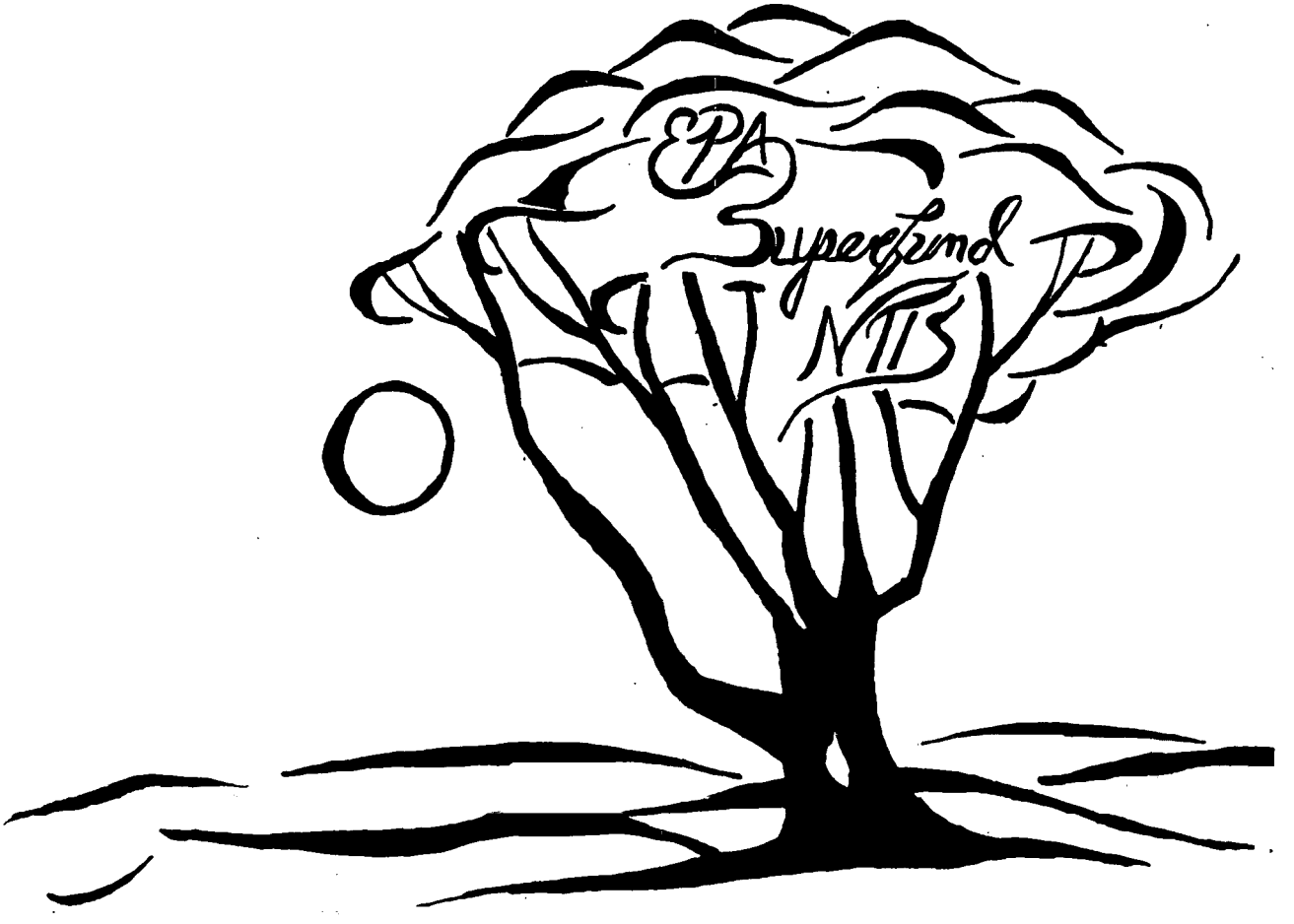
PB94-963724
EPA/ROD/R01-94/100
May 1995

EPA Superfund Record of Decision:

Old Southington Landfill (O.U. 1), Southington, CT 9/22/1994



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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SITE NAME AND LOCATION

Old Southington Landfill
Old Turnpike and Rejean Road
Southington Connecticut

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 alternati treatment technologies to the maximum extent practicab . 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.

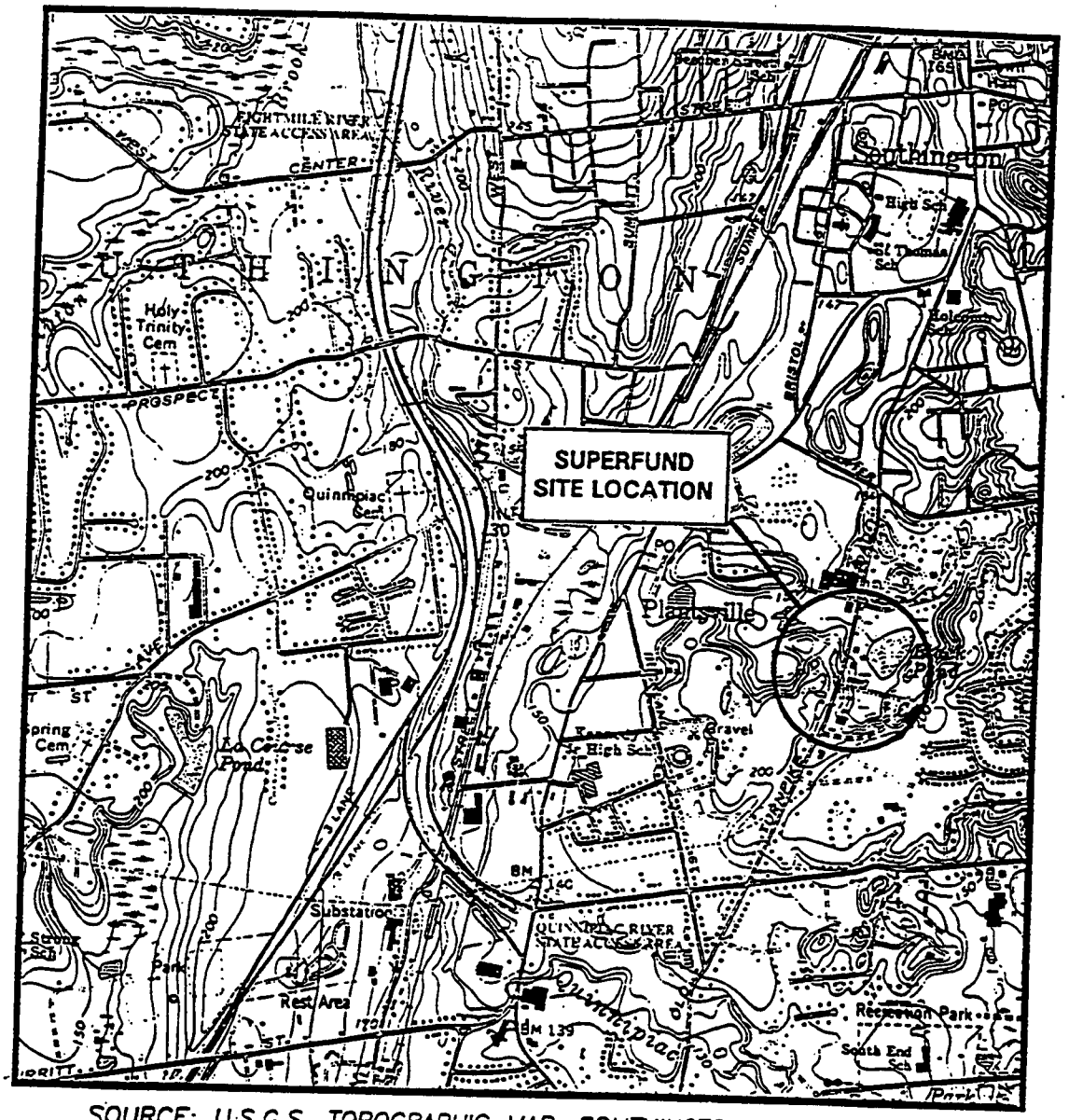
A more complete description of the Site can be found in the Remedial Investigation/Feasibility Study (RI/FS) Report Section 1.0. These documents are part of the Administrative Record which is available at the Southington Library site repository, and at the Environmental Protection Agency's Boston office.

II. SITE HISTORY & ENFORCEMENT ACTIVITIES

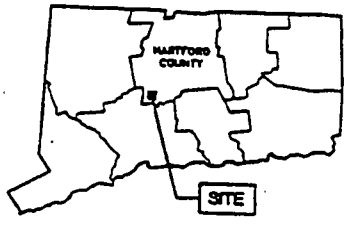
A. Land Use and Response History

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.



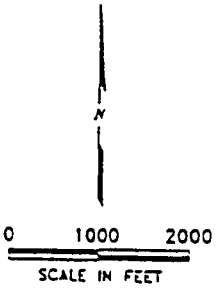
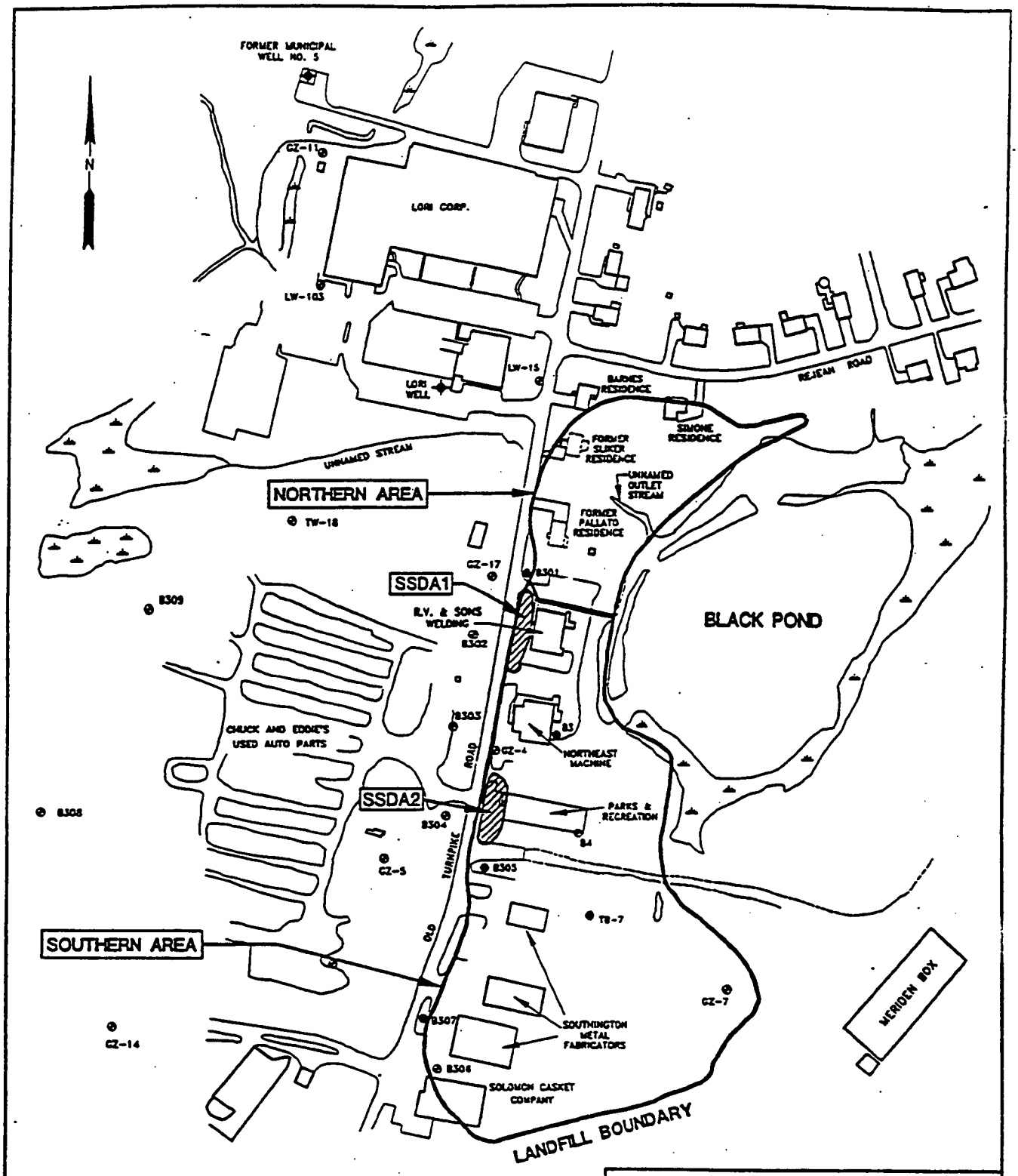


FIGURE 1

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	max	Exposure Factor (L/kg/day)	Cancer Potency Factor (mg/kg−dy)−1	Risk Estimate ave	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 Risk Assessment.
ND − not determined

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 selected 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

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. 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

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/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

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/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 [illegible]manently 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 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 6
SUMMARY OF CONTAMINANTS OF CONCERN
IN SURFACE WATER

Contaminants of Concern	Average Concentration (mg/L)	Maximum Concentration (mg/L)	Frequency of Detection
barium	0.09	0.27	11/11
carbon disulfide	0.006	0.015	4/11
chromium (hexavalent) (1)	0.002	0.01	2/11
di-n-butylphthalate	0.0007	0.0007	2/11
1,3-dichlorobenzene	0.002	0.002	2/11
1,2-dichloroethene (total)	0.005	0.009	2/11
manganese	0.57	2.21	11/11
trichloroethene	0.003	0.003	2/11
zinc	0.03	0.24	2/11

TABLE 7
SUMMARY OF CONTAMINANTS OF CONCERN
IN OUTDOOR AIR IN THE NORTHERN AREA

Contaminants of Concern	Average Concentration (mg/m3)	Maximum Concentration (mg/m3)	Frequency of Detection
benzene	3.7E−06	2.2E−05	7/7
ethylbenzene	4.9E−06	1.6E−05	7/7
styrene	3.5E−06	9.0E−06	2/7
tetrachloroethene	1.6E−07	2.1E−07	1/7
toluene	3.9E−05	2.7E−04	7/7
1,1,1−trichloroethane	1.4E−06	9.2E−06	7/7
trichloroethene	1.9E−07	4.9E−07	3/7
xylenes	2.8E−05	9.8E−05	7/7

TABLE 8
SUMMARY OF CONTAMINANTS OF CONCERN
IN INDOOR AIR IN THE NORTHERN AREA

Contaminants of Concern	Average Concentration (mg/m3)	Maximum Concentration (mg/m3)	Frequency of Detection
benzene	5.7E−05	3.4E−05	7/7
ethylbenzene	7.7E−05	2.5E−04	7/7
styrene	5.4E−05	1.4E−04	2/7
tetrachloroethene	2.4E−06	3.2E−06	1/7
toluene	6.1E−04	1.1E−03	7/7
1,1,1−trichloroethane	2.1E−05	1.4E−04	7/7
trichloroethene	2.9E−06	7.5E−06	3/7
xylenes	4.3E−04	1.5E−03	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

TREK:CAL:cl

APPENDIX D

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

TABLE 1
OLD SOUTHINGTON LANDFILL SUPERFUND SITE
CHEMICAL-SPECIFIC ARARs AND TBCs

Medium	Requirements	Status	Synopsis of Requirement	Action to be taken to attain ARAR
N/A	USEPA Human Health Assessment Cancer Slope Factors (CSFs)	TBC	CSFs are developed by EPA for health effects assessments or evaluation by the Human Health Assessment Group (HHAG).	These values present the most up to date cancer risk potency information. CSFs were used to compute the individual cancer risk resulting from exposure to contaminants.
N/A	USEPA Reference Doses (RfDs)	TBC	RfDs are dose levels developed by EPA for use in the characterization of risks due to non-carcinogens in various media.	RfDs are typically employed to characterize risks of groundwater contaminant exposure (for ingestion pathways).

TABLE 2
OLD SOUTHINGTON LANDFILL SUPERFUND SITE
ACTION-SPECIFIC ARARs AND TBCs

Medium	Requirements	Status	Synopsis of Requirement	Action to be taken to attain ARAR
Waste	Federal RCRA - Closure and Post-Closure of Municipal Solid Waste Landfills (40 CFR Part 258 Subpart F).	Relevant and Appropriate	Requires installation and maintenance of a final cover system that is designed to minimize infiltration and erosion. Also requires leachate collection, groundwater monitoring, and landfill gas monitoring.	The cap and associated systems in the northern portion of the Site will be designed to meet or exceed the closure/post-closure requirements for municipal solid waste landfills.
Waste	Federal RCRA - Emergency Preparedness and Prevention; Contingency Planning (40 CFR Part 264 Subparts C, D).	Relevant and Appropriate	Establishes requirements for minimizing the possibility of fire, explosion or release of hazardous material and contingency plan requirements in the event of fire, explosion or release from a facility.	The interim remedy will meet the substantive requirements specified in these regulations through the preparation and implementation of appropriate plans and procedures.
Waste	Federal RCRA - Closure and Post-Closure Requirements (40 CFR Part 264 Subpart G).	Relevant and Appropriate	Details general requirements for closure and post-closure of hazardous waste facilities.	The cap and associated systems will be designed to meet these requirements.
Waste	USEPA Technical Guidance - Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA/530-SW-89-047.	TBC	Presents technical specifications for the design of multi-layer covers at landfills where hazardous wastes were disposed of.	The cap and associated systems in the southern portion of the Site will be designed to meet these design specifications.
Air	Federal Clean Air Act - National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61:	Relevant and Appropriate	Establishes emission levels for eight listed hazardous air pollutants emitted from particular types of facilities.	The gas collection and treatment system will be designed to attain the NESHAP numerical standards for potential landfill gases, including benzene and vinyl chloride.
Air	Federal Clean Air Act - Non-methane organic compounds (NMOCs) (Proposed rule - 56 FR 24468, to be codified at 40 CFR Part 60 Subpart WWW).	TBC	Regulations would require NMOC-specific gas collection and control systems, monitoring, and gas generation estimates. The proposed rule would also establish a performance standard for NMOCs emissions from municipal solid waste landfills.	The proposed regulations will be considered in the design of the landfill gas collection and treatment system.
Waste	Connecticut Solid Waste Management Regulations (RCSA 22a-209-1 - 15)	Applicable	Establishes standards for the closure of solid waste disposal areas.	Those portions of the regulations that are more stringent than the federal RCRA Subtitle D regulations will be complied with.
Waste	Connecticut Hazardous Waste Management Regulations (RCSA 22a-449(c)-100 - 110)	Relevant and Appropriate	Establishes standards for the management and closure of hazardous waste facilities.	Those portions of the regulations that are more stringent than the federal RCRA Subtitle C regulations will be complied with.

TABLE 2
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, will be 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 landfill cap construction will be conducted in a manner to minimize 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 control the 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, will be designed to meet the substantive requirements of these 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 regulations 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 remedial 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 Act, they shall meet the requirements of this Act.
Water	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 discharges to surface water or groundwater, they must comply with the substantive requirements in these regulations. Specific criteria may be established for discharges so that numeric criteria established in the WQS are not violated.

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.