in. wide at the tip. Two paddles (set at 180 degrees from each other) were set every 6 in. along the two tapered shafts; this resulted in a clearance of 2 in. between paddle sets. As shown in Figure A-7, each set was offset 90 degrees from adjoining sets. The throughput capacity of the mill was reported to be almost 100 tons/hr.

Char and Mud Treatment

The objective of the char and mud processing operations planned for this project was to reduce the size of these materials to less than 2 in. so they would be suitable for feed to a thermal destruction system. The crusher brought on site for this purpose was a Masterskreen Explorer, manufactured by M&KK Quarry

Table A-3. Properties of Foam Reagents[a]

Properties	FX-9161 foam stabilizer	FX-9162 foam concentrate
Appearance	Yellow, clear liquid solution	Amber liquid solution
Density, lb/gal	8.99	8.51
Viscosity at 77°F (25° C), cp	1500	2300
Specific gravity at 77°F (25°C)	1.08	1.02
pH at 77°F (25°C)	–	7.8
Flash point, °F	200	–
Freeze point, °F	–	28
Minimum-use temperature, °F	–	32
Storage temperature, °F	40 to 100	35 to 120
Noncorrosive	Yes	Yes
Moisture-sensitive	Yes	No
Price, $/lb	4.65	2.55

[a]From 3M Corp., St. Paul, MN.

Table A-4. Fly Ash and Portland Cement Properties[a]

	Fly ash	Portland cement
Silicon dioxide, %	61.04	22.61
Aluminum oxide, %	18.59	3.78
Iron oxide, %	5.16	3.25
Sulfur trioxide, %	1.07	1.84
Calcium oxide, %	5.97	65.15
Loss on ignition, %	0.29	0.88
Bulk density[b], lb/ft^3	86	78
Classification	Class F	Type V

[a]From Amcal Minerals Corporation, 1990.
[b]From field measurements

Figure A-4. Pug Mill (with Product Hopper in Foreground).

Plant Ltd. in 1989. With this system, material is dumped into a 4-yd^3 tray feed hopper fitted with 6-in. stationary bars. From the hopper, material is transported by a feed belt into the jaws of the crusher. After passing through the crusher, material is picked up by a product conveyor and transported to a vibrating screen with 2-in.-square openings. Undersize material passes through the screen to the ground, whereas oversize material rolls off the screen to another pile on the ground. The conveyor belts, crusher, and hydraulic control system were powered by a diesel engine.

The crusher was expected to operate on both char alone and on a mixture of char and mud. A schematic of the crusher is shown in Figure A-8. The overall dimensions of the unit were 51 ft long, 7 ft wide, and 17 ft deep.

Figure A-7. Pug Mill Paddles During Tar Processing.

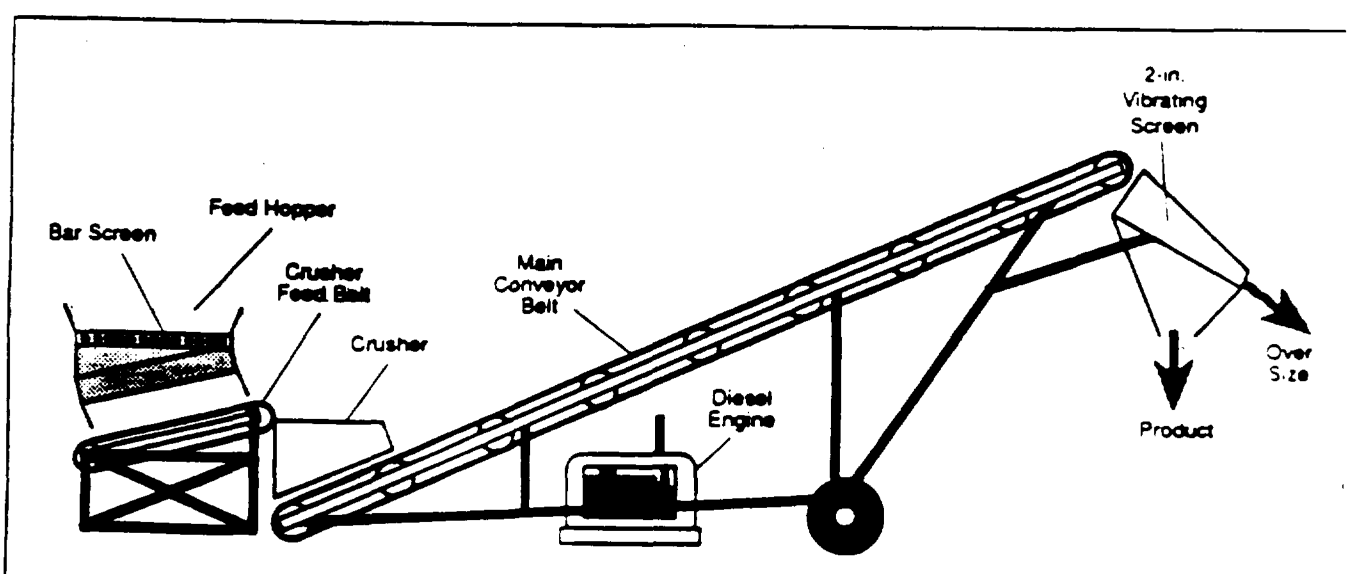

Figure A-8. Char/Mud Crusher Schematic.

Appendix B

Summary of SITE Demonstration at McColl Superfund Site

Introduction

The McColl hazardous waste site is an inactive waste disposal facility located at 2650 Rosecrans Avenue in the city of Fullerton, Orange County, CA. The site was used in the early and mid-1940s for the disposal of acidic refinery sludge, a by-product of the production of aviation fuel. A series of pits or sumps were excavated on the site to receive the refinery sludge at that time. Onsite disposal of refinery sludge ceased in 1946. From 1951 through 1962, fill material (soil) and drilling mud from oil exploration activities near the Coyote Hills were deposited in some of the pits in an attempt to make the site suitable for future development.

By 1962, the Upper Ramparts area had been covered with soil and has existed since that time as unoccupied open space. In the early 1980s, a clay cap was placed on the Lower Ramparts area to reduce odors. The Los Coyotes area was covered with 4 to 5 ft of soil and developed as part of the Los Coyotes Country Club golf course.

Areas east of the McColl site were subdivided and developed for residential housing in the late 1970s and the early 1980s. Recreational facilities were constructed west of the site at the Ralph B. Clark (formerly Los Coyotes) Regional Park. As the population increased and development continued, residents began complaining of odors emanating from the site. Odor complaints were first received by the Orange County Health Department in 1978. Subsequent environmental investigations at the site identified extensive contamination. In 1982, the McColl site was placed on the National Priorities List (NPL).

In February 1989, EPA and DHS issued a proposed plan for the McColl project that named thermal destruction, either on or off site, as the preferred remedy. Important components of this remedy are the excavation and waste-handling activities that must occur as a precursor to thermal destruction. The overall goal of the trial excavation was to obtain information pertaining to these activities to support the selection of thermal destruction as the preferred remedy and to aid in the design of a thermal destruction remedy or any other remedy involving excavation of the waste material after its selection in a Record of Decision (ROD)

Reg of the EPA determined that the trial excavation was necessary to ascertain if McColl waste could be excavated with conventional equipment without releasing significant amounts of VOCs and SO_2 into the surrounding community. The trial excavation was also necessary to define the treatment needed, if any, to improve the handling characteristics of the waste as a precursor to thermal destruction, or any other remedy which would involve treatment of the waste.

Site Characteristics

The McColl site covers approximately 20 acres, and approximately 8 acres of the site contain waste in pits or sumps. As shown in Figure B-1, the site is divided into two distinct areas, the Ramparts area and the Los Coyotes area. The Ramparts area comprises the eastern portion of the site and contains six bu waste pits or sumps (R-1 through R-6). The Los Coyotes located immediately southwest of the Ramparts area, also contains six pits (L-1 through L-6). The six pits in this area were covered with soil during the construction of the golf course. The site is bordered by the West Coyote Hills Oil Field to the north, housing developments to the east and south of the Ramparts area, Los Coyotes Country Club golf course to the south, and the Ralph B. Clark Regional Park to the west. All pits are covered with soil, and the site is secured with a chain-link fence and 12-hr guard.

Objectives

The trial excavation was conducted on a portion of Los Coyotes Sump L-4 (see Figure B-1). The objectives of the trial excavation are as follows.

1. To excavate approximately 100 yd of waste to assess waste-handling characteristics and to determine if any treatment is required to improve handling characteristics as a precursor to thermal destruction.

   More than 130 solid yd^3 of waste material (mud, tar, and char) was excavated under the enclosure by conventional excavation methods.

   During the trial excavation, it was determined that the mud and char material did not need further treatment. For the mud, it was apparent that the waste could be easily sized to the nominal 2-in.-diameter thermal destruction requirement. For the char, it was determined that more than 50% of the excavated char was under 2 in. in diameter and that the remaining material could easily be sized by conventional methods (i.e., pug mill, shredder).

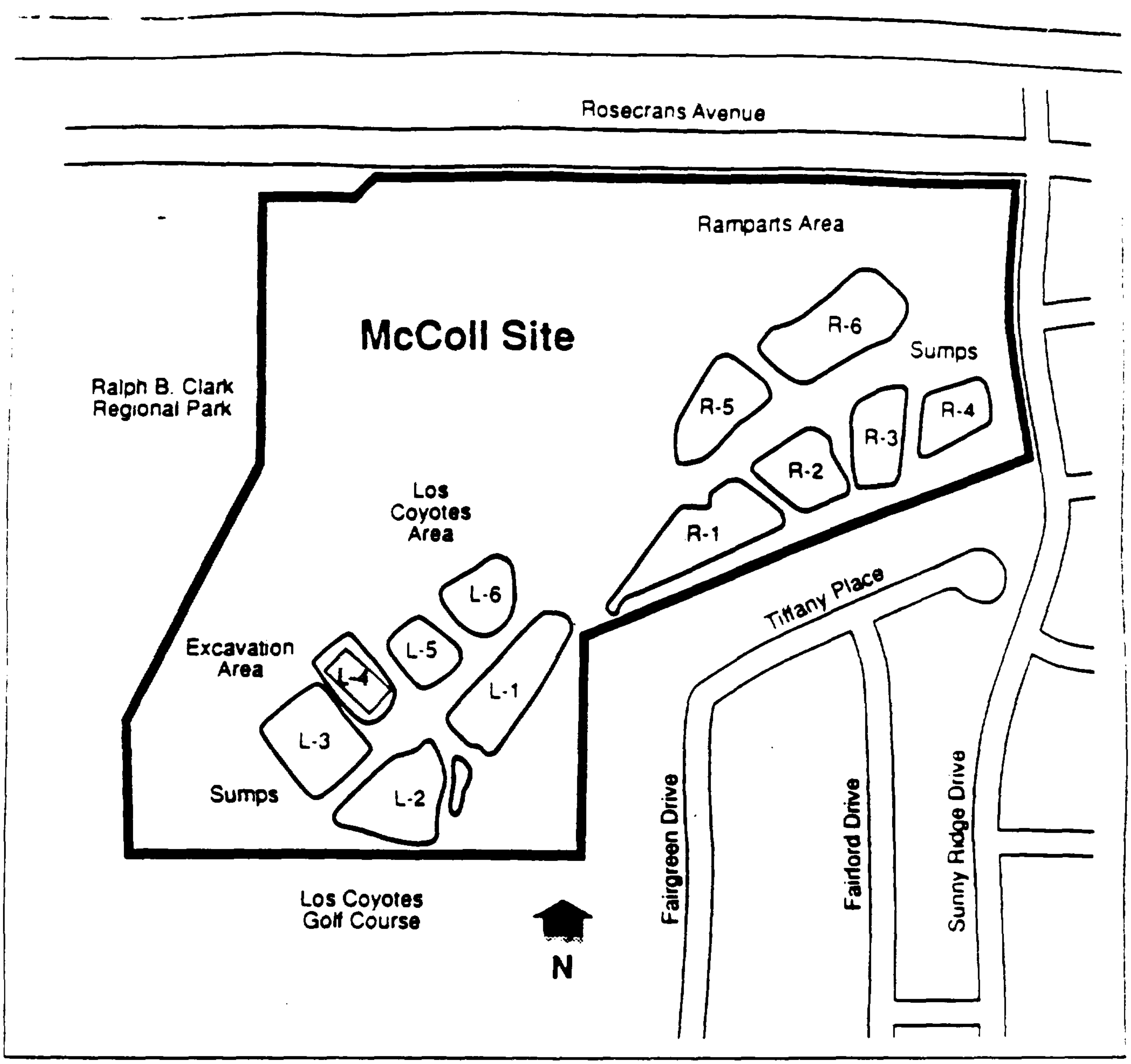

Figure 8-1. McColl Site.

The tar material was determined to require additional treatment to allow for future processing into a thermal destruction unit. This was accomplished by mixing the tar with cement or fly ash and water in a pug mill. The result of this treatment process was pellets that were less than 2 in. in diameter.

2. To determine the atmospheric emissions resulting from the excavation activities.

This objective was only partially achieved during the trial excavation. Data for SO_2 and total hydrocarbons (THC) are reported; however, no data for organic species or reduced sulfur species are reported.

High-quality data were obtained for SO_2 and THC emissions exiting the enclosure exhaust treatment system. Five-minute averages for SO_2 emissions were maintained at less than 1 ppm throughout the project. The highest 5-min average for THC emissions was 98.1 ppm. Samples for organic and reduced sulfur compounds were collected from the stack and analyzed, but the data were determined to be invalid by an EPA audit.

Benzene (a known carcinogen), toluene, ethyl benzene, and xylenes are known to be the major constituents of the THC concentrations reported, but no quantifiable concentrations of these compounds can be reported for the reason given in the preceding paragraph.

3. To assess the degree of SO_2 and THC emission control achieved through the use of an enclosure and an enclosure exhaust treatment system.

This objective was achieved by erecting an enclosure around the excavation area and exhausting the ventilation air through an enclosure exhaust treatment system consisting of a sodium-hydroxide scrubber and an activated carbon unit.

The daily average removal efficiency for SO_2 ranged from 71.8 to 99.9%, with greater than 90% removal being achieved on most days.

The daily average removal efficiency for THC ranged from 15.8 to 90.7%, with greater than 50% removal being achieved on most days.

4. To determine the emission levels for SO_2 and VOCs at the fenceline of the McColl site as an indicator of impacts on the local community.

   This objective was partially achieved for the reasons outlined in Objective 2. Reliable data for SO_2 and THC emissions were collected at four perimeter monitoring stations, with no levels being detected that would adversely affect the surrounding community.

5. To assess the effectiveness of vapor-suppressing foam.

   This objective was partially achieved. Reduction efficiency rates have been calculated for dynamic conditions. Reduction efficiency rates could not be calculated for static conditions because analytical data were determined to be invalid by an EPA audit.

   Under dynamic conditions, it has been estimated that the vapor-suppression foam can be up to 80% effective for SO_2 control and 60% effective for THC control.

6. To assess potential problems that might occur during excavation.

   Assessments were made regarding problems that occurred because of the following: higher-than-expected emissions of SO_2 and THC from the tar and char; high particulate diesel emissions; heat gain; working in Level B and Level A personal protection equipment; excess water in a confined space; and seepage of tar material.

Excavation and Waste Processing

Removal of overburden and excavation of the underlying waste were readily performed with a trackhoe equipped with an extended boom and a 1-yd³ bucket. The waste, which was found to be fairly well segregated into layers, was placed in rolloff bins or piles for subsequent use. Removal of the overburden proceeded routinely and was followed by excavation of a 3-ft-thick mud layer. A 4-ft-thick tar layer was excavated next. After the tar was removed, a trench shield was placed in the excavated area to reduce seepage of additional tar into the opening. After the tar layer was excavated, a hard, coal-like, char layer was encountered. This material was broken up and excavated.

During the tar excavation, SO_2 and total hydrocarbons (THC) levels within the enclosure increased dramatically and reached 5-min average values of 1000 and 492 ppm, respectively. The enclosure exhaust treatment system removed up to 99.9% of the SO_2 and 60% of the THC during this excavation period. The use of the enclosure and enclosure exhaust treatment system prevented any significant amounts of these pollutants from reaching the site perimeter, as evidenced by the low concentrations measured there. The higher-than-expected concentrations within the enclosure required an upgrading of personal protection equipment from Level B (coated tyvek overalls with supplied air) to Level A (completely encapsulating suit with supplied air).

Char excavation was also accompanied by high concentrations of SO_2 and THC, which reached 5-min average values of 755 and 350 ppm, respectively. The enclosure exhaust treatment system operated efficiently during the entire study with up to 99% removal of the SO_2 and up to 90.7% removal of the THC.

Higher-than-expected levels of SO_2 and THC within the enclosure were caused by the failure of vapor-suppressing foams to form an impermeable membrane over the exposed wastes. The foams reacted with the extremely acidic waste, which severely impacted the foam's ability to suppress emissions.

This ability was improved somewhat, however, when the concentration of foam reagents in water was increased. Though difficult to estimate, the overall reduction achieved by applying foam was estimated at up to 80% for SO_2 and 60% for THC, based on concentrations measured at the enclosure exhaust treatment system inlet during excavation activities with and without foam.

In all, 137 yd³ of waste and 101 yd³ of overburden were excavated. Maximum and average trial excavation rates are summarized in Table B-1.

The average excavation rates achieved during this trial excavation will be increased considerably during full-scale excavation, as fewer observations and measurements would be needed. Average excavation rates that could be expected to be achieved during full-scale excavation are estimated at 49, 32, and 25 yd³/h for overburden and mud, tar, and char, respectively.

The tar waste was further processed to reduce its size and to form a solid and easier-to-handle pellet. This was accomplished by mixing the tar with cement, fly ash, and water in a pug mill. Ten test runs were made within the enclosure at various ratios of tar, cement, fly ash, and water. A ratio of 1 part tar to between 2.3 and 7 parts cement and fly ash and from 0.26 to 1 part water formed a solid, easy-to-handle pellet. Tar processing rates of approximately 3 tons/h were achieved during the trial excavation, and it is estimated that this rate could

Table B-1. Maximum and Average Trial Excavation Rates (yd³/h)

Component	Maximum	Average
Overburden	51	7.6
Mud	66	4.1
Tar	58	4.3
Char	9	2.6

be increased by up to a factor of 2 with a more continuous operation. Indications were that tar processing with alkaline materials such as cement and fly ash reduced the amount of SO_2 released by the tar. The mud and char waste fractions did not require further processing, but could have been fed through the pug mill if necessary.

Previous investigations at the McColl site indicated that the waste has the potential to emit significant amounts of VOCs, organic sulfur compounds, and SO_2. For the trial excavation, this potential air emission impact was mitigated by the erection of a temporary enclosure 60 ft wide, 160 ft long, and 26 ft high in the center of the excavation area. Air from the enclosure was vented through an enclosure exhaust treatment system consisting of a sodium-hydroxide-based wet scrubber and an activated-carbon adsorber in series before being released to the ambient air.

For the trial excavation, this potential air emission impact resulted in having workers wear Level B or Level A protection at all times while inside the enclosure. Concentrations of SO_2 and THC were continuously monitored before and after the enclosure exhaust treatment system.

Waste Characteristics

Three major waste types are present at the McColl site: 1) hard, black, char-like asphaltic wastes; 2) viscous, black, tar-like wastes; and 3) mud. The predominant waste type found at the site is a black asphaltic waste that is apparently the result of chemical and physical changes in acidic refinery sludge that have occurred over the last 40 years. This asphaltic waste has a low pH (acidic) and contains elevated levels of organic compounds. When disturbed, the waste emits sulfur dioxide (SO_2) and hydrocarbon vapors. Because of its acidic nature, the McColl waste is characterized as RCRA corrosive waste according to CFR 261.22.

Borings previously made in the L-4 Sump showed that both tar and char were present in fairly segregated layers under a layer of moist soil or mud, which was in turn under approximately 8 ft of overburden soil. During previous studies at this site, two types of air emissions were observed when the waste was disturbed. The initial disturbance generally caused a high level or "puff" release of contaminants, followed by a rapid decline to lower levels (Radian 1983). These steady-state emission levels were then observed for longer periods of time and gradually decreased over several hours. The emission potential in the Ramparts area ranged from 130 to 130,000 mg/m² per min for SO_2 and 10 to 3600 mg/m² per min for THC for all disturbed waste types. Average steady-state emissions from asphaltic waste were 5200 mg/m² per min for SO_2 and 190 mg/m² per min for THC. Hydrocarbon analysis of air samples showed an average composition of 60% aliphatic and oxygenated species, 30% aromatic species, and 10% organic sulfur species. The waste composition did vary from sump to sump, however, and even with depth within a sump (Schmidt 1989).

Samples of excavated waste were analyzed to determine heat value and the concentrations of selected constituents. The information obtained by these analyses is summarized in Table B-2.

The mud fraction of this waste consisted largely of inorganic, noncombustible material with an ash content of 82.9% and a heating value of less than 500 Btu/lb. The raw tar sample contained a high percentage of combustible material and had a heating value of more than 9000 Btu/lb, an ash content of less than 2%, and a high sulfur content (10.6%). The treated tar sample contained cement dust and fly ash (low-sulfur, high-ash components), and the addition of this material decreased all of the combustible parameters and increased the ash value. Raw char has a fairly high ash level (about 55%), a sulfur content of 4.5%, and a heating value of 5200 Btu/lb.

Common indicators for petroleum waste are the concentrations of benzene, toluene, ethylbenzene, and xylene (BTEX). The McColl samples data show that the tar fraction of this waste contains the highest levels of these compounds and that the mud layer contains only a relatively small portion of these compounds.

Toxicity characteristics of the raw tar and char were determined by the Toxicity Characteristics Leaching Procedure (TCLP) and California Wet Test. No metal constituents exceeded the regulatory limit in either case. Benzene in the tar and char waste extract exceeded the EPA TCLP limit of 500 µg/liter by greater than a factor of 2.

Community Impact

Perimeter air monitoring for SO_2 and THC was conducted continually during this study. Windspeed and wind direction were also recorded continually at the site. This information was obtained to comply with the Community Contingency Plan, which mandates that all site work be stopped if SO_2 levels at the perimeter exceed 0.5 ppm for 5 min or if THC levels exceed 70 ppm for 30 sec. These levels were never reached during this study. The maximum 1-hr readings obtained at any perimeter station in June, which was the period of highest emissions from the waste, were 0.08 ppm for SO_2 and 21.9 ppm for THC. Specific compounds in the air at the perimeter of the site and in the neighborhood were sampled and analyzed.

Health and Safety Issues

Both health and safety and community exposure issues were assessed prior to the trial excavation demonstration. These issues are discussed in the following subsections:

Table B-2. Waste Characteristics, As-Received Basis

	Mud	Tar	Treated tar	Char
Moisture, %	13.2	11.8	8.1	21.2
Sulfur, %	0.8	10.6	3.6	4.5
Fixed carbon, %	0.2	16.9	2.0	4.0
Ash, %	82.9	1.6	75.9	54.7
Benzene, ppm	<0.7	240	NA[a]	97
Toluene, ppm	1.5	580	NA	150
Xylene, ppm	8.8	910	NA	220
Ethylbenzene, ppm	0.9	140	NA	35
Heat value, Btu/lb	<500	9160	2200	5200

[a]NA = Not analyzed. Use of cement additive would reduce concentrations found in raw tar sample.

Worker Safety

Excavation work inside the enclosure was conducted either in Level B or Level A personal protective equipment. Level B equipment consisted of supplied-air respirators, coated Tyvek overalls, steel-toed boots, inner and outer gloves, and a hard hat. Air bottles were mounted on the trackhoe, loader/backhoe, and Bobcat for operator air supply; other members of the crew used air lines supplied from air cylinders located outside the enclosure. Level A requirements included the addition of a totally encapsulating chemical protective (TECP) suit to the preceding equipment list. Air supplies to these suits were either from air lines (as previously discussed) or from a self-contained breathing apparatus inside the suits.

The observation camera used was an invaluable tool for observing/recording activities that occurred within the enclosure. The camera also allowed all workers to be observed from a health and safety standpoint. The camera also assisted in a reduction of the number of employees necessary within the enclosure, which allowed for more efficient operations and reduced the risk of employee accidents.

Community Exposure

Because of the nature of the contamination at the McColl site, community exposure was determined to be a significant concern. Perimeter air monitoring for SO_2 and THC was conducted continually during this study. Windspeed and wind direction were also recorded continually. This information was obtained to comply with the Community Contingency Plan, which mandates that all site work be stopped if SO_2 levels at the perimeter exceed 0.5 ppm for 5 min or if THC levels exceed 70 ppm for 30 sec. These levels were never reached during this study.

Based on observations by personnel during the trial excavation, the noise level related to the excavation and treatment activities was minimal. At no time during the trial excavation were the health-based levels established in the McColl Contingency Plan for SO_2 and THC exceeded at the fenceline monitoring stations. Although odor complaints were received during the trial excavation period, they were not excessive. Most of the complaints were received after the trial excavation/treatment activities were completed for the day, and may not have been related to the excavation/treatment activities.

Costs of Excavation and Tar Processing

The costs for the field aspects of this trial excavation work consisted of those involved with the enclosure and the enclosure exhaust treatment system, actual excavation labor and equipment, foam application, tar processing, and air monitoring. Much of the equipment for this project (e.g., enclosure framework, scrubber, and excavation machinery) was rented on a monthly basis; therefore, total costs consisted of the monthly machinery charges, labor, and fixed costs required to mobilize and demobilize. These costs are summarized in Table B-3 for the 2-month duration of the field work.

Table B-3. Summary of Onsite Costs

Item	Total cost, $
Enclosure	70,976
Air exhaust control system	40,415
Foam vapor suppressants	89,591
Excavation [a]	82,512
Tar processing	17,367
Air monitoring	100,160
Total	401,021

[a] Based on 18 days of excavation.

Appendix C

Applicability of the McColl Enclosure and Excavation Technologies to Current CERCLA Sites

Many CERCLA sites share the problem of soil contaminated with volatile organics, volatile metals, and metal-laden dust that can result in toxic air emissions during waste excavation, processing, and treatment. Table C-1 presents a list of current CERCLA sites where the McColl enclosure and excavation techniques may be applicable. These sites were selected based on the existence of airborne contaminants and the site's proximity to areas threatened by the release of these contaminants. Other site-specific conditions may preclude the use of some or all of the McColl techniques at certain sites.

Table C-1. Current CERCLA Sites Where the McColl Enclosure and Excavation Technologies May Be Applicable

Site name location	Air contaminants	Threatened areas
Region I		
Silresim Chemical Corp. Lowell, MA	Pesticides, VOCs	Business district Residential
Region II		
Combe Fill North Landfill, Mount Olive Township, NJ	Bis (2-ethylhexyl) phthalate, chlorobenzenes, phenol, VOCs	Residential
Fried Industries, East Brunswick Township, NJ	VOCs	Residential
Glen Ridge Radium Site, Glen Ridge, NJ	Radon	Residential
Montclair/West Orange Radium, Montclair/West Orange, NJ	Radon	Residential
Woodland Township, Route 532 and Route 72 Sites, Woodland Township, NJ	Organic solvents	Residential Agricultural
Richardson Hill Road Landfill, Sidney Center, NY	VOCs	Residential
Port Washington Landfill, Port Washington, NY	Methane Benzene Toluene Xylene Vinyl chloride	Residential Golf Course School
Region III		
Abex Corp. Portsmouth, VA	Heavy metals	Residential
Greenwood Chemical Co., Newton, VA	VOCs	Residential Agricultural
Rhinehart Tire Fire Dump, Frederick County, VA	VOCs	Agricultural
Kane & Lombard Street Drums, Baltimore, MD	Acrolein Benzene Ethyl benzene Xylene Chromium	Residential
Ambler Asbestos Piles, Ambler, PA	Asbestos	Residential Playground
Brown's Battery Breaking, Shoemakersville, PA	Lead	Residential
McAdoo Associates, McAdoo, PA	Heavy metals PAHs Phthalate esters VOCs	Residential
Taylor Borough Dump, Taylor, PA	Heavy metals, VOCs	Residential Community Park
Region IV		
Interstate Lead Co., Leeds, AL	Lead	Residential
Brantley Landfill, Island, KY	Ammonia Dust Heavy metals	Residential
Fort Hartford Coal Co., Inc., Olaton, KY	Ammonia	Residential Recreational
Maxey Flats Nuclear Disposal, Hillsboro, KY	Tritium	Residential
Carolawn, Fort Lawn, SC	Heavy metals Phenols VOCs	Residential

(continued)

Table C-1. (continued)

Site name/location	Air contaminants	Threatened areas
Region V		
Taracorp Lead Smelter, Granite City, IL	Lead	Residential
Berlin & Farro, Swartz Creek, MI	Pesticide byproducts	Residential
Feed Materials Production Center, Fernald, OH	Radon	Residential Agricultural
Region VI		
Bayou Sorrel Site, Bayou Sorrel, LA	Volatile organic and inorganic pollutants	Industrial
Combustion Inc., Denham Springs, LA	VOCs	Residential Agricultural
Dutchtown nontreatment Plant, Ascension Parish, LA	VOCs	Residential
Lee Acre Landfill, Farmington, NM	VOCs	Residential Recreational
Cal West Metals, Lemitar, NM	Lead	Residential Recreational
Region VII		
A.Y. McDonald Industries, Inc., Dubuque, IA	Lead	Residential
Peoples Natural Gas Co., Dubuque, IA	Cyanide PAHs Phenols	Business district Residential
White Farm Equipment Co., Charles City, IA	Heavy metals, dust	Residential, Wetlands
Missouri Electrical Works, Cape Girardeau, MO	Aroclor 1260, Aroclor 1260, dust	Residential, Wetlands
Weldon Spring Quarry, St. Charles County, MO	Radioactive dust	Industrial
Region VIII		
Uravan Uranium Project, Uravan, CO	Uranium	Wildlife habitat
Richardson Flat Tailings, Summit County, UT	Heavy metals	Residential, Recreational
Silver Creek Tailings, Park City, UT	Heavy metals	Residential
Region IX		
Montrose Chemical Corp. Torrance, CA	DDT	Industrial, Residential
South Bay Asbestos Area, Alviso, CA	Asbestos-laden dust	Residential, Wildlife Refuge
United Heckathorn Co., Richmond, CA	DDT	Residential
Region X		
Teledyne Wah Chang Albany, Albany, OR	Metals, VOCs, radioactive dust	Residential
Seattle Municipal Landfill, Kent, WA	1,2-Dichloroethane, tetrachloroethylene	Residential

TECHNICAL REPORT DATA

1. REPORT NO. EPA/540/AR-92/015	3. RECIPIENT'S ACCESSION NO. PB 93-100121
4. TITLE AND SUBTITLE: Demonstration of a Trial Excavation at the McColl Superfund Site Applications Analysis Report	5. REPORT DATE: October 1992
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S): IT Corporation	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS: IT Corporation, 11499 Chester Road, Cincinnati, OH 45246	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. 68-02-4284
12. SPONSORING AGENCY NAME AND ADDRESS: Risk Reduction Engineering Laboratory--Cin., OH, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH 45268	13. TYPE OF REPORT AND PERIOD COVERED: Final Report
	14. SPONSORING AGENCY CODE: EPA/600/14

15. SUPPLEMENTARY NOTES

Project Manager: S. Jackson Hubbard (513) 569-7507

16. ABSTRACT

A trial excavation of approximately 137 cubic yards of waste was performed at the McColl Superfund Site in Fullerton, CA, to better determine the nature of this waste, any treatment needed to improve its handling characteristics, and the extent of air emissions that might occur during excavation. This type of information is necessary to plan full-scale remediation of this highly acidic petroleum refinery waste buried at this site. The trial excavation was conducted within a temporary enclosure with air exhausted from the enclosure through a sodium hydroxide-based wet scrubber and activated-carbon bed adsorber to reduce air emissions of sulfur dioxide and organic compounds. Foam was used in an attempt to suppress atmospheric releases from the raw waste during excavation, storage, and processing. The air exhaust was monitored for total hydrocarbons and sulfur dioxide before and after the air emission control system. In addition, total hydrocarbons and sulfur dioxide were monitored along the site perimeter to determine potential impact of air emissions on the nearby community.

This report presents an evaluation of the equipment used to control emissions and to measure the resulting emissions before and after the air control system. An assessment of the foam vapor suppressants and information on the full-scale remediation costs of the technology are also provided.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Excavation Petroleum	Hydrocarbons Sulfur Dioxide Petroleum Wastes	

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March 8, 1991

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Office of Regional Counsel
U.S. EPA - Region I
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Boston, MA 02203-2211

RE: Old Southington Landfill - Unavailability of Groundwater for Use as a Potable Water Supply

Dear Almerinda & Julie:

I am providing the following information as we discussed at our February 27, 1991 meeting to address concerns expressed by several members of EPA's staff regarding availability of groundwater underneath the landfill mass, and in the Study Area, for consumption as a potable water supply. This information has significant bearing upon criteria considered in the assessment of risk posed by the former landfill. As Respondent's presented at that meeting, state and local regulations prohibit the use of groundwater for drinking water supplies not only in the Study Site but also in the Study Area. In addition, existing institutional controls apply to the undeveloped land west of the Study Area which restrict the development of private drinking wells. For the reasons presented in this letter, the use of groundwater in these areas is precluded and consequently poses no risk to residents and potential future residents. Briefly, my conclusions are:

- Land in the Study Site and Study Area currently not developed as residential is zoned for industrial use. Residential development in these areas -- either through new construction or conversion -- is prohibited.

- Even if residences were to be located within the Study Site and Area, no wells could be drilled due to State Public Health Code restrictions. Drilling of wells on industrial properties is likewise precluded.

- The area immediately west of the Study Area is zoned for residential use of medium to high density. However, the Public Health Code precludes groundwater wells for the area and zoning regulations offer additional protection.

- The power of the Southington Department of Health to determine and enforce Public Health Code provisions provides a stop gap mechanism in the unlikely event that a well is illegally drilled within the Study Site or within or west of the Study Area.

Before discussing the institutional controls that are in place, a brief description of the zoning classifications and status of the properties of concern is in order. The zoning map for the Town of Southington depicts the Study Area and surrounding land. See Attachment A. The Study Area lies mostly within the light industrial (I-1) zone. That zone's permitted uses include manufacturing, sales of building materials, farm and construction equipment, greenhouses, research laboratories, warehouses, and gymnasiums. Section 5-01.1 of the Town of Southington Zoning Regulations (hereinafter "Zoning Regulations"). The northernmost portion of the Study Area is zoned for rather dense residential use on lots of 22,500 square feet or more (R-20/25). The residential zone is fully developed.

West of the I-1 zone lies another R-20/25 zone. The zoning map, last amended in October 1988, does not provide the most current view of lot development in the zone. Although the area west of Chuck and Eddie's is shown as undeveloped on the map, the Southington Water Department maps show the open-ended road (Nunzio Drive) has been extended to a cul-de-sac terminating immediately west of Chuck and Eddie's. The frontage along the extended Nunzio Drive has been fully subdivided into housing lots.

1) <u>New residential development, or conversion from industrial to residential, is prohibited within the Study Site and Study Area.</u>

As discussed above, except for the residences on the northernmost portion of the Study Site, the Study Site and Study Area are zoned I-1 for light industry. The northern residential area is fully developed and served by municipal water.

Pursuant to § 5.01 et seq. of the Town of Southington Zoning Regulations, residential uses are not permitted in an I-1 zone. Development of housing or conversion of existing buildings to housing is therefore prohibited by the Zoning Regulations. Although zoning law permits a zoning commission to adopt changes in its regulations, the commission must consider a number of factors, including public health, the character of a district, and the suitable and appropriate use of land. Here a zoning commission decision to change the I-1 zone to residential is improbable due to the predominant industrial uses already established within the zone and also due to the area's well-documented environmental condition. These factors not only have a profound negative effect on the zone's suitability for residential development, but also provide ample bases for the commission to reject any amendment petitions to allow residential use.

2) <u>The Public Health Code would prohibit well drilling throughout the I-1 zone.</u>

The Connecticut General Statutes direct the local Director Health to enforce the Public Health Code, a body of regulations adopted by the Connecticut Commissioner of Health Services. C.G.S. §§ 19a-36, 19a-207; Regs. of Conn. State Agencies § 19-13-B1 et seq. Pursuant to his statutory authority and the Code provisions, the Southington Director of Health has direct authority over the location of wells, well drilling permits, and well water testing.

Before starting a well, a well driller must obtain a permit from the Director of Health. C.G.S. § 25-130. A proposed well must conform to the Public Health Code before a permit is issued. Section 19-13-B51d of the Public Health Code requires that all wells be located in a direction away from groundwater flow "from an existing or probable source of pollution." In addition, all wells must meet definite minimum distance requirements when a source of pollution is nearby. A well must be located no closer than 75 to 150 feet from a source of pollution, depending upon the well's drawing capacity. The distance must be greater where an area of industrial waste is involved. Through these state regulations affecting the siting of wells, the Southington Director of Health must prohibit wells cited downgradient from the Study Area as well as the Study Site.

In addition to the location requirements listed above, the Code sets out two key criteria which must be met in order for a permit to be issued: 1) either a public sewer is available or a private sewage disposal system can be installed; and 2) the proposed well must be for property whose boundaries are more than 200 feet from a community water supply system. Public Health Code § 19-13-B51m.

This last Public Health Code provision prohibits installation of new wells in the Study Area. No well drilling could be permitted for that portion of the Study Area located within 200' of the municipal water supply. That supply system runs throughout the length of Old Turnpike Road. No parcel in the Study Area is further than 200' from the public water system.

3) Drinking water wells are effectively foreclosed for the area west of the Study Area.

Immediately west of the I-1 zone and beyond the configuration of the Study Area is an R-20/25 zone allowing residences on lots of 22,500 square feet or more. §§ 3-02 and 7-00 of the Zoning Regulations. However, for lots where both on-site water and septic systems are proposed, Southington imposes an additional lot area requirement. Such lots must contain a full acre (43,560 square feet). § 7-00 of the Zoning Regulations. Consistent with that regulation, the Southington Director of Health has typically required municipal water and/or sewer to lots in an R-20/25 zone.

Most of the undeveloped land west of the Study Area lies within 200 feet from the nearest water supply system, so hook-up to the system will be required by Public Health Code § 19-13-B1n. Water mains are located throughout the lengths of Buckland Street and Nunzio Drive. The Water Department has received a preliminary proposal for lots and a new street which would connect the northern end of Nunzio Drive to Buckland Street. Public water is already available at both termini of this proposed road. Since the termini are already within 200 feet of the public water supply, the Town will require the developer to lay water lines along the entire length of the proposed road.

Finally, an undeveloped parcel west of the Lori Corporation has frontage on Marboy Street, which is served by the Southington Water Department throughout its length. The 200' Code prohibition would therefore apply to this parcel, too.

4) The Director of Health is authorized to prohibit the use of any non-public wells or new wells which violate provisions of the Public Health Code.

In the unlikely event that all the above fail, the Director of Health still has recourse to prohibit use of a well. The Public Health Code requires the owner of a non-public water supply well to sample for bacteriological, physical and sanitary chemical parameters. The Director of Health must approve the samples before the well water may be used. Because the Code empowers the Director to determine potability, if a well does not furnish healthful drinking water, the Director may use the enforcement powers granted by the Connecticut legislature. These powers include the power to examine nuisances and sources of possible injury to the public health; to abate or order the abatement of any such nuisance; and to bring an action for injunctive relief. The Director may obtain an *ex parte* injunction for immediate hazards to health. Conn. Gen.

Stat. § 19a-206. These same enforcement powers extend beyond issues of potability, however. If a well is illegally drilled, for example, the Director may enjoin its use for violating the provisions of the Public Health Code. Id.

In summary, the Southington Zoning Regulations prohibit residential uses in an I-1 zone. Although zoning regulations may be amended or a variance sought therefrom, the likelihood of a residential use being allowed in this I-1 zone is limited by the regulations themselves and the unsuitability of the area for residences.

The Public Health Code provisions on minimum distances from a pollution source, and the requirement that a well not be located in the direction of groundwater flow from a pollution source, give the Southington Director of Health explicit power to prohibit wells within the Study Site and within and to the west of the Study Area. The Code provides a clear-cut requirement for hook up to a public water system located within 200 feet of a property's boundary line. All the undeveloped property in the area of EPA's concern that we could identify from town maps would be required to hook up to municipal water because of this provision.

The Director of Health determines whether well water is potable, and has a full array of enforcement powers to assure that a well meets all Public Health Code provisions, from potability to installation. These powers include abatement orders, and actions for injunctive relief.

Consequently, water from beneath the landfill or the Study Area cannot be used as a potable drinking water supply. There will thus be no risk to human health associated with ingestion of groundwater from beneath the landfill. As you know this has important ramifications for assessment of the human health risk required as part of the Remedial Investigation. Criteria used in assessing such risk should reflect the fact that this water cannot be used as a potable drinking water supply. If you have any questions or comments, please do not hesitate to call me at your convenience.

Best regards,

Carol Lear

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TABLE 1

ESTIMATE OF AVERAGE WASTES GENERATED VERSUS AVERAGE WASTES REMOVED

FROM GROUNDWATER UNDER ALTERNATIVE REMEDIATION STRATEGIES

Old Southington Landfill Feasibility Study

Southington, Connecticut

ITEMS	ALT SC3	ALT SC4	ALT SC5 W/DIV	ALT SC5 W/O DIV	ALT MM1/SC4
SVOC/VOC Removed lbs/day	2.20	0.30	1.40	5.29	0.72
SVOC/VOC Removed tons/year	0.40	0.05	0.26	0.97	0.13
SVOC/VOC Removed tons/5 years	2.00	0.25	1.28	4.85	0.65
Spent Carbon Generated lbs/day	251.00	324.00	648.00	2700.00	1440.00
Spent Carbon Generated tons/year	45.80	59.13	118.26	492.75	262.80
Spent Carbon Generated tons/5 years	229.00	295.65	591.30	2463.75	1314.00
Inorganics Removed lbs/day	96.00	45.00	92.00	612.00	694.00
Inorganics Removed tons/year	17.52	8.21	16.90	111.69	126.66
Inorganics Removed tons/ 5 years	87.60	41.10	84.50	558.45	633.30
Inorganic Sludge Generated lbs/day	275.00	129.00	262.00	1750.00	1984.00
Inorganic Sludge Generated tons/year	50.19	23.54	47.82	319.38	362.08
Inorganic Sludge Generated tons/5 years	250.95	117.70	239.10	1596.90	1810.40
Total Waste Generated lbs/day	526.00	453.00	910.00	4450.00	3424.00
Total Waste Generated tons/year	96.00	82.67	166.08	812.13	624.88
Total Waste Generated tons/5 years	480.00	413.35	830.40	4060.65	3124.40
Ratio VOC/SVOC Removed To Total Waste Generated	0.0040	0.0006	0.0020	0.0010	0.0002
Ratio VOC/SVOC/Inorganics Removed To Total Waste Generated	0.1870	0.1000	0.1030	0.1390	0.2069
Ratio Total Waste Generated To SVOC/VOC Removed	239.09	1510.00	650.00	841.21	4755.56
Ratio Total Waste Generated To SVOC/VOC/Inorganics Removed	5.34	10.00	9.74	7.21	4.93

Handy & Harman

John C. Bullock, Environmental Counsel
. S. Mail P.O. Box 120, Waterbury, CT 06720
Delivery 35 Sheffield Street, Waterbury CT 06704
TEL (203) 757-9231 • FAX or DATA (203) 574-7980

RECEIVED
AUG 16 1994

August 13, 1994

Almerinda Silva
Remedial Project Manager
USEPA, Region I
JFK Federal Building (HEC-CAN6)
Boston, MA 02203

Re: Old Southington Landfill
Southington, Connecticut

Dear Ms. Silva:

This letter comments upon remedial action for the Old Southington Landfill. Handy & Harman is the parent of the successor of the former Consolidated Tube Company, which apparently sent 495 gallons of spent solvent to the Solvents Recovery Service site during the 1960's, the period SRS was using OSL for some disposal. Our connection and potential liability at OSL is thus indirect and small, and we do not see the selection of any remedy as having a significant economic impact upon Handy & Harman. But we also see the expenditure of societal resources, taken from anyone's pocket, as requiring wise application and administration, to achieve the maximum benefit to society. We object to the selection of a remedy involving excavation and surface re-engineering, and support selection of a much less intrusive and much less expensive remedy. The site is suitable for a modified no action remedy, with appropriate administrative restrictions and a permanent commitment by the local government to police and monitor the area.

A striking fact about the site is its outward appearance to a passer-by. It would be impossible to know that it is a former waste disposal site, much less a National Priorities List Hazard Waste Disposal Site. The site looks like any other somewhat older mixed business and industrial area in a small New England community. The businesses operating on the site itself and in the surrounding area do not raise concern, or even attention. The site is open to visitors day and night, and a casual walk around the site presents no observable evidence of a threat to human health, short term or chronic, or to the environment. Black's Pond, immediately to the east of the site, appears to be a very attractive body of water, supporting a variety of flowers and other vegetation along its shores. The nearby residential area on Rejean Road is well-kept and attractive.

A more detailed inspection of the record indicates that the outward appearance is very much the reality of the site. It is apparent from the health assessment performed by the Connecticut Department of Health that no one is really at any risk because of the site. There are three pathways of exposure which might bring about actual risk, but all are adequately blocked. The first is the possibility of exposure to contaminated ground water beneath the site and migrating off-site to the west, beneath the automobile junkyard. But the single public water supply well found to be contaminated, which operated from 1972 to 1979, was closed in 1979, ending that exposure. For the past fifteen years no one has consumed any ground water associated with the site. The second exposure is to buried hazardous chemicals if there were to be excavation in particular areas, but it is clear to the casual observer that no such excavation is taking place, and the areas of concern have now been identified in the remedial investigation. The third exposure is to methane gas generated in the decomposition of buried organic waste, which may migrate into buildings located over areas of waste disposal. But there is an ongoing monitoring program by the Southington Fire Department which will detect and prevent exposure. Therefore there does not appear to be any circumstance at the site which is actually threatening to human ealth and the environment.

Remediation must address and ensure the continuation of that no-risk status permanently. That can be done by administrative rather than engineering action. Use of ground water as a source potable drinking water can be prevented through community land use restrictions. Excavation in areas of concern, or any part of the site, can be prevented through deed restrictions, as well as community land use restrictions. Migration of methane gas can be monitored, and buildings at the landfill can be adequately vented to prevent exposure to the gas.

All of these administrative steps are particularly protective at this site because a major PRP, the owner and operator, is the governmental authority with local jurisdiction and police power over the site and its immediate surroundings. The Town of Southington has extensive authority under the Connecticut General Statutes to enact laws which govern the use of land for protection of human health. For example, Title 8 of the Connecticut General Statutes gives each municipality to regulate land use through a zoning commission:

> "The zoning commission of each .. town .. is authorized to regulate, within the limits of such municipality .. the location and use of buildings, structures and land for trade, industry, residence or other purposes, including water-dependant uses.." (C.G.S. Section 8-2)

And the Town of Southington has police power, and an established police force, with which to enforce its legal authority. Of particular importance to selection of a CERCLA remedy, the Town of

Southington, unlike a private party, will have a permanent existence. It can not declare bankruptcy, or avoid site administration.

If areas at the site are excavated, hazardous materials are moved to another area of the site, and an impermeable RCRA cap is created over that area, there will continue to be a long term danger of excavation through the cap and into the hazardous materials. Therefore there will need to be administrative measures taken to ensure the integrity of the area. These administrative steps will ultimately rely upon the Town of Southington for observation, policing and land use regulation. Thus the excavation, movement and RCRA capping will not remove the need for permanent administration by the Town of Southington to protect public health.

And the proposed remedy will make the administrative burden upon the town greater. Because the cap will prevent infiltration of rain water, it will preserve the buried hazardous materials for a much longer period of time than would be the case if the materials were exposed to rain water infiltration. Rain water infiltration promotes both the degradation of organic substances and their migration, with associated attenuation and dilution. We recognize that the intent of the proposed capping remedy is exactly the opposite - excavation and capping of hazardous materials are intended to lessen their migration into ground water. But that increases protection of human health only if there is exposure to ground water, and such exposure has been stopped here by administrative steps. So the preservation of the hazardous materials at the site, in a hazardous condition, will only serve to greatly extend the length of time for which the Town of Southington will have to administer the site, over what would be necessary if the hazardous materials were not capped.

The capping of the hazardous materials will also make control of the third pathway of exposure, to methane, more difficult, perhaps causing methane to spread laterally, and in any case requiring the creation of a complex methane collection system. In the absence of a cap, the methane generated at a sanitary landfill can infiltrate and discharge harmlessly at the ground surface. Of course, buildings on and near the site will require periodic monitoring for methane, and may require venting measures, but this will be much more cost efficient than the collection system necessitated by capping.

The proposed remedy also causes an exposure cited in the health assessment which would otherwise not exist at all, the exposure to direct contact to hazardous material and dust in the course of excavation and other engineering actions, not only to workers at the site but to the surrounding community. That exposure dramatically increases still another health concern cited by the Connecticut Department of Health, the psychological stress upon nearby residents. At the public hearing in Southington on July 12, 1994, a number of residents in the area expressed sincere concern with their safety during the excavation and waste relocation process. That concern, and the actual exposure to hazardous materials to which it relates, can be eliminated by reliance upon administrative steps to ensure continuation, and enhancement, of the present status of the site.

Finally, with regard to the overall cost of the selected remedy, we want to request that EPA consider cost effectiveness not only in relation to other remedies proposed in the feasibility study, but also in a broader economic context. While the proposed remedy may seem relatively modest in terms of an average National Priorities List site, it involves an enormous expenditure of truly scarce societal resources. It is not subject to question that there are other ways in which those same resources could be spent which would provide greater protection of public health and safety although not within the context of the Superfund program. The Town of Southington, which is not a wealthy town, could greatly enhance the protection and well-being of its citizens, beyond any incremental benefit which may actually be derived from the proposed remedy, through judicious use of only a fraction of the money which would be spent upon that remedy.

We recognize that EPA must follow the mandate of Congress to ensure that a high priority is given to the risk of exposure to industrial chemicals. But EPA has authority to interpret and apply that mandate. You can determine that administrative control by the Town of Southington is effective, protective of human health and the environment, and permanent. You therefore can select a remedy which relies primarily upon administrative steps taken by the Town of Southington, at substantially less cost than what you have proposed. The reality of the Old Southington Landfill site is that it presently exposes no one to actual harm, and has not done so for a long period of time. That status can be continued permanently at low cost, if you will concur in the creation, with the Town and other PRPs, of a cost effective administrative remedy.

Please call if you have any questions.

Very truly yours,

John C. Bullock

NES, Inc.

44 Shelter Rock Road
Danbury, CT 06810
(203) 796-5000

• Integrated Environmental Services
• Engineering & Consulting Services
• Engineered Products

Refer to ESG-796
August 11, 1994

Ms. Almerinda Silva
Remedial Project Manager
U. S. Environmental Protection Agency
Waste Management Division (HEC-CAN 6)
JFK Federal Building
Boston, MA 02203

Re: Old Southington Landfill Superfund Site
Southington, CT

Dear Ms. Silva:

As you are aware, Integrated Environmental Services (IES), a division of NES, Inc., is the Technical Assistance Grant (TAG) consultant for Southington Old Landfill Victims (SOLV). Attached please find comments prepared by IES regarding the above-referenced site. Should you have any questions regarding this matter, please call me at 203-796-5229.

Very truly yours,

Robert E. McPeak, Jr., P.E.
Senior Department Manager
Environmental Engineering and Remediation

cc: L. Barnes

Written Comments Submitted During the Public Comment Period
Old Southington Landfill Superfund Site
Southington, CT

1. Treatment of Ground Water

The project should not be divided into two operable units designed to address waste material within the landfill and ground water separately. Both the waste material and the ground water should be addressed simultaneously as soon as possible. There is no reason to conduct an entire new RI/FS for ground water. Although there are some factors about ground water contamination that have not been fully answered, such as how far off-site the contamination extends, the existing data clearly indicates that significant ground water contamination exists at and down gradient of the site. In addition, the preferred remedy includes leaving a significant volume (about 100,000 cubic yards) of highly contaminated material in ground water beneath the cap. The proposed approach will allow the continued leaching of contaminants into the ground water. Therefore, ground water remediation should be included as part of the current remedy and should not be delayed while another RI/FS is conducted.

If ground water remediation is included in the preferred remedy, the FS will require revision. The public should be provided an opportunity to comment on this new feasibility study

There appear to be conflicting ground water objectives in the RI/FS documents and the Proposed Plan prepared by the EPA (May 23, 1994). The FS indicates that the ground water objective is to prevent ingestion (pg. 1-22); however, the EPA's proposed plan indicates the objective is to minimize the effects of contaminants on ground water quality (pg. 13) The FS objectives should be revised to be more consistent with those specified in the proposed plan prepared by the EPA because current EPA policy indicates that ground water objectives should not be achieved solely by institutional controls (i.e., just prevention of ingestion).

The FS (pg. 3-4) establishes a series of 5 year reviews which will be utilized to assess the success of the cap in reducing leaching of contaminants from the landfill. If the final plan does include a second operable unit for ground water, action levels should be established and compared with contaminant concentrations in the ground water during each 5 year review. If during these reviews it is discovered that the cap has not been successful in reducing contaminant concentrations to below established action levels, additional ground water remedial action should be implemented without delay.

2. Evaluation of Treatment Technologies

The plan does not directly address the treatment of the majority of the source material in contact with the ground water. A plan which would treat the waste directly by using combined off-site disposal and/or in situ soil treatment technologies would be more desirable. The EPA has stated in their RI comments that the natural flushing approach will probably take even longer than estimated in the RI/FS due to the overly optimistic assumptions utilized in the flushing calculations. This natural flushing approach would render the local aquifer useless for an indefinite period. It would be more efficient to treat the waste material directly using the alternate direct techniques rather than indirectly in the ground water. This approach would also make ground water treatment more effective and likely to succeed in a shorter period of time

A variety of in situ technologies (i.e. soil vapor extraction, vitrification, bioremediation, soil flushing, sparging, etc.) have been eliminated from the feasibility study by the use of a single line (pg. 2-10) which indicates that they would be ineffective due to the heterogeneous nature of the material in the landfill. This factor may limit the efficiency of these methods; however, it appears inappropriate to eliminate them completely due to less than perfect efficiency. This is especially true in light of the local community's desire to treat and/or remove the waste rather than leave it in place indefinitely.

Consideration should be given to possible uses of in situ technologies. For example, with limited additional expenditure and effort, an active soil vapor extraction system could be tied into the gas collection system and provide supplemental treatment of the material within the landfill. Although a system of this type would probably not provide complete remediation, it would certainly assist in reducing the concentrations of VOCs within the landfill. More consideration should be given to the incorporation of technologies and approaches of this type before the installation of the cap. After the cap has been installed, they become more difficult to implement.

3. Treatment of "Hotspots"

It is inappropriate to excavate material from SSDA-1 solely on the basis of visual observations. Cleanup levels should be established for several of the main constituents known to be present in the material. Excavation limits would then be extended until analysis of confirmation samples (collected at the excavation face) indicate the concentrations of selected constituents are below the cleanup levels. Cleanup level concentrations could be representative of the majority of the material in the landfill.

The remedial alternative selected by USEPA does not require that SSDA-2 be treated as a unique "hot spot" like SSDA-1. Part of the rationale for requiring the excavation of SSDA-1 is "to prevent wastes below the water table from further contaminating ground water" (USEPA, 5/94). However, the RI results discussed below indicate that a significant contaminant source below the water table is located at SSDA-2, also.

- The highest concentration of VOCs detected in shallow off-site ground water occurs directly downgradient of SSDA-2 (Plate 4-8). Well B304A shows a level of close to 50 ppm total dissolved VOCs. Six of the VOCs detected in Well B304A were above the Federal MCLs or the proposed state action levels. Ground-water contamination downgradient of SSDA-1 can be considered comparatively less severe because benzene at a concentration of 2 ppb is the only VOC detected above these standards.

- The results of the soil gas survey show a relatively high anomaly of aromatic hydrocarbons just to the southwest of the area designated as SSDA-2 (Plate 4-2). A similar anomaly was not detected at SSDA-1. This information would suggest that a significant pocket of VOC contamination is present near SSDA-2.

- Boring logs from TB-101, TB-103 and TB-112 respectively contained references to "solvent odor", "petroleum smell" and "oily soil." Each of these borings is within or adjacent to SSDA-2. These references suggest liquid residue is present in the landfill at these locations.

- The concentration of total VOCs in a soil sample collected from Boring TB-114 was approximately 25 ppm (Table 4-17). A comparison of the sampling data for TB-114 and water-level data presented in Plate 3-5 indicates that the sampled interval is below the water table. As shown in Plate 3-5, the water table is approximately 16 feet below land surface at TB-114, while Table 4-17 indicates that the subsurface soil sample was collected at a depth interval of 20 ft to 23.8 ft below land surface.

- It is also evident from Plate 3-5 that the bottom of the landfill slopes downward to the east, away from Turnpike Road and that landfill material intersects the water table just to the west of the Parks and Recreation Building. The ground penetrating radar study was not able to determine the extent of SSDA-2 beneath the building, so it is possible that this "hotspot" is in contact with ground water.

The proposed cap will only address contamination above the water table. Contaminant sources below the water table will continue to leach compounds into ground water unless additional treatment or controls are implemented. It is estimated that there are over 100,000 yd^3 of waste below the water table (ESE, 3/94); however, there is no estimate provided in the RI/FS concerning the amount of time required to naturally flush contamination from the saturated waste or the mass of contamination that could potentially be released to ground water over time. At present, there are no plans to treat or control contamination in the area of SSDA-2 other than by capping.

An estimate should be made concerning the mass of contaminant that will remain below the water table and how long it will take to naturally flush contaminants from the waste and the aquifer. This information should be used to evaluate whether active treatment and/or additional engineering controls are warranted for SSDA-2 and other identified "hot spots." Controlling or treating such "hot spots" will remove or reduce the continuing source of ground-water contamination at the site. This issue should be addressed now since the continued degradation of ground water will increase the scope of any future aquifer clean-up efforts.

4. Ground Water Classification

The local aquifer was reclassified from a GA area to a GB area in the recent past. This reclassification process should be reviewed to verify that the GB classification is justified and was performed in accordance with all state regulations and requirements. Current EPA policy indicates that institutional controls shall not substitute for active response which includes restoration of ground water to beneficial use. Based on these criteria, it appears most appropriate for the local aquifer to be classified as a GB/GA area to ensure restoration to beneficial use.

5. Black Pond

No information has been provided which demonstrates that contaminants will not leach from the landfill back into Black Pond if the additional soil pressure of capping material is added to the top of the landfill. Annual analysis of the sediments in Black Pond should be performed as a part of the O&M process in order to determine whether release of material is occurring due to the weight of the cap.

Waste material beneath Black Pond has not been sufficiently delineated and, consequently, may not be properly addressed during clean up of the site. During the remedial investigation, ESE performed a number of hand-auger borings along the southwest shore of the pond to delineate the waste in that area (ESE, 12/93). Specific information and data concerning the placement and results of the borings were not presented as part of RI report. However, based upon Figure 2-4 in the RI report, the eastern extent of waste into the pond was not completely established by ESE.

Also, additional investigation work along the northern shore of Black Pond is needed to determine if waste is present in this area. A review by IES of aerial photographs dated 1965, 1966, 1967 and 1970 indicate that past landfilling activity occurred beneath the north-northwest shore of Black Pond which was not included as part of ESE's investigation.

Although it is USEPA's (5/94) intention that, "waste found along the shore of Black Pond will be excavated and placed underneath the cap," there is a potential to miss buried waste material unless additional investigation work is performed. Any additional investigative work could easily be performed concurrently with remedial activities. Also, deep test pits into Black Pond should be conducted following the excavation of the waste material to confirm that clean up is complete, and post-excavation sampling should be conducted to ensure that sediments stirred up during digging have not spread contamination. To ensure public safety, the degree of public access to the pond should be assessed based upon sampling results after the completion of the remedy.

6. Risk Assessment Calculations for Exposure to Sediment in Black Pond

The Remedial Investigation report (Volume IA, date: 12-10-93, page: 4-47) indicates that the human health risk assessment was conducted using only the 1992 data because the "1992 data set provides a more current and complete database..." Therefore, the sediment data collected by ESE in 1990 and the earlier data collected by GZA were not used to evaluate potential exposure point concentrations. As a result, samples with elevated levels of contamination were not included in the analysis. For example, sample SED-5, collected by ESE on 7/3/93, contained a concentration of total SVOCs of 128.09 ppm; this sample represented the highest detection of SVOCs of any sediment sample collected at the site, and should have been included in the calculation of exposure point concentrations. In addition, the data collected by GZA indicated total PAH concentrations in sediment of up to 125.84 ppm. By using only the 1992 sediment data, the risk assessment does not consider samples which contained significant contamination and which therefore may present a human health risk. Just because these data are not the most current does not provide sufficient justification to exclude them from the analysis.

7. Cost Estimates

Cost estimates appear to be high in several cases, thus influencing the perception of the scope of work and the selection of alternatives. For example, calculations for the transportation and disposal of the material in SSDA-1 (Appendix B, Alternate SC7, pg. 8&9) have several overly conservative assumptions and quotes.

- Weight of the material within SSDA-1 was appropriately estimated at 100 lb/cf., however, the factor used to convert from cubic yards to tons is incorrect. The conversion factor should be 1.35 tons per cubic yard, not 1.5 tons per cubic yard: *(100 lb/cf x 27 cf/cy / 2000 lb/ton = 1.35 tons/cy)*

- The FS estimate assumes that each individual truck load sent for disposal would require an individual lab analysis costing aproximately $1200. Vendors contacted by IES representatives indicated that analyses would not be required for each truckload of material sent to the incinerator. It was actually suggested that one composite sample might be sufficient to generate a single profile/waste stream for all of the material. Based on these reduced requirements, the potential cost savings for the high cost scenario could be significant.

- The FS estimate utilized a unit price of $1600 per ton for disposal of the material from SSDA-1. These disposal costs also appear to be too high. One facility contacted by IES personnel quoted a price of $900 per ton, and a second facility quoted a price of $1300 per ton with a BTU rating of 2500 to 5000. Disposal facility representatives clearly indicated that these prices are "negotiable". It is also possible for disposal facilities to reduce the final actual cost lower than unit prices quoted over the telephone.

If the present cost estimate were revised to incorporate these comments, it is possible that the material in the SSDA-1 area could be disposed of off site for approximately 30 to 40% less than originally estimated. Additional review of cost estimates for this alternative should be performed and the decision to keep that material on-site should be re-evaluated.

In general, substantial additional cost has been added to the cost estimates of each of the alternatives evaluated through the use of percentage increases for health and safety (20%), engineering design (20%), and contingencies (25%). These three categories have added 65% to the cost of each of the alternatives evaluated. These increases are excessive and once again are influencing the perception of the scope of work and the selection of alternatives. Cost estimates should be re-evaluated using more reasonable percentage increases.

8. Future Community Review and Comment Opportunities

If the preferred remedy is accepted and the ROD is signed, engineering designs will be performed. It is presumed that they will be performed by the PRPs. During the design process, various reports will be prepared; these will include a work plan describing the pilot test for determining how to treat landfill gases, a health and safety plan, and others.

After the ROD is signed, there are no requirements for the EPA to hold public hearings or to solicit public comment on those documents. It is up to the EPA to provide information to the public, either in writing or through public meetings, whenever they feel appropriate.

A schedule should be established for quarterly public meetings, regardless of what has or has not occurred during that quarter, so that the community is kept well informed about project activities. In addition, it is recommended that the PRPs and the EPA solicit the input of the community during preparation of the health and safety plan, the site restoration plan and the construction management plan (regarding traffic, site security, etc.) and other appropriate documents. The solictation of input from the community during preparation of these documents, rather than providing them to the community after they have been prepared, will be more effective in keeping the community informed and ensuring that community concerns are addressed.

9. Ecological Risk Assessment

The Ecological Risk Assessment addressed only the site itself, Black Pond and the adjoining wetlands. No evaluation was conducted regarding the impact of groundwater which has and will continue to migrate off-site into downstream environmental receptors such as the Quinnipiac River. Future investigations should include as an objective the identification of off-site environmental receptors and the potential impact of contaminated groundwater on those receptors.

10. Classification of the Site as a Municipal Landfill

Numerous project documents refer to the site as a municipal landfill. Based upon this classification, the use of the presumptive remedy for municipal landfills (containment) has been adopted as the preferred remedy. The Feasibility Study (date: 12-10-93, page: 1-5) states that "CERCLA municipal landfills are primarily composed of municipal, and to a lesser extent hazardous wastes..." This statement does not accurately describe the site because the [illegible] portion of the site, which is the major area of concern, may not be primarily composed of municipal waste. Therefore, it should not be presumed that containment is the appropriate remedy, and other remedial technologies should have been more fully evaluated in the FS.

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

August 12, 1994

Ms. Almerinda Silva
US Environmental Protection Agency
Waste Management Division (HEC-CAN 6)
JFK Federal Building
Boston, MA 02203

RE: Old Southington Landfill Proposed Plan

Dear Ms. Silva,

The Connecticut Department of Environmental Protection has reviewed the Proposed Plan for the Old Southington Landfill NPL Site. In a letter dated May 26, 1994, the Department expressed support for the remedial approach presented in the Proposed Plan dated May, 1994. DEP's letter was based on our understanding of EPA's approach prior to the formal release of the Proposed Plan, EPA's Addendum to the Feasibility Study, and EPA's Revised ARARs Table (Table EPA 1-A). In a letter dated April 15, 1994, DEP commented to EPA that the revised ARAR Table should include Connecticut's Water Quality Standards and Criteria (the WQS) as an ARAR for OU1. A reference to the Groundwater portion of the WQS appears on page 2 of 6 on Table EPA 1-A, with the status listed as "not an ARAR for OU1".

DEP's position is that all of Connecticut's Water Quality Standards and Criteria are action specific requirements which must be recognized as ARARs in this decision making process, even though a specific groundwater remedy may not be decided at this time. The narrative portions of the Water Quality Standards and Criteria contain antidegradation policies and requirements for both surface water and ground water, which must be considered and satisfied in the selection of a remedial approach for the site, and in the actual implementation (construction) of the selected remedy (whatever it may entail). EPA's apparent position that the groundwater standards and criteria portion of the WQS are not an ARAR could result in there being no mechanism during construction of the proposed cap to address the State's stated goal for GB areas. These goals would, in part, prevent any additional discharges which would cause irreversible contamination. There would also be no mechanism to require that Best Management Practices be used, or to require a demonstration that reasonable controls will or are being used.(See #41 of the Groundwater Standards section of the WQS.) The WQS for surface water would prevent degradation of the surface water quality to a level that would be inconsistent with the assigned classification. EPA's failure to acknowledge the WQS as ARARs for both surface and groundwater could be interpreted as permission to impact the waters of the State without any regulation. This is unacceptable to DEP.

The recognition of the WQS as an ARAR is consistent with recent guidance on the evaluation of state antidegradation laws as ARARs. It is also important to note that the WQS have been identified as an ARAR for every Record of Decision issued for NPL sites in Connecticut.

It is not DEP's intent to delay or prevent the timely selection and implementation of even a partial remedy at this site. It is very important, however, that the authority to require that the implementation of the selected remedy (whether partial, interim or final remedy) is done properly and in a manner that is consistent with all of Connecticut's Water Quality Standards, is recognized.

As part of our continuing discussions to resolve this issue, I will be providing some suggested language to be incorporated into Table 1B to identify the WQS as an ARAR. If you have any questions, please call me at (203) 566-5486.

Sincerely,

Christine Lacas

Christine Lacas
Supervising Environmental Analyst
Bureau of Water Management

CA

APPENDIX B

RISK ASSESSMENT TABLES 2 THROUGH 10

TABLE 2
SUMMARY OF CONTAMINANTS OF CONCERN
IN NORTHERN AREA SURFACE SOILS

Contaminants of Concern	Average Concentration (mg/kg)	Maximum Concentration (mg/kg)	Frequency of Detection
acenaphthene	0.27	1	12/17
acenaphthylene	0.27	1.3	8/17
anthracene	0.33	1.1	12/17
arsenic	1.42	2.6	5/8
benzo(a)anthracene	1.16	4.6	16/17
benzo(a)pyrene	0.71	3.5	15/17
benzo(b)fluoranthene	1.1	5.7	16/17
benzo(g,h,i)perylene	0.32	1.2	13/17
benzo(k)fluoranthene	0.8	3	16/17
beryllium	0.46	0.66	8/8
cadmium	0.33	1.1	2/8
chrysene	1.1	4.1	16/17
dibenzo(a,h)anthracene	0.33	1.3	11/17
fluoranthene	1.96	7.6	17/17
fluorene	0.26	0.79	10/17
indeno(1,2,3-cd)pyrene	0.57	2.8	15/17
lead	32.9	177	8/8
manganese	324	408	8/8
naphthalene	0.21	0.46	7/17
phenanthrene	1.46	5.5	16/17
pyrene	1.99	8.2	16/16

TABLE 3
SUMMARY OF CONTAMINANTS OF CONCERN
IN SOUTHERN AREA SURFACE SOILS

Contaminants of Concern	Average Concentration (mg/kg)	Maximum Concentration (mg/kg)	Frequency of Detection
acenaphthene	0.05	0.07	2/21
acenaphthylene	0.19	0.42	5/21
anthracene	0.21	0.41	4/21
aroclor 1254	0.06	0.44	2/21
aroclor 1260	0.05	0.16	3/21
arsenic	1.54	2.7	15/21
benzo(a)anthracene	0.38	1.6	10/21
benzo(a)pyrene	0.24	1	10/21
benzo(b)fluoranthene	0.58	2.1	10/21
benzo(g,h,i)perylene	0.32	1.2	7/21
benzo(k)fluoranthene	0.36	1.2	10/21
beryllium	0.62	2.9	13/21
chrysene	0.54	1.8	10/21
dibenzo(a,h)anthracene	0.19	0.39	5/21
fluoranthene	0.59	2.8	13/21
fluorene	0.18	0.24	2/21
indeno(1,2,3-cd)pyrene	0.29	1.2	9/21
lead	57.5	372	21/21
manganese	324	418	8/8
naphthalene	0.06	0.09	4/21
phenanthrene	0.49	2	11/21
pyrene	0.67	4.5	16/21

TABLE 4
SUMMARY OF CONTAMINANTS OF CONCERN IN ON-SITE SEDIMENTS

Contaminants of Concern	Average Concentration (mg/kg)	Maximum Concentration (mg/kg)	Frequency of Detection
acenaphthene	0.31	0.54	2/7
acenaphthylene	0.31	0.61	3/7
anthracene	0.54	1.3	3/7
aroclor 1260	0.18	0.35	2/7
arsenic	4.73	10.4	7/7
benzo(a)anthracene	2.27	6.1	4/7
benzo(a)pyrene	2.29	5.6	3/7
benzo(b)fluoranthene	2.97	8.8	4/7
benzo(g,h,i)perylene	0.98	1.7	3/7
benzo(k)fluoranthene	2.29	5.4	3/7
beryllium	0.47	0.89	3/7
chrysene	2.07	7.8	6/7
dibenzo(a,h)anthracene	0.66	1.5	3/7
fluoranthene	3.82	18	7/7
fluorene	0.38	0.86	3/7
indeno(1,2,3-cd)pyrene	1.75	3.2	3/7
manganese	2793	11900	7/7
naphthalene	0.23	0.23	1/7
phenanthrene	2.02	9.8	7/7
pyrene	3.02	14	7/7

TABLE 9
SUMMARY OF CONTAMINANTS OF CONCERN IN OUTDOOR AIR IN THE SOUTHERN AREA

Contaminants of Concern	Average Concentration (mg/m3)	Maximum Concentration (mg/m3)	Frequency of Detection
benzene	3.9E−05	2.1E−04	18/21
cis−1,2−dichloroethene	3.4E−06	1.6E−05	8/21
trans−1,2−dichloroethene	9.4E−07	2.0E−06	3/21
ethylbenzene	3.2E−05	3.2E−04	19/21
methylene chloride	2.8E−05	1.1E−04	9/21
styrene	3.4E−05	3.5E−05	2/21
toluene	4.8E−05	2.0E−04	21/21
1,1,1−trichloroethane	7.4E−06	3.8E−05	9/21
trichloroethene	4.3E−06	8.5E−06	2/21
vinyl chloride	1.6E−04	5.8E−04	4/21
xylenes	1.1E−04	1.3E−03	19/21

TABLE 10
SUMMARY OF CONTAMINANTS OF CONCERN IN INDOOR AIR IN THE SOUTHERN AREA

Contaminants of Concern	Average Concentration (mg/m3)	Maximum Concentration (mg/m3)	Frequency of Detection
benzene	2.2E−04	1.2E−03	18/21
cis−1,2−dichloroethene	1.8E−05	9.0E−05	8/21
trans−1,2−dichloroethene	5.2E−06	1.1E−05	3/21
ethylbenzene	1.8E−04	1.8E−03	19/21
methylene chloride	1.5E−04	5.9E−04	9/21
styrene	1.9E−04	1.9E−04	2/21
toluene	2.7E−04	1.1E−03	21/21
1,1,1−trichloroethane	4.1E−05	2.1E−04	9/21
trichloroethene	2.4E−05	4.7E−05	2/21
vinyl chloride	9.0E−04	3.2E−03	4/21
xylenes	5.8E−04	7.3E−03	19/21

APPENDIX C

CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION CONCURRENCE LETTER

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

September 15, 1994

RECEIVED

SEP 21 1994

OFFICE OF THE REGIONAL ADMINISTRATOR

John P. DeVillars
Regional Administrator
U.S. EPA Region I
J.F.K. Federal Building
Boston, MA 02203

Dear Mr. DeVillars:

The Connecticut Department of Environmental Protection (CT DEP) concurs with the interim remedial action for limited source control selected by EPA for the Old Southington Landfill Superfund Site in Southington, Connecticut. The interim remedial action is described in detail in the Proposed Plan dated May, 1994 and in the Record of Decision dated September 1994.

Concurrence with EPA's selected interim remedial action for limited source control at the Old Southington Landfill Site shall in no way affect the Commissioner's authority to institute any proceeding to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of any permit issued by the Commissioner.

Sincerely,

Timothy R.E. Keeney
Commissioner

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APPENDIX D

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

D94-178
9/15/94

OLD SOUTHINGTON LANDFILL SUPERFUND SITE
ACTION-SPECIFIC ARARs AND TBCs

Medium	Requirements	Status	Synopsis of Requirement	Action to be taken to attain ARAR
Air	Connecticut Air Pollution Regulations - Stationary Sources (CGS 22a-174-3).	Applicable	Requires that stationary sources of air pollutants meet specified standards prior to construction and operation. May require controls to abate pollution.	The landfill gas collection and treatment system, w designed to meet substantive standards established under these regulations.
Air	Connecticut Air Pollution Regulations - Fugitive Dust Emissions (CGS 22a-174-18[b]).	Applicable	Requires that reasonable precautions be taken to prevent particulate matter from becoming airborne during demolition and construction activities and material handling operations.	Activities involving building demolition and landfil construction will be conducted in a manner to mini fugitive dust emissions from the Site.
Air	Connecticut Air Pollution Regulations - Control of Odors (CGS 22a-174-23).	Applicable	Prohibits the emission of any substance that constitutes a nuisance because of objectionable odor.	Site remediation activities will be planned to contro release of objectionable odors from the Site.
Air	Connecticut Air Pollution Regulations - Incineration (CGS 22a-174-18[c]).	Applicable	Establishes regulations and emission rates for incinerators.	The landfill gas collection and treatment system, wi designed to meet the substantive requirements of the regulations.
Air	Connecticut Air Pollution Regulations - Hazardous Air Pollutants (CGS 22a-174-29).	Applicable	Establishes testing requirements and allowable concentrations for any stack emission for the constituents listed.	Direct discharges to the air from the landfill gas collection and treatment system will be designed to meet the substantive requirements of these regulatior so that the numeric criteria are not exceeded.
Water	Connecticut Water Quality Standards (WQS) (CGS 22a-426)	Applicable	Establishes numeric and antidegradation criteria for groundwater and surface water.	Remedial activities will be consistent with the antidegradation criteria in the WQS. If any remedia activities occur that are regulated under these provisions, the use of engineering controls and best management practices may be required to prevent or minimize adverse impacts to the waters of the state.
Water	Connecticut Water Pollution Control Act-Permitting Requirements (CGS 22a-430-430[b]).	Relevant and Appropriate	Establishes discharge permit requirements.	If any remedial activities result in discharges to groundwater or surface water regulated under this A they shall meet the requirements of this Act.
Wat	Connecticut Water Pollution Control Regulations-Permitting Regulations (22a-430 1-8)	Relevant and Appropriate	Establishes permitting requirements for discharges to surface water, groundwater and POTWs.	If any remedial activities result in any direct dischar to surface water or groundwater, they must comply with the substantive requirements in these regulation Specific criteria may be established for discharges so that numeric criteria established in the WQS are not violated.

1194 178
9/15/94

TABLE 3
OLD SOUTHINGTON LANDFILL SUPERFUND SITE
LOCATION-SPECIFIC ARARs AND TBCs

Medium	Requirements	Status	Synopsis of Requirement	Action to be taken to attain ARAR
Wetlands	Federal Executive Order on Protection of Wetlands (E.O. 11990, 40 CFR Part 6, App. A).	Applicable	Requires federal agencies to avoid impacts associated with the destruction or loss of wetlands, minimize potential harm, preserve and enhance wetlands, and avoid support of new construction in wetlands if a practicable alternative exists.	The landfill cap and the dredging of waste materials will be designed to minimize impacts to the shoreline of Black Pond. To the extent necessary, wetlands restoration and/or replication will be undertaken.
Wetlands	Federal Clean Water Act §404 - Dredge and Fill Activities (40 CFR Part 230; 33 CFR Parts 320-328).	Applicable	Requires that for dredging or filling of wetlands: no practicable alternatives exist; the activity will not cause a violation of state water quality standards or significant degradation of the water; and adverse effects will be minimized.	The landfill cap and the dredging of waste materials will be designed to meet these standards and minimize impacts to the shoreline of Black Pond. To the extent necessary, wetlands restoration and/or replication will be undertaken.
Surface Water	Federal Fish and Wildlife Coordination Act (40 CFR Part 6).	Relevant and Appropriate	Requires consultation with the Fish and Wildlife Service and state wildlife agencies to mitigate losses of fish and wildlife resulting from modification of a water body.	The landfill cap and dredging activities will be designed to minimize the impact to fish and wildlife habitats in Black Pond.
Surface Water and Wetlands	Connecticut - Inland Wetlands Regulations (RCSA 22a-39-1 through 15).	Applicable	Regulates any operation within or use of a wetland or watercourse involving removal or deposition of material, or any obstruction, construction, alteration or pollution of such wetland or watercourse.	The landfill cap and the dredging of waste materials will be designed to minimize impacts to the shoreline of Black Pond. To the extent necessary, wetlands restoration and/or replication will be undertaken.