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EPA Superfund
Record of Decision:

PINE STREET CANAL
EPA ID: VTD980523062
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BURLINGTON, VT
09/29/1998

EPA 541-R98-130

<IMG SRC98130>

DECLARATION FOR THE RECORD OF DECISION

Pine Street Canal Superfund Site
Burlington, Vermont

STATEMENT OF PURPOSE

This Decision Document presents the selected remedial action for the Pine Street Canal Superfund Site in Burlington, Vermont, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. °° 9601 et. seg. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as amended, 40 C.F.R. Part 300. The Regional Administrator for EPA New England has been delegated the authority to approve this Record of Decision. The Regional Administrator has redelegated this authority to the Director of the Office of Site Remediation and Restoration.

The State of Vermont has concurred with the selected remedy.

STATEMENT OF BASIS

This decision is based on the Administrative Record which has been developed in accordance with Section 133(k) of CERCLA and is available for public review in Burlington, Vermont, at the Fletcher Free Public Library and Bailey Howe Library at the University of Vermont, and at the EPA New England Office of Site Remediation and Restoration Records Center in Boston, Massachusetts. The Administrative Record Index (Appendix D) identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to the public health or welfare, or to the environment.

DESCRIPTION OF THE SELECTED REMEDY

This Record of Decision sets forth the selected remedy for the Pine Street Canal Superfund Site.

The major components of the selected remedy include:

- Capping contaminated sediments in Canal and Wetland Subareas 1, 2,3,7, and 8,
- Institutional controls for groundwater below the Site,
- Institutional controls for land-use development,
- Site boundary definition,
- Long-term performance monitoring, and,
- Five-year reviews.

DECLARATION

The selected remedy is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this remedial action, and is cost-effective. This remedy does not satisfy the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances, however, it does reduce the mobility of the hazardous substances through containment. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

As this remedy will result in hazardous substances remaining on site above health-based levels and guidelines for ecological health, five-year reviews will be conducted after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

<IMG SRC 98130A>

ENVIRONMENTAL PROTECTION AGENCY
REGION I

RECORD OF DECISION

PINE STREET CANAL SUPERFUND SITE
BURLINGTON, VERMONT

SEPTEMBER 1998

PINE STREET CANAL SUPERFUND SITE

TABLE OF CONTENTS

PINE STREET CANAL SUPERFUND
RECORD OF DECISION

I. SITE NAME, LOCATION AND DESCRIPTION

The Pine Street Canal Superfund Site (VTD980523062) (the "Site"), is located on Pine Street in Burlington, Vermont, on the shores of Lake Champlain (Figure 1). The Site consists of an abandoned barge canal and turning basin, surrounding vegetated wetlands, and upland areas. It is hydraulically connected to Lake Champlain and is subject to flooding from the lake. The canal and turning basin constructed circa 1868, runs north-south on the western portion of the Site.

Studies conducted under the direction of the U.S. Environmental Protection Agency (EPA) since 1988 have examined a 70- to 80-acre area (the "Study Area") which includes the properties between Lakeside Avenue to the south, Pine Street to the east, Vermont Railway property to the north, and the Vermont Railway and Lake Champlain to the west. The Site itself is defined as a much smaller 38-acre area (within the Study Area) where contaminants associated with wastes from the manufactured gas plant have been found. Figure 2 shows the Site boundaries, as defined in this Record of Decision.

Currently, the majority of the Site is vacant. Surrounding land uses include industrial, commercial, and residential. It is estimated from 1990 census data that 1,450 people reside within a half-mile radius of the Site. The City of Burlington recognizes Pine Street as its major industrial corridor, and plans to encourage further economic development. The City also recognizes that the Site is a unique natural setting, and has in the past, considered rezoning the barge canal for recreation, conservation and open space. It is expected that future land use will be recreation/open space in the wetland areas along the lakefront, and commercial/industrial in the upland areas along the Pine Street corridor. The State of Vermont has reclassified the groundwater under the Site as Class IV, designating it suitable only for agricultural or commercial use, and prohibiting its use for drinking water purposes. Municipal sources supply potable water for all businesses and residences in the City. Several industrial facilities near the Site have deep bedrock wells that supply process water.

Wetlands comprise approximately 21 acres of the Site and support a diversity of mammals, birds, reptiles and amphibians. The wetland community types present on the Site are palustrine emergent wetland, palustrine open water, palustrine forested wetland, and palustrine scrub-shrub wetland. The wetlands and canal receive stormwater runoff from the Site and from three storm sewer culverts that drain a watershed of approximately 150 acres. The canal and turning basin are connected to Lake Champlain through a partially restricted outlet under the railroad trestle in the northwest corner of the Site. The rest of the Site consists of grassy covered open areas, scrub-shrub upland and forested upland.

Red quartzite and dolomite bedrock lies at depths of 60 to 150 feet below the ground surface, and dips to the west. Directly overlying the bedrock are glacially deposited tills and ice-marginal kame terrace deposits of silty gravel. These deposits are discontinuous. A thick sequence of laminated silts and clays lies on top of the silty gravel and/or bedrock. Overlying most of this sequence is a peat deposit. The exception is along the shore of Lake Champlain, and in the vicinity of two deltaic deposits where numerous fine to coarse sand units are found. Fill, varying in age and composition, has been deposited on much of the Site. The hydraulic gradients vary in the different geologic units and are influenced, especially in the fill, peat, and silty-sand, by precipitation recharge, canal stage, and lake stage. In general, groundwater flow is toward Lake Champlain.

Several locations on and surrounding the Site are possible candidates for the National Registry of Historic Places. Five sunken wooden barges and two marine railways are submerged within the canal itself. Several surrounding properties, including the General Dynamics facility and an old barge terminal at the end of South Champlain Street, are also important historical resources.

A more complete description of the Site and the surrounding Study Area, can be found in the Supplemental Remedial Investigation (SRI) Report (Metcalf & Eddy, March 1992), and the Additional Remedial Investigation (ARI) Report (The Johnson Company, July 1997).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land-Use History

The Site has been used for various industrial/commercial purposes since the mid-1800s, when the railroad on the western edge of the canal was built. The barge canal and turning basin were first dredged in 1868 to provide access to Lake Champlain for several lumber companies, a coal company and a boat builder. By 1879, two slips for barges, one running north from the turning basin, the second running east towards Pine Street from the middle of the canal, had also been constructed.

Around 1895, Burlington gas works, a manufactured gas plant (MGP), was constructed near Pine Street, just north of what is now the Burlington Electric Department (Figure 3). The plant used a coal gasification process to manufacture gas for the community. The Burlington gas works reportedly disposed of large quantities of coal gasification wastes, such as coal tar, fuel oil, cyanide, contaminated wood

chips, iron oxide, cinders and metals at its former location along Pine Street and in the wetland areas behind the plant. These waste materials are the primary source-of-contamination at the Site.

Disposal practices at the MGP, as well as the operations of other industries at the Site, have resulted in the infilling of wetlands and peaty soils at much of the Site. The gas plant ceased operations in 1966 and was dismantled in 1967. By 1977, both barge slips had been filled in. Naturally occurring processes, such as deposition, eutrophication, and sediment trapping in large root mats, continue to fill in the canal and turning basin today.

The first observation of visible contamination on surface water was documented in 1926, when a daily log book for the MGP noted that light tar from the plant's tar well was running into the lake. A series of oily releases to the canal occurred in the late 1960's and early 1970's.

A more complete description of the Site history can be found in the 1992 SRI and 1997 ARI Reports.

B. Environmental Responses

Many environmental studies have been conducted at the Site since the late 1970s by the State, various landowners, and EPA. A list of these studies can be found in Table 2.1-1 of the 1997 ARI Report.

In 1977 and 1978, the State of Vermont took exploratory borings for the Southern Connector highway that was proposed for the Site. The borings revealed extensive sub-surface contamination. In 1981, the State of Vermont nominated the Pine Street Canal Site as a candidate for the newly-created Superfund program. The Site was proposed for the CERCLA National Priorities List (NPL) on October 23, 1981, and listed on September 8, 1983.

In 1985, EPA Undertook an emergency removal action at Maltex Pond (see Figure 2). The Vermont Department of Environmental Conservation (DEC) provided field oversight. Six to eighteen inches of soil contaminated with coal tar were removed from the surface, mixed with limestone, solidified, and shipped off site for disposal at an approved facility. A permeable geotextile membrane was placed over the excavated area, and topped with six inches of clean topsoil. Contaminated soil was left in place below that. Today, Maltex Pond supports a diverse wetland community of plants and animals. There is no evidence that recontamination has occurred.

The Vermont Agency of Transportation investigated the Site, primarily along the proposed Southern Connector right-of-way, from 1976 to 1988. In 1988, EPA took the lead for site investigations and broadened their scope. The results of EPA's work is documented in the 1992 SRI Report. EPA also completed a Baseline Risk Assessment Final Report (Metcalf & Eddy, May 1992) and a Feasibility Study Report (Metcalf & Eddy, November 1992). Treatability studies were performed in 1992 as part of the Feasibility Study.

In November of 1992, EPA proposed a cleanup plan for the Site. The plan called for (1) the construction of a containment/disposal facility (CDF) over the most heavily contaminated portion of the Site (wetland area west of the former coal gasification plant); (2) dredging contaminated sediments from the canal and turning basin and placing the sediments in the CDF; (3) collecting mobile coal tar and coal oil; (4) on site restoration or replication of wetlands; and, (5) institutional controls to protect the integrity of the CDF and prevent ingestion of groundwater. Public comment on the 1992 Proposed Plan was overwhelmingly negative. Commenters raised several concerns about the studies, including questions about the nature and extent of ecological risk at the Site, the migration of contaminated groundwater, and air quality. In addition, commenters were concerned about the short-term health effects of excavation and the construction of a large CDF on the shores of Lake Champlain. After a six-month comment period, EPA withdrew the proposed cleanup plan due to community opposition.

After EPA's withdrawal of the proposed cleanup plan in 1993, environmental regulators, the potentially responsible parties (PRPs), and citizens and groups who had been active in commenting on the 1992 Proposed Plan, formed the Pine Street Barge Canal Coordinating Council (PSBCCC). The purpose of the council was to provide for more meaningful public involvement in the selection of a remedy. Specifically, the PSBCCC's mission was to design and oversee the implementation of additional studies to fill in data gaps from prior studies, and to recommend a proposed remedy for the Site to EPA management, The PSBCCC consists of representatives of EPA, the Vermont DEC, the City of Burlington, US Fish & Wildlife Service, The Lake Champlain Committee, The Pine Street Arts and Business Council, Ward 5 Planning Association, and the PRPs. EPA retained its statutory responsibility for final remedy selection. PSBCCC meetings were announced in the Federal Register and to local news media, and were open to the public. The unofficial minutes of the PSBCCC meetings are available as part of the Administrative Record for this Record of Decision (Appendix D).

Under the oversight of EPA and the State, and with involvement by the members of the PSBCCC, additional studies of the Site were performed in 1994-1998. The results of these studies are summarized throughout this document, and contained in the 1997 ARI Report, Supplemental Baseline Ecological Risk Assessment (SBERA) (Roy F. Weston, July 1997), and Additional Feasibility Study (AFS) RETEC May 1998). After reviewing the results of the 1997 ARI, SBERA and AFS, the PSBCCC formally recommended that EPA adopt the remedial approach contained in this Record of Decision. In May 1998, EPA released the proposed cleanup plan for remediation of the Pine Street Canal Superfund Site. A public comment period was held from June 5 to August 7, 1998.

C. Enforcement History

In 1987, 1988 and 1992, EPA notified parties who owned portions of the Site, were former owners or

operators of the gas plant, or had succeeded to the liability of former operators of the gas plant, of their potential liability and responsibility for cost of environmental response actions under CERCLA. EPA entered into negotiations with PRPs for the performance of the Remedial Investigation and Feasibility Study (RI/FS) and reimbursement of EPA's response costs in 1988, but no agreement was reached.

On June 27, 1988, EPA began the RI/FS, financed by the Superfund program. In December, 1988, EPA filed suit against three PRPs who had owned and/or operated the gas plant from 1930-1968, seeking reimbursement of costs incurred by EPA in undertaking the removal action at Maltex Pond and certain other response costs. Several additional parties were brought into the suit by the original defendants. In 1990, EPA reached a settlement with the defendants and third-party defendants. Under the terms of the settlement, EPA recovered $945,000 in past CERCLA response costs and reserved the right to seek the cost of future response actions from the parties. The settlement was approved by the United States District Court for the District of Vermont on December 26, 1990.

Following the withdrawal of EPA's 1992 Proposed Plan, the PSBCCC identified several data gaps that needed further study before another remedial alternative could be approved, and developed a statement of work for such studies. EPA and the State of Vermont issued an Administrative Order on Consent in 1994 (U.S. EPA Docket No. I-94-1065), and a second Administrative Order on Consent in 1995 (U.S. EPA Docket No. I-95-1048), under which certain PRPs agreed to undertake an Additional Remedial Investigation (ARI) and Additional Feasibility Study (AFS), and to compensate EPA and the State of Vermont for the costs of oversight over the ARI and AFS. The settling PRPs retained a contractor and conducted the ARI/AFS under EPA and DEC oversight and in cooperation with the PSBCCC.

Many of the PRPs have been active in the remedy selection process for this Site. At the time of the 1992 Proposed Plan, technical comments by several of the PRPs were submitted in writing and presented at the public hearing during the public comment period. The PRPs had three representatives on the PSBCCC, representing both generator and landowner parties. They participated fully in the development of additional studies and the recommendation of a remedy for the site, reflected in the May 1998 Proposed Plan. The PRPs endorsement of the proposed cleanup plan was received during the public comment period and is included in the Responsiveness Summary (Appendix E).

III. COMMUNITY PARTICIPATION

Community concern and involvement with the Site has varied over time. EPA's Community Relations Plan, released in December 1990, outlined a program to keep citizens informed about and involved in activities during the remedial process. Between the time of the Site's listing on the NPL in 1983, and the 1992 Proposed Plan, EPA used meetings, fact sheets and press releases to keep the community and other interested parties apprized of activities at the Site. The public's interest in the Site peaked in 1992 when EPA proposed a cleanup plan. In response to requests from the community, EPA extended the formal comment period on the proposed cleanup plan from 30 days to six months. EPA held numerous public informational meetings and a public hearing during those six months to discuss and receive comments on the proposed remedy. EPA withdrew the Proposed Plan in June 1993 in response to community opposition.

In 1993, the Pine Street Barge Canal Coordinating Council (PSBCCC) was formed to direct further studies and recommend a remedy for the Site. The PSBCCC consists of representatives of EPA, the DEC, the City of Burlington, US Fish & Wildlife Service, The Lake Champlain Committee, The Pine Street Arts and Business Council, Ward 5 Planning Association, and the PRPs. The Lake Champlain Committee received a Technical Assistance Grant under Section 117(e) of CERCLA, and used the funds to hire technical experts to advise the community representatives on the Council.

The PSBCCC retained a neutral facilitator and agreed on Organizational Protocols to guide the decision making process. Decisions were made with consensus from each party on the Coordinating Council. The Council formed technical work groups to direct each phase of the ARI/AFS which was being conducted by the PRPs' contractor. The Council and the work groups had an opportunity to comment on all interim and draft technical documents. The Coordinating Council formed a Public Participation Committee, issued printed progress updates, and held community informational meetings. All PSBCCC meetings were open to the public, and members of the public were able to make presentations to the Council.

On May 27, 1998, the PSBCCC formally recommended to the EPA New England Regional Administrator that the Agency adopt the remedy in this Record of Decision. On May 29th, EPA published a notice and brief analysis of the 1998 Proposed Plan in the Burlington Free Press, and made the Administrative Record available for public review at EPA's offices in Boston, and the Fletcher Free Public Library and Bailey Howe Library at the University of Vermont, both in Burlington.

On June 4, 1998, EPA and the PBCCC held an informational meeting to discuss and answer questions from the public about the results of the Additional Remedial Investigation and Supplemental Baseline Ecological Risk Assessment, and the cleanup alternatives presented in the Additional Feasibility Study. Also at this meeting, EPA presented and answered questions about its proposal for remediation at the Pine Street Canal Site. A 30-day public comment period opened the next day, June 5th. The formal public hearing to accept oral comments on the plan was held in Contois Auditorium in Burlington, Vermont, on June 24, 1998. The public comment period was extended to August 7, 1998. Several comments from the public were received and were considered in the development of the final Record of Decision. Appendix E contains a summary of the comments received during the public comment period and EPA's responses, indicating how they have been considered in the final Record of Decision.

IV. SCOPE OF REMEDIAL RESPONSE ACTION

The selected remedy was developed by combining components of different source control and management of migration alternatives to obtain a comprehensive approach to address the environmental and public health risks posed by the Site. In summary, the remedy provides for the following actions.

- Capping Contaminated Sediments in Subareas 1, 2, 3, 7, and 8 (Figure 7). A cap of sand and silt will be placed over contaminated sediments to reduce exposure of benthic organisms, amphibians and bottom-feeding fish to elevated concentrations of polycyclic aromatic hydrocarbons, and to reduce mobility of contamination to overlying surface waters within the canal and lake.

- Site Boundary Definition. The boundaries of the Site are defined by the extent of wastes related to the gas plant. The Site is smaller than the original "Study Area", and allows for redevelopment of parcels surrounding the Site.

- Institutional Controls for Groundwater below the Site. Prevents the use of on-site groundwater as drinking water.

- Institutional Controls for Land-Use Development. Prevents land uses that could result in unacceptable risks to human health, such as residential use, use as a children's day care center, and most excavations below five feet.

- Long-term Performance Monitoring. Monitoring of groundwater, stormwater, surface water, sediment and cap performance per a regular schedule to ensure that the selected remedy remains protective over time.

- Five-year Reviews. Ensures that the remedy continues to provide adequate protection of human health and the environment in the future.

Remedial activities at the Site are comprehensive and intended to be a final remedy.

V. SUMMARY OF SITE CHARACTERISTICS

The significant findings of the environmental investigations conducted at the 70- to 80-acre Study Area are summarized below. This summary integrates findings from both the 1992 Supplemental Remedial Investigation (SRI), and the 1997 Additional Remedial Investigation (ARI). The 1998 Additional Feasibility Study (AFS) Report also contains an overview of the remedial investigation. This Record of Decision defines the Site as a smaller 38-acre area, within the Study Area, where contaminants associated with wastes from the manufactured gas plant have been found (Figure 2).

A. Waste/Source Areas

The primary contamination at the Pine Street Canal Site is waste material from the Burlington gas works, which operated from about 1895 to 1966. Those wastes are residuals or by-products from the coal gasification process and include aromatic hydrocarbons such as benzene, toluene, ethylbenzene, and xylene (known as "BTEX"); polycyclic aromatic hydrocarbons (PAHs) in the form of light and heavy tars; and, cyanides and sulfur compounds. These wastes also contain inorganics such as aluminum, antimony, cobalt, nickel, iron, titanium, manganese, arsenic, lead, chromium, copper, vanadium, zinc, cadmium, molybdenum, and selenium. Wood chips, probably contaminated with tar, iron filings, and complex forms of cyanides, are reported to have been disposed of at the Site. Remedial investigations reveal the presence of many of these chemicals across the Site, with PAHs being the most widespread and in the highest concentrations (Figures 4, 5, and 6). Concentration gradients tend to decrease towards the edges of the plumes.

Other historical activities on or abutting the Site may have also contributed PAHs, oils, solvents, volatile organic compounds (VOCs), and metals to the Site. These include boat building, asphalt plants, auto junk yard, oil storage, metal fabrication and finishing operations, railroad operations and helicopter and Gatling gun manufacturing, as well as fill. Current urban activities provide a continuing source of PAHs, such as auto emissions.

The current primary source of contaminants is an extensive area of non-aqueous phase liquid ("free phase" waste coal tar and coal oil), or NAPL, in the subsurface beneath the canal and the wetlands area west of the former gas plant (Figure 4). The presence of NAPL has been confirmed to a depth of 24 feet. The volume of NAPL-contaminated soils is estimated to be more than 200,000 cubic yards. The NAPL is found most extensively in the peat and fill layers.

B. Surface and Subsurface Soils

1. Surface Soils

The 1992 SRI found that surface soils (top 6 inches) were contaminated with PAHs in much of the Study Area. Surface soils with PAHs in the highest concentrations were located west of the former coal gasification plant, particularly in the wetlands. Other organic chemicals were detected in surface soils infrequently and in low concentrations. Metals are prevalent at varying concentrations - most were slightly elevated when compared to background levels. Chromium, cyanide, lead, barium, iron, and selenium concentrations were elevated in the wetlands

west of the former coal gasification plant and the wetlands south of the Burlington Electric Department.

During the 1997 ARI, shallow surface soil (top 4 inches) in areas of likely human access were resampled. The highest and mean PAH values detected in immunoassay screening in these areas were 10 ppm and 1.3 ppm, respectively. The highest PAH laboratory values were in the turning basin access area (21.7 ppm) and along Pine Street (24 ppm). The maximum values for metals by laboratory analysis were 80 ppm for lead and 86 ppm for zinc. These concentrations are lower than the Reasonable Maximum Exposure concentrations used for the 1992 Baseline Risk Assessment for human health (Metcalf & Eddy, May 1992).

Deeper surface soil samples (top 12 inches) were collected in the 1997 ARI in an area of stained soil and stressed vegetation north of the Burlington Electric Department. Concentrations of PAHs and metals in these samples were lower than the rest of the Site. Four pesticides and amenable cyanide were found in concentrations near the detection limits.

2. Subsurface Soils

Subsurface soil contamination (deeper than 12 inches) was delineated in the 1992 SRI. No additional subsurface soil sampling was conducted in the 1997 ARI. Highly elevated coal tar, PAH, BTEX, and cyanide concentrations were found in subsurface soils within the wetlands west of the former coal gasification plant, where NAPL is present. Based on the stratigraphy at the Site, it is believed that the majority of the contamination is within the peat and fill layers to a depth of 24 feet. Dissolved BTEX compounds are also present in subsurface soils outside the free-phase NAPL area. Metal concentrations in subsurface soil vary widely across the Study Area and are highest in four areas: the wetlands west of the former coal gasification plant; the filled south barge slip; subsurface sediments of the canal; and, near the industrial landfill at the northern property line of General Dynamics (formerly Lockheed-Martin/GE).

C. Groundwater Contamination and Migration

1. Groundwater Contamination

Groundwater contamination was characterized primarily in the 1992 SRI. The 1997 ARI studies concentrated on the groundwater below the portion of the Study Area that is west of the canal, and the potential for contamination to migrate to Lake Champlain. The two studies revealed that the major contaminants in the overburden hydrogeologic units are PAHs, BTEX, and cyanide. PAHs are present at concentrations up to 78 ppm, BTEX to 25 ppm, and cyanide to 755 ppb. The areal extent of PAHs in groundwater is similar to that found in subsurface soils (Figure 5). The highest concentrations of PAHs are present in groundwater west of the former coal gasification plant in the fill/peat and upper silt/clay zones. PAHs are also present in groundwater south of the Burlington Electric Department and the former tank farm area north of the turning basin. The distribution of BTEX compounds in groundwater is similar to that of PAHs but extends farther in all directions. Benzene has migrated through a sand unit to the west of the canal but may be localized in the vicinity of monitoring well MW-17 (see Figure 6). The extent of cyanide in groundwater is limited to areas with PAH and BTEX contamination. To date, no groundwater contamination has been detected in bedrock monitoring or water supply wells.

2. Groundwater Migration

Groundwater flow and potential dissolved contaminant transport directions at the Study Area are predominantly toward Lake Champlain. Dissolved contaminants in groundwater are found primarily in areas where free-phase coal tar (NAPL) is present in the subsurface. Groundwater contamination has been detected between the canal and the lake at monitoring well MW-17, and at boring location PZ-3 (Figure 4) where NAPL was encountered. In the area west of the canal, only benzene was found at levels greater than the Maximum Contaminant Level (MCL), the levels set by EPA for protection of drinking water. Models using conservative assumptions suggest that benzene migration to the lake at levels above the MCL is unlikely.

D. Surface Water

Surface water in both the canal and Lake Champlain was characterized in the 1992 SRI. Relatively low levels, at or near the detection limits, of volatile and semi-volatile organic compounds were detected in the canal. Metal concentrations were generally less than those found in groundwater. Samples of lake water were collected just off shore from the Study Area, and up to 450 feet from the Study Area. Adjacent lake samples did not contain elevated levels of site-related contaminants (PAHs, benzene, toluene, and xylene). Nine metals were detected in Lake Champlain surface water, but at concentrations that increased with increasing distance from the Study Area suggestive of other sources. No PAHs were detected in stormwater inflow to the canal, but thirteen metals were detected.

Water quality data (pH, temperature, specific conductance, and dissolved oxygen) for the canal included measurements taken during June and August 1990 and a continuous monitoring program conducted in 1994 and 1995. Dissolved oxygen levels range from 0.9 to 11.7 mg/L. The higher oxygen levels are at the surface of the canal, the lower levels occur near the bottom. The variability of dissolved oxygen may be attributed to high sediment oxygen demand associated with eutrophic conditions in the canal. A detailed discussion of water quality information is in the 1997 ARI.

E. Sediments

A thorough characterization of shallow (top 4 inches) sediments in the canal and wetlands during the 1997 ARI revealed extensive PAH contamination (mean concentration of 505.5 ppm), with the highest levels (up to 29,360 ppm) in the northern part of the canal and turning basin. Concentrations of metals and cyanide were also elevated in shallow canal and bordering wetland sediments. Concentrations of cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc exceeded their published ecological effects guidelines (Long et al., 1995; Jaagumagi et al., 1995).

F. Air

Air sampling was conducted during the 1992 SRI and 1997 ARI. The results indicate that during undisturbed conditions, that is when the soil and sediments at the Site are not stirred up, there is no impact on the local ambient air.

G. Ecological Resources/Wetlands

1. Ecological Setting

Approximately 21 acres of the Site are represented by four wetland community types. These are palustrine emergent wetland (7.5 acres), palustrine open water (6.2 acres), palustrine forested wetland (3.7 acres) and palustrine scrub-shrub wetland (3.7 acres). (Palustrine refers to a specific wetland system that is nontidal and dominated by trees, shrubs and emergent vegetation.) The remaining 17 acres of the Site are upland scrub-shrub and forested communities, and open grassy areas typical of disturbed urban areas. Pine Street Canal Site wetlands rated high in a wetlands functions and values assessment based on the presence of physical (abiotic) elements and vegetation (plant assemblages). The wetlands rated high because structural elements exist for promotion of wildlife and aquatic habitat, nutrient removal/transformation, sediment/toxicant retention, and production export. These wetlands have the potential to provide the following ecological and socio-economic services: temporary storage of stormwater runoff, surficial-flow stormwater quality enhancement, fisheries habitat, wildlife and migratory bird habitat, and open space and aesthetics. Based on a computer simulation model (WEThings), wildlife surveys and best professional judgement, the wetlands have the potential to support a variety of mammals, reptiles, fish, and amphibians, based on the interspersion and juxtaposition of vegetation and abiotic structural elements.

The wetlands are heavily influenced by the canal's connection to Burlington Bay and, to a lesser extent, by the inflow from several culverts connected to the Burlington sewer/stormwater system. Much of the wetland is flooded in spring when the level of Lake Champlain is normally at its highest annual elevation. Water levels in the canal typically recede through the summer, fall and winter as lake levels recede. During these seasons, inflow from surface runoff become a more important factor, During the period of study, beaver dams in the southern portion of the canal and near the outlet of the turning basin to the lake influenced water levels in the canal and wetlands.

The Pine Street Canal Site wetlands and uplands have the potential to form a distinct ecological community, unique in that it is in an urban setting less than a half mile from the center of Burlington. However, the Study Area has been dramatically altered by human activity and is currently impaired. The cessation of industrial operations within the last two decades has allowed some portions of the Study Area to revert back to a more natural state characterized by early successional vegetation (succession may be delayed due to impairment) and wildlife not common to an urban setting. The Study Area attracts a diversity of seasonal migratory wildlife and resident wildlife, which may be exposed to contaminated sediments directly or indirectly through the food chain. No rare, threatened, or endangered species were identified in the Pine Street study area.

2. Ecological Studies

The Pine Street Canal Site ecosystem has been studied extensively. During the 1992 SRI, the aquatic environment at Pine Street was surveyed and compared with that of Malletts Creek, to determine if any differences are the result of contamination. Malletts Creek, which drains to Lake Champlain approximately eight miles north of the Site, was selected as a reference site because it has physical and biological characteristics similar to the Pine Street Canal ecosystem but has not been influenced by historic disposal activities. Wildlife surveys, wetland delineation and vegetation mapping, and a wetland functional assessment were conducted. Studies of samples taken from benthic invertebrate, fish and zooplankton showed that the invertebrates inhabiting the canal sediments at the Site appeared to be greatly affected by the environmental conditions in the canal, as demonstrated by some abiotic areas and the dominance of opportunistic species (tubificid worms). The aquatic communities appeared to be less affected by contamination. However, EPA interim sediment quality criteria were exceeded for acenapthene, fluoranthene and phenanthrene in the canal and turning basin sediments, and it was noted that the fish communities were more likely to be exposed to contaminated sediments, during feeding, spawning, and when using the canal as a nursery.

The 1997 ARI focused on the Site's ecological resources and included a wetland habitat assessment, chemical screening of surficial sediments for PAHs and metals, an avian dietary study through the collection of site-specific aquatic insect tissue, a fish biomarker study, fish tissue sampling, and sediment toxicity testing. Shallow sediment and soil samples from the entire Study Area were screened for PAHs and metals. Using a threshold value of 40 ppm total PAH, an area of focus was delineated. The focus area was divided into eight subareas on the

basis of topography, bathymetry, vegetation type, and contaminant concentrations (Figure 3). Sediment samples were collected in each of these eight subareas for chemical characterization and toxicity testing. The highest PAH concentrations (over 1000 ppm) were found in the northern portion of the canal and in the turning basin. The remainder of the canal had lower, but still elevated, PAH concentrations. High metals concentrations (primarily aluminum, barium, cadmium, chromium, copper, and zinc) in relation to site-wide averages were found in the south end of the wetland west of the canal, in the northern portion of the canal, in the turning basin, and in the wetlands south of North Road.

The results of the sediment toxicity testing program indicated at least one or more toxicity tests in each area within the canal and turning basin in which benthic invertebrate and frog embryos exhibited statistically significant decrease in growth and survival rates compared to the on-site reference location in the wetlands west of the canal. The areas showing the most consistent statistically significant toxic responses in the tests were the turning basin and canal and the area between Burlington Electric Department and Lockheed-Martin, and the wetlands south of North Road. A fish biomarker study was performed using brown bullhead to evaluate exposure of bottom feeding fish to PAH contaminants. The level of biochemical biomarkers (Cytochrome P4501A) indicates the fish from the Site have greater exposure to PAHs than fish from the reference site. No statistically significant differences in cellular or organ level biomarkers were observed, possibly suggesting that, although fish were exposed to PAHs at the Site, the levels of exposure could not be correlated to adverse physical effects. However, because fish caught from both the Site and reference site were relatively young, they are not necessarily expected to have high frequencies of these physical abnormalities. Avian receptor modeling, incorporating the data from the avian dietary study, and using conservative assumptions, shows that exposure of birds to PAHs and metals through the ingestion of fish and insects is not expected to be significantly greater at the Pine Street Canal Site than at the reference site.

VI. SUMMARY OF SITE RISKS

In 1992, EPA performed a risk assessment to estimate the probability and magnitude of potential adverse human health and ecological effects from exposure to contaminants found at the Site (Baseline Risk Assessment Final Report, Metcalf & Eddy, May 1992). One of the tasks of the Coordinating Council was to reexamine certain aspects of the human health risk assessment. Their conclusions are documented in a series of position papers which are summarized below in Section A.3. Ecological risk was revisited in the Supplemental Ecological Baseline Risk Assessment (Weston, 1997) with Coordinating Council oversight, using additional data collected during the 1997 ARI.

A. Human Health Risk Assessment

Carcinogenic and noncarcinogenic risk estimates were developed in the 1992 Baseline Risk Assessment (Metcalf & Eddy, May 1992) and evaluated against EPA's criteria and target risk range to identify the need for remedial actions at the Site. The following section presents the findings of the human health risk assessment first. These are followed by a summary of the risk assessment process, and subsequent reevaluation by the Pine Street Barge Canal Coordinating Council. For a more complete discussion, see Section 2 of the Baseline Risk Assessment Final Report.

1. Findings

The most significant human health risk at the Site is associated with potential residential ingestlon of groundwater. Estimated carcinogenic risk in groundwater exceeded EPA's target risk range of 10 -4 to 10 -6 by orders of magnitude. Non-carcinogenic risks estimated for ingestion exceed it hazard index of 1. However, the State of Vermont has reclassified the groundwater under the Site as Class IV, designating it suitable for agricultural or commercial use only, prohibiting its use as drinking water (Appendix B of 1998 AFS). Furthermore, the Pine Street Canal Site is in an area that has been used for industrial purposes for over 130 years and is currently zoned for industrial use. It is located in a 100-year floodplain and contains extensive wetlands. These factors make residential development and use of groundwater at the Site for drinking unlikely.

Carcinoclenic and non-carcinogenic risk estimates for all of the other exposure pathways evaluated were below, within, or close to EPA's target risk range. Therefore, there are no unacceptable risks from Site contaminants to swimmers in Lake Champlain, current Site visitors, outdoor workers exposed to soils above a depth of 5 feet, or future visitors (adults and children) to an area which may be zoned as recreation, conservation, and open space.

2. 1992 Human Health Risk Assessment

The human health risk assessment followed a four step process: a) contaminant identification, which identified those hazardous substances that, given the specifics of the Site, were of significant concern; b) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; c) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; and, d) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks carcinogenic and non-carcinogenic risks posed by hazardous substances at the Site. The results are summarized below.

a. Contaminant Identification

Several Contaminants of Concern (COCs) were selected to represent potential Site-related hazards based on toxicity, concentration, frequency of detection, mobility, and persistence in the environment. The chemicals preselected as COCS included coal gasification process-related chemicals PAHs and cyanide, volatile organics, non-PAH semi-volatile organics, and metals. There were a total of 45 COCS for groundwater, 27 for soil, 32 for sediment, and 24 for surface water, for a total of 56 COCs found in one or more of the four environmental media. The complete list of human health COCs for the Pine Street Canal Site can be found in Table 1 of this Record of Decision

b. Toxicity Assessment

Each COC was evaluated in terms of the scientific evidence of toxicity and information relating to chemical exposures (dose), and anticipated health effects (response). This information was used to quantitatively evaluate the exposure assessment models (discussed below). Detailed toxicity assessment data for each COC can be found in Appendix C of the 1992 Baseline Risk Assessment Final Report.

c. Exposure Assessment

Potential human health effects were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to COCs based on the present uses, potential future uses, and location of the Site. Currently, the Site is a mixture of industrial/commercial and undeveloped areas which include wetlands, open water, and upland forest and fields. Future land-use assumptions are: 1) the Site will not be used as a residential area; 2) a highway may be built through a portion of the Site; and 3) part of the Site along the waterfront may be developed as a recreation/conservation/open space area.

The following is a brief summary of the exposure pathways evaluated and the assumptions used to model exposure. For each pathway evaluated, average and reasonable maximum exposure estimates were generated using average and maximum concentrations detected in that particular medium.

i. Present and future incidental ingestion of water, and dermal adsorption of water and sediment by swimmers in Lake Champlain close to the canal.

An adult was assumed to swim in Lake Champlain regularly (36 days/year) for 2.5 hours/day over a 30-year residency period. It assumes an incidental ingestion of 50 ml of water per hour of swimming, a chemical-specific dermal permeation constant for water, and 500 mg of lake sediment adhering to the swimmer's skin.

ii. Present and future incidental ingestion of water, and dermal absorption of water and sediment by persons falling into the canal.

An adult was assumed to be exposed to canal water and sediment at a frequency of two one-hour periods per year for 30 years, using the same exposure assumptions as a lake swimmer.

iii. Present incidental ingestion and dermal absorption of surface soils and sediments by Site visitors.

The frequency of Site visits was assumed to be twice per month for both adults and children, using the standard ingestion and dermal absorption assumptions that are presented in "i" above.

iv. Present and future incidental ingestion and derinal absorption of soils not deeper than five feet by outdoor maintenance workers in the southern and northern parts of the Site.

It was assumed that adult exposure would continue over a full period of employment, 250 days per year for 25 years, using the standard ingestion and dermal absorption assumptions that are presented in "i" above. (Given the climate in northern Vermont, this is a conservative exposure assumption.)

v. Future incidental ingestion and dermal absorption of soils and sediments by frequent visitors under a recreation/conservation/open space scenario.

It was assumed that adults and children would be exposed five days/week from May through October (130 days/year), to an area of the site that is expected to be developed as a recreation/open space area in the future. Standard ingestion and dermal absorption assumptions as in item "i" above were used. (Given the climate in northern Vermont, this is a conservative exposure assumption.)

vi. Future ingestion of groundwater as a source of potable domestic water.

This scenario was evaluated during the 1992 Baseline Risk Assessment because the

groundwater underlying the site was classified, at that time, as a potential drinking water source. Since then, the Vermont Agency of Natural Resources has reclassified the groundwater for nonpotable uses only. Given that, and the fact that there is an ample alternative water supply (Lake Champlain) provided by the City of Burlington, it was determined groundwater at the Site is unlikely to be used as a drinking water source in the future.

d. Risk Characterization

Excess lifetime cancer risks were determined for each exposure pathway (i-vi) 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 x 10 -6 is 1/1,000,000. One x 10 -6 means 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 to 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 (i-vi) as EPA's measure of the potential for non-carcinogenic health effects. First, a hazard quotient is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects for an individual compound. RfDs reflect a daily exposure level that is unlikely to result in the increased risk of an adverse health effect. EPA has developed RfDs to protect sensitive individuals over the course of a lifetime. RfDs are derived from epiclemioloalcal 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 sum of hazard quotients for compounds that have the same or similar toxic endpoints (e.g., the hazard, quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage) is the hazard index.

As stated above in Section A.1., the human health risks posed by the Site were generally in EPA's target risk range, and do not pose an unacceptable risk. The risks associated with ingestion of groundwater would be unacceptable; however, it is unlikely that the Site will be used as a drinking water source.

3. Refinement of Human Health Risk Assessment

In 1993, the Pine Street Barge Canal Coordinating Council identified several human health exposure pathways as requiring additional consideration beyond the 1992 Baseline Risk Assessment. Position papers on these issues were developed by the technical experts advising the Coordinating Council, and were subsequently adopted by the council. The conclusions drawn in the position papers helped council members as they directed studies to fill data gaps during the 1997 ARI. The position papers can be found in Appendix 7 of the 1997 ARI. The following summarizes the results of the additional exposure pathways.

a. Exposure to shallow soil

Additional surficial soil samples were collected from accessible areas of the Site during the 1997 ARI. The contaminant concentrations in these additional surficial soil samples were below those used for the 1992 Baseline Risk Assessment, thus confirming the previous conclusion that there is no unacceptable human health risk to site visitors from exposure to Site soils.

b. Air

Additional air samples collected during the 1997 ARI confirmed that the Site, in an undisturbed state (i.e., neither soil nor sediments recently dug up), does not adversely affect the local ambient air.

c. Groundwater

A risk assessment screening for the use of Site groundwater for agricultural and commercial purposes (consistent with the current Class IV designation) found that there is no unacceptable risk associated with agricultural, commercial or industrial use. Possible exposure pathways associated with commercial or agricultural use include dermal contact and inhalation of groundwater, but not ingestion.

d. Fish consumption/metals

Based on an evaluation of metals, a risk screening concluded that a person would have to consume multiple whole fish meals per week, 52 weeks per year, to experience unacceptable risk from arsenic, cadmium, and silver. It is not likely that consumption of whole fish

(including internal organs) from the canal occurs at this level. Mercury levels posed an unacceptable risk at a consumption rate of one whole fish meal per month. However, mercury contamination is a regional problem, which is not limited to the Site.

e. Fish consumption/PAHs and metabolites

A search of research literature shows that it is not likely that there is an unacceptable risk from the consumption of fillets from fish exposed to PAHs or their metabolites.

f. Subsurface soil

Given the high water table and structurally weak soils, the Coordinating Council believed that it is unlikely that development of the site would result in excavations below five feet, in which case there would be no exposure to these deeper soils. However, as discussed below in the Description of the Remedy, because of the uncertainty of predicting future building techniques, the selected remedy includes a requirement that legal controls be established to limit worker exposure to subsurface soils to frequencies that will assure protection of human health.

g. Exposure to Site contaminants in Lake Champlain water

The 1997 ARI studies regarding fate and transport concluded that contaminants are not reaching Lake Champlain through groundwater migration or through sediment transport at concentrations exceeding their Maximum Contaminant Levels (levels set to protect drinking water). This confirms the previous conclusion that there is no unacceptable Site- related human health risk to persons swimming in Lake Champlain or using it as a drinking water source.

h. Synergy and antagonism of PAHs

The question of synergistic and antagonistic effects was not answered directly by the risk assessment methodology since this is an area that continues to be the subject of much research. However, the Coordinating Council concluded that EPA's original Human Health Risk Assessment was based on assumptions that were sufficiently conservative to accommodate the possibility of some synergistic effects between chemicals.

i. Children's day care scenario

It is possible, under current zoning ordinances, that a day care center for children could be developed on site. A risk screening analysis indicated that there would be some concern for a child's exposure to areas of the Site with elevated lead levels in the soil. In addition, although carcinogenic PAHs are not expected to result in an elevated risk of internal cancers, there is also a concern for dermally toxic effects to children from exposures to carcinogenic PAHs in Site soils.

B. Ecological Risk Assessment

Two ecological risk assessments were conducted at Pine Street Canal Superfund Site. The first as part of the 1992 Baseline Risk Assessment. A supplemental baseline ecological risk assessment (SBERA, Weston, July 1997) was conducted under a workplan developed by the Pine Street Barge Canal Coordinating Council. The findings of the risk assessments are presented first in the section below. This is followed by summaries of the two risk assessment processes.

1. Findings

The ecolocrical risk assessments indicate that actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision, mail present an imminent and substantial endangerment to the environment. Specifically, contaminants in sediments in Subareas 1, 2, 3, 7, and 8, appear to be responsible for statistically significant adverse effects in benthic organisms and amphibians exposed to these sediments. While there are findings of ecological significance associated with individual measurement endpoints, in Subareas 4, 5, and 6, these lines of evidence are not as compelling and do not appear to constitute a baseline ecological risk.

The SBERA identified statistically significant ($P< 0.05$) adverse effects in aquatic invertebrates or amphibians exposed in the laboratory to sediments collected from subareas 1, 2, 3, 7 and 8, relative to reference or control sediment. Significant reductions in 10 day growth and survival were observed in freshwater, larval midge (Chironomus tentans) or amphipod (Hyalella azteca) tests using samples from these subareas. Significant reductions in 30 day (full life-cycle) survival and emergence of the midge were also observed. The magnitude and/or frequency of adverse effects in the bacterial bioassay, Microtox R, was greatest in samples from Subareas 1, 2, 3, 7 and 8. Mean embryo survival in amphibian (frog) bioassays were significantly reduced in exposures to sediment ftom the wetland south of North Road (Subareas 2 and _33), relative to reference or control sediment.

Conclusions from the ecological risk assessment include the following:

- PAHs and metals exceeded sediment guidelines published by NOAA (Long et al., 1995) and

Ontario Ministry of Environment and Energy (OMEE) (Persaud et al., 1993) indicating that the level of sediment contamination would be responsible for a pronounced disturbance to sediment-dwelling organisms and the contaminant concentration will be detrimental to the majority of benthic species.

- Data from the 1994 sampling event identified that draft EPA sediment quality criteria were exceeded by acenapthene, fluoranthene and phenanthrene in the turning basin (Subarea 8) and 1995 data exceeded criteria for acenapthene and phenanthrene in the canal (Subarea 1).

- Biochemical biomarker levels and PAH metabolite levels detected in fish bile samples for brown bullheads were statistically significantly higher than corresponding levels for fish collected in the reference area. Therefore, bottom feeding fish are more likely exposed to sediment contaminants that could be responsible for adverse effects to that fish community.

- There was 100% mortality among frog embryos exposed to sediments from the southern section of the Canal. In addition, embryo survival was significantly reduced when exposed to sediments from the wetland south of North Road.

The response action selected in this Record of Decision addresses the risks at the Site in Subareas 1, 2, 3, 7 and 8, by covering the contaminated sediments with a cap of sand and silt. This creates a barrier between the contaminated sediments, which were found to cause adverse effects, and wildlife, thereby preventing or limiting direct exposure and reducing the associated risk.

2. 1992 Ecological Risk Assessment

Risks to mammals, birds, fish and amphibians that live in terrestrial, emergent wetland, wooded wetland, and aquatic habitats at the Site were evaluated for exposure to PAHs, benzene, toluene and xylene in soils and sediment. Target species, or species groups such as the benthic organisms, were identified and evaluated against measures of exposure and effects such as, comparisons to chemical concentrations in sediments to criteria, and guidance values and sediments toxicity testing using benthic invertebrates and frog embryos. Specific bird species were evaluated by calculating food-chain models with site-specific aquatic insect tissue contaminant concentrations. These predicted body burdens for target avian species were compared to literature values to determine whether the burded could be responsible for an adverse effect to reproduction, growth and survival. All potential exposure pathways were evaluated including ingestion of contaminated media and biota, inhalation, and dermal exposures from contaminants in, or volatilizing from, surface soils and sediments.

The results of the quantitative assessment revealed that contaminated canal sediments have demonstrable adverse effects to benthic organisms. Site soils, particularly in emergent wetland areas, also have the potential for causing adverse effects to mammals, like the muskrat, from dermal exposure. Ecological effect levels (defined as the concentration of a contaminant in a specific medium below which no adverse effects are likely to occur) were developed based on 1) established numerical criteria (i.e., EPA's Draft Interim Sediment Quality Criteria, NOAA's ER-Ls and ER-Ms and OMEE's LELs and SELs) for aquatic areas, and 2) exposure pathway modeling using general- and site-specific data for wetland and upland habitats. Mammals (beavers, muskrats, and mink) were selected as representative organisms for the wetland and upland areas since their activities would bring them into direct contact with contaminated wetlands or uplands areas.

Ecological effect levels, converted to equivalent total PAH levels, were then compared to observed Site concentrations to determine the magnitude of baseline risk. Ecological effect levels for total PAHs in emergent wetland surface soils were 13.7 mg/kg (based upon a dermal exposure of muskrats to benzo(a)pyrene), in wooded wetland surface soils within 10 feet from the canal bank were 24.8 mg/kg (based upon a dermal exposure of beavers to benzo(a)pyrene), in wooded wetland surface soils more than 10 feet from the canal bank were 878.4 mg/kg (based upon ingestion exposure of beavers to benzo(a)pyrene), and in upland surface soils were 160.6 mg/kg (based upon ingestion exposure of Peromyscus mice to benzo(a)pyrene). For volatile organics, the effect level was 0.286 mg/kg (based upon an inhalation exposure to benzene) for all wetland and upland habitats. Ecological effect levels for total PAHs in canal surface sediments were 42.4 mg/kg (based on the interim sediment quality criterion for phenanthrene and a five percent total organic carbon content).

In emergent wetland areas and wooded wetland areas within 10 feet of the canal bank, effect levels were less than the respective mean and maximum observed Site concentrations in surface soils, suggesting, potential adverse effects to mammals. For wooded wetland areas more than ten feet from the canal bank, the total PAH effect level exceeded the maximum observed soil concentration, suggesting that risks in these areas are neglialble. PAH concentrations in the Canal surface sediments exceeded interim sediment quality criteria for three of the six compounds with existing criteria values. Thus, the potential for adverse effects from exposure to Canal sediments is relatively high. This was supported by field observations of adverse effects to benthic organisms inhabiting the Canal sediments. In upland areas, effects levels were less than the maximum observed Site concentrations in surface soils but greater than the observed mean soil concentrations. This suggests that potential adverse effects would be limited to relatively small areas with high concentrations, such as the area of the former coal gasification plant. All potential exposure pathways were evaluated including ingestion of contaminated media and biota, inhalation, and dermal exposure from contaminants in, or

volatilizing from, surface soils and sediments.

3. 1997 Supplemental Baseline Ecological Risk Assessment (SBERA)

In 1993, the Pine Street Barge Canal Coordinating Council convened an Ecological Work Group to address data gaps and to re-evaluate the ecological risks associated with the Site. The Ecological Work Group, comprised of technical experts representing EPA, the State of Vermont, the PRPs and the citizen members of the Coordinating Council reached consensus on additional work necessary to re-evaluate the ecological risks, agreed upon a weight of evidence approach to evaluating the resuits of the data, and provided input into the preparation of the SBERA (Weston, 1997). The SBERA augments the 1992 Baseline Risk Assessment.

The additional investigatory work proposed by the Coordinating Council was performed by the PRPs in 1994-95 for the ARI. The ARI was completed in phases. Phase I included extensive surficial soil sampling and screening for PAHs and metals. Using a threshold value of 40 ppm total PAH, the Ecological Work Group delineated an area of focus within the Study Area. The focus area was divided into eight subareas on the basis of physical characteristics and contaminant concentrations (Figure 3). Phase II of the ARI included fish biomarker studies, aquatic insect tissue collection analyses, and, in each subarea, chemical analyses and sediment toxicity testing using two species of benthic invertebrates (Chironomus tentans and Hyalella azteca) and the frog embryo, Xenopus laevis. A summary of ecological contaminants of concern in sediment can be found in Table 2 of this Record of Decision.

The SBERA outlines the potential effects of site contaminants on ecological receptors. The assessment methods used consider various endpoints and effects that differ in their suitability for and sensitivity to assessing potential risks at the site. In assessing ecological risk, a number of endpoints are measured and evaluated to provide a weight of evidence to the assessment of risk. The weight of evidence approach is a process by which measures of exposure and effects are evaluated against the target species or species groups to evaluate whether a significant risk of harm is posed. The weights of evidence for ecological endpoints were agreed upon by the Ecological Work Group prior to evaluation of the ARI data and potential ecological effects (see Appendix C of the SBERA).

Section 4.3 of the SBERA report discusses the risk estimates and an interpretation of the ecological significance of those estimates. Risk estimates consist of two primary elements, the weight of evidence analysis and the interpretation of ecological significance. The weight of evidence analysis the results of the risk estimation and uncertainty analysis and assesses confidence in the risk estimates through a discussion of the different lines of evidence. The second element, is the interpretation of ecological significance, which may be described in terms of the spatial and temporal extent of adverse effects.

The following presents the findings of ecological risk to Pine Street Canal Superfund Site target species or groups of species from exposure to detected contaminants in sediments. Due to the complexity of contaminants and sediment environments at the Site, individual contaminants could not be identified as specifically responsible for the adverse effects observed.

a. Sediment benchmarks and SEM/AVS ratios

Based on comparisons with NOAA and OMEE sediment benchmarks (ER-Ls, ER-Ms, LELs and SELs), exceedances suggest that adverse effects on benthic communities from exposure to sediment contaminants are a potential. EPA's Draft Sediment Criteria for acenapthene, fluoranthene, and phenanthrene were exceeded by samples collected in 1994 in Subarea 8 (the turning basin) and for samples collected in Subarea 1 (the canal) for acenapthene and phenanthrene in 1995. Simultaneously extracted metals/acid volatile sulfides (SEM/AVS) ratios exceeded 1 for several samples in Subareas 2, 4, 6, and 7,indicating that benthic, toxicity attributable to the five divalent metals (copper, cadmium, nickel, zinc and lead) is possible.

b. Biomarkers

A biomarker is an indicator of toxic exposure observed at the biochemical, cellular, or organ-level of an organism. The level of biochemical biomarkers observed during this study indicates that fish from the Site had greater exposure to PAHs; than fish of the same species found in the reference site (Shelburne Bay). No statistically significant differences in cellular or organ-level biomarkers were observed, possibly suggesting that although fish were exposed to PAHs at the Site, the levels of exposure were not great enough to cause physical effects. However, because fish from both the Site and the reference site were relatively young, they are not necessarily expected to have high frequencies of these physical abnormalities.

c. Sediment Toxicity Tests

For the Chironomus tentans 10-day test, a statistically significant reduction in growth and survival were observed in at least one sampling location in Subareas 1, 2, 3, 5, 6, 7, and 8. The Chironomus tentans 30-day emergence test was conducted for samples in which there was not statistically significant reduction in survival or growth in the 10-day test when compared to the reference location response. Statistically significant reductions in growth and ernergence were observed in at least one sample in Subareas 3, 4, and 7. For

the Hyalella azteca 10-day test, a significant decrease in growth and survival were observed in samples Subareas 1, 2, 5, and 8. For the frog embryo teratogenesis assay Xenopus (FETAX), statistically significant lower results for one or more of the three endpoints evaluated (i.e., survival, growth, and malformation) were identified in samples from Subareas 2, 6, and 7.

d. Avian Receptor Modeling

Estimates to the red-winged blackbird, tree swallow and great blue heron resulting from exposure to contaminated media and biota are not expected to result in body burdens responsible for adverse effects to reproduction, growth and survival.

The SBERA concluded that, based on the multiple lines of evidence associated with the comparison of chemical concentrations to published sediment guidelines, evaluation of chemical bioavailability using total organic carbon, SEM/AVS and equilibrium partitioning (EPA Draft Sediment Quality Criteria), sediment toxicity testing using C. tentans and H. azteca, cytochrome P450 analysis, bile analysis and FETAX, baseline ecological risks were exceeded in sediments in Subareas 1, 2, 3, 7, and 8. While there were findings of adverse effects in Subareas 4, 5, and 6, these lines of evidence are not as compelling and do not appear to constitute a baseline ecological risk.

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 that permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances. Remedial alternatives were developed to be consistent with these Congressional mandates.

B. Remedial Action Objective/Goals

Remedial alternatives were also developed with and evaluated against site-specific remedial action objectives and goals (RAO/Gs) that mitigate existing and potential threats to public health and the environment. The remedial action objectives and goals established for the Site (Ecological, Human Health, and Management of Migration) are discussed below.

1. Ecological

   a. In areas where risks are unacceptable, including Subareas 1, 2, 3, 7, and 8, eliminate direct exposure of ecological receptors to contaminated soils and sediments, or reduce exposure to levels representing an acceptable risk.

   a. In areas as identified in item a above, where it is not feasible to eliminate direct exposure to contaminated soils and sediments or reduce exposure to levels presenting an acceptable risk, reduce direct exposures of ecological receptors to contaminants of concern to the extent feasible.

   c. Prevent or minimize the long-term adverse effects of remediation activities on the existing aquatic environment and/or wetland habitat.

   d. Restore wetlands affected by remediation.

2. Human Health

   a. Absent an appropriate risk assessment which has been approved by EPA, prevent unacceptable exposure (direct contact, ingestion and inhalation) to contaminated soils located greater than five feet below grade.

   b. Prevent ingestion and exposures associated with residential use (direct contact, ingestion and inhalation) to contaminated groundwater where contaminated groundwater presents unacceptable risks, including Class IV areas.

   c. Prevent exposures associated with residential use (direct contact, ingestion and inhalation) to contaminated soils, sediments, air and surface water at the Site.

3. Management of Migration

   a. Protect Lake Champlain from being impacted by contaminants left on site.

      i. Ensure Lake Champlain is not impacted by a significant increase in mass flux

of contaminants through groundwater migration.

ii. Ensure Lake Champlain is not impacted by a significant increase in mass flux of contaminants through contaminated sediment migration.

iii. Prevent changes in hydrogeologic conditions that will likely cause migration of contaminated groundwater to Lake Champlain in concentrations that exceed a standard to be developed.

b. Protect areas not targeted for remediation (both on- and off-site) by preventing significant migration of contamination from on-site sources.

i. Ensure that contaminated groundwater with concentration levels above drinking water standards does not migrate beyond the Class IV classification boundary.

ii. Ensure that contaminated on-site sediments are not significantly mobilized.

iii. Ensure that NAPL is not significantly mobilized.

iv. Prevent degradation of surface water to levels above ambient water quality criteria.

v. Prevent degradation of local (urban) background air quality.

c. Protect remediated area on the Site from becoming recontaminated from on site and know off-site sources.

i. Ensure that hazardous substances left in place do not mobilize or create unacceptable risk to ecological receptors and humans in remediated areas.

ii. Monitor to provide the necessary data to determine if non-CERCLA substances are mobilizing or are creating unacceptable risks.

iii. Monitor to provide the necessary data to determine whether stormwater and non-contact cooling water may be creating an unacceptable risk to ecological receptors and humans in remediated areas.

4. Site Uses

a. Ensure to the extent practical that the remedy itself does not reduce the suitability of the Site for current and future uses, including a highway.

b. Retain or expand current Class IV groundwater classification and boundary.

c. Maintain or replace beneficial functions and values of wetlands.

C. Development of Technology and Process Options

CERCLA and the NCP set forth the process by which technologies and process options are evaluated and selected. The universe of technologies and process options to be considered for remedial action at the Pine Street Canal Site was developed from a variety of sources. Technologies and process options were identified based on a literature search and experiences at other manufactured gas plant sites, using the resources of the Electric Power Research Institute, Gas Research Institute, EPA's Superfund Innovative Technology Program, and information from vendors. Remedial technologies and process options identified by the public during the 1992 comment period were also included.

In accordance with the requirements, a range of alternatives were developed for the Site. The 1998 AFS and the 1992 RI/FS evaluated alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances is a principal element, as well as alternatives that reduce toxicity and mobility of hazardous substances by containment, which limits or eliminates the exposure of humans and wildlife to contamination. Alternatives that remove or destroy hazardous substances to the maximum extent feasible, eliminating or minimizing to the degree possible the need for long-term management, were included. Also included was a limited action alternative that involves no treatment or containment, but provides limited protection through institutional controls, as well as a "no action" alternative. Table 3 of this Record of Decision presents all the remedial technologies and process option evaluated for the Pine Street Canal Site.

With respect to groundwater, it is extremely unlikely that groundwater under the Site would be used as a drinking water source. The City of Burlington has a municipal water supply and prohibits drilling of drinking water wells within the City, and Lake Champlain provides an alternative source of drinking water. Furthermore, in 1993, the State of Vermont reclassified groundwater under the Site to Class IV, which prohibits its use as a potable drinking water source. Accordingly, the AFS did not evaluate any remedial alternatives that seek to attain cleanup of the groundwater to meet federal and state drinking water standards. However, the AFS did evaluate the imposition of additional institutional controls to make certain that groundwater will not be used for drinking water purposes, as well as a no action alternative.

D. Technology and Alternative Screening

Various remedial technologies and process options that are potentially applicable to the RAO/Gs were screened in accordance with EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. This screening step includes three phases: 1) a preliminary screening phase, 2) an initial screening phase, and 3) a detailed screening phase. The preliminary screening phase evaluates broad technologies and process options based on implementability. The second screening phase, the initial screening, evaluates the retained technologies and process options for effectiveness, implementability, and cost. The third phase, the detailed screening, evaluates the retained technologies and process options against the nine criteria established in the NCP. Screening results are summarized below. For more detailed information, see Section 2 of the AFS.

1. Preliminary Screening for Implementability

Many technologies and treatment options were eliminated from consideration early on due to site conditions that would make actual construction difficult or impossible. The subaqueous environment of the canal and turning basin, as well as the saturated soils in the wetlands and upland areas are problematic for many in-situ treatment technologies such as soil venting, soil washing, vitrification, radio frequency heating, and, bioremediation which requires the presence of oxygen. Applying these technologies on sediments removed from the canal, turning basin and wetlands would be impracticable because the fine-grain size of the sediments hinders requisite dewatering. Many different types of caps for containment of the contaminated sediments, such as compacted soil, geomembrane liners, non-compacted bentonite, and bentonite mats, were also eliminated because of excess water.

In some instances, the types of contaminants found at the Site were the cause for a technology or process to be eliminated. Solvent extraction is inefficient for PAHS. Incineration, and landfarming or composting are not effective on inorganics. The organic content of the sediments, prevents recycling in an asphalt paving batch plant (organic content too high), or for fuel blending at a power generating station or industrial kiln (organic content too low). Innovative technologies such as foam injection, electrokinetics, molten metal, while may be promising in the future, are either not currently available for full-scale operation, or are still in the research and development phase.

Upon completion of the preliminary screening phase, thirteen options remained for treatment of contaminated sediments in the canal and turning basin, six remained for the wetlands and uplands areas, and two remained for groundwater. The remedial action options retained are listed below. (Note: Assessment of a "no action" alternative is required under Superfund and provides a baseline for comparison to all other alternatives.)

a. Subareas 1-8

- No Action
- Institutional Controls
- Enhanced In-Situ Bioremediation
- Capping
- In-Situ Solidification/Stabilization
- Excavation with On-Site Disposal
- Vertical Containment
- Phytoremediation
- Excavation and Solvent Extraction
- Excavation and Ex-Situ Solidification/Stabilization
- Excavation and Ex-Situ Bioremediation
- Excavation and Thermal Desorption
- Excavation and Off-Site Disposal

b. Uplands/Wetlands

- No Action
- Institutional Controls
- Soil Excavation and Off-Site Disposal
- In-Situ Stabilization/Fixation
- Capping
- Phytoremediation

c. Groundwater

- No Action
- Institutional Controls

2. Initial Screening for Effectiveness, Implementability and Cost

Following the preliminary screening for technical implementability, the options retained are evaluated for effectiveness, further implementability and cost. The effectiveness relates to the overall performance in eliminating, reducing, or controlling the current and potential risks posed by the Site, both during implementation and over time. The implementability involves the degree of difficulty associated with actual construction, both technical and administrative, and logistical problems that affect the time necessary to complete the remedy. Cost considerations

include construction costs and the cost of operating and maintaining the remedy over time.

The results of assessments of these three considerations (effectiveness, implementability and cost) are weighed against each other. Treatability studies might show a technology to be very effective, but at an extremely high cost. Or, a technology might have relatively low capital, and operation and maintenance costs, but might not be very effective in treating the contamination. In this example, neither treatment option would make it to the short list to be considered for the final, detailed screening phase.

At this Site, enhanced in-situ bioremediation, while possibly effective, would likely cause a release of contaminants to surface water and ambient air, and is costly. In-situ solidification and stabilization of submerged sediments in the canal and turning basin would be very difficult to implement. Phytoremediation would not be effective during the dormant seasons of fall and winter. Excavation of contaminated sediments is very effective in the long-term, but in the short-term, increases risk because contaminants will be suspended in the water column, and will migrate. Excavation would be difficult and costly to implement, given the amount of sediments that would require dredging, dewatering, and subsequent treatment.

The treatment options that were retained for the final screening phase, are listed below.

a. Subareas 1-8

- No Action
- Capping
- Excavation and Off-Site Treatment/Disposal

b. Uplands/Wetlands

- No Action
- Institutional Controls

c. Groundwater

- No Action
- Institutional Controls

3. Detailed Screening Phase

The purpose of this detailed analysis is to objectively assess the alternatives with respect to nine evaluation criteria established in the NCP that encompass statutory requirements and include other gauges of the overall feasibility and acceptability of remedial alternatives. The criteria fall into three categories: threshold, balancing, and modifying. The two threshold criteria must be met in order for an alternative to be eligible for selection in accordance with the NCP. The five primary balancing criteria are used to compare and evaluate the elements of alternatives that meet the threshold criteria. The two modifying criteria, state and community acceptance are used in the final evaluation of the alternatives, generally after EPA has received public comment on the RI/FS and proposed cleanup plan. The criteria are listed in Section IX of this Record of Decision. A detailed description of the eight alternatives retained for the final analysis, and assessed against the criteria are described in the following section, Section VIII.

VIII. DESCRIPTION OF ALTERNATIVES

The 1998 AFS evaluated the remedial alternatives retained after the initial screening process for effectiveness, implementability and cost. These include engineering measures as well as institutional controls to protect human health and the environment from the risks presented at the Site. This Section provides a summary of each alternative evaluated. A more comprehensive discussion of each alternative can be found in Section 3 of the 1998 AFS.

Alternative 1	No Action Groundwater, Subareas 1-8, and Uplands/Wetlands; Long-term Monitoring
Alternative 2a	Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 1, 2, 3, 7, and 8; Long-term Monitoring
Alternative 2b	Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 1, 2, 7, and 8; Capping in Subarea 3; Long-term Monitoring
Alternative 2c	Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 3 and 7; Capping in Subareas 1, 2, and 8; Long-term Monitoring
Alternative 2d	Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 3 and 7; Excavation and Off-site Treatment and Disposal for Subareas 1, 2, and 8; Long-term Monitoring; Dewatering
Alternative 3a	Institutional Controls for Groundwater and Uplands/Wetlands; Capping

	in Subareas 1, 2, 3, 7, and 8; Long-term Monitoring
Alternative 3b	Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 3 and 7; Excavation and Off-site Treatment/Disposal for Subareas 1, 2, and 8; Long-term Monitoring; Dewatering
Alternative 3c	Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 1, 2, 3, and 8; No Action in Subarea 7; Long-term Monitoring

All of the alternatives include long-term environmental monitoring and five-year reviews. All of the alternatives also include institutional controls to prevent the use of contaminated groundwater and place deed restrictions on land use.

Alternative 3a is the remedy selected with this Record of Decision.

A. Alternative 1: No Action Groundwater, Subareas 1-8 and Uplands/Wetlands; Long-term Monitoring

The "No Action" alternative is provided as a baseline for the comparison of all the other alternatives. Under this alternative, no remedial activities and no institutional controls are implemented. This alternative uses monitoring programs for groundwater, the eight subareas, and the rest of the uplands/wetlands areas to assess impacts from the contaminants left on site.

Current groundwater data show that contaminants are not being discharged into Lake Champlain at detectable levels. This condition is unlikely to change unless there is an increase in hydraulic gradient, area occupied by contaminants, or in concentrations in groundwater at or near the "source". With the "No Action" alternative, a groundwater monitoring program would be used to identify changes in site conditions relating to the fate and transport of contaminants in groundwater. There is no risk to human health or the environment currently demonstrated in the uplands/wetlands area.

The "No Action" alternative for the eight subareas relies, to the extent possible, on natural attenuation to prevent migration of chemicals of concern in the sediments. Two studies conducted by RETEC, a contractor hired by the PRPs, in 1995 and 1996 tend to support the hypothesis that naturally occurring mechanisms may be helping to stabilize the rate of transport of the organic constituents present in the soils and sediment. A monitoring program would be implemented to test sediments for sulfide, PAHs, heterotrophic microorganisms, and pH. The results of these sampling would be used to monitor the degradation of the organic constituents in the sediments.

The "No Action" alternative does not prevent or reduce the risk to human health or the environment. Risks identified during the SBERA evaluation are not mitigated, and without additional institutional controls such as deed restrictions, the potential for consumption of contaminated groundwater in excess of the MCLs still exists.

Estimated Capital Cost: $125,050
Estimated Annual Operation and Maintenance (0&M) Cost: $102,563
Estimated Total O&M over 30 Years (net present worth): $1,272,702
Estimated Total Cost of the Remedy (net present icorlh): $1397,752

B. Alternative 2a: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 1, 2, 3, 7, and 8; Long-term Monitoring

Alternative 2a combines natural attenuation principles from Alternative 1 with a variety of institutional and administrative controls for the groundwater and upland/wetland areas, including

- implementation of institutional controls to prevent the use of groundwater and limit land use at the Site;
- installation and maintenance of a barrier system around the Site to prevent unauthorized dumping;
- groundwater monitoring;
- sediment sampling, to monitor attenuation process; and,
- sediment transport monitoring to evaluate mass flux of contaminants from the Site.

Alternative 2a reduces the risk to human health by implementing groundwater and land-use restrictions. Enforceable institutional controls, such as deed restrictions, in conjunction with the Class IV water classification, will provide a greater level of assurance that groundwater that does not meet State standards for drinking water will not be used. In addition, deed restrictions or other institutional controls would prevent land uses that could cause unacceptable risk to human health, including risks to workers or visitors at the Site.

Alternative 2a would not reduce the risk to the environment in Subareas 1, 2, 3,7, or 8.

Estimated Capital Cost: $244,0469
Estimated Annual Operation and Maintenance (0&M) Cost: $119,750
Estimated Total O&M over 30 years (net present worth): $1,485,983
Estimated Total Cost of the Remedy (net present worth): $1,730,032

C. Alternative 2b: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 1, 2, 7, and 8; Capping in Subarea 3; Long-Term Monitoring

Alternative 2b consists of the same elements as Alternative 2a with the addition of a sand and silt cap over the emergent wetlands in Subarea 3. A cap is used to reduce exposure to contaminated sediments by placing clean material over the existing contaminated substrate. Construction of the sand and silt cap, approximately 1.5 feet thick, will consist of the following steps:

- mobilization and site preparation;
- site clearing to remove trees, brush, and grass from Subarea 3;
- if required to maintain wetlands functions, excavation of sediments from area to be capped with disposal in the turning basin;
- cap construction using standard excavation equipment;
- wetland restoration or replacement; and,
- site restoration.

Monitoring programs that consists of the same elements from Alternatives 1 and 2a will be used to assess groundwater, natural attenuation, and sediment transport. Additional monitoring programs will be implemented to monitor cap integrity, stormwater and sediment monitoring to evaluate cap performance. The cap monitoring program ensures that the physical integrity of the cap is not compromised over time.

Since the portions of the Site affected in this alternative are wetlands, wetland impact will be unavoidable. Every feasible measure will be taken to minimize or mitigate the impact on existing wetlands. In areas where wetlands will be capped over, an effort will be made to replicate the wetlands using suitable material from the local area. If no suitable material from the local area is available an appropriate seed bank mix would be used to reestablish wetland vegetation in the impacted areas.

This alternative offers the same level of overall protection of human health as Alternative 2a. The same land-use and groundwater restrictions that were applied to the previous alternative would also apply to this alternative. This alternative would provide a reduction in ecological risk for Subarea 3, where exposure would be reduced by the presence of the cap. However, it provides no protection for the other subareas (1, 2, 7, and 8) identified as having ecological risk.

Estimated Capital Cost: $532,613
Estimated Annual Operation and Maintenance (O&M) Cost: $132,250
Estimated Total O&M over 30 Years (net present worth): $1,641,096
Estimated Total Cost of the Remedy (net present worth): $2,173,709

D. Alternative 2c: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 3 and 7; Capping in Subareas 1, 2, and 8; Long-Term Monitoring

This alternative includes the land-use and groundwater restrictions from Alternative 2a. This alternative provides for capping for Subareas 1, 2, and 8, the canal and turning basin, and no action for Subareas 3 and 7.

Capping isolates contaminated sediments by placing clean sediments over the existing substrate. The proposed subaqueous cap will be constructed of layers of sand and silt. A cap thickness of 1 to 1.5 feet will likely be sufficient to chemically isolate the PAHs and metals in the canal and turning basin. The cap design must also provide resistance to erosion caused by surface currents and groundwater currents, waves caused by wind, and propeller wash as well as a barrier to the effects of borrowing bottom dwelling organisms (bioturbation). One important feature of this alternative is the construction of a permanent weir at the mouth of the turning basin where it enters Lake Champlain. This weir would be constructed in the approximate location of the existing beaver dam and will maintain a water level of 96 feet above MSL or greater. The sand and silt cap construction would follow the steps listed below:

- mobilization and site preparation,
- site clearing to remove trees, brush, and grass from cap area,
- construction of a permanent weir and a temporary turbidity curtain over the mouth of the canal to prevent the potential migration of contaminants;
- if required to maintain wetlands functions, excavation of sediments from areas to be capped with disposal in the turning basin;
- cap construction using a hydraulic method ;
- wetland restoration or replacement; and,
- site restoration.

This alternative would cause some adverse impacts to wetlands. After the clean fill has been placed, the original bottom contours and hydrologic connections to Lake Champlain to the north, and storm sewers and non-contact cooling water discharges to the south, will be restored. It is estimated that the bottom elevation will be raised by 1 foot following the capping. However, in order to prevent or mitigate adverse impacts on the wetlands caused by a decrease in water depth, a weir will be designed to ensure that the water elevation in the canal remains at 96 feet above MSL or higher. The restored bottom contours will permit emergent vegetation to colonize the clean sediments up to the maximum depth the species will tolerate. Undisturbed plants in Subarea 4 will provide a seed bank for recolonization of the restored areas.

Cap design will call for silt in the final sand layer to encourage recolonization by benthic organisms. However, the benthic community will largely be determined by the natural processes that take place in the canal and turning basin during spring flooding of Lake Champlain and water that enters the Site

from the south. This water movement will both reintroduce benthic organisms to the area, and provide additional silt to the system.

This alternative includes stormwater redirection, stormwater inflow monitoring and sediment and stormwater monitoring. (These monitoring programs are included for any alternative where active remediation is provided in the canal and the turning basin.) This alternative also includes cap, sediment and stormwater monitoring programs to monitor the protectiveness of the cap.

This alternative provides a high degree of protection of human health and the environment through the use of land-use and groundwater restriction, and a reduction in ecological risk at a significant portion of the site (namely Subareas 1, 2, and 8). However, the ecological risk identified in Subareas 3 and 7 would not be addressed by this alternative.

Estimated Capital Cost: $2,083,107
Estimated Annual Operation and Maintenance (O&M) Cost: $147,895
Estimated Total O&M over 30 Years (net present worth): $1,835,235
Estimated Total Cost of the Remedy (net present worth): $3,918,342

E. Alternative 2d: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 3 and 7; Excavation and Off-site Treatment/Disposal for Subareas 1, 2, and 8; Long-term Monitoring; Dewatering

This alternative includes all the same components from Alternative 2c, except for the areas of the canal and turning basin, where contaminated sediments would be excavated and taken off site for treatment and/or disposal. This alternative includes the following:

- groundwater monitoring;
- administrative controls to prevent the use of Site groundwater as a drinking water source;
- restrictions on the installation of wells that might mobilize NAPL;
- in Subareas 1, 2, and 8, all of the visually contaminated materials in the canal and turning basin will be excavated and transported off site for treatment and/or disposal;
- sediment and stormwater monitoring in Subareas 3 and 7;
- monitoring of stormwater inflow to the canal and turning basin;
- installation of barriers to prevent access for dumping;
- implementation of zoning changes to prevent site usage for commercial activities involving children, and,
- prevention of potential unacceptable risks associated with soils at depths greater than 5 feet in uplands/wetlands.

It is estimated that excavation in Subareas 1, 2, and 8 would be approximately 25 feet in depth. To remove the contaminated materials the following steps would be taken:

- sheet piles will be driven into the clay layer to provide support for the excavation;
- existing stormwater and process water inflows to the canal and turning basin will be diverted into Lake Champlain;
- the canal and turning basin will be dewatered;
- the removed water will be treated in an onsite treatment system and discharged either to the local POTW or to Lake Champlain;
- the visually contaminated soft sediments and peat will be excavated;
- excavated materials will be further dewatered and stabilized (as necessary) to prepare the excavated material for transportation and treatment or disposal;
- clean fill will be returned to the excavation area to maintain current subsurface elevations;
- the temporary weir will be removed and the area of the Site affected by remediation activities will be revegetated;
- stormwater inflow diversion structures will be constructed; and,
- the Site and associated wetland areas will be restored and equipment will be decontaminated and demobilized.

The excavation alternative for the canal and turning basin would require that trees, shrubs and large herbaceous vegetation in a 10-foot perimeter be cleared for the placement of sheet piling. The cleared perimeter in the drier northern end of the Site and around the turning basin will be seeded and mulched. Aggressive scrub shrub species would be expected to fill in the cleared area rapidly, once the soil is stabilized.

The excavated material will be replaced with clean fill to recreate the present bottom contours. The original bottom contours and hydrologic connections to Lake Champlain will be restored as far south as the southern storm sewers and non-contact cooling water discharges. The restored bottom contours will permit the emergent vegetation surrounding the restored area to colonize the clean sediments up to the maximum depth the species will tolerate. The spring flooding of Lake Champlain and the flow from the south at other times of the year will introduce the native benthic species to the restored areas. This water movement will also bring in silt to add to the sediments. The ultimate mix of sand and silt in the sediments will be strongly influenced by these depositional processes, and the final benthic community will be largely determined by these factors.

Under this alternative, a reduction in long-term ecological risks is anticipated. Long-term contact with contaminants in Subareas 1, 2, and 8 would be eliminated by removing the entire depth of impacted soils and sediments and replacing with clean fill. The installation of permanent sheet pilings around

the perimeter of these subareas would reduce the likelihood of recontamination, although the sheet piling could cause alterations to the hydrogeologic regime. This alternative does not address ecological risks in Subareas 3 and 7, however.

This alternative contains protection from any risks posed by the groundwater or exposure to contaminated media in the uplands/wetlands by implementation of groundwater and land-use restrictions. However, a short-term increase in human health risks is anticipated as a result of volatilization of contaminants during excavation. These risks could be controlled through the use of emission control measures.

The potential for contaminated sediments in the canal and turning basin to migrate off site would be completely removed with this alternative.

Estimated Capital Cost: $39,042,497
Estimated Annual Operation and Maintenance (O&M) Cost: $125,770
Estimated Total O&M over 30 Years (net present worth): $1,560,685
Estimated Total Cost of the Remedy (net present worth): $40,603,182

F. Alternative 3a: Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 1, 2, 3, 7, and 8; Long-term Monitoring

This alternative combines the institutional controls for the groundwater and the uplands/wetlands areas with the capping activities described in Alternative 2c. Additionally, Subareas 3 and 7 would be capped and restored with an engineered wetlands. With this alternative, all areas that have been identified as posing an unacceptable ecological risk would be capped, thereby reducing direct exposure of wildlife to contaminated soils and sediments.

Alternative 3a is the alternative that EPA has chosen as the most feasible and protective of human health and the environment, and is explained in detail in Section X of this Record of Decision.

Estimated Capital Cost: $2,543,762
Estimated Annual Operation and Maintenance (0&M) Cost: $147,895
Estimated Total O&M over 30 Years (net present worth): $1,835,235
Estimated Total Cost of the Remedy (net present worth): $4,378,997

G. Alternative 3b: Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 3 and 7; Excavation and Off-site Treatment/Disposal for Subareas 1, 2, and 8; Long-term monitoring; Dewatering

This alternative combines the institutional controls on groundwater and the uplands/wetlands, capping of the emergent wetlands in Subareas 3 and 7, and excavation and off-site disposal of the sediments and underlying peat layer in Subareas 1, 2, and 8. After excavation of Subareas 1, 2, and 8, clean fill would replace all excavated materials, and the area will be restored to its original contours. As with the previous alternatives, wetland restoration activities will take place throughout the Area of Focus. Specific components of this alternative include:

- groundwater water monitoring;
- administrative controls to prevent the use of site groundwater for drinking water;
- restrictions on installation of wells that might mobilize NAPL;
- sediment and stormwater monitoring in Subareas 3 and 7;
- redirection of offsite stormwater;
- monitoring of stormwater inflow to the canal and turning basin;
- installation of barriers to prevent access for dumping;
- prevention of site usage for a day care center or commercial activities involving children;
- prevention of potential unacceptable risks associated with soils at depths greater than 5 feet in the uplands/wetlands;
- capping of Subareas 3 and 7 as described in Alternatives 2b and 3a; and,
- excavation and off-site disposal of sediments in the canal and turning basin as described in Alternative 2d.

Since the two technologies used in this alternative, capping and excavation and backfilling with clean fill, both result in reduction of the same ecological risk exposure pathway, this alternative has the same level of overall protection of the environment as Alternative 3a.

Estimated Capital Cost: $39,477,672
Estimated Annual Operation and Maintenance (0&M) Cost: $119,895
Estimated Total O&M over 30 Years (net present value): $1,487,782
Estimated Total Cost of the Remedy (net present value): $40,965,454

H. Alternative 3c: Institutional Controls for Groundwater and Uplands/Wetlands; Capping, in Subareas 1, 2, 3, and 8; No Action in Subarea 7; Long-term Monitoring

This alternative is exactly the same as alternative 3a, except that no cap would be constructed in Subarea 7. Each alternative with active remediation in the canal and turning basin include plans to construct a sedimentation basin in Subarea 7 as part of the stormwater redirection program. This alternative has been included in acknowledgment of the fact that soils placed during cap construction in Subarea 7 may be subject to some degree of recontamination from stormwater.

Estimated CJapital Cost: $2,344,212
Estimated Operation and Maintenance (0&M) Cost (annual): $147,895
Estimated Present Value of O&M over 30 Years: $1,835,235
Estimated Cost of the Remedy: $4,179,447

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

A. Evaluation Criteria

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 (NCP) articulates nine evaluation criteria to be used in assessing the individual remedial alternatives. These nine evaluation criteria are listed below.

Threshold Criteria

The two threshold criteria described below must be met in order for an alternative 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 of the ARARs of other Federal and State environmental laws and/or provide grounds for invoking a waiver.

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the elements of the alternatives that meet the two threshold criteria.

3. Long-term effectiveness and permanence 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 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, RI/FS and ARI/AFS.

B. Summary of the Comparative Analysis of Alternatives

A detailed analysis was performed on each alternative using the nine evaluation criteria in order to select a Site remedy. The strengths and weaknesses of each alternative with respect to the evaluation criteria are summarized in Table 4 of this Record of Decision. After the detail analysis of each individual alternative is conducted, a comparative analysis, again focusing on the relative performance of each alternative against the nine criteria, is conducted. The following is a summary of the comparative analysis. A more complete discussion of the comparative analysis can be found in Section 4 of the 1998 AFS.

1. Overall Protection of Human Health and the Environment

The potential risks identified at the Site are attributed to human health risks from consumption

of groundwater and ecological risks from exposure to soils and sediments in Subareas 1, 2, 3, 7, and 8. Additionally, the Site remedial action objectives/goals (RAO/Gs) provide for protection and restoration of wetlands, prevention of unacceptable exposure to contaminated soils located greater than 5 feet below grade, prevention of exposures associated with residential use, and prevention of impacts to Lake Champlain. An evaluation of the ability of each site-wide alternative to obtain the RAO/Gs is included in Table 5.

Alternatives 1 and 2a provide no protection against ecological risk. The remaining six remedies have an active remediation component that would result in the reduction of risk to ecological receptors from long-term exposures; however, some risk from short-term exposure to contaminants during construction of the remedy will occur. Although off-site transport of contaminants is not occurring at levels that are considered significant under current conditions, the implementation of alternatives involving remedial activities in the canal and turning basin greatly reduces the potential for future off-site migration of contamination.

The ranked order of active remediation alternatives with respect to ecological risk reduction. Based on the square area of contaminated sediments capped or excavated and filled in, is as follows: 3b (highest), 3a, 3c, 2d, 2c, 2b (lowest). Alternative 3b provides a slightly greater level of protection of the environment than Alternative 3a, EPA's selected remedy, in the long-term due to the complete removal of all contaminated materials in the canal and turning basin versus capping these areas. On the other hand, Alternative 3a is more protective of human health in the short term.

Alternative 1, "no action", does not eliminate site human health risks. Alternative 2a relies on institutional controls to eliminate site human health risks by preventing consumption of groundwater and unacceptable exposures to soils greater than 5 feet. As long as institutional controls are maintained, site-related human health risks would remain within acceptable levels. Like 2a, Alternatives 2b, 2c, 3a, 3b, and 3c rely on institutional controls for groundwater and soils greater than 5 feet, as well as the integrity of the caps for protection of human health and the environment.

Alternatives 3a and 3b are the most protective of human health and the environment, but involve a level of short-term risk to Site workers and commercial area employees. Short term risk to Site workers and commercial area employees is much greater under Alternative 3b because of the added component of excavation and off-site transportation of contaminated materials, which could result in exposures to volatilized contaminants. The short-term, temporary displacement of ecological receptors and disruption of ecological habitats will occur with Alternatives 2b, 2c, 2d, 3a, 3b, and 3c, although this displacement can be minimized through engineering controls during construction and wetlands restoration at the conclusion of construction activities. The success of wetlands restoration would require long-term evaluation and maintenance.

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

Appendix B of this Record of Decision contains a summary of the applicable and relevant requirements for the alternatives considered in detail, and states how the alternatives comply or fail to comply with all ARARs.

The most significant ARARs for the Pine Street Canal Superfund Site are laws and regulations relating to the protection of wetlands and floodplains, the protection of historic resources and handling, storage and disposal of hazardous wastes.

a. Wetland/Floodplain and CWA Section 404 Requirements

Wetland and floodplain requirements relate to the prevention of significant degradation of the waters of the United States under Section 404 of the Clean Water Act, and require that all appropriate steps be taken to minimize impacts to wetlands. The alternatives that have remedial action components that eliminate the potential for migration of contaminated sediments into Lake Champlain (Alternatives 2c, 2d, 3a, 3b, 3c) provide the highest degree of protection. Alternatives 2a and 2b provide protection by monitoring sediment transport.

The alternatives that have an active remediation component (Alternatives 2b, 2c, 2d, 3a, 3b, 3c) would all require wetlands restoration activities to meet the requirements of Executive Order 11990, Section 404 of the Clean Water Act, and the Vermont Wetlands Rules. Although remediation activities would result in some short-term impacts to wetlands, restoration of wetlands and floodplains is a practical alternative for the Site. Section 404 of the Clean Water Act and the Vermont Wetland Rules require that remediation and mitigation efforts will protect significant wetlands and the functions that they serve, Under the Section 404 regulations, 40 CFR 230.10(a), there must be a comparison to other practicable alternatives, and the "least environmentally damaging practicable alternative" must be selected. Based on the comparison below, EPA has determined that Alternative 3a is the least environmentally damaging practicable alternative that achieves the remedial action objectives and goals. For purposes of the Section 404 analysis, the alternatives were grouped into general categories of no action and engineering controls (Alternatives 1, 2a), capping alternatives (Alternatives 2b, 2c, 3a, 3c), and excavation and disposal alternatives (Alternatives 2d, 3b). The no action and institutional controls alternatives would leave habitat intact but would also leave contaminants where they are exposed to wildlife, posing an unacceptable long-term ecological risk. Although the capping alternatives would result in some direct short-term impacts to the Site, disturbance of

wetlands and floodplains with subsequent wetlands restoration is the only practicable alternative for the Site to address contamination while minimizing impact on the terrestrial and aquatic ecosystem. Capping alternative 3a would restore portions of the Site and replicate other portions on site to serve as a viable habitat where an indigenous population of wildlife may exist and breed. The excavation and complete in-filling alternatives present the maximum adverse impact on the terrestrial and aquatic environments of all the alternatives evaluated.

The capping and excavation alternatives would require temporary disturbance of indigenous population of wildlife. Although excavation would require temporary disturbance of a significant portion of the submerged areas, these impacts would be minimized, and to a large extent, mitigated through a variety of measures. Mitigating measures would be implemented during and after dredging and capping to ensure that the replacement areas are stable, will not erode, and will continue to perform the wetland functions of nutrient, sediment, and toxicant removal and stabilization. The area will be restored (or enhanced) as close as is practical to pre-excavation or capping conditions such that there are no long-term adverse impacts to wildlife, recreation, aesthetics, and economic values. Performance of the capping alternatives will meet or attain all applicable or relevant and appropriate federal and state wetland and floodplain requirements for the Site. However, placing a cap over sediments in the canal and turning basin will result in a slight loss of flood storage capacity.

The excavation alternatives, 2d and 3b, can be designed and implemented to meet action-specific ARARs with the exception of Section 404 of the Clean Water Act and Vermont Wetlands Rules.

b. National Historical Presenation Act (NHPA)

The alternatives that involved excavation or capping of Subareas 1, 2, and 8 (Alternatives 2c, 2d, 3a, 3b, 3c) in which the potentially historically significant structures would either be covered or excavated and disposed of off site with other debris would trigger this ARAR. Compliance with the NHPA could be met by involving the proper agencies during remedial design/remedial action and by initiating mitigation efforts such as additional research and documentation, recordation, and/or data recovery. Alternatives where no action is contemplated for these subareas would not trigger this ARAR. Alternatives involving excavation and off-site disposal would result in the greatest adverse impacts with regard to this ARAR and may require more significant activities to be compliance.

c. RCRA Issues

Those alternatives that involve the excavation and off-site disposal of materials that may be identified as hazardous by characteristic would require management of these materials according to specific RCRA requirements. For alternatives that have a consolidation of materials that may be hazardous under a cap component (Alternatives 2c, 3a, 3c), specific RCRA requirements including General Facility Standards, Preparedness and Prevention, Contingency Planning and Emergency Procedures, Releases from Solid Waste Management Units, and certain Closure and Post-Closure requirements (including groundwater monitoring) may be relevant and appropriate. Those RCRA standards that may apply to the off-site disposal or on-site containment portions of the alternatives will be considered during the Remedial Design/Remedial Action phases of the work.

d. Groundwater ARARs

Although groundwater at the Site is heavily contaminated, EPA has determined, based on the factors set forth at 40 C.F.R. 300.400(g), that drinking water regulations including those established under the Safe Drinking Water Act, are not ARARs for the Pine Street Site. Therefore, none of the remedial alternatives evaluated are required to meet drinking water standards.

This determination is based on several conditions specific to the Pine Street Canal Site. EPA has concluded that it is extremely unlikely that contaminated groundwater underlying the Pine Street Site will be used as a source of drinking water. First, the Site is located in an urban area that has been used for industrial/commercial purposes for many years. The Site is not zoned for residential purposes, and residential development is unlikely because much of the Site contains extensive wetlands and is located in a 100-year floodplain. It is therefore unlikely that private drinking water wells would be installed. Second, ample alternative water supplies are available. The Site is located next to Lake Champlain, which provides drinking water for the City of Burlington and will continue to meet the City's needs in the future. Although groundwater in the deep bedrock aquifer is currently used for commercial/industrial purposes, all residential drinking water in the city of Burlington is provided (after treatment) by Lake Champlain. Finally, pursuant to 10 V.S.A. 1394, the State of Vermont in 1993 reclassified the groundwater underlying most of the Site as Class IV groundwater, which is not suitable as a source of potable water (but which is suitable for some agricultural, industrial and commercial uses).

3. Long-Term Effectiveness and Permanence

To conduct the evaluation of long-term effectiveness and permanence for each alternative, the

remedies have been grouped into "active" remedies (those that contain remedial actions for at least one portion of the Site including Alternatives 2b, 2c, 2d, 3a, 3b, 3c), alternatives that rely solely on monitoring and institutional controls for effectiveness (Alternative 2a), and the no action alternative (Alternative 1). No action includes monitoring of the groundwater and sediments for natural attenuation potential and stormwater outflow monitoring.

Alternatives 3a and 3b provide the highest degree of long-term effectiveness. Both rely on institutional controls to prevent the consumption of contaminated groundwater and access to the uplands/wetlands portion of the Site. Alternative 3b, which minimizes long-term ecological risk by removing contaminants in Subareas 1, 2, and 8, would provide a greater level of long-term effectiveness over Alternative 3a, which reduces long-term risk by capping contaminated sediments there. While the permanence of Alternative 3a relies on long-term monitoring and maintenance of the cap to ensure effectiveness, the cap and construction methods would be designed to provide long-term success. Alternative 3c would provide the third highest level of long-term effectiveness and permanence. Alternatives 2a, 2b, 2c, and 2d are effective in preventing consumption of the groundwater, but provide a lesser degree of ecological protection. With all of the active remedies, the long-term effectiveness of wetland and aquatic habitat restoration must be monitored. Over time, modifications may be needed to increase the long-term effectiveness and permanence of these alternatives. Alternative 1, "no action", provides the least degree of ecological protection.

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

Alternatives 2d and 3b, those alternatives with excavation and off-site treatment/disposal components, would provide reductions in toxicity, mobility, and volume. These two alternatives would also provide a reduction in the toxicity, mobility, and volume of contaminated surface water recovered during the excavation and dewatering steps. Alternatives 2d and 3b are the only alternatives in which process residuals may be generated. These would probably be sent off site for treatment/disposal or discharged to surface water or storm sewers. The volume of residuals generated would be a function of the required effluent water quality parameters. None of the other alternatives under consideration would provide a reduction in the toxicity, mobility or volume through treatment of contaminated groundwater or soils/sediments, nor would they generate process residuals.

In the no action and institutional controls alternatives (Alternatives 1, 2a), natural attenuation might provide some measure of reduction in the toxicity of the sediments in the upper portions of the sediments. The capping alternatives (Alternatives 2b, 2c, 3a, 3b, 3c) will result in a reduction of mobility and exposure to toxicity through the isolation of contaminants from ecological receptors.

5. Short-Term Effectiveness

The RAO/Gs would be best met in the short-term by the placement of a cap over all areas identified as presenting unacceptable ecological risk (Alternative 3a), second by those alternatives with a capping activity over some portions of these areas (Alternatives 3c, 2c, and 2b in descending order), and then those alternatives with an excavation component (Alternatives 3b, 2d). Alternatives 1 and 2a would not meet the RAO/Gs in the short-term.

Institutional controls to protect human health could be obtained in a relatively short time frame (approximately 3 months). The alternatives that have a capping component and wetlands restoration (Alternatives 2b, 2c, 3a, 3b, 3c), may be associated with an increase in short-term human health risk from volatilization of contaminants during construction. Volatilization potentials are slightly greater with the placement of caps in the emergent wetlands areas (Alternatives 2b, 3a, 3b, 3c) rather that in the aqueous environment of Subareas 1, 2, and 8. However, capping activities in the aqueous portions of the Site have a greater potential for release of contaminants into surface water. The mitigation activities, including construction controls and the placement of a temporary weir at the mouth of the turning basin, would reduce these risks.

Short-term risks to ecological receptors are likely to increase for all alternatives with an active remediation component (all alternatives except 1 and 2a). Those alternatives with greater soil and sediment disruption requirements, i.e., excavation of Subareas 1, 2, and 8, would cause the greatest short-term risk to the benthic population. This risk is deemed lower for Alternatives 2b, 2c, 3a, and 3c, where the remedial components consist of capping and wetlands restoration activities. All active remedial alternatives will result in short-term displacement and mortality of some organisms.

Additionally, short-term habitat impacts will occur during and following implementation of the active remediation alternatives. Disturbed habitat would be restored after remediation.

6. Implementability

Alternatives 1 and 2a, which require administrative activities and minor site activities (possible installation of additional monitoring wells, and installation of a barrier system), would be the easiest to implement. Alternatives with active remediation components would require varying degrees of effort and are evaluated below.

Alternative 2b, which requires capping of Subarea 3, would be the most implementable of the

active remedies. With potential access from the General Dynamics property and the use of conventional earth moving equipment, this alternative could be rapidly implemented. Construction of the restored wetlands habitat would be easiest in this area, which is less submerged than other portions of the area of focus.

Alternative 2c, which would require subaqueous capping in Subareas 1, 2, and 8, would be slightiv more difficult to implement, and fewer contractors are available to conduct this work. However, wetland restoration activities would be the easiest to conduct.

Alternatives 3a and 3c, capping and wetlands restoration across all subareas evaluated in the area of focus (with the exception of Subarea 7 in Alternative 3c), would require significant coordination of activities to reduce impacts to the surrounding emergent wetlands and would require more than one set of construction methods. Wetlands restoration in both Subareas 3 and 7 would be significantly greater than Subarea 3 only, or in Subareas 1, 2, and 8.

Alternative 2d, with excavation of the entire depth of impacted soft sediments and peat in Subareas 1, 2, and 8, would require significant dewatering and subsequent water treatment activities, sheet pile installation, large staging areas, and coordination with the City to conduct large scale transportation of excavated materials to disposal. The implementability of dewatering these materials has not been tested, and the issues surrounding dewatering peat could be significant. Furthermore, the extremely large volume of clean fill necessary to infill this area may be limited in availability.

Alternative 3b, which combines the implementability problems of capping the emergent wetlands and subsequent wetlands restoration activities with the excavation and infilling issues of Subareas 1, 2, and 8, would be the most difficult remedy to implement.

7. Cost

As summarized in the Estimated Cost Table on the following page, the total net present cost for all alternatives varies from $1.4 million for no action (Alternative 1) to $41 million for Alternatives 2d and 3b. The costs developed for this document are intended for comparison purposes only, actual remedial action costs would be developed after the Record of Decision and remedial design.

8. State Acceptance

The Vermont Department of Environmental Conservation (DEC) has been involved in all Site activities to date. Representatives of Vermont DEC served as members of the Coordinating Council, that developed and oversaw the ARI/AFS, and joined in the consensus recommendation of the Coordinating Council that EPA should propose Alternative 3a as the remedy for the Pine Street Canal Site.

The Secretary of the Vermont DEC has provided EPA with a letter of concurrence with the selected remedy. This letter is attached as Appendix C.

Estimated Cost Table

	Site-Wide Alternative	Estimated Cost ($)	
1:	No Action, Groundwater, Subareas 1-8, and Uplands/Wetlands;Long-term Monitoring	Capital	125,050
		Annual O&M	102,563
		PV of O&M	1,272,702
		NPV	1,397,752
2a:	Institutional Controls, Groundwater and Uplands/Wetlands; No Action, Subareas 1,2,4,7, and 8; Long-term Monitoring	Capital	244,049
		Annual O&M	119,750
		PV of O&M	1,485,983
		NPV	1,730,032
2b:	Institutional Controls, Groundwater and Uplands/Wetlands; No Action, Subareas 1,2,7, and 8; Capping, Subarea 3; Long-term Monitoring	Capital	532,613
		Annual O&M	132,250
		PV of O&M	1,641,096
		NPV	2,173,709
2c:	Institutional Controls, Groundwater and Uplands/Wetlands; No Action, Subareas and 7; Capping, Subareas 1, 2, and 8; Long-term Monitoring	Capital	2,083,107
		Annual O&M	147,895
		PV of O&M	1,835,235
		NPV	3,918,342
2d:	Institutional Controls, Groundwater and Uplands/Wetlands; No Action, Subareas 3 and 7; Excavation and Off-site Treatment/Disposal, Subareas 1, 2, and 8; Long-term Monitoring; Dewatering	Capital	39,042,497
		Annual O&M	125,770
		PV of O&M	1,560,685
		NPV	40,603,182
3a:	Institutional Controls, Groundwater and Uplands/Wetlands; Capping, Subareas 1,2,3,7, and 8; Long-term Monitoring (EPA's selected alternative)	Capital	2,543,762
		Annual O&M	147,895
		PV of O&M	1,835,235
		NPV	4,378,997

3 b:	Institutional Controls, Groundwater and Uplands/Wetlands; Capping, Subareas 3 and 7; Excavation and Off-site Treatment/Disposal, Subareas 1, 2, and 8, Long-term Monitoring; Dewatering	Capital	39,477,672
		Annual O&M	119,895
		PV of O&M	1,487,782
		NPV	40,965,454
3c:	Institutional Controls, Groundwater and Uplands/Wetlands; Capping, Subareas 1, 2, 3, and 8; No Action, Subarea 7; Long-term Monitoring	Capital	2,344,212
		Annual O&M	147,895
		PV of O&M	1,835,235
		NPV	4,179,447

* Present Value (PV) is based on 7 % discount rate with a term of 30 years
** Net Present Value (NPIV) is the sum of the capital and PV costs

Notes: All costs are estimated for comparative purposes and may not reflect actual costs of the remedy, Cost estimates, are intended to reflect an accuracy of +50%/- 30%.

9. Community Acceptance

As mentioned above, EPA began working in 1993 with the Pine Street Barge Canal Coordinating Council, which includes several community representatives including the City of Burlington, the Lake Champlain Committee (a regional environmental organization), The Pine Street Arts and Business Council, and the Ward 5 Planning Association. Each of these representatives frequently reported back to larger constituencies. Over the course of five years, the Coordinating Council and its working groups met scores of times. Consensus decisions on the scope and implementation of studies were made with the full participation of the community members on the Coordinating Council. In May 1998, the Coordinating Council voted as a whole to recommend that EPA propose Alternative 3a as the preferred remedy for the Site.

Comments received from the public at large during the 60-day comment period were generally supportive of the selected remedy. One member favored selecting the more permanent remedial alternatives rather than a containment alternative. Copies of the comments received and EPA's response are presented in the Responsiveness Summary, attached as Appendix E.

X. THE SELECTED REMEDY

Detailed Description of Alternative 3a: Institutional Controls, Groundwater and Uplands/Wetlands; Capping, Subareas 1, 2, 3, 7, and 8; Long-term Monitoring

The remedy selected to address contamination at the Pine Street Canal Superfund Site is Alternative 3a, which best satisfies the statutory criteria for remedy selection.

Alternative 3a provides for capping of contaminated sediments in all areas where an unacceptable ecological risk has been found, effectively isolating the contamination below the biologically active zone. Long-term performance monitoring of groundwater, surface water, stormwater, sediments and the caps is required. This alternative includes institutional controls to:(1) prevent the use of on-site groundwater for drinking water,(2) prevent land uses that could result in unacceptable risks to human health, such as residential use, use as a children's day care center and most excavations below five feet; and (3) prevent or limit the migration of existing contamination. These institutional controls are discussed below in Section E.

Implementation of this combination of engineering and institutional controls is expected to be completed within a three-year time frame. All design issues presented in this section will be reevaluated during the remedial design.

A. Capping

Alternative 3a calls for subaqueous capping of Subareas 1, 2, and 8 (the canal and turning basin), and construction of a cap in the emergent wetlands in Subareas 3 and 7 (Figure 7).

As conceived in the AFS, the subaqueous cap in Subareas 1, 2, and 8, will be constructed of layers of sand and silt. A final cap thickness of 1 to 1.5 feet above the current bottom elevation will likely be sufficient to chemically isolate the PAHs and metals in the sediments in the canal and turning basin. Analysis of site-specific cap design requirements will be conducted to identify necessary elements in the final design to ensure satisfactory performance in the field. For example, it may be necessary to place at least 2.5 to 3 feet of capping material to attain the final cap thickness, after settling and consolidation occurs. The cap design must provide resistance to erosion caused by surface currents, waves caused by wind, and propeller wash, as well as a barrier to the effects of borrowing bottom dwelling organisms (bioturbation). It is not expected that excavation of existing bottom sediments prior to placement of the cap will be required to limit increases in the elevation in the bottom of the canal; however, this issue will be reevaluated during design. If it is determined that excavation is required, sediments would be dredged from the canal and transported by pipeline or truck to the turning basin for on-site disposal.

The method for placement of the subaqueous cap is expected to be hydraulic placement, as described in Section 3.5.1 of the AFS. This would require placement of the cap over and around the five sunken barges in the canal and turning basin, and would require measures to minimize disturbance. State and

federal law require mitigation of the adverse effects of the remedial action on these potentially historic resources. The barges and other potential historic structures will be recorded and documented, prior to placement of the cap.

One important feature of this alternative is the construction of a permanent weir at the mouth of the turning basin where it enters Lake Champlain. This weir would will be constructed in the approximate location of the existing beaver dam and will maintain a water level of 96 feet above MSL or greater. The weir will not cause significant additional inundation during periods of high water, and will help maintain an adequate surface water depth where the subaqueous cap is constructed. The weir will also help to reduce the potential for cap erosion. Based on historic lake level records, the weir will not hinder fish migration between the Lake and canal.

Construction of the subaqueous cap will follow the steps listed below:

- mobilization anti site preparation;
- site clearing, to remove trees, brush, and grass from cap area;
- construction of a permanent weir and a temporary turbidity curtain over the mouth of the canal to prevent the potential migration of contaminants;
- excavation of sediments from areas to be capped, if required to maintain wetlands functions, with disposal in the turning basin;
- construction of subaqueous cap;
- wetland restoration or replacement; and,
- site restoration.

In order for the subaqueous cap to be effective, it must prevent the migration of contaminants (by erosion, diffusion, advection or bioturbation) from the underlying contaminated sediments through the cap, and then their contact with benthic organisms and fish in the biologically active portion of the canal bottom at ecologically harmful levels. Performance standards for physical, chemical and biological characteristics of the cap will be developed during the design phase. Post-construction, the cap will meet the physical requirements of the design within pre-determined tolerance limits. Chemical concentrations in vertical samples of the cap will be compared to screening-level benchmarks such as EPA's Draft Sediment Quality Criteria for PAHs or Ambient Water Quality Criteria (AWQC), NOAA's Effects Range-Medium (ER-M) or -Low (ER-L) concentrations, or Ontario Ministry of the Environment (OME) Lowest Effects Level (LEL) guidelines. Grab samples of the cap will be evaluated for the presence/absence of benthic macroinvertebrate species.

In addition to the subaqueous cap in the canal and turning basin, the selected remedy provides for placement of a sand/silt cap over the emergent wetlands in Subareas 3 and 7, in order to prevent the migration of contaminants to the environment. The steps for construction of the cap over Subareas and 7 are similar to the process for construction of the subaqueous cap in Subareas 1, 2, and 8. However, because access is significantly easier in Subarea 7 than in the other four subareas, and because excavation equipment will be used in the area to restore Subarea 7 wetlands, it is likely that mechanical methods will be used to place the cap (although hydraulic methods are a possibility).

As with Subareas 1, 2, and 8, it is possible that some excavation of sediments may be required in Subareas 3 and 7 to meet wetland restoration goals established during remedial design. Excavated materials would be transported by truck and placed in the turning basin for disposal.

Alternative 3a also calls for placement of a soil cover over an area of elevated concentrations of COCs in the uplands/wetlands area to reduce exposure. An evaluation of soil constituent concentrations in that area indicate that an area of approximately 100 feet by 100 feet will require covering. Topsoil will be spread over the area followed by seeding with wetland species and plantings of appropriate plants.

B. Stormwater Inflow Management

The selected remedy includes the redirection of stormwater from storm sewers at the southern end of the Site, in order to reduce the potential that any contaminants from off site may recontaminate remediated portions of the Site. Stormwater entering Subarea 7 will be redirected using a spreader structure. It is expected that the culvert under North Road will be modified, and North Road will be raised by about two feet, to allow suitable retention time to remove sediments from stormwater passing through the wetland. As an added benefit, this will reduce the occurrence of flooding over the road. In addition, the stormwater flowing onto the Site north of the Burlington Electric Department property will be redirected using a spreader structure.

C. Performance Monitoring

Long-term performance monitoring to address the remedial action objectives and goals is required as part of the selected remedy. The monitoring program will include, but will not be limited to:

1. Groundwater monitoring to verify the current understanding of hydraulic conditions, to ensure that contaminants do not migrate beyond the Class IV boundary at concentrations Champlain. The monitoring data will be used to evaluate whether there is a change in hydraulic gradient, an increase in the cross sectional area occupied by contaminants, an increase in contaminant concentration in groundwater at or near the "source", or an increase in mass flux of contaminants to the Lake. The groundwater monitoring program will be refined during, design, but will include, at a minimum, chemical monitoring of existing wells at regular intervals, installation and chemical monitoring of additional wells as

determined necessary by EPA; and measurement of groundwater elevations.

2. Surface Water Monitoring to prevent degradation of surface water to levels above ambient water quality criteria ensuring protection of the canal and Lake Champlain, and the protectiveness of the remedy over the long term.

3. Stormwater Inflow and Non-Contact Cooling Water Monitoring to determine whether or not stormwater (dissolved and sediment loads) and non-contact cooling water are creating unacceptable ecological or human health risks in remediated areas of the Site.

4. Sediment Monitoring to determine if contaminated sediments from the non-capped uplands and wetlands portions of the Site are contaminating the remediated areas or the Lake. Also, to ensure that the sediment cover in unremediated portions of the Site remains of a sufficient thickness so as not to pose unacceptable ecological or human health risks.

5. Performance Physical and Chemical Monitoring of the Cap to verify attainment of remedial action objectives and goals. The methods of measuring performance of the subaqueous cap will be refined during design of the cap, but will include physical inspection; chemical monitoring of cap sediments (including pore water) and surface water, and, biological monitoring.

6. Wetlands Monitoring to ensure that erosion controls and wetland hydrology remain in place for the establishment of stable biological communities, and restoration/mitigation of wetland and aquatic structure and function as defined by the ecological advisory group.

D. Site Boundary Definition

Studies conducted under the direction of the EPA since 1988 have examined a 70-to 80-acre area, known as the Study Area, which includes the properties between Lakeside Avenue to the south, Pine Street to the east, Vermont Railway property to the north, and the Vermont Railway and Lake Champlain to the west. With this Record of Decision, the Site is now defined as the much smaller 38-acre area (within the Study Area) where contaminants associated with wastes from the manufactured gas plant have been found (Figure 2). The remaining portions of the original 70-acre Study Area are not part of the Pine Street Canal Superfund Site. Future land use on the Site and parcels outside of the Site boundary that are identified in the footnote on the following page will be subject to institutional controls to limit the potential for unacceptable risk to human health and the environment.

E. Institutional Controls

The selected remedy includes legal controls (known as "institutional controls") to ensure protection of human health over the long term. The institutional controls will impose certain groundwater use and land use restrictions on the site and on parcels adjoining the site, in order to prevent unacceptable exposures to contaminants and to prevent further migration of contaminants. The form of institutional controls will be determined during implementation of the remedy, but may include deed restrictions, easements, and/or zoning ordinances. The institutional controls will be crafted so that they will run with the land, and will be enforceable by either EPA, the State of Vermont, or other appropriate entities.

The institutional controls will include restrictions for parcels of property within the site boundary, as well as certain properties outside the boundary of the Site, 1 where restrictions are necessary to ensure that the on-site remedy remains effective (collectively, the "Properties"). The restrictions will include:

- The Properties will not be used for residential use or for children's day care centers;
- Groundwater under the Properties shall not be used for potable drinking water purposes. No production well (e.g. for industrial use) will be installed at any location where free phase contamination has been shown to be present;
- The Properties will not be used so as to interfere with investigations of environmental conditions, or cause recontamination of the Site or contamination of off-site properties following completion of the remedy.
- No construction activities that will change hydrogeologic conditions and that would cause migration of contaminated groundwater to Lake Champlain will be allowed;
- Excavations to depths greater than five feet (including those below the water table) on the Properties will be prohibited unless one or more of the following exceptions apply:(a) the excavation is performed to install, repair, maintain, service or remove underground utility components, conduits, installations or channels, which may presently be in place deeper than five feet and which may be below the water table; (b)drilling, driving or boring to install pilings for otherwise allowable construction is permitted; or,(c) the excavation is performed in a location on the property in which current contaminant concentrations at depths greater than five feet are below 140 mg/kg total PAH In the case of exceptions (a) and (b), workers conducting the excavations and working in the area must use appropriate personal protective equipment as required by the Occupational Health and Safety Administration or its successor agencies, unless a site-specific risk assessment is performed and its results have been approved by EPA prior to the excavation.

1 These properties are identified as properties 53-0-7-0, 52-0-1-0, 52-04-0, 52-0-5-0, 52-0-6-0, 52-0-8-0, 52-0-9-0, 52-0-10-0, 56-0-6-0, 56-0-7-0, and 56-0-9-0 on the City of Burlington tax assessor's map.

F. Wetlands Restoration

The selected remedy will result in some immediate adverse impacts to wetlands at the site, which will be mitigated. Significant wetlands restoration activities will be conducted with this alternative to restore the functions and values of the various wetlands habitats affected by remediation. The specific goals and objectives of the wetlands restoration/mitigation program will be refined during design, in meetings of an ecological advisory group that the EPA intends to reconvene. No restoration/mitigation activities will be allowed that could change hydrogeologic conditions, and cause erosion and migration of contaminated sediments to Lake Champlain or the canal.

The current mix of open water, emergent, scrub/shrub and forested wetlands on the Site will be preserved. This will also provide sediment trapping and flood storage functions. The restored bottom contours will permit emergent vegetation (such as cattail) surrounding the restored area to colonize the clean sediments. The spring flooding of Lake Champlain and the flow from the south at other times of the year will also introduce the native benthic species to the restored areas in the canal and turning, basin. This water movement will also bring in silt to add to the sediments. Silt will be included in the final layers of the sand cap to encourage recolonization by benthic organisms, but is not essential to the long-term recovery of the community. The final mix of sand and silt in the sediments will be strongly influenced by the depositional processes that occur naturally, which in turn will determine the characteristics of the benthic community.

In Subareas 3 and 7, wetland soils or top soil will be placed over the sand cap. In Subarea 3, young shrubs will be planted along the northern boundary of the General Dynamics property and the edge of the cap to accelerate the development of scrub/shrub vegetation. The combination of the placement of the cap and the raising of the water level will likely increase the amount of scrub/shrub wetland and decrease the amount of emergent wetland in Subarea 3. In Subarea 7, a wetlands diversity seed mix, including rushes, sedges, grasses and other fauna, will be applied if necessary to restore the functions and value of the wetlands there. Measures (such as a weir) at the culvert under North Street may be taken to control the water levels in Subarea 7.

G. Cost

The capital cost for Alternative 3a is estimated as $2,543,762. The annual operating cost for the alternative is $147,895 with a present worth value for 30 years of $1,835,235. The total present worth cost of the remedy is estimated at $4,378,997. Details of this estimate are presented in Table C-6B of the AFS.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Pine Street Canal Superfund Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy does not satisfy the statutory preference for treatment that permanently and significantly reduces the mobility, toxicity or volume of hazardous substances as a principal element. The remedy does significantly reduce mobility through use of containment techniques. The selected remedy utilizes alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

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

The remedy at this Site will permanently reduce the risks posed to human health and the environment by eliminating, reducing or controlling exposures to human and environmental receptors through containment, engineering controls, and institutional controls. Capping will also prevent further transport of contaminants into the surface water. Institutional controls will be implemented to prevent the use of contaminated groundwater. Legal mechanisms, such as deed restrictions, will restrict future land uses that could result in unacceptable risks to human health and the environment. Long-term monitoring will insure that the remedy remains protective in the future.

B. The Selected Remedy Attains ARARs

This remedy will meet or attain all applicable or relevant and appropriate federal and state requirements that apply to the Site. A detailed listing of environmental laws from which ARARs for the selected remedial action are derived, and the specific ARARs can be found in Appendix B of this Record of Decision. These tables give 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 actions at the Site. In addition to ARARs, the tables describe standards that are To-Be-Considered (TBC) with respect to remedial actions.

The more significant ARARs are discussed in detail below.

1. Principal ARARs for Groundwater Protection

As noted above in Section IX federal drinking water standards promulgated under the Safe Drinking Water Act are not relevant and appropriate, because it is highly unlikely that groundwater at the site will be used as a drinking water source.

Primary Groundwater Standards, contained in the State of Vermont Groundwater Protection Act and Groundwater Quality Standards (10 V.S.A. Chapter 47 and 48) are applicable. The Vermont Agency of Natural Resources has classified groundwater under the Site as Class IV, suitable for some agricultural, industrial and commercial use but not as a source of potable water. The management objective for Class IV groundwater is to achieve the Vermont Groundwater Standards to the extent feasible. The selected remedy will comply with this ARAR by achieving the standards at and beyond the boundary of the Class IV designation.

2. Principal ARARs/TBCs for Wetland Protection

The federal Clean Water Act, the Vermont Wetland Rules, and Executive Order 11990 are ARARs for the remedy, as the cap will be constructed in and will affect wetlands at the Site.

The selected remedy complies with regulations promulgated under Section 404 of the Clean Water Act at 40 CFR 230.10. The selected remedy is the least environmentally damaging practicable alternative which attains the project purpose of addressing ecological risk; the remedy will not cause or contribute to a violation of a state water quality standard, violate any toxic effluent standard; and will not jeopardize any endangered species; the remedy will not cause or contribute to significant degradation of water of the United States; and the remedy includes appropriate steps to minimize the impacts the aquatic ecosystem. Although the remedy will result in some direct short-term impacts to the Site, disturbance of wetlands and floodplains with subsequent wetlands restoration is the only practicable alternative for the Site that will address contamination while minimizing impact on the terrestrial and aquatic ecosystem. Mitigating measures will be implemented during and after both the dredging activities and the cap placement activities to ensure that the replacement areas are stable, will not erode, and will continue to perform the wetland functions of nutrient, sediment, and toxicant removal and stabilization. The remedy includes restoration/mitigation of portions of the Site and replication of other portions on-site to allow the area to serve as a viable habitat where an indigenous population of wildlife may exist and breed. The area will be restored (or enhanced) as close as is practical to pre-excavation or capping conditions such that there are no long-term adverse impacts to wildlife, recreation, aesthetics, and economic values.

The remedy complies with applicable Vermont Wetlands Rules, 10 V.S.A.37. Vermont policy is to protect significant wetlands and the values and functions that they serve in a manner such that no net loss of significant wetlands and their function is achieved. Adverse impacts to wetlands must be mitigated according to a hierarchy of avoidance, minimization, restoration, and compensation or replacement. Wetlands on the Pine Street Site are Class 2.

In addition, the design of the cap will take include efforts to avoid and limit adverse effects on wetlands and on the beneficial values of the floodplain, consistent with Executive Orders 11988 and 11990. Construction of the weir will comply with Vermont dam requirements at 10 V.S.A.43.

3. Historic Preservation ARARs

The selected remedy provides for capping of Subareas 1, 2 and 8, where potentially historically significant structures, including five sunken barges and a marine railway will be covered. Under the federal and state historic preservation statutes, EPA must take into account the effects of the remedy on these potentially historic structures. The Vermont Historic Preservation Law and the federal National Historic Preservation Act (NHPA) are applicable laws which limit actions that may affect historic properties or properties eligible for inclusion on the, National Register of Historic Places. If an effect exists that would materially alter the characteristics of the historic property, EPA in consultation with the State Historic Preservation Officer must determine if the effect is adverse. An effect can be adverse if it causes destruction, damage or alteration to the property; however, if a property has only archeological, historical or architectural research values, the effect may not be adverse if such values can be preserved through research and data recovery. If an adverse effect is found, consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation to seek ways to avoid or minimize harm to the property.

NHPA and Vermont requirements will be attained by conducting a full assessment of the historic structures during remedial design and by consulting with the State Historic Preservation Officer and appropriate federal authorities. If there is a possibility of an adverse effect on a historic property, appropriate steps will be taken to minimize the harm, including mitigation efforts such as additional research and documentation, recordation (such as photography), and/or other data recovery.

4. Hazardous Waste

Based on the chemical composition and concentrations, the coal the constituents of the manufactured gas plant wastes are similar to listed RCRA hazardous wastes, such as K087 wastes. As part of the 1992 SRI, EPA conducted TCLP test of the on-site contaminants. Some, but not all, samples of contaminated material failed the TCLP test for benzene. Accordingly, portions of federal RCRA regulations and the current State of Vermont Hazardous Waste Regulations, 10 V.S.A.

ch. 159, may be relevant and appropriate to this remedy. In those limited instances where these regulations may conflict, the more stringent regulation will be followed.

Basic RCRA facility requirements are relevant and appropriate during the construction period of the remedy. These include appropriate portions of 40 CFR Part 264, Subparts B,C,D,F and G. The deed restriction provisions at 40 CFR 264.116 and 264.119(b)(1) will be considered, as appropriate, in fashioning the institutional controls for the site.

Land disposal regulations at 40 CFR Part 268 are not ARARs. As noted in Section X, the remedy will likely not involve placement or disposal of contaminated materials, but rather the application of clean fill over contaminated sediments. If some excavation of contaminated sediments before placement of the cap is necessary to maintain the proper elevations and hydrology for ultimate wetlands restoration, such excavated materials will be placed in the turning basin, which is within the same area of contamination. Such in-situ consolidation and capping within an existing area of contamination does not implicate RCRA land disposal regulations.

In addition, the subaqueous cap and the cap in Subareas 3 and 7, which are intended to provide a clean substrate and to isolate contaminants from ecological receptors (rather than to protect groundwater by providing an impermeable barrier to prevent wastes from leaching), are not subject to the landfill cap requirements set out at 40 CFR Subpart N.

5. Air Pollution Control

Vermont air pollution control regulations at 10 V.S.A. ch. 48 and ambient air quality standards for particulates are ARARs and will be attained during construction period of the remedial action. These air quality regulations will be considered during the remedial design for the excavation/cap placement portions of the remedy. Necessary steps will be taken to control dust during implementation of the remedy.

C. The Selected Remedial Action is Cost Effective

In the Agency'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, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs.

The present worth costs of this remedial alternative, as presented in the Proposed Plan, are:

Estimated Capital Cost: $2,543,762
Estimated Annual Operation and Maintenance (O&M) Cost: $147,895
Estimated Total O&M over 30 Years (net present worth): $1,835,235
Estimated Total Cost of the Remedy (net present worth): $4,378,997

For comparison, the estimated total costs for the only other alternative (3b) that meets the threshold criteria for protection of human health and the environment and compliance with ARARs are:

Estimated Capital Cost: $39,477,672
Estimated Annual Operation and Maintenance (O&M) Cost: $119,895
Estimated Total O&M over 30 Years (net present value): $1,487,782
Estimated Total Cost of the Remedy (net present value): $40,965,454

The selected remedy (Alternative 3a) is the less expensive of the two alternatives that meet the threshold criteria.

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 alternatives.

The selected remedy provides long-term effectiveness through capping, institutional controls on groundwater use as drinking water, land-use restrictions to prevent future uses that could result in unacceptable risk to human health and the environment, and long-term performance monitoring.

E. The Selected Remedy Does Not Satisfy the Preference for Treatment That Permanently and

Significantly reduces the Toxicity, Mobility or Volume of the Hazardous Substances as a Principal Element

The selected remedy does not satisfy the preference for treatment that permanently and significantly reduces the toxicity, mobility or volume of hazardous substances. The remedy proposed in 1992 which did satisfy this preference was withdrawn, because of concerns over implementability, short term health impacts, cost and community and state opposition. The remedy selected in this Record of Decision was recommended by the Pine Street Barge Canal Coordinating Council after a thorough re-evaluation of issues raised by the public in 1992-1993. Although the selected remedy does notutilize treatment, it does reduce the mobility of the hazardous substances through containment.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

The selected remedy in this Record of Decision is generally consistent with the Proposed Plan for remediation of the Site, issued on May 29, 1998. The preferred alternative included:

- Capping contaminated sediments in canal Subareas 1, 2, 3, 7, and 8;
- Institutional controls for groundwater below the Site;
- Institutional controls for land-use development;
- Site boundary definition;
- Long-term performance monitoring; and,
- Five-year reviews.

XIII. STATE ROLE

The Vermont Department of Environmental Conservation has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the draft Remedial Investigation, the Supplemental Remedial Investigation, the Additional Remedial Investigation, the Baseline Human Health Risk Assessment, the Supplemental Baseline Ecological Risk Assessment, and the Additional Feasibility Study to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. The State of Vermont concurs with the selected remedy for the Pine Street Canal Superfund Site. A copy of the declaration of concurrence is attached as Appendix C.

ACRONYMS and ABBREVIATIONS

1992 SRI	Supplemental Remedial Investigation (Metcalf & Eddy, Inc, March 1992)
1997 ARI	Additional Remedial Investlaation (Johnson Company, July 1997)
AFS	Additional Feasibility Study (The Johnson Company, May 1998)
ARAR(s)	Applicable or Relevant and Appropriate Requirement(s)
AWQC	ambient water quality criteria
BTEX	aromatic hydrocarbons (benzene, toluene, ethylbenzene and xylene)
CDF	containment/disposal facility
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC(s)	contaminant(s) of concern
DEC	Vermont Department of Environmental Conservation
ER-L	effects range-low
ER-M	effects range-medium
EPA	United States Environmental Protection Agency
FETAX	frog embryo teratogenesis assay - Xenopus
LEL	lowest effects levels
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
ml	milliliter
MGP	manufactured gas plant
MSL	mean sea level
NAPL	non-aqueous phase liquid
NCP	National Contingency Plan
NHPA	National Historic Preservation Act
NOAA	National Oceanographic and Atmospheric Administration
NPL	National Priorities List
OMEE	Ontario Ministry of Environment and Energy
PAH(s)	polycyclic aromatic hydrocarbon(s)
PCB(s)	polychlorinated biphenyl(s)
ppb	parts per billion
ppm	parts per million
PRP(s)	Potentially Responsible Party(ies)
PSBCCC	Pine Street Barsge Canal Coordinating Council
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RI/FS	Remedial Investigration/Feasibility Study
ROD	Record of Decision
SEL	severe effects level
SEM/AVS	Simultaneously Extracted Metals/Acid Volatile Sulfides
SBERA	Supplemental Baseline Ecological Risk Assessment (Weston, July 1997)
TCLP	toxicity characteristic leachate procedure
VOC(s)	volatile organic compound(s)

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APPENDIX A

FIGURES AND TABLES

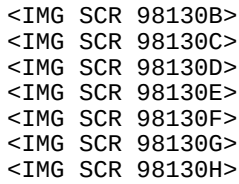

TABLE 1
CHEMICALS OF CONCERN FOR THE PINE STREET SITE

CHEMICAL NAME	GROUNDWATER	SOIL	SEDIMENT	SURFACE WATER
Vinyl Chloride	x			
Methylene Chloride	x			
Acetone	x		x	
Carbon Disulfide				x
1,2-Dichloroethene				x
1,2-Dichloroethane	x			
2-Hexanone	x			
Chloroform				x
Trichloroethene	x			x
Benzene	x	x		x
Toluene	x	x		x
Ethylbenzene	x	x		x
Styrene	x			
Xylene				x
Naphthalene	x	x	x	x
2-Methylnaphthalene	x	x	x	x
1-Methylnaphthalene	x	x		
Acenaphthylene	x	x	x	x
Acenaphthene	x	x	x	
Fluorene	x	x	x	
Phenanthrene	x	x	x	
Anthracene	x	x	x	
Flouranthene	x	x	x	
Pyrene	x	x	x	
Benzo(a)anthracene	x	x	x	
Chrysene	x	x	x	
Benzo(b)fluoranthene	x	x	x	
Benzo(k)fluoranthene	x	x	x	
Benzo(a)pyrene	x	x	x	
Indeno(1,2,3-c,d)pyrene	x	x	x	
Dibenz(a,h)anthracene	x	x	x	
Benzo(g,h,i)perylene	x	x	x	
2-Methylphenol				x
4-Chloroaniline			x	
4-Nitrophenol			x	
Dibenzofuran	x	x	x	
Bis(2-ethylhexyl)phthalate	x		x	x
Methoxychlor	x			
Endosultan	x			
Dieldrin	x			
gamma-Chlordane				x
Antimony	x		x	x
Arsenic	x		x	x
Barium	x			x
Beryllium	x			
Cadmium	x		x	
ChromiumVI	x	x	x	x
Cobalt	x	x	x	
Lead	x	x	x	x
Manganese	x		x	x
Mercury	x			
Selenium			x	x
Silver			x	
Vanadium	x	x		x
Zinc				x
Cyanide	x	x	x	x

Table 2

Summary of Ecological Contaminants of Concern in Sediment
(Supplemental Baseline Risk Assessment Report, Weston, July 1997)

Contaminant of Concern	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Frequency of Detection
Organics (PAHs)			
Acenaphthene	0.14	180	23/25
Acenapthylene	0.024	30	23/25
Anthracene	0.08	160	25/25
Benzo(a)anthracene	0.62	100	25/25
Benzo(b)fluoranthene	0.71	35	25/25
Benzo(k)fluoranthene	0.37	50	25/25
Benzo(a)pyrene	0.44	72	25/25
Benzo(g,h,i)perylene	0.24	31	25/25
Chrysene	0.98	100	25/25
Dibenzo(a,h)anthracene	0.11	9.7	17/25
Fluoranthene	0.6	220	25/25
Fluorene	0.13	160	23/25
Inorganics			
Arsenic	3.8	26	21/21
Cadmium	1	13.4	21/21
Chromium	32.2	1130	21/21
Copper	57.3	1680	21/21
Lead	79.6	1110	21/21
Mercury	0.11	4.3	18/21
Nickel	16.6	1330	21/21
Selenium	0.35	13.6	15/21
Silver	1	90.6	18/21
Thallium	0.29	0.76	3/21
Vanadium	9.3	71.8	21/21
Zinc	148	1300	21/21

TABLE 3

Summary of Process Option Descriptions as Applicable to Groundwater

Remedial Technology Category	Process Option	Description
None	No Action	No remedial or response action taken.
Monitoring	Ground Water Monitoring	Monitoring of selected site wells for contaminants of concern and against established standards.
Access Restrictions	Deed Restrictions	Deeds for properties in the site area would include restrictions of ground water use.

Summary of Process Option Descriptions as Applicable to the Area of Focus

Remedial Technology Category	Process Option	Description
Offsite Disposal	Asphalt Batching	Asphalt batching can be performed either as a cold-mix process or a hot-mix process. These two processes work quite differently and are described below. The contaminants are physically and chemically bound in the cold mix asphalt. The hot mix process removes the organic contaminants from the soil. The cold-mix asphalt process mixes the soil (after being reprocessed to remove debris and oversized material) with a liquid asphalt emulsion. The mixture is allowed to cure for several days prior to use. The contaminants are resistant to leaching in this form. The hot-mix asphalt process foods the contaminated soil into kiln with aggregate where the mixture is heated to approximately 500! F at which temperature organic contaminants are volatilized. Liquid asphalt is mixed the soil and aggregate to form asphalt. The off gases from the kiln are treated.
	Molten Metal Technology	Molten Metal Technology uses a catalytic extraction process to reduce wastes to their component elements. The wastes are placed into molten metal (temperatures between 2,400! F and 3,200! F) which cause the molecular bonds of waste compounds to break. The molten metal sets as a solvent and catalysts. This technology does not have demonstrated full-scale operations and no mobile units are available.
	Landfill	Contaminated material is excavated, tested and disposed of at an appropriate landfill facility.
	Co-Firing at Utility Boiler	The contaminated soil is blended with coal at concentrations between 1 and 5 percent and the mixture is burned in the power generating boiler. The process was originally developed for soils which contained free product because of their high BTU value, but the technology has been applied to soils with which contain light to moderate contamination. Co-firing would require seperate contaminated soil storage facilities, material handling, and feed systems. Studies would need to be conducted to determine the effects on the potential reduction in power generation, additional ash generation, ash handling and disposal requirements, potential effects on combustion performance, and air emissions.

Summary of Process Option Descriptions as Applicable to the Area of Focus

Remedial Techonology Category	Process Option	Description
Thermal Treatment	Infrared Desorption	Infrared thermal desorption is similar to other thermal desorption processes except that it uses infrared heating rods to heat the contaminated material to seperate the contaminants. The volatilized contaminants are collected for further onsite or offsite treatment. The infrared thermal desorption process is marketed by Westinghouse Remediation Services, Inc., and the advantages are better control over temperature, and the minimization of fines carryover.
	In Situ Vitrification	In Situ vitrification transmits high voltage electricity to the contaminated soil through electrodes, heat generated by the resistance of the soil to the flow of electricity between the electrodes raises the temperature of the soil above its melting point. When cooled, the result is a glass-like material which is resistant to leaching and further chemical action. The high temperatures created by the process and the off-gas treatment system would destroy PAHs. Vitrification is not applicable to soils with high organic contents or non-homogeneous or fill materials. Vitrification would require the area to be dewatered. The limited thickness of sediment at the site makes this alternative costly.
	Radio Frequency Heating	Electromagnetic energy is used to heat the soil to remove contaminants by volatilize, steam stripping, and distillation. The volatilized contaminants are then captured at the ground surface for additional treatment. This technology relies on the contaminants volatilizing from the soil.
	Incineration	The soil is placed in an incinerator which volatilizes and combusts the organic contaminants. Costs for incineration are generally fairly high in comparison with other remedial technologies. The incineration process must be carefully monitored to prevent the creation of more toxic compounds. Some of the metals detected in the sediments may become volatile during incineration and further complicate the process.
Physical/Chemical Treatment	Soil Venting	Soil venting is the removal of organic compounds by induced air flow. Vacuum extraction, air stripping, soil sparging, and soil vapor extraction all fall under the category of soil venting. Soil venting works well on volatile compounds in hydraulically conductive soils above the water table. Soil venting is often used in conjunction with bioremediation as a method of adding oxygen to the soil to enhance microbial activity.
	Solidification/ Stabilization	Solidification/stabilization (SS) consists of mixing the contaminated media with Portland cement and/or other admixtures either in situ or ex situ. The resulting solid mass generally has a lower permeability and chemically binds the contaminants to reduce their mobility. For in situ applications, the type of equipment used to mix the additives varies with the depth of soil targeted to be stabilized. For shallow applications, it is likely that mixing would occur with rototiller-like equipment mounted on the boom of an excavator. For ex situ applications, a pugmill is typically used. This technology has been applied to an MGP site. Bench-scale tests conducted for the FS on samples of peat, fill and sediment indicated that solidification treatment could potentially result in some reduction in leachability of PAHs and BTEX as measured by TCLP extraction tests.

Summary of Process Option Descriptions as Applicable to the Area of Focus

Remedial Techonology Category	Process Option	Description
Physical/Chemical Treatment (continued)	IWT Fixation	Internal Waste Technologies (IWT) supplies chemical fixation additives for the solidification/stabilization of soil.
	Soil Washing	Soil Washing removes contamination from soils and sediments by using a combination of mechanical and chemical processes. Chemical additives may include surfactants, pH adjustments, and chelating agents. Soil washing can be performed in situ or ex situ. Typical ex situ soil washing processes separate the fine grained materials from the coarse grained particles. Contaminants are removed from the coarse grained particles and fine grained particles are collected for additional treatment. This type of soil washing is a volume reduction process. Soils with high humic content, such as those found at the site, inhibit the desorption of contaminants. Due to the limited volume of coarse grained material expected in the Area of Focus, this technology would not result in a significant volume reduction. Biogenesis Enterprises, Inc. (Biogenesis), a soil washing contractor, claims that their process differs from conventional soil washing and can effectively decontaminate sediments (including silts and clays), but has not been used for full-scale operations. Soil washing can also be peformed in situ by injecting the washing solution below the ground, allowing it to flow through the contaminated material, and recovery of washing solution/sediments via pumping. Soil washing can be enhanced with the use of steam to increase contaminant removal efficiencies.
	Solvent Extraction	Contaminants are extracted from the soil by dissolving them in a solvent. Multiple extractions may be required to decrease contaminants to the required concentrations. To effectively dissolve the contaminants, the solvent must penetrate the soil matrix, which is difficult in low permeability soils. High water contents, which would be expected from soils excavated from the site, would inhibit the performance of solvent extraction.
	Carver-Greenfield Process	The Carver-Greenfield process is a solvent extraction process with moisture removal pretreatment. The pretreatment also serves to break any emulsions which are present. The lower water content of the solvent extraction feedstock allows the process to operate more efficiently. The Carver-Greenfield process has been used in a pilot-scale basis to treat drilling fluids, and full-scale in industrial applications to treat various sludges.

Summary of Process Option Descriptions as Applicable to the Area of Focus

Remedial Technology Category	Process Option	Description
Biological Treatment	Enhanced Bioremediation	Nutrients/amendments are added to promote bacterial growth. RETEC's Natural Biodegradation Evaluation at the site has preliminarily identified this alternative as a viable option.
	Limmofix Inc.	Limnofix Inc. is a company that specializes in the in situ bioremediation of shallow sediments. Similar to other types of bioremediation, nutrients an added to the shallow sediments to increase the rate of biodegradation using an injection system mounted on a marine vessel.
	Land Farming/Composting	Land farming/composting is the ex situ biological treatment of soils or sediment, often under controlled conditions. This technology can treat organic contaminants (VOCs and PAHs) and conventional pollutants (BOB, COD, and TOC). The control measures provide favorable conditions for the bacteria to grow and may include oxygen enhancement, temperature control, moisture adjustment, pH adjustment and nutrient control. Biological treatment is limited by the bioavailability of contaminants. Full-scale remediation his been conducted at sites which were contaminated by coal-tar distillation, petroleum refining and petroleum storage industries.
	Bioslurry Reactor	A bioslurry reactor is a type of bioremediation where contaminated soils and sediments are mixed with water to create a slurry. The slurry is placed in a bioreactor (large tank) where the environment is controlled to create favorable conditions for microbial activity and nutrients are added. The slurry is constantly agitated to maximize contact between contaminants, microorganisms and nutrients. As a result of the controlled conditions, biodegradation occurs more rapidly.
	In Situ Slurry Bioreactor	In Situ slurry bioremediation is similar to the bioslurry reactor except it is performed in situ. An area of the canal would be isolated with and dewatered to remove any free liquids. The sediments which remain in the enclosed area would be in a slurry form. Nutrients would be mixed with the sediments to provide favorable biological conditions. In Situ dewatering of sediments would be required to achieve required solids content.
Horizontal Barriers	Geomembrane	A geomembrane cap is constructed of a polymer liner (typically HDPE or LDPE) with layers of sand to protect the liner from punctures. The polymer liner has a low permeability to limit contaminant migration through the cap and limit direct contaminant contact. Installation of the geomembrane cap below the water table may result in sediments being displaced to the top of the membrane. Vertical gradients would need to be investigated to determine uplift pressures on the cap.
	Non-Compacted Soil	A non-compactod soil cap consists of low permeability soil (bentonite) cap constructed underwater. The clay is placed on top of the sediments and hydrates when in contact with water, increasing in size and reducing voids spaces in an attempt to form a continuous layer. The non-compacted soil cap would be difficult to construct, is likely to contain voids despite the hydration, and be discontinous in coverage. It is likely that significant mixing between the clay and sediments would occur.

Summary of Process Option Descriptions as Applicable to the Area or Focus

Remedial Technology Category	Process Option	Description
Horizontal Barriers (continued)	Bentonite Mat	A bentonite mat is a polymer liner with a layer of bentonite attached to one side of the liner. The bentonite mat is installed with protective layers of send on either side. Difficulties with subaqueous implementation of this process option include: deployment logistics, subgrade preparation, and quality control.
	Compacted Cap	A compacted soil cap, consisting of low permeability soil, would limit contaminant migration through the cap and limit direct contaminant contact. Constructability limitations in subaqueous environments.
	Composite Cap	A composite cap is a combination of a compacted soil cap and a geomembrane cap. The composite cap consists of compacted low permeability soil with a polymer liner. This system has redundancy built into the design. Constructability limitations in subaqueous environments.
	Subaqueous Composite Cap	A subaqueous composite cap may consist of filter fabric, a structural grid and soil constructed underwater. A layer of sand is placed on the gas textiles as a barrier to the contaminated sediments.
Vertical Barriers	Sheet Piling	Interlocking steel sheets which are driven or vibrated into place. Joints can be grouted to limit flow through connections between steel sheets.
	Soil Bentonite Slurry Wall	A low permeability will constructed with a soil-bentonite mixture using slurry trench construction techniques.
	Cement Bentonite Slurry Wall	Similar to a soil bentonite slurry wall with a lean concrete added to the soil-bentonite mixture.
	Concrete Diaphragm Wall	Pre-cast or cast-in-place reinforced concrete panels installed with slurry trench construction techniques.
	Vertical Membrane	A high density polyethylene (HDPE) membrane vibrated in place or inserted with slurry trench techniques. HDPE panels are joined with interlocking joints.
	Pressure Grouting	Construction of a vertical barrier by injection of ground, under pressure, into multiple rows of drill holes.

Summary of Process Option Descriptions as Applicable to Upland and Wetland Areas

Remedial Technology Category	Process Option	Description
Offsite Disposal	Asphalt Batching	Asphalt batching can be performed either as a cold-mix process or a hot-mix process. These two processes work quite differently and are described below. The contaminants are physically and chemically bound in the cold-mix asphalt. The cold-mix asphalt process mixes the soil (after being preprocessed to remove debris and oversized material) with a liquid asphalt emulsion. The mixture is allowed to cure for several days prior to use. The contaminants are resistant to leaching in this form. The hot-mix asphalt process feeds the contaminated soil into kiln with aggregate where the mixture is heated to approximately 500! F at which temperature organic contaminants are volatilized. Liquid asphalt is mixed the soil and aggregate to form asphalt. The off gases from the kiln are treated.
	Land Filling	Contaminated material is excavated, tested and treated and/or disposed at an appropriate landfill facility.
	Co-Firing at Utility Boiler	The contaminated soil is blended with coal at concentrations between 1 and 5 percent and the mixture is burned in the power generating boiler. The process was originally developed for soils which contained free product because of their high BTU value, but the technology has been applied to soils with which contain light to moderate contamination. Co-firing would require separate contaminated soil storage facilities, material handling, and feed systems. Studies would need to be conducted to determine the effects on the potential reduction in power generation, additional ash generation, ash handling and disposal requirements, potential effects on combustion performance, and air emissions. Several test burns have been conducted and soil from two MGP sites have been remediated in this method.
Thermal Treatment	Infrared Desorption	Infrared thermal desorption is similar to other thermal desorption processes except that it uses infrared heating rods to heat the contaminated material to separate volatile contaminants. The volatilized contaminants are collected for further onsite or offsite treatment. The infrared thermal desorption process is marketed by Westinghouse Remediation Services, Inc., and the advantages are better control over temperature, and minimization of fines carryover.
	In Situ Vitrification	High voltage electricity is transmitted through the contaminated soil. Heat generated by the resistance of the soil to the flow of electricity elevates the temperature past the melting point of soil. The result of the process is a glass-like material which is resistant to leaching. Off-gases created by the process are treated. A large source of electricity would be required. The vitrified material would need to be disposed of (may contain metals).
	Radio Frequency Heating	Electromagnetic energy is used to beat the soil to remove contaminants by volatilize, steam stripping, and distillation. The volatilized contaminants are then captured at the ground surface for additional treatment. This technology relies on the contaminants volatilizing from the soil.

Summary of Process Option Descriptions as Applicable to Upland and Wetland Areas

Remedial Technology Category	Process Option	Description
Thermal Treatment (continued)	Incineration	The soil is placed in an incinerator which volatilizes and combusts the organic contaminants. Costs for incineration are generally fairly high in comparison with other remedial technologies. The incineration process must be carefully monitored to prevent the creation of more toxic compounds. Some of the metals detected in the sediments may become volatile during incineration and further complicate the process.
Physical/Chemical Treatment	In Situ Soil Venting	Soil venting is the removal of organic compounds by induced air flow. Vacuum extraction, air stripping and soil vapor extraction all fall under the category of soil venting. Soil venting works well on volatile compounds in hydraulically conductive soils above the water table. Soil venting is often used in conjunction with bioremediation as a method of adding oxygen to the soil to enhance microbial activity.
	Solidification/ Stabilization	Solidification/stabilization (SS) consists of mixing the contaminated media with Portland cement and/or other admixtures either in situ or ex situ. The resulting solid mass generally has a lower permeability and chemically binds the contaminants to reduce their mobility. For shallow applications, it is likely that mixing would occur with rototiller-like equipment mounted on the boom of an excavator. For ex situ applications, a pugmill is typically used. This technology has been applied to an MGP site. Bench-scale tests conducted for the FS on samples of peat, fill and sediment indicated that solidification treatment could potentially result in some reduction in leachability of PAHs and BTEX as measured by TCLP extraction tests.
	IWT Fixation	International Waste Technologies (IWT) supplies chemical fixation additives for the solidification/stabilization of soil. Solidification/stabilization technologies are discussed above.
	Soil Washing	Soil Washing removes contamination from soils and sediments by using a combination of mechanical and chemical processes. Chemical additives may include surfactants, pH adjustments, and chelating agents. Soil washing can be performed in situ or ex situ. Typical ex situ soil washing processes separate the fine grained materials from the coarse grained particles. Contaminants are removed from the coarse grained particles and fine grained particles are collected for additional treatment This type of soil washing is a volume reduction process. Soil washing can also be performed in situ by injecting the washing solution below the ground, allowing it to flow through the contaminated material and pumping it out again. Soil washing can be enhanced with the use of steam to increase contaminant removal efficiencies.
	Solvent Extraction	Contaminants are extracted from the soil by dissolving them in a solvent. The contaminants are removed from the solvent so that it may be reused. Multiple extractions may be required to decrease contaminants to the required concentrations. To effectively dissolve the contaminants, the solvent must penetrate the soil matrix, which is difficult in low permeability soils. Limited quantities make unit treatment costs very high. Not effective for treatment of metals.

Summary of Process Option Descriptions as Applicable to Upland and Wetland Areas

Remedial Technology Category	Process Option	Description
Biological Treatment	Enhanced Bioremediation	In Situ biological treatment uses existing microorganism to biodegrade contaminants. Ground water is pumped from the contaminated aquifer, enhanced with nutrients to promote bacteria growth and reinjected upgradient. Use at MGP sites has been only partially successful due to the inability to distribute nutrients throughout the extent of contaminated media. Not effective for treatment of metals.
	Land Farming/ Composting	Composting is the ex situ biological treatment of soils or sediment, often under controlled conditions. This technology can treat organic contaminants (VOCs and PAHs) and conventional pollutants (BOB, COD, and TOC). The control measures provide favorable conditions for the bacteria to grow and may include oxygen enhancement, temperature control, moisture adjustment, pH adjustment and nutrient control. Not effective for metals.
	Bioslurry Reactor	A bioslurry reactor is a type of bioremediation where contaminated soils and sediments are mixed with water to create a slurry. The slurry is placed in a bioreactor (large tank) where the environment is controlled to create favorable conditions for microbial activity and nutrients are added. The slurry is constantly agitated to maximize contact between contaminants, microorganism and nutrients. As a result of the controlled conditions, biodegradation occurs more rapidly.
Horizontal Barriers	Compacted Soil	A compacted soil cap consisting of low permeability soil would limit infiltration of water through contaminated soils and reduce leaching potential. A compacted soil cap would provide a limited barrier to burrowing animals contacting contaminated soil. Once holes are burrowed through the cap, its effectiveness at reducing surface water infiltration and providing a barrier to contaminated soil is reduced.
	Geomembrane Cap	A geomembrane cap is constructed of a polymer liner (typically HDPE or LDPE)with layers of sand to protect the liner from punctures. The polymer liner has a low permeability to limit infiltration of water through the contaminated soils to reduce leaching and may provide a limited barrier to discourage animal burrowing.
	Composite Cap	A composite cap is a combination of a compacted soil cap and a geomembrane cap. The composite cap consists of compacted low permeability soil with a polymer liner. This system has redundancy built into the design. This cap does not provide any additional benefit to prevent burrowing animals from contacting contaminated soils but has higher cost.
	Bentonite Mat	A bentonite mat is a polymer liner with a layer of bentonite attached to one side of the liner. The bentonite mat is installed with protective layers of sand on either side.
	Steel Barrier	A layer of chain-link fencing or similar barrier would be placed in conjunction with a capping process option. The steel barrier would inhibit burrowing animals from contacting soil contaminants.

TABLE 4

Ranking for the Criteria of the NCP

		Threshold Criteria		Balancing Criteria				
Alt. Number	**Description**	**Overall Protection of Human Health and the Environment**	**Compliance with ARARs**	**Long-Term Effectiveness and Permanence**	**Short-Term Effectiveness**	**Reduction of Toxicity, Mobility, & Volume Through Treatment**	**Implementability**	**Cost**
No Action								
1:	No Action, Groundwater, Area of Focus and Uplands/Wetlands; Monitoring	8	No 1	8	8	8	1	1
Monitoring and Institutional Controls Only								
2a:	Institutional Controls, Groundwater and Uplands/Wetlands; No Action, Subareas 1, 2, 4 7, and 8; Monitoring	7	No 2	7	7	7	2	2
"Active" Remedies								
2b:	Institutional Controls, Groundwater and Uplands/ Wetlands; No Action, Subareas 1, 2,7, and 8; Capping, Subarea 3; Monitoring	6	Partial 2	6 (Significant areas ecological) risk not addressed)	4	6 4	3	3
2c:	Institutional Controls, Groundwater and Uplands/ Wetlands; No Action, Subareas 3 and 7; Capping, Subareas 1, 2, and 8; Monitoring	5	Partial 2	5 (Ranks closely with Alternative 2d)	3	5 4	4	4
2d:	Institutional Controls, Groundwater and Uplands/ Wetlands; No Action Subareas 3 and 7; Excavation and Off Site Treatment/Disposal, Subareas 1, 2, and 8; Monitoring; Dewatering	4	Partial 3	4 (Slightly greater permanence due to removal of Subareas 1, 2, and 8 materials over alternative 2d, capping these areas)	6	2 4	7	7
3a:	Institutional Controls, Groundwater and Uplands/ Wetlands; Capping, Subareas 1, 2, 3, 7. and 8; Monitoring	2	Yes	2 (All areas of ecological risk capped)	1	3 4	6	6
3b:	Institutional Controls, Groundwater and Uplands/ Wetlands; Capping, Subareas 3 and 7: Excavation and Off Site Treatment/Disposal, Subareas 1, 2, and 8; Monitoring; Dewatering	1	Partial 3	1 (Largest volume of potentially contaminated material removed, remaining ecological risk capped)	5	1 4	8	8
3c:	Institutional Controls, Groundwater and Uplands/ Wetlands: Capping, Subareas 1, 2, 3 and 8; No Action, Subarea 7; Monitoring	3	Partial 2	3 (All areas that are not subject to recontamination from stormwater capped)	2	4 4	5	5

All areas potentially exceeding sediment quality criteria will continue to be exposed: Wetlands regulations regarding the mitigation of past wetlands impacts would not be met.
Some areas potentially exceeding sediment quality criteria will continue to be exposed: Wetlands regulations regarding the mitigation of past wetlands impacts would not be met.
Most areas potentially exceeding sediment quality criteria will be capped or in-filled thereby meeting the TBC sediment criteria; however, excavation of Subareas 1,2, and 8 will cause more destruction to wetlands than other available alternatives, therefore this alternative does not comply with Section 404 of the CWA. These alternatives obtain a reduction in the toxicity and mobility through containment.

TABLE 5

Remedial Action Objection and Goals By Area/Media of Interest

		Alternatives Which Meet RAO/G:	Alternatives Which Do Not Meet RAO/G:	RAO/G Does Not Apply To:
Ecological				
1	In areas where risks are unacceptable, including Subareas 1, 2, 3, 7, and 8, eliminate direct exposure of ecological receptors to contaminated soils and sediments, or reduce exposure to levels presenting an acceptable risk.	3a, 3b	1, 2A, 2b (partial), 2c (partial), 2d (partial), 3c (partial)	
2	In areas identified in Paragraph 1 above, where it is not feasible to eliminate direct exposure to contaminated soils and sediments or reduce exposure to levels presenting an acceptable risk, reduce direct exposures of ecological receptors to contaminants of concern to the extent feasible.	3a, 3b	1, 2a, 2b (partial), 2c (partial), 2d (partial), 3c (partial)	
3	Prevent or minimize the long-term adverse effects of remediation activities on the existing aquatic environment and/or wetland habitat.	2b, 2c, 2d, 3a, 3b, 3c		1, 2a
4	Restore wetlands affected by remediation.	2b, 2c, 2d, 3a, 3b, 3c		1, 2a
Human Health				
1	Absent an appropriate risk assessment which has been approved by EPA, prevent unacceptable exposure (direct contact, ingestion, and inhalation) to contaminated soils located greater than five feet below grade.	2a, 2b, 2c, 2d, 3a, 3b, 3c	1	
2	Prevent ingestion and exposures associated with residential use (direct contact, ingestion, and inhalation) to contaminated groundwater where contaminated groundwater presents unacceptable risks, including Class IV areas.	2a, 2b, 2c, 2d, 3a, 3b, 3c	1	
3	Prevent exposures associated with residential use (direct contact, ingestion and inhalation) to contaminated soils, sediments, air and surface water at the site.		All 1	
Management of Migration				
1	Protect Lake Champlain from being impacted by contaminants left on site.			
	A Ensure Lake Champlain is not impacted by a significant increase in mass flux of contaminants through groundwater migration.		All	

1 Site is currently zoned for industrial/commercial use only.

Remedial Action Objection and Goals By Area/Media of Interest

Management of Migration (continued)	Alternatives Which Meet RAO/G:	Alternatives Which Do Not Meet RAO/G:	RAO/G Does Not Apply To:
B Ensure Lake Champlain is not impacted by a significant increase in mass flux of contaminants through contaminated sediment migration.	All		
C Prevent changes in hydrogeologic conditions that will likely cause migration of contaminated groundwater to Lake Champlain in concentrations that exceed a stands to be developed.	1, 2a, 2b, 2c, 3a, 3c	2d(potentially), 3b(potentially)	
2 Protect areas not targeted for remediation (both on and off site) by preventing significant migration of contamination from on-site sources.			
A Ensure that contaminated groundwater with concentration levels above drinking water standards does not migrate beyond the Class IV classification boundary.	All		
B Ensure that contaminated on-site sediments are not significantly mobilized.	All		
C Ensure that NAPL is not significantly mobilized.	1, 2a, 2b, 2c, 3a, 3c	2d(potentially), 3b(potentially)	
D Prevent degradation of surface water to levels above ambient water quality criteria.	All		
E Prevent degradation of local (urban) background air quality.	2b, 2c, 3a, 3c	2d(potentially) 3b(potentially)	1,2a
3 Protect remediated areas on the site from becoming recontaminated from on-site and known off-site sources.			
A Ensure that hazardous substances left in place do not mobilize or create unacceptable risk to ecological receptors and humans in remediated areas.	2b, 2c, 2d, 3a, 3b, 3c		1,2a
B Monitor to provide the necessary data to determine if non-CERCLA substances are mobilizing or creating unacceptable risks.	All		
C Monitor to provide the necessary data to determine whether stormwater and non-contact cooling water may be creating an unacceptable risk to ecological receptors and humans in remediated areas.	2c, 2d, 3a 3b, 3c		1, 2a, 2b
4 Site Uses			
A Ensure to the extent practical that the remedy itself does not reduce the suitability of the site for current and future uses, including a highway.	All		
B Retain or expand current Class IV groundwater classification and boundary.	2a, 2b, 2c, 2d 3a, 3b, 3c	1	
C Maintain or replace beneficial functions and values of wetlands.	2b, 2c, 2d, 3a, 3b, 3c		1, 2a

APPENDIX B

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

ARARs Specific to Remedial Alternative 3a: Capping Subareas 1, 2, 3, 7 and 8

REQUIREMENTS/ CRITERIA	DESCRIPTION	EVALUATION DECISION	ACTION TO BE TAKEN TO ATTAIN ARAR
	Chemical-Specific		
Draft Sediment Quality Criteria	Criteria developed by the USEPA for certain hydrophobic organic compounds to protect benthic organisms.	TBC	No action necessary; sediments currently meet this criteria.
Ontario Ministry of the Environment and Energy (OMEE) Sediment Quality Guidelines	Guidelines derived specifically for freshwater sediments that define three levels of chronic effects on benthic organisms: no-effect level; lowest-effect level (LEL) which indicates level of sediment contamination that can be tolerated by most benthic organisms; severe-effects level (SEL) level at which pronounced disturbances or sediment-dwelling organisms will occur for a majority of the benthic species.	TBC	Capping sediment areas that currently exceed these criteria will attain compliance with the guidance criteria. Alternative 3a. capping all subareas with ecological concern, will address this ARAR most completely.
NOAA Sediment Screening Guidelines	Used to identify concentration levels associated with deleterious effects on estuarine and marine species and environments Based on a database complied from 89 publications lowest (ER-L) and median (ER-M) effects ranges (corresponding to 10th and 50th percentiles, respectively) of observed biological effects were developed.	TBC	Capping sediment areas that currently exceed these criteria will attain compliance with the guidance criteria. Alternative 3a. capping all subareas with ecological concern, will address this ARAR most completely
Clean Water Act (CWA) Ambient Water Quality Criteria Guidelines. 40 CFR Part 131	Establishes policy of user-based surface water quality criteria for protection of aquatic organisms and human health.	TBC	No action necessary; surface water quality presently meets Ambient Water Quality Criteria (AWQC).
	Location-Specific		
Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Located on 100-year Floodplain, 40 CFR 264.18 (b)	Facility must be designed and operated to avoid washout.	Applicable	Substantiative portions of this requirement will be considered during design or the capped areas to minimize wash out effects from flood events.
Executive Order 11988 Floodplains Management, 40 CFR 6, Subpart A	Actions by federal agencies taking place within floodplains must be done to avoid adverse impacts and preserve beneficial values in floodplains.	Applicable	Substantiative portions or this requirement will be considered during design of the capped areas minimize wash out effects from flood events
Executive Order 11990 Protection of Wetlands, 40 CFR 6, Subpart A	Actions by federal agencies taking place within wetlands must be planned to limit adverse impacts.	Applicable	All remedial actions will be designed to minimize wetlands areas to be impacted during implementation of the remedy and all remediated areas will have wetlands restoration activities.

ARARs Specific to Remedial Alternative 3a: Capping Subareas 1, 2, 3, 7 and 8 (continued)

REQUIREMENTS/ CRITERIA	DESCRIPTION	EVALUATION DECISION	ACTION TO BE TAKEN TO ATTAIN ARAR
Clean Water Act (CWA) Section 404 Dredge and Fill in Wetlands, 40 CFR Part 230	Dredging or filling activities in wetlands; are regulated. Appropriate and practicable steps must be taken to minimize the address impacts of any discharges occurring as a result of the selected remedial alternative. No activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available.	Applicable	Substantive portions of this act will be met through the design of these alternatives. In particular, actions which minimize impacts to non-remediation areas of the Site will be taken and every effort will be made to prevent migration of either contaminated sediments or cap material during placement. Steps to prevent this occurrence may include, but are not limited to silt curtains, weirs, subaqueous cap placement, and specialized placement techniques. Alternative 3a is the least environmentally damaging practicable alternative. Restoration and mitigation measures will be taken following placement of the cap.
National Historic Preservation Act Regulations Preservation of Historic Properties Controlled by Federal Agency, 36 CFR 800	Actions by federal agencies must be planned to preserve historic properties and minimize harm to National Historic Landmarks. Statues include requirements that actions must be taken to recover and preserve artifacts, preserve historic properties and minimize harm to National Historic Landmarks	Applicable	A full assessment or the status of the historical submerged structures will be conducted prior to remedial design. Appropriate steps to record and document the structures will be conducted following consultation with the state and prior to construction or the cap.
Archaeologic and Historical Preservation Act Regulations, 36 CFR Part 65	Actions by federal agencies must be done to preserve and recover any historical/archeological artifacts found.	Applicable	A full assessment of the status of the historical submerged structures will be conducted prior to remedial design. Appropriate steps to record and document the structures will be conducted following consultation with the state and prior to construction or the cap.
Vermont Historic Preservation Law, 22 VSA Ch. 14, °° 743 (4) and 767	Places controls on actions conducted by the State of Vermont that may impact historic, scientific, or archaeological data.	Applicable	A full assessment of the status of the historical submerged structures will be conducted prior to remedial design. Appropriate steps to record and document the structures will be conducted following consultation with the state and prior to construction of the cap.
Fish and Wildlife Coordination Act Modification to Waterway that Affects Fish or Wildlife, 50 CFR Part 297	Actions by federal agencies must be taken to protect fish or wildlife when diverting channeling, or otherwise modifying a stream or river.	Applicable	The requirements of this Act will be considered during design of the remedy. Consultation with U.S. Fish and Wildlife Service and Vermont Fish and Wildlife Dept. is required.
Vermont Wetlands Rules, 10 VSA Ch. 37, ° 905	Identification and protection of significant wetlands and their values and functions.	Applicable	The wetland functions and values will be restored by implementation or these alternatives. Alternative 3a most completely addresses this ARAR by restoration of all stressed wetlands identified at the Site.

ARARs Specific to Remedial Alternative 3a: Capping Subareas 1, 2, 3, 7 and 8 (continued)

REQUIREMENTS/ CRITERIA	DESCRIPTION	EVALUATION DECISION	ACTION TO BE TAKEN TO ATTAIN ARAR
Vermont Groundwater Protection Law. 10 VSA Ch. 48 ° 1340	Establish classifications for groundwater to protect the existing and potential future use of each groundwater source.	Applicable	In 1993, the Vermont Agency of Natural Resources designated most of the groundwater under the site as a Class IV groundwater, which is not suitable for potable use but suitable for some agricultural, industrial and commercial uses. Existing Class IV designation establishes a measure of protection from consumption of groundwater exceeding federal drinking water standards (MCLs). As a Class IV goundwater, appropriate management practices must be used to prevent violation of groundwater quality standards in adjacent Class III groundwaters.
	Action-Specific		
RCRA - Identification and Listing of Hazardous Wastes 40 CFR 261	Criteria for determining if a waste is a hazardous waste and is subject to regulation.	potentially ARAR	If a contaminatated media exhibits the characteristic of a hazardous waste, these regulations are applicable. If a contaminated media is sufficiently similar to listed RCRA hazardous wastes, these regulations are potentially relevant and appropriate.
RCRA - Treatment, Storage and Disposal Facilities, 40 CFR Part 268	Regulations concerning land disposal of listed or characteristically hazardous waste.	Not ARAR	No RCRA hazardous wastes would be generated under this alternative. In Situ capping activities will involve consolidation of materials within an area of existing contamination, which does not implicate RCRA standards [55 Fed. Reg. 8666, 8760 (March 8, 1990)].
Resource Conservation and Recovery Act Land Disposal Facility Notice in Deed 40 CFR 264.116, 264.119 (b)(1)	Establishes provisions for a deed notation for closed hazardous waste disposal units, to prevent land disturbance by future owner.	Potentially Relevant and Appropriate	Purpose of deed restrictions or other institutional controls for these alternatives is sufficiently similar to the purpose of RCRA deed notations to consider the RCRA restriction language.
Resource Conservation and Recovery Act General Facility Standards and Security 40 CFR 264 Subpart B	General Standars and security provisions for facilities that treat, store, or dispose of hazardous waste.	Potentially Relevant and Appropriate	Criteria will be considered during Remedial Design/Remedial Action phases.
RCRA Preparedness and Prevention. 40 CFR 264 Subpart C	Requirements for the design, construction and operation of hazardous waste facilities to maintain equipment to prevent an unplanned release.	Potentially Relevant and Appropriate	These standards will be considered during the Remedial Design/Remedial Action Phases.

ARARs Specific to Remedial Alternative 3a: Capping Subareas 1, 2, 3, 7 and 8 (continued)

REQUIREMENTS/ CRITERIA	DESCRIPTION	EVALUATION DECISION	ACTION TO BE TAKEN TO ATTAIN ARAR
Contingency Plan and Emergency Procedures, 40 CFR 264 Subpart D	Regulations pertaining to hazardous waste facilities requiring a contingency plan and emergency procedures.	Potentially Relevant and Appropriate	These standards will be considered during the Remedial Design/Remedial Action Phases.
Releases from Solid Waste Management Units, 40 CFR 264 Subpart F	Regulations pertaining to hazardous waste facilities requiring monitoring and corrective action for units that manage solid waste.	Potentially Relevant and Appropriate	These standards will be considered during the Remedial Desing/Remedial Action Phases.
Closure and Post-Closure 40 CFR 264 Subpart G	Regulations pertaining to closure and post-closure activities for regulated units.	Potentially Relevant and Appropriate	These standards for groundwater monitoring will be considered during development of long-term monitoring plans.
Vermont Hazardous Waste Management Regulations, 10 VSA Ch. 159	Requirements for the management, treatment and disposal of hazardous wastes.	Potentially ARAR	If a contaminatated media exhibits the characteristic of a hazardous waste, these regulations are applicable. If a contaminated media is sufficiently similar to hazardous wastes regulated by the State of Vermont, these regulations are relevant and appropriate. The requirements for storing hazardous wastes and designing, sonstructing and operation hazardous waste facilities will be considered during remedial design and remedial action.
State Water Quality Policy, 10 VSA ° 1250	Establishes policy to protect and enhance the quality, character and usefulness of source water and to assure the public health; control the discharge of wastes to the waters of the state, prevent degradation of high quality waters and prevent, abate, or control all activities harmful to water quality.	Applicable	These criteria will be considered during design of cap placement techniques.
Vermont Water Quality Standards, 10 VSA Ch. 47, EPR Ch. 1, and Vermont NPDES Permit Program Regulations, 10 VSA Ch. 47	Establishes requirements for surface water quality, effluent standards and/or limitations for discharges to surface water.	Applicable	Surface water quality presently meets Ambient Water Quality Criteria (AWQC). However, these standards will be considered during design and construction of the cap.
Vermont Air Pollution Control Regulations, 10 VSA Ch. 23 ° 554	Lists hazardous contaminants and sets Hazard Limiting Values and action Limits for numerous compounds. Identifies source registration and pollution control requirements.	Applicable	These values and action limits will be considered during design of cap placement techniques.
Vermont Primary and Secondary Ambient Air Quality Standards (5-304, 5-305)	Establishes maximum 24-hour concentrations and annual geometric mean ambient air quality standards for parliculate matter.	Relevant and Appropriate	These standards will be considered during design of cap placement techniques.
Stormwater Discharge Permit, 10 VSA ° 4152	Limits stormwater runoff off the Site.	Relevant and Appropriate	No stormwater from the Site has been identified to exceed pertinent standards. This alternative includes measures to manage stormwater runoff.

ARARs Specific to Remedial Alternative 3a: Capping Subareas 1, 2, 3, 7 and 8 (continued)

REQUIREMENTS/ CRITERIA	DESCRIPTION	EVALUATION DECISION	ACTION TO BE TAKEN TO ATTAIN ARAR
Vermont Wetland Regulations, 10 VSA Ch. 37	Procedures to identify and protect significant wetlands and the values and functions which they serve in such a manner that the goal of no net loss of such wetlands and their functions is achieved.	Applicable	Wetlands functions and values will be restored by implementation of these measures. Alternative 3a most completely addresses this ARAR.
Vermont Dam Regulations 10 VSA 43	This law governs all dams that are constructed in the State impounding more than 500,000 cubic feet of water and sediment, except those dams relating to the generation of electrical power for public use.	Potentially Applicable	If design calculations indicate that the volume of impounded water may exceed 500,000 cubic feet, these rugulations would apply to the design of the weir. The requirements of this law include; 1) proper notification of state and local offices; 2) preparation of plans and specification for the project by an engineer; 3) determination of public good; and 4) oversight of the construction of the project by an engineer.

APPENDIX C

STATE OF VERMONT DECLARATION OF CONCURRENCE

September 16, 1998

Mary Jane O'Donnell Chief, ME/VT/CT Superfund Section
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency, Region 1
J.F. Kennedy Federal Building
Boston, Massachusetts 02203-0001

Re: Concurrence With The Pine Street Canal Record of Decision

Dear Mary Jane:

This letter will confirm our concurrence in the Pine Street Canal Superfund Site Record of Decision (ROD) by the State of Vermont. Concurrence is based in large part from input by members of my staff who have reviewed the Record of Decision Final Draft provided to them by the EPA Regional Project Manager for the Pine Street Site. They have reported to me that the ROD comprehensively and accurately addresses the chain of events and deliverables leading up to the selection of the site remedy.

The state believes that the selected remedy is protective of human health and the environment, meets all state requirements that are applicable to the remedial action and is cost effective. We look forward to working with EPA during the remedial design and remedial action phases of the Pine Street Canal Superfund Site remedy.

I would like to take the opportunity to commend you and your staff on a job well done in the development of technically sound and acceptable remedy for the site. The formation of the Pine Street Coordinating Council with local, municipal and regulatory representation was very effective in arriving at a remedial solution that everyone can support.

cc: George Desch
Stanley Corneille

APPENDIX D

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX

for the

Pine Street Canal NPL Site

1.0 Pre-Remedial Records

1.2 Preliminary Assessment

1. "Preliminary Site Assessment and Site Inspection," Ecology and Environment, Inc. (June 23, 1982).

2.0 Removal Response

Although not expressly listed in this Index, all documents contained in the December 20, 1988 Removal Administrative Record are incorporated by reference herein, and are expressly made apart of this Preliminary Administrative Record.

3.0 Remedial Investigation (RI)

3.1 Correspondence

1. Memorandum from Robert F. Ramey, City of Burlington to Ross L. Gilleland, EPA Region I (March 18, 1991). Concerning the attached "Appendix A - Zoning" requirement.

3.2 Sampling and Analysis Data

The Sampling and Analysis Data for the Draft and Supplemental Remedial Investigations (RI) may be reviewed, by appointment only, at EPA Region I,
Boston, Massachusetts.

3.4 Interim Deliverables

EPA Region I

Appendix A and B for the record cited in entry number 1 may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

1. "Ambient Air Toxics Sampling and Analysis Results," EPA Region I (November 1990).

Metcalf & Eddy, Inc.

2. "Chemical Quality Assurance Project Plan for Biological Studies," Metcalf & Eddy, Inc. (June 1990).
3. "Final Health and Safety Plan for Supplemental Remedial Investigation/Feasibility Study," Metcalf & Eddy, Inc. (September 1990).
4. "Final Quality Assurance Project Plan for Supplemental Remedial Investigation/Feasibility Study," Metcalf & Eddy, Inc. (October 1990).
5. "Final Field Sampling Plan for Supplemental Remedial Investigation/Feasibility Study," Metcalf & Eddy, Inc. (October 1990).

Peer Consultants

6. "Field Operations Plan for Pine Street Canal Site Remedial Investigation/Feasibility Study," Peer Consultants (March 20, 1989).
7. "Quality Assurance Project Plan for Pine Street Canal Site Remedial Investigation/Feasibility Study," Peer Consultants (March 20, 1989).
8. "Summary of Biological Survey Activities," Peer Consultants (September 1989).

3.5 Applicable or Relevant and Appropriate Requirements (ARARs)

1. Letter from Robert B. Finucane, State of Vermont Agency of Natural Resources to Mary Jane O'Donnell, EPA Region I (March 2, 1992). Concerning Vermont's regulatory requirements.

3.6 Remedial Investigation (RI) Reports

1. "Draft Remedial Investigation Report - Volume IA," Peer Consultants (May 1990).
2. "Draft Remedial Investigation Report - Volume IB," Peer Consultants (May 1990).
3. "Draft Remedial Investigation Report - Volume III," Peer Consultants (May 1990).
4. "Draft Remedial Investigation Report - Volume IV," Peer Consultants (May 1990).
5. "Supplemental Remedial Investigation Final Report - Volume I," Metcalf & Eddy, Inc. (March 1992).
6. "Supplemental Remedial Investigation Final Report - Volume II," Metcalf & Eddy, Inc. (March 1992).
7. "Supplemental Remedial Investigation Final Report - Volume III," Metcalf & Eddy, Inc. (March 1992).

3.7 Work Plans and Progress Reports

1. "Draft Work Plan for the Remedial Investigation/Feasibility Study," Perkins Jordan, Inc. (1986).
2. "Work Plan Volume I - Technical - for Remedial Investigation/Feasibility Study," Peer Consultants (March 20, 1989).
3. "Draft Amendment for Work Plan Volume I - Technical for Remedial Investigation/Feasibility Study," Peer Consultants (October 3, 1989).
4. "Work Plan for Remedial Investigation/Feasibility Study Activities," (05-1L19) Metcalf & Eddy, Inc. (November 1989).
5. "Final Work Plan for Biological Studies," (03-1L19) Metcalf & Eddy, Inc. (January 1990).
6. "Final Work Plan for Supplemental Remedial Investigation/Feasibility Study," (10-1L19) Metcalf & Eddy, Inc. (August 1990).
7. "Ambient Air Toxics Sampling and Analysis Work Plan," EPA Region I (August 1990).

3.9 Health Assessments

1. Memorandum from Susanne Simon, Department of Health & Human Services Centers for Disease Control to Ross L. Gilleland, EPA Region I (October 15, 1991). Concerning the health consultation on the Jackson Terrace Apartments property.

4.0 Feasibility Study (FS)

4.4 Interim Deliverables

Reports

1. "Final Health and Safety Plan for the Treatability Study," Metcalf & Eddy, Inc. (September 1990).
2. "Treatability Study Quality Assurance Project Plan," Metcalf & Eddy, Inc. (October 1990).
3. "Treatability Study - Final Report - Volume I," Metcalf & Eddy, Inc. (February 1992).
4. "Treatability Study - Final Report - Volume II," Metcalf & Eddy, Inc. (February 1992).

4.7 Work Plans and Progress Reports

1. "Treatability Study Work Plan," Metcalf & Eddy, Inc. (October 1990).

Comments

2. Comments Dated January 11, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.
3. Comments Dated April 24, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.

Responses to Comments

4. Response Dated May 24, 1991 from Cinthia L. McLane, Metcalf & Eddy, Inc. to Comments Dated January 11, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.
5. Response Dated March 10, 1992 from Cinthia L. McLane, Metcalf & Eddy, Inc. to Comments Dated April 24, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.

10.0 Enforcement

10.4 Interviews, Depositions and Affidavits

1. Memorandum from Ross L. Gilleland, EPA Region I to File (April 27, 1992). Concerning

information about disposal practices at the site.

10.8 EPA Consent Decrees

1. Consent Decree, United States v. Green Mountain Power Corporation, New England Electric System, and Vermont Gas Systems, Civil Action 88-307 (Judge Gagliardi) (June 22, 1990).

10.9 Pleadings

1. Complaint, United States v. Green Mountain Power Corporation, New England Electric System, and Vermont Gas Systems, Civil Action 88-307 (April 20, 1988).

11.0 Potentially Responsible Party (PRP)

11.9 PRP-Specific Correspondence

City of Burlington

1. Letter from Paul G. Keough, EPA Region I to Peter A. Clavelle, Mayor of Burlington (November 22, 1989). Concerning the status and time frame of work at the site.
2. Letter from Paul G. Keough, EPA Region I to Peter A. Clavelle, Mayor of Burlington (April 10, 1990). Concerning release of part of the site to the State of Vermont for highway development.
3. Letter from Christian M. Rascher, EPA Region I to Robert F. Ramey, City of Burlington (May 23, 1990). Concerning transmittal of analytical data and sample location map of the site.
4. Letter from Mark T. Eldridge, City of Burlington to Merrill S. Hohman, EPA Region I (May 25, 1990). Concerning appointment of Robert F. Ramey as Special Projects Manager for the City of Burlington.
5. Letter from Ross L. Gilleland, EPA Region I to Robert F. Ramey, City of Burlington (May 21, 1991). Concerning transmittal of sample data.
6. Letter from William F. Ellis, McNeil & Murray (Attorney for City of Burlington) to Ross L. Gilleland, EPA Region I (May 21, 1991) with attached access-to-property form. Concerning request for all sample results to which the City of Burlington is legally entitled.
7. Letter from Ross L. Gilleland, EPA Region I to William F. Ellis, McNeil & Murray (Attorney for City of Burlington) (May 28, 1991). Concerning earlier transmittal of sample results.
8. Letter from Ross L. Gilleland, EPA Region I to Robert F. Ramey, City of Burlington (June 5, 1991). Concerning update of property lot numbers and owners.
9. Letter from Robert F. Ramey, City of Burlington to Ross L. Gilleland, EPA Region I (June 14, 1991). Concerning current list of property owners near barge canal area.
10. Letter from Peter A. Clavelle, Mayor of Burlington to Julie D. Belaga, EPA Region I (August 27, 1991). Concerning lack of communication from EPA regarding schedule changes for site work.
11. Letter from Peter A. Clavelle, Mayor of Burlington to James M. Jeffords, U.S. Senate (October 4, 1991). Concerning lack of communication from EPA regarding schedule changes for site work.
12. Letter from Julie D. Belaga, EPA Region I to Peter A. Clavelle, Mayor of Burlington (October 21, 1991). Concerning schedule changes for site work.
13. Letter from Merrill. S. Hohman, EPA Region I to Peter A. Clavelle, Mayor of Burlington (December 17, 1991) with attached Letter from Ross L. Gilleland to Joseph M. Kwasnik, New England Power Service (October 15, 1991). Concerning improvement in communication with the City of Burlington.

Green Mountain Power Corporation

14. Letter from David O. Ledbetter, Hunton & Williams (Attorney for Green Mountain Power Corporation) to Margery L. Adams, EPA Region I (February l4, 1991). Concerning transmittal of Comments Dated January 11, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.
15. Cross-Reference: Comments Dated January 11, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc. [Filed and cited as entry number 2 in 4.7 Work Plans and Progress Reports].
16. Letter from David O. Ledbetter, Hunton & Williams (Attorney for Green Mountain Power Corporation) to Margery L. Adams, EPA Region I (May 2, 1991). Concerning transmittal of Comments Dated April 24, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.
17. Cross-Reference: Comments Dated April 24, 1991 from Groundwater Technology, Inc. for Nancy Huelsberg, Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc. [Filed and cited as entry number 3 in 4.7 Work Plans and Progress Reports].

PRP Technical Committee Documents

18. Letter from A. Norman Terreri, Green Mountain Power Corporation; Joseph M. Kwasnik, New England Power Service; and Michael E. Sullivan, Vermont Gas Systems to Ross L. Gilleland, EPA Region I (July 1, 1991). Concerning request for a meeting to discuss technical issues related to the site.
19. Letter from Ross L. Gilleland, EPA Region I to A. Norman Terreri, Green Mountain Power Corporation (July 19, 1991). Concerning acceptance of invitation for meeting with PRP representatives.
20. Letter from Ross L. Gilleland, EPA Region I to Joseph M. Kwasnik, New England Power Service (October 15, 1991). Concerning proposed meetings between EPA and PRP representatives.
21. Letter from Margery L. Adams, EPA Region I to Karen K. O'Neill, Green Mountain Power Corporation (October 15, 1991). Concerning decision not to release draft documents to PRPs.
22. Letter from Ross L. Gilleland, EPA Region I to Joseph M. Kwasnik, New England Power Service (November 4, 1991). Concerning attached address list of PRPs.
23. Letter from Karen K. O'Neill, Green Mountain Power Corporation to Margery L. Adams, EPA Region I (November 7, 1991). Concerning proposed meetings between EPA and PRPs.
24. Letter from A. Norman Terreri, Green Mountain Power Corporation; Michael E. Sullivan, Vermont Gas Systems; Andrew H. Aitken, New England Electric Systems; and Robert F. Ramey, City of Burlington to R. Bradford Cawley, Southern Union Company (November 25, 1991) with attached address list. Concerning an invitation to participate in meetings between EPA and PRPs.
25. Letter from A. Norman Terreri, Green Mountain Power Corporation to Michael Jarrett, Citizen Oil Company (December 10, 1991) with attached address list. Concerning minutes of PRP meeting held on December 6, 1991.
26. Letter from Joseph M. Kwasnik, New England Power Service to Michael Jasinski, EPA Region I (January 20 1992). Concerning the attached:
    A. Copies of invitation letters to PRPs
    B. List of PRP Technical Committee.
27. Letter from Michael Jasinski and Ross L. Gilleland, EPA Region I to Joseph M. Kwasnik, New England Power Service (January 30, 1992). Concerning ground rules for informational meetings and the attached:
    A. List of analytical data collected by EPA
    B. "Presentation of Preliminary Investigation Results," Metcalf & Eddy, Inc.
28. Letter from Michael Jasinski, EPA Region I to Joseph M. Kwasnik, New England Power Service (February 20, 1992). Concerning transmittal of two volumes of "Treatability Study - Final Report," Metcalf & Eddy, Inc. (February 1992).
29. Letter from Michael Jasinski, EPA Region I to Joseph M. Kwasnik, New England Power Service (April 10, 1992). Concerning transmittal of three volumes of "Supplemental Remedial Investigation - Final Report," Metcalf & Eddy, Inc. (March 1992).

30. Letter from Michael Jasinski, EPA Region I to Joseph M. Kwasnik, New England Power Service (April 22, 1992). Concerning transmittal of the May 1990 "Draft Remedial Investigation Report," Peer Consultants.

Vermont Agency of Transportation

31. Letter from Paul R. Philbrook, Vermont Agency of Transportation to Christian M. Rascher, EPA Region I (August 23, 1990) with attached map. Concerning permission to perform construction for traffic-light system.
32. Letter from Ross L. Gilleland, EPA Region I to Paul R. Philbrook, Vermont Agency of Transportation (December 4, 1990). Concerning EPA's request that VT AOT wait until sample results are available before proceeding with construction.
33. Letter from Paul R. Philbrook, Vermont Agency of Transportation to Ross L. Gilleland, EPA Region I (December 10, 1990). Concerning minor construction activity at Lakeside Avenue.
34. Letter from Robert F. Ramey, City of Burlington to Mary Jane O'Donnell, EPA Region I (December 20, 1990). Concerning request to proceed with minor construction at Lakeside Avenue.
35. Letter from Ross L. Gilleland, EPA Region I to Paul R. Philbrook, Vermont Agency of Transportation (January 18, 1991). Concerning contingencies for construction at Lakeside Avenue.
36. Letter from Robert M. Murphy, Vermont Agency of Transportation to Ross L. Gilleland, EPA Region I (January 29, 1991). Concerning contingent approval to perform minor construction at Lakeside Avenue upon receipt of sample results.
37. Letter from Ross L. Gilleland, EPA Region I to Robert M. Murphy, Vermont Agency of Transportation (May 16, 1991). Concerning withdrawal of wetlands permit application.
38. Letter from Ross L. Gilleland, EPA Region I to Robert M. Murphy, Vermont Agency of Transportation (June 6, 1991). Concerning Confirmation of proposed highway alignment.
39. Letter from Robert M. Murphy, Vermont Agency of Transportation to Ross L. Gilleland, EPA Region I (June 14, 1991). Concerning status of wetlands permit and the highway alignment plan.
40. Letter from Patrick J. Garahan, Vermont Agency of Transportation to Julie D. Belaga, EPA Region I (November 7, 1991). Concerning request for meeting to discuss site issues.
41. Letter from Ross L. Gilleland, EPA Region I to Robert M. Murphy, Vermont Agency of Transportation (November 21, 1991). Concerning EPA's understanding of the highway project as it relates to the site and setting for the contingencies on minor

construction at Lakeside Avenue.

42. Letter from Robert M. Murphy, Vermont Agency of Transportation to Ross L. Gilleland, EPA Region I (December 5, 1991). Concerning clarification of modified highway construction plans.
43. Letter from Julie D. Belaga, EPA Region I to Patrick J. Garahan, Vermont Agency of Transportation (December 10, 1991). Concerning withdrawal of request for a meeting.
44. Memorandum from John H. Perkins, Vermont Agency of Transportation to File via Robert M. Murphy, Vermont Agency of Transportation (March 17, 1992). Concerning the February 21, 1992 meeting.

11.12 PRP Related Documents

Blodgett Oven Company

1. "Subsurface Investigation," Aquatec, Inc. for Blodgett Oven Company (July 1989).
2. Letter from Craig H. Campbell, Mintz, Levin, Cohn, Ferris, Glovsky and Popeo (Attorney for G.S. Blodgett Company) to Ross L. Gilleland and Margery L. Adams, EPA Region I (November 19, 1991) with maps. Concerning request to redelineate boundaries and attached November 1991 "Analytical Data to Support Exclusion of the Blodgett Property West of the Railroad Tracks," Aquatec, Inc. for Blodgett Oven Company.

General Electric Company

3. "Summary of Environmental Sampling," Wehran Engineering Corporation for General Electric Company (October 1989).

Ultramar Petroleum, Inc.

4. "Environmental Site Assessment - Ultramar Petroleum, Inc."ERM-Northeast for Atlantic Petroleum Company (November 1986).
5. Letter from Christopher H. Marraro, Kaye, Scholer, Fierman, Hays & Handler (Attorney for Ultramar Petroleum, Inc.) to Margery L. Adams, EPA Region I (November 16,1990). Concerning objection to certain analytical methods used at the Ultramar site.
6. Letter from Margery L. Adams to Christopher H. Manaro, Kaye, Scholer, Fierman, Hays & Handler (Attorney for Ultramar Petroleum, Inc.) (March 4, 1991). Concerning response to Mr. Marraro's November 16, 1990 letter with attached:
   A. Letter from Patrick O. Gwinn and Martha L. Zirbel, Metcalf & Eddy, Inc. to Ross L. Gilleland, EPA Region I (January 18, 1991). Concerning response to Mr. Marraro's November 16, 1990 letter.
   B. Letter from Patrick O. Gwinn and Martha L. Zirbel, Metcalf & Eddy, Inc. to Ross L. Gilleland, EPA Region I (February 22, 1991). Concerning further clarification of analytical methods.
   C. Standard Practice for Identification of Waterborne Oils.
   D. Appendix G - Analytical Method for Determining Fuel Oil Component in Soil/Sediment.

Vermont Agency of Transportation

7. "Final Summary - Burlington Administrative Action Environmental Statement," Vermont Agency of Transportation and U.S. Department of Transportation (1977).
8. "Burlington Southern Connector - Remedial Action and Highway Construction Study," Perkins Jordan, Inc. for Vermont Agency of Transportation (October 1982).
9. "Draft Burlington Southern Connector - Remedial Action and Highway Construction Assessment - Phase II," Perkins Jordan, Inc. for Vermont Agency of Transportation (January 1983).
10. "Burlington Southern Connector Permit Application - Design Report - Volume I," Perkins Jordan, Inc. for Vermont Agency of Transportation (January 1984).
11. "Burlington Southern Connector Permit Application - Technical Appendices - Volume 2," Perkins Jordan, Inc. for Vermont Agency of Transportation (January 1984).
12. "Burlington Southern Connector Permit Application - Groundwater Treatment Plant Operations and Maintenance Manual - Volume 3," Perkins Jordan, Inc. for Vermont Agency of Transportation (January 1984).
13. "Southern Connector Subsurface Contamination Search," Aquatec, Inc. for Vermont Agency of Transportation (June 1988).
14. "Wiessner Property and St. Johnsbury Trucking Sites Subsurface Contamination Delineation Survey," Aquatec, Inc. for Vermont Agency of Transportation (February 1989).
15. "Evaluation of the Final Environmental Impact Statement for the Champlain Parkway/Burlington Southern Connector," U.S. Department of Transportation and Vermont Agency of Transportation (March 13, 1989).

13.0 Community Relations

13.1 Correspondence

1. Letter from Theresa Freeman, Vermonters Organized for Cleanup to Michael R. Deland, EPA Region I (July 26, 1985). Concerning the reauthorization of Superfund.
2. Letter from Michael R. Deland, EPA Region I to Theresa Freeman, Vermonters Organized for Cleanup (January 14, 1986). Concerning a status report on site activities.
3. Letter from Mark L. Wert, ICF Kaiser Engineers to Robert F. Ramey, City of Burlington (June 5, 1990). Concerning information to be included in the community relations

plan.
4. Letter from William J. Keogh Sr. to Christain M. Rascher, EPA Region I (September 4, 1990). Concerning lack of progress with site cleanup causing delay in construction of the Southern Connector.
5. Letter from Ross L. Gilleland, EPA Region I to William J. Keogh Sr. (November 29, 1990). Concerning current and future activities at the site.
6. Letter from Ross L. Gilleland, EPA Region I to Cindy Houston (December 12, 1990). Concerning receipt of information packet.

13.2 Community Relations Plans

1. "Community Relations Plan," EPA Region I (December 1990).

13.3 News Clippings/Press Releases

Press Releases

1. "Environmental News - EPA to Hold Public Meeting to Discuss Pine Street Barge Canal Superfund Site," EPA Region I (March 22, 1989).
2. "Environmental News - EPA Moves Into New Phase of Remedial Investigation at the Pine Street Canal Superfund Site in Burlington, Vermont," EPA Region I (August 31, 1990).
3. "Environmental News - EPA Announces Open House for Residents Near Pine Street Canal Superfund Site in Burlington, Vermont," EPA Region I (November 23, 1990).
4. "Environmental News - Media Advisory," EPA Region I (November 23, 1990). Concerning open house to be held at the site.
5. "Open House for the Pine Street Canal Superfund Site," EPA Region I (December 5, 1990).
6. "Environmental News - EPA Announces Two Weeks of Additional Field Studies at the Pine Street Canal Superfund Site in Burlington, Vermont," EPA Region I (April 3, 1992).

13.5 Fact Sheets

1. "EPA Completes Plans," EPA Region I (March 1989). Concerning plans for conducting an investigation into contamination at the site.
2. "EPA Conducts Biological Studies," EPA Region I (May 1990). Concerning plans to conduct biological and aquatic field studies at the site.
3. "EPA Announces Results of Treatability Studies," EPA Region I (February 1992). Concerning summary of major findings of the treatability studies.
4. "EPA Announces Results of Remedial Investigations," EPA Region I (April 1992). Concerning findings of widespread contamination of soils, groundwater and sediments.

14.0 Congressional Relations

14.1 Correspondence

1. Letter from Curtis A. Moore, U.S. Senate to Eric Sapirstein, EPA Headquarters (September 10, 1981). Concerning information received on two sites in Vermont.
2. Letter from Jack Woolley to Robert T. Stafford, U.S. Senate (September 30, 1981). Concerning information on two sites in Vermont.
3. Letter from James M. Jeffords, Patrick J. Leahy and Peter Smith, U.S. Senate to Julie D. Belaga, EPA Region I (March 14, 1990). Concerning lack of progress at the site and a request for a meeting to be held in April 1990.
4. Memorandum from Bob Paquin, Office of Patrick J. Leahy, U.S. Senate to May 10, 1990 Meeting Participants (May 2, 1990). Concerning relocation of meeting to the Aiken Forestry Research Lab in Burlington.
5. Letter from James M. Jeffords, U.S. Senate to Julie D. Belaga, EPA Region I (July 9, 1991). Concerning adherence to site schedules.
6. Letter from Julie D. Belaga, EPA Region I to James M. Jeffords, U.S. Senate (August 8, 1991). Concerning status report on activities at the site.

19.0 Resource Conservation and Recovery Act (RCRA) Records

Although not expressly listed in this Index, all documents contained in the September 1991 Resource Conservation and Recovery Act (RCRA) Administrative Record are incorporated by reference herein, and are expressly made a part of this Preliminary Administrative Record.

ADMINISTRATIVE RECORD ADDENDUM INDEX

for the

Pine Street Canal NPL Site

1.0 Pre-Remedial Records

1.1 CERCLIS Site Discovery

1. "Site Identification," EPA Region I (July 9, 1981).

1.2 Preliminary Assessment

1. "Site Identification and Preliminary Assessment," EPA Region I (October 5, 1981).
2. "Site Identification and Preliminary Assessment," EPA Region I (May 27, 1982).

3.0 Remedial Investigation (RI)

3.1 Correspondence

1. Letter from John A. Malter, Vermont Agency of Environmental Conservation to Richard C. Boynton, EPA Region I (November 20, 1986). Concerning the State's decision to discontinue contracting for site studies.
2. Letter from Richard C. Boynton, EPA Region I to John A. Malter, Vermont Agency of Environmental Conservation (December 18, 1986). Concerning the State's decision not to continue with site studies.
3. Letter from Karle L. Snyder, U.S. Department of Transportation Federal Highway Administration to Paula Fitzsimmons, EPA Region I (April 13, 1989). Concerning the transmittal of boring logs and the attached February 22, 1985 letter from Elizabeth A. Higgins, EPA Region I.

3.2 Sampling and Analysis Data

1. "Technical Memorandum - Summary of Sampling Modifications - Biological Assessment," Metcalf & Eddy, Inc. (May 15, 1990).
2. Letter from Andrew Beliveau, Metcalf & Eddy, Inc. to Deb Szaro, EPA Region I (September 27, 1990). Concerning the attached development of total PAH/carcinogenic PAH method.
3. Memorandum from Joseph Montanaro, EPA Region I to Daniel Granz, EPA Region I (May 7, 1992). Concerning the attached low-level purgeable organic analyses.
4. Memorandum from Peter Philbrook, Shirish Vora and Richard Siscanaw, EPA Region I to Daniel Granz, EPA Region I (May 13, 1992). Concerning the attached gas chromatography-mass spectrometry analysis of extractable organics in aqueous samples.
5. Memorandum from Peter Philbrook, Shirish Vora, ESAT and Richard Siscanaw, EPA Region I to Daniel Granz, EPA Region I (May 14, 1992). Concerning the attached gas chromatography-mass spectrometry analysis of extractable organics in aqueous samples.
6. Memorandum from Daniel S. Granz, EPA Region I to Michael Jasinski, EPA Region I (May 21, 1992). Concerning PAH data from well samples.
7. Letter from Martha L. Zirbel, Metcalf & Eddy, Inc. to Michael Jasinski, EPA Region I (June 26, 1992). Concerning the attached analysis of coal tar samples.
8. Letter from Christopher M. Crandell, The Johnson Company to Michael Jasinski, EPA Region I (July 1, 1992). Concerning the attached:
   A. Map of sampling locations
   B. Table 1 - Fuel Characterization
   C. Table 2 - Hazardous Waste Characterization
   D. Table 3 - Asphalt Batch Plant Characteristics
   E. Laboratory analysis reports.
9. Commercial Testing & Engineering Co. Analysis Report No. 71-34861 for the The Johnson Company (July 9, 1992). Handwritten note regarding viscosity reading is from The Johnson Company.
10. "START Program - Computer Assisted Site Evaluation of Carcinogenic PAH Contamination in Soil and Sediment," EPA Region I (October 2, 1992).

3.4 Interim Deliverables

1. "Draft Technical Memorandum - Review of Site Information and Contaminant Information," Metcalf & Eddy, Inc. (June 1990).
2. Letter from Gary P. Kjelleren, General Electric to Ross Gilleland, EPA Region I (June 13, 1991). Concerning the attached:
   A. "CERCLA Oversight," General Electric (November 1990)
   B. "Draft - Report on Oversight for the CERCLA Field Activities Conducted at the GE, Lakeside Avenue Facility, Burlington, Vermont," Wehran Engineering for General Electric (February 1990).

3. Letter from Gary P. Kjelleren, General Electric to Michael Jasinski, EPA Region I (July 13, 1992). concerning transmittal of the attached April 1992 "Oversight Report for EPA Activities on the GE Site on April 16 and 20, 1992."

3.6 Remedial Investigation (RI) Reports

Reports

1. "Technical Memorandum No. 14 - Pine Street Canal - Supplemental RI/FS - Task 3," Metcalf & Eddy, Inc. (June 16, 1992).

Comments

The documents upon which entry numbers 2 through 5 comment are filed and cited as entry numbers 5 through 7 in 3.6 Remedial Investigation (RI) Reports of the May 18, 1992 Initial Administrative Record for this site.

2. Comments Dated July 1, 1992 from Gary P. Kjelleren, General Electric on the March 1992 "Supplemental Remedial Investigation Final Report - Volumes I - III," Metcalf & Eddy, Inc.
3. Comments Dated July 1, 1992 from Gary P. Kjelleren, General Electric on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc.
4. Comments Dated July 10, 1992 from Joseph M. Kwasnik for A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc.
5. Comments Dated July 24, 1992 from Robert R. Dill, Whiting Company on the March 1992 "Supplemental Remedial Investigation Final Report - Volumes I - III," Metcalf & Eddy, Inc.

3.7 Work Plans and Progress Reports

Reports

1. Letter from Martha L. Zirbel, Metcalf & Eddy, Inc. to Michael Jasinski, EPA Region I (April 7, 1992). Concerning the attached:
   A. "Field Sampling Plan Addendum," (April 6, 1992)
   B. "Quality Assurance Project Plan Addendum," (April 6, 1992).
2. "Groundwater (monitoring and production) Well Sampling - Spring 1992," EPA Region I (April 8, 1992).

Comments

The documents upon which entry number 1 comment are filed and cited as entry numbers 6 and 7 in 3.4 Interim Deliverables and entry number 2 in 3.7 Work Plan and Progress Reports of the May 18, 1992 Initial Administrative Record for this site.

3. Comments Dated April 12, 1989 from Gary P. Kjelleren and Douglas E. Seely, Wehran Engineering for General Electric on the March 20, 1989 "Field Operations Plan for Pine Street Canal Site Remedial Investigation/Feasibility Study," "Quality Assurance Project Plan for Pine Street Canal Remedial Investigation/Feasibility Study," and "Work Plan Volume I - Technical - for Remedial Investigation/Feasibility Study," PEER Consultants.

3.9 Health Assessments

1. Memorandum from Tammie A. McRae, Department of Health & Human Services Agency of Toxic Substances and Disease Registry to Suzanne Simon, EPA Region I (October 29, 1992). Concerning a health consultation for the site.

3.10 Endangerment Assessments

1. "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc. (May 1992).

Comments

2. Comments Dated July 1, 1992 from Gary P. Kjelleren, General Electric on the "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc. (May 1992).
3. Cross-Reference: Comments Dated July 1, 1992 from Gary P. Kjelleren, General Electric on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc. [Filed and cited as entry number 3 in 3.6 Remedial Investigation (RI) Reports].
4. Cross-Reference: Comments Dated July 10, 1992 from Joseph M. Kwasnik for A. Norman

Terreri, Green Mountain Power Corporation for the PRP Technical Committee on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc. [Filed and cited as entry number 4 in 3.6 Remedial Investigation (RI) Reports].

5. Comments Dated July 22, 1992 from Robert Dill, Whiting Company on the July 10, 1992 Comments from Joseph M. Kwasnik for A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc.

4.0 Feasibility Study (FS)

4.1 Correspondence

1. Letter from A. Norman Terreri, Green Mountain Power Corporation to Julie Belaga, EPA Region I (May 6, 1992). Concerning the PRP Technical Committee's request to extend the review period for various feasibility studies.
2. Letter from Peter A. Clavelle, Mayor of Burlington to Julie Belaga, EPA Region I (May 8, 1992). Concerning support for the PRP Technical Committee's request to extend the review period for various feasibility studies.
3. Letter from William E. Ahearn, Vermont Agency of Natural Resources to Mary Jane O'Donnell, EPA Region I (May 11, 1992). Concerning support for PRP Technical Committee's request to extend the review period for various feasibility studies.
4. Letter from Karen K. O'Neill, Green Mountain Power Corporation to Ross Gilleland, EPA Region I (May 13, 1992). Concerning inclusion of Comments Dated January 11, 1991 from Groundwater Technology, Inc. for Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc. in the Administrative Record.
5. Letter from Todd G. Schwendeman, Groundwater Technology, Inc. to Ross Gilleland, EPA Region I (May 14, 1992). Concerning release from copyright restrictions on the Comments Dated January 11, 1991 from Groundwater Technology, Inc. for Green Mountain Power Corporation on the October 1990 "Treatability Study Work Plan," Metcalf & Eddy, Inc.
6. Letter from Julie Belaga, EPA Region I to Peter A. Clavelle, Mayor of Burlington (May 29, 1992). Concerning EPA's approval of a 60-day extension for review of various feasibility studies.
7. Letter from Julie Belaga, EPA Region I to A. Norman Terreri, Green Mountain Power Company (May 29, 1992) with attached letter from Julie Belaga, EPA Region I to Peter A. Clavelle, Mayor of Burlington. Concerning EPA's approval of a 60-day extension for the completion of the Feasibility Study and issuance of a Proposed Plan.
8. Letter from Michael Jasinski, EPA Region I to Joseph M. Kwasnik, New England Power Service (June 5, 1992). Concerning the transmittal of several remedial documents and the attached "Draft - Remedial Action Objectives for the Pine Street Canal Site."
9. Letter from Joseph M. Kwasnik, New England Power Service to Michael Jasinski, EPA Region I (June 10, 1992). Concerning the attached "Anticipated Schedule for the Development of Additional Remedial Alternative Information to EPA."
10. Letter from Mary Jane O'Donnell for Michael Jasinski, EPA Region I to Joseph M. Kwasnik; New England Power Service (June 12, 1992). Concerning EPA's approval of The Johnson Company to perform sampling and analysis activities for the PRP Technical Comittee.
11. Letter from Julie Belaga, EPA Region I to Mark T. Eldridge, City of Burlington (July 2, 1992). Concerning zoning issues as they pertain to remediation at the site.
12. Letter from Julie Belaga, EPA Region I to Robert F. Ramey, City of Burlington (July 2, 1992). Concerning EPA's review of a containment remedial alternative for the site which involves capping.
13. Letter from Peter A. Clavelle, Mayor of Burlington to Julie Belaga, EPA Region I (August 27, 1992). Concerning a request for a personal briefing of the Feasibility Study and the Proposed Plan.
14. Letter from Howard Dean, Governor of Vermont and Peter Clavelle, Mayor of Burlington to Julie Belaga, EPA Region I (October 26, 1992). concerning the hope that EPA will approve the PRP Technical Committee's remediation plan.

4.2 Sampling and Analysis Data

1. Letter from Gary P. Kjelleren, General Electric to Michael Jasinski, EPA Region I (February 28, 1992). Concerning the attached water-quality results from the oldest well on GE's property.
2. Letter from Joseph M. Kwasnik, New England Power Service to Michael Jasinski, EPA Region I (June 5, 1992). Concerning transmittal of the attached June 1992 "Sampling and Analysis Work Plan for Limited Supplemental Feasibility Study," The Johnson Company for The PRP Technical Committee.
3. "Amendment to the Sampling and Analysis Work Plan for Limited Supplemental Feasibility Study," The Johnson Company for the PRP Technical Committee (June 11, 1992).
4. Letter from Alfred F. Clancy and Martha L. Zirbel, Metcalf & Eddy, Inc. to Michael Jasinski, EPA Region I (Aug. - 5, 1992). Concerning the Tier I validation performed on TCLP inorgarnics analytical data packages from Lancaster Laboratories.

5. Letter from Alfred F. Clancy and Martha L. Zirbel, Metcalf & Eddy, Inc. to Michael Jasinski, EPA Region I (August 5, 1992). Concerning the Tier I validation performed on TCLP organic analytical data packages from Lancaster Laboratories.

Comments

6. Comments Dated June 12, 1992 from Michael Jasinski, EPA Region I on the June 1992 "Sampling & Analysis Work Plan for Limited Supplemental Feasibility Study," The Johnson Company for the PRP Technical Committee.

The remaining Sampling and Analysis Data for the Feasibility Study (FS) may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

4.4 Interim Deliverables

Reports

1. Technical Memorandum - Treatability Study," Metcalf & Eddy, Inc. (Financial information is withheld as CONFIDENTIAL).
2. "Technical Memorandum No. 2 - Treatability Study - Pumping Test Plan," Metcalf & Eddy, Inc. (August 15, 1990) (Financial information is withheld as CONFIDENTIAL).
3. "Technical Memorandum No. 3 - Treatability Study," Metcalf & Eddy, Inc.
4. "Technical Memorandum No. 4 - Treatability Study - Bioremediation Literature Search," Metcalf & Eddy, Inc.
5. "Technical Memorandum No. 5 - Treatability Study - Trial Pumping Test Results," Metcalf & Eddy, Inc. (September 13, 1990).
6. "Technical Memorandum No. 6 - Treatability Study," Metcalf & Eddy, Inc.
7. "Technical Memorandum No. 7 - Treatability Study - Task 7," Metcalf & Eddy, Inc. (January 4, 1991).
8. "Technical Memorandum No. 8 - Treatability Study," Metcalf & Eddy, Inc.
9. "Site Health and Safety Plan," The Johnson Company for Green Mountain Power Corporation (June 1992).
10. "A Stage IA Cultural Resources Survey of the Pine Street Canal Superfund Site," John Milner Associates for Metcalf & Eddy, Inc. (1992).

Comments

The documents upon which entry numbers 11 and 12 comment are filed and cited as entry numbers 3 and 4 in 4.4 Interim Deliverables of the May 18, 1992 Initial Administrative Record for this site.

11. Cross-Reference: Comments Dated July 1, 1992 from Gary P. Kjelleren, General Electric on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc. [Filed and cited as entry number 3 in 3.6 Remedial Investigation (RI) Reports].
12. Cross-Reference: Comments Dated July 10, 1992 from Joseph M. Kwasnik for A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee on the March 1992 Supplemental Remedial Investigation Final Report," Metcalf & Eddy, Inc., the February 1992 "Treatability Study Final Report," Metcalf & Eddy, Inc., and the May 1992 "Baseline Risk Assessment Final Report," Metcalf & Eddy, Inc. [Filed and cited as entry number 4 in 3.6 Remedial Investigation (RI) Reports].

4.5 Applicable or Relevant and Appropriate Requirements (ARARs)

1. Letter from Arthur D. Aldrich, Vermont Agency of Transportation to Eric Gilbertson, Vermont Agency of Development and Community Affairs (September 10, 1984). Concerning historical information about the site. Meeting Notes, Vermont Agency of Development and Community Affairs and Vermont Advisory Council on Historic Preservation (August 7, 1985). Concerning shipwrecks in the canal not be endangered by the cleanup. Letter from David Skinas, Vermont Agency of Development and Community Affairs to Stanley Corneille, Vermont Agency of Natural Resources (January 26, 1988). Concerning possible impact of cleanup activities to the canal and associated historic resources.
4. Letter from Stanley Corneille, Vermont Agency of Natural Resources to Paula L. Fitzsimmons, EPA Region I (February 4, 1988). Concerning transmittal of a copy of the January 26, 1988 letter from David Skinas, Vermont Agency of Development Community Affairs.
5. Letter from Giovanna Peebles, Vermont Agency of Development and Community Affairs and Paula L. Fitzsimmons, EPA Region I (February 23, 1989). Concerning EPA's responsibility for carrying out archaeological studies of known shipwrecks at the site.
6. "Urban Renewal Plan for the Waterfront Revitalization District - A Revitalization Strategy for the 1990s and Beyond," Burlington Planning Commission (September 24, 1990).
7. "Burlington Municipal Development Plan (pages 14, 15, 44, 97, 100, and 3 maps)," Burlington City Council, Mayor of Burlington, and the Burlington Planning Commission (June 1991).
8. Letter from David Webster, EPA Region I to William Ahearn, Vermont Agency of Natural

Resources (January 3, 1992). Concerning Vermont's regulatory requirements.

9. Memorandum from Giovanna Peebles, Vermont Agency of Development and Community Affairs to Robert B. Finucane and Stanley Corneille, Vermont Agency for Natural Resources (January 15, 1992) with attached map. Concerning EPA's compliance with Section 106 of the National Historic Preservation Act.
10. Letter from Robert B. Finucane, Vermont of Agency of Natural Resources to Mary Jane O'Donnell, EPA Region I (March 2, 1992). Concerning Vermont's regulatory requirements.
11. Letter from Robert B. Finucane, Vermont of Agency of Natural Resources to Mary Jane O'Donnell, EPA Region I (October 22, 1992). Concerning groundwater reclassification at the site.
12. Letter from Peter A. Clavelle, Mayor of Burlington to Jube Belaga, EPA Region I (October 26, 1992). Concerning groundwater reclassification at the site and the attached:
    A. "Draft - Interim Procedures for the Submission and Review of Proposals for the Reclassification of Ground Water to Class IV," Secretary of the Agency of Natural Resources (October 13, 1992)
    B. "Draft - Hazardous Materials Management Division Policy to Map Class IV Ground Water Areas," Department of Environmental Conservation (October 13, 1992)
    C. Title 10, Vermont Statutes Annotated, Chapter 48, Groundwater Protection (November 30, 1988).
13. Letter from Robert F. Ramey, City of Burlington to Ross Gilleland, EPA Region I (October 26, 1992). concerning attached excerpts from Code of Ordinances pertaining to potable water.
14. Memorandum from Stephen Mangion, EPA Region I to Sheila Eckman, EPA Region I (November 3, 1992). Concerning ground water classification at the site.

4.6 Feasibility Study (FS) Reports

1. "Feasibility Study - Final Report - Volume I," Metcalf & Eddy, Inc. (November 1992).
2. "Feasibility Study - Final Report - Volume II," Metcalf & Eddy, Inc. (November 1992).
3. "Feasibility Study - Final Report - Volume III," Metcalf & Eddy, Inc. (November 1992).

4.7 Work Plans and Progress Reports

1. Memorandum from Barbara Wyskowski, Metcalf & Eddy, Inc. to Martha L. Zirbel, Metcalf & Eddy, Inc. (July 6, 1992). Concerning oversight of field work for the Limited Feasibility Study at the site.

4.9 Proposed Plans for Selected Remedial Action

1. "EPA Proposes Cleanup Plan for the Pine Street Canal Superfund Site," EPA Region I (November 1992).

10.0 Enforcement

10.1 Correspondence

1. Letter from Merrill S. Hohman, EPA Region I to Charles M. Samuelson (November 6, 1992). Concerning the Proposed Plan for site cleanup.
2. Letter from Merrill S. Hohman, EPA Region I to Robert H. Penniman (November 6, 1992). Concerning the Proposed Plan for site cleanup.
3. Letter from Merrill S. Hohman, EPA Region I to Philip H. Hoff (November 6, 1992). Concerning the Proposed Plan for site cleanup.
4. Letter from Merrill S. Hohman, EPA Region I to Thomas A. Farrell (November 6, 1992). Concerning the Proposed Plan for site cleanup.
5. Letter from Merrill S. Hohman, EPA Region I to George P. Barrett (November 6, 1992). Concerning the Proposed Plan for site cleanup.
6. Letter from Merrill S. Hohman, EPA Region I to James Fitzgerald, Central Vermont Railroad (November 6, 1992). Concerning the Proposed Plan for site cleanup.
7. Letter from Merrill S. Hohman, EPA Region I to Charles A. Cairns, Champlain Oil Company (November 6, 1992). Concerning the Proposed Plan for site cleanup.
8. Letter from Merrill S. Hohman, EPA Region I to The Augsbury Corporadon, c/o Atlantic Fuels Marketing Corp. (November 6, 1992). Concerning the Proposed Plan for site cleanup.
9. Letter from Merrill S. Hohman, EPA Region I to President, Allied-Signal, Inc. (November 6, 1992). Concerning the Proposed Plan for site cleanup.
10. Letter from Merrill S. Hohman, EPA Region I to Richard Grundler, Robert Perrin, Charles Hadden, Richard Reed, Stanley Smith, Stuart Jacobs, Robert Watson, Charles Shea, Stan Fersing (formerly The Leverage Group) (November 6, 1992). Concerning the Proposed Plan for site cleanup.
11. Letter from Merrill S. Hohman, EPA Region I to Stan Cyphers, Uhlman Co. (November 6, 1992). Concerning the Proposed Plan for site cleanup.
12. Letter from Merrill S. Hohman, EPA Region I to George L. Lindemann, Southern Union Company (November 6, 1992). Concerning the Proposed Plan for site cleanup.
13. Letter from Merrill S. Hohman, EPA Region I to John W. Rowe, New England Power Service (November 6, 1992). Concerning the Proposed Plan for site cleanup.

14. Letter from Merrill S. Hohman, EPA Region I to Robert M. Furek, Heublein, Inc. (November 6, 1992). Concerning the Proposed Plan for site cleanup.
15. Letter from Merrill S. Hohman, EPA Region I to Robert Heinemann, U.S. Department of Commerce (November 6, 1992). Concerning the Proposed Plan for site cleanup.

10.3 State and Local Enforcement Records

1. Memorandum from W. William Martinez, Vermont Department of Water Resources to A. William Albert, Vermont Department of Water Resources (July 18, 1968). Concerning oil spilled into Lake Champlain and action taken to contain the spill.
2. Memorandum from Water Quality Section, Vermont Department of Water Resources to A. William Albert, Vermont Department of Water Resources (July 23, 1968). Concerning meeting notes discussing oil pollution caused by the Burlington Gas Works.
3. Report of Investigation of E.B. & A.C. Whiting Co., Army Corps of Engineers, Case #77-064 (June 2, 1977).
4. Report of Investigation of General Electric, Army Corps of Engineers, Case #78-218. Concerning the attached:
   A. Letter from Phillip W. McGrade, Army Corps of Engineers to General Electric (January 11, 1979). Concerning placement of fill material in wetlands area adjacent to the site.
   B. Letter from W.N. Aswad, General Electric to Phillip W. McGrade, Army Corps of Engineers (January 19, 1979). Concerning material inadvertently deposited at the site.
   C. Report of Investigation, Martha Abair, Army Corps of Engineers.
   D. Letter from D.E. Momot, General Electric to G.A. Laraway, Army Corps of Engineers (September 14, 1979). Concerning transmittal of a work plan describing GE's proposal to remove fill.
   E. Letter from Phillip W. McGrade, Army Corps of Engineers to D.E. Momot, General Electric (December 14, 1979). Concerning GE's violation of Federal statutes by performing work at the site without an Army permit.
   F. General Location Map, Burlington Harbor, Vermont (1974).

10.5 General Negotiations

1. Special-Notice Letter from Merrill S. Hohman, EPA Region I to List (February 23, 1988). Concerning a demand for reimbursement of costs incurred, and those expected to be incurred, in response to the environmental problems at the site. Letter was sent to the following:
   Michael Jarrett, Citizens Oil Company
   Bernard Sanders, Mayor of Burlington
   Derrick Davis, Davis Development Corporation
   Christine Farrell
   Louis Farrell, L.E. Farrell Company, Inc.
   Robert McLaughlin, G.S. Blodgett Company
   Karen K. O'Neill, Green Mountain Power
   Susan C. Crampton, Vermont Agency of Transportation
   Derrick Davis, Maltex Partnership
   Anette S. Lewis, New England Electric Service
   Christopher Marraro for Ultramar Petroleum
   Andrew Field, Vermont Development Credit Corporation
   Douglas Wacek, Vermont Gas Systems
   John Pennington, Vermont Railroad
   Robert R. Dill, E.B. & A.C. Whiting Company, Inc.
   W.N. Aswad, General Electric
   William Milaschewski, St. Johnsbury Trucking.

10.7 EPA Administrative Orders

1. Letter from Ira W. Leighton for Merrill S. Hohman, EPA Region I to Thomas R. Viall, U.S. Department of Justice (May 12, 1989). Concerning the attached Administrative Order for Access.

10.8 EPA Consent Decrees

1. Consent Decree, United States v. Green Mountain Power Corp., New England Electric System, and Vermont Gas Systems, Inc., United States District Court for the District of Vermont, Civil Action No. 88-307 (June 22, 1990).

10.10 Trial Documents

1. The following documents were reproduced in response to a request for production of documents:
   A. News of Green Mountain Power Corporation (October 1928)
   B. News of Green Mountain Power Corporation (December 1928)
   C. News of Green Mountain Power Corporation (August 1929)
   D. News of Green Mountain Power Corporation (September 1929)
   E. News of Green Mountain Power Corporation (October 1929)
   F. News of Green Mountain Power Corporation (November 1929)

G. "Tar-Like Substance in Lake Traced to Source, Stopped," Burlington Free Press, Burlington, VT (June 9, 1966)
H. "Burlington's Gas House Comes Down," Burlington Free Press, Burlington, VT (November 21, 1966)
I. "Hanoi After U.S. Attack?," Burlington Free Press, Burlington, VT (May 29, 1967)
J. "Officials Continue Battle Against Flow of Sludge," (July 24, 1968)
K. "Workers Try to Dam the Pollution."

11.0 Potentially Responsible Party (PRP)

11.2 Contractor Related Correspondence

1. Letter from Christopher M. Crandell, The Johnson Company for the PRP Technical Committee to Michael Jasinski, EPA Region I (June 23, 1992). Concerning field work performed at the site.
2. Letter from Christopher M. Crandell, The Johnson Company for the PRP Technical Committee to Michael Jasinski, EPA Region I (August 11, 1992). Concerning remedial alternative technology cost estimate.

11.9 PRP-Specific Correspondence

G.S. Blodgett International Corp.

1. Letter from William A. Sullivan Jr., EPA Headquarters to G.S. Blodgett International Corp. (March 5, 1982). Concerning notice of potential liability.

Citizens Oil Company

2. Letter from Merrill S. Hohman, EPA Region I to President or General Manager, Citizens Oil Company (May 4, 1987). Concerning notice of potential liability and a request for information.

City of Burlington

3. Letter from Merrill S. Hohman, EPA Region I to Bernard Sanders, Mayor of Burlington (May 4, 1987). Concerning notice of potential liability and a request for information.
4. Letter from Paul Keough for Julie Belaga, EPA Region I to Peter A. Clavelle, Mayor of Burlington (January 24, 1992). Concerning response to the December 6, 1991 letter expressing concerns over delays at site.

The maps associated with entry numbers 5 and 6 may be reviewed, by appointment only, at EPA Region 1, Boston, Massachusetts.

5. Letter from Robert F. Ramey, City of Burlington to Julie Belaga, EPA Region I (June 5, 1992). Concerning transmittal of the attached analysis and recommendation from the Burlington Conservation Board regarding potential EPA wetlands remediation strategy.
6. Cross-Reference: Letter from Julie Belaga, EPA Region I to Robert F. Ramey, City of Burlington (July 2, 1992). Concerning EPA's review of a containment remedial alternative for the site which involves capping [Filed and cited as 4.1.12 in 4.1 Correspondence].
7. "Aspects of the Pine Street Barge Canal Area: Additional Information Relative to the Supplemental Remedial Investigation (RI), Urban Storm Water Run-off, and Local Topology," (July 14, 1992) with attached:
   A. "Lake Champlain Lake Levels," (September 1976)
   B. "Wiessner Property Subsurface Contamination Study," Vermont Agency of Transportation (August 1989).
8. Letter from Peter A. Clavelle, Mayor of Burlington to Julie Belaga, EPA Region I (August 10, 1992). Concerning the Ultramar tank farm property.
9. Letter from Robert F. Ramey, City of Burlington to Ross Gilleland, EPA Region I (September 1, 1992). Concerning attached comments on the August 1992 "Feasibility Study-Like Analysis, Proposed Remedial Action Plan," PRP Technical Committee.
10. Letter from Julie Belaga, EPA Region I to Peter A. Clavelle, Mayor of Burlington (September 11, 1992) with attached map. Concerning the Ultramar tank farm property.
11. Letter from Julie Belaga, EPA Region I to Peter A. Clavelle, Mayor of Burlington (September 21, 1992). Concerning a proposed meeting between EPA Region I and the City of Burlington to discuss cleanup options.
12. Letter from Peter A. Clavelle, Mayor of Burlington to Ross Gilleland, EPA Region I (October 2, 1992). Concerning outstanding issues of remediation design between the City and the PRP Technical Committee.

City of Burlington

13. Cross-Reference: Letter from Michael Jasinski, EPA Region I to Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee (October 2, 1992). Concerning transmittal of the 1992 "A Stage IA Cultural Resources Survey of the Pine Street Canal Superfund Site," John Milner Associates for Metcalf & Eddy, Inc. [Filed and cited as entry number 31 in 11.9 PRP-Specific Correspondence].

14. Letter from Peter A. Clavelle, Mayor of Burlington to Ross Gilleland, EPA Region I (October 9, 1992). Concerning closure on outstanding issues raised by the City.
15. Cross-Reference: Letter from Howard Dean, Governor of Vermont and Peter Clavelle, Mayor of Burlington to Julie Belaga, EPA Region I (October 26, 1992). Concerning the hope that EPA will approve the PRP Technical Committee's remediation plan [Filed and cited as entry number 4.1.14 in 4.1 Correspondence].

Davis Development Corporation

16. Letter from Merrill S. Hohman, EPA Region I to Rick Davis, Davis Development Corporation (May 4, 1987). Concerning notice of potential liability and a request for information.

Farrell, Louis, E.

17. Letter from Merrill S. Hohman, EPA Region I to Louis E. Farrell (May 4, 1987). Concerning notice of potential liability and a request for information.

General Electric

18. Letter from Merrill S. Hohman, EPA Region I to President or General Manager, General Electric (November 30, 1987). Concerning notice of potential liability, an invitation to attend an enforcement activities meeting, and a demand for reimbursement of past costs.

Green Mountain Power Company

19. Letter from William A. Sullivan Jr., EPA Headquarters to Green Mountain Power Company (March 5,1982). Concerning notice of potential liability.

Maltex Partnership

20. Letter from Merrill S. Hohman, EPA Region I to The Maltex Partnership (May 4, 1987). Concerning notice of potential liability and a request for information.

PRP Technical Committee

New England Power Service

21. Letter from Joseph M. Kwasnik, New England Power Service to Michael Jasinski, EPA Region I (July 31, 1992). Concerning transmittal of the attached Letter from Sylvia K. Lowrance, EPA Headquarters to Douglas H. Green, Piper & Marbury (June 11, 1992) discussing guidance for application of RCRA to some remedial alternatives being evaluated at the site.
22. "Draft - Preliminary Review of Remedial Technologies," The Johnson Company for Green Mountain Power Corporation for the PRP Technical Committee (May 1992).
23. Letter from A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee to Michael Jasinski, EPA Region I (July 21, 1992). Concerning transmittal of the attached:
    A. Letter from Sylvia K. Lowrance, EPA Headquarters to C. Richard Bozek, Edison Electric Institute (July 1, 1992).
    B. "Attachment A - Supplemental Site Sampling and Analysis Report for the Pine Street Canal Site," The Johnson Company for the PRP Technical Committee (July 1992).
    C. "Attachment B - Alternative Remedial Technology Identification and Screening Report for the Pine Street Canal Site," The Johnson Company for the PRP Technical Committee (July 1992).
24. Letter from A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee to Michael Jasinski, EPA Region I (July 29, 1992). Concerning the attached list of possible site remedies.
25. Letter from A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee to Michael Jasinski, EPA Region I (August 5, 1992). Concerning transmittal of the attached "PRP Technical Committee Proposed Remedial Plan," the PRP Technical Committee (August 1992).
26. Letter from Gregory B. Johnson, The Johnson Company for the PRP Technical Committee to Michael Jasinski, EPA Region I (August 10, 1992). Concerning transmittal of the attached replacement for Figure 1 in the "PRP Technical Committee Proposed Remedial Plan."
27. Letter from James Howley, The Johnson Company for the PRF Technical Committee to Michael Jasinski, EPA Region I (August 10, 1992). Concerning the attached cost estimate.
28. Letter from Gregory B. Johnson, The Johnson Company for the PRP Technical Committee to Michael Jasinski, EPA Region I (August 12, 1992). Concerning transmittal of the attached revised page 2 of the "PRP Technical Committee Proposed Remedial Plan."
29. Letter from A. Norman Terreri, Green Mountain Power Corporation for the PRP Technical Committee to Ross Gilleland, EPA Region I (August 26, 1992). Concerning the attached "Feasibility Study-Like Analysis, Proposed Remedial Action Plan," PRP Technical Committee (August 1992).

30. Letter from George B. Johnson, The Johnson Company for the PRP Technical Committee to Michael Jasinski, EPA Region I (September 3, 1992). Concerning replacement of the attached Figure 3 in the Feasibility Study-Like. Analysis report.

PRP Technical Committee

31. Letter from Michael Jasinski, EPA Region I to Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee (October 2, 1992). Concerning transmittal of the 1992 "A Stage IA Cultural Resources Survey of the Pine Street Canal Superfund Site," John Milner Associates for Metcalf & Eddy, Inc.

St. Johnsbury Trucking

32. Letter from Merrill S. Hohman, EPA Region I to President or General Manager, St. Johnsbury Trucking (November 30, 1987). Concerning notice of potential liability, an invitation to attend an enforcement activities meeting, and a demand for reimbursement of past costs.

Ultramar Petroleum

33. Letter from Merrill S. Hohman, EPA Region I to President or General Manager, Ultramar Petroleum (May 4, 1987). Concerning notice of potential liability and a request for information.

Vermont Agency of Transportation

34. Memorandum from John H. Perkins, Vermont Agency of Transportation to File (March 17, 1992). Concerning February 21, 1992 meeting with EPA.

Vermont Development Credit Corporation

35. Letter from Merrill S. Hohman, EPA Region I to President or General Manager, Vermont Development Credit Corporation (November 30, 1987) with attached meeting agenda. Concerning an invitation to attend an enforcement activities meeting and a demand for reimbursement of past costs.

Vermont Gas Works

36. Letter from William A. Sullivan Jr., EPA Headquarters to Vermont Gas Works (March 5, 1982). Concerning notice of potential liability.

E.B.& A.C. Whiting Company

37. Memorandum from John A. Malter, Vermont Department of Water Resources to Donald Manning, Vermont Department of Water Resources (October 31, 1977). Concerning the attached E.B. & A.C. Whiting Company Application #77-22 permit request.
38. Letter from Merrill S. Hohman, EPA Region I to President or General Manager, E.B. & A.C. Whiting Company (November 30, 1987). Concerning notice of potential liability, an invitation to attend an enforcement activities meeting, and a demand for reimbursement of past costs.

11.11 PRP-Specific Evidence

General Electric

1. Letter from D.E. Momot, General Electric to G.A. Laraway, Army Corps of Engineers (September 14, 1979) with attached maps. Concerning GE's proposal to remove fill.
2. Letter from G.A. Laraway, Army Corps of Engineering, D.E. Momot, General Electric (September 18, 1879). Concerning GE's proposal to remove fill.
3. List of Spills Since August 1985 (October 29, 1987).

13.0 Community Relations

13.3 News Clippings/Press Releases

News Clippings

1. "No State Action Yet on Pine St. Toxic Wastes," Vermont Vanguard Press, Burlington, VT (April 24-May 1, 1981).
2. "Barge Canal, Dump State's Candidates for Superfund Aid," Burlington Free Press, Burlington, VT (July 23, 1981).
3. "$1.6 Billion War Launched on 114 Toxic Waste Sites," Burlington Free Press, Burlington, VT (October 24, 1981).
4. "Barge Canal Listed as Hazardous Site," Burlington Free Press, Burlington, VT (October 24, 1981).
5. "Canal Dump Dangerous Says EPA. Rutland Herald, Rutland, VT (July 30, 1982).
6. "Super Fund May Aid in Canal Cleanup," Rutland Herald, Rutland VT (July 31, 1982).
7. "Huge Amounts of Waste in Canal Dump Pose a Major Problem for Authorities," Sunday

Rutland Herald, Barre, VT (August 1, 1982).
8. "EPA Finds Benzene in Barge Canal," Burlington Free Press, Burlington, VT (August 2, 1982).
9. "PCB Deposit Found in Pine Street Barge Canal," Burlington Free Press, Burlington, VT (January 19, 1983).
10. "Water Quality Unaffected by Barge Canal's Wastes," Caledonia Record, St. Johnsbury, VT (January 19, 1983).
11. "Federal Agency Allots $400,000 for Barge Canal," Burlington Free Press, Burlington, VT (March 9, 1985).
12. "Waste Cleanup Begins," Times-Argus, Barre, VT (October 1, 1985).
13. "Burlington Barge Canal Cleanup About to Begin," Burlington Free Press, Burlington, VT (October 2, 1985).
14. "EPA Completes Initial Cleanup of Barge Canal," Burlington Free Press, Burlington, VT (December 6, 1985).

Press Releases

15. "Environmental News -EPA Announces Public Meeting to Present Remedial Investigation and Risk Assessment Results for the Pine Street Canal Superfund Site in Burlington, Vermont," EPA Region I (July 1, 1992).

16.0 Natural Resource Trustee

16.4 Trustee Notification Form and Selection Guide

1. Letter from Merrill S. Hohman, EPA Region I to William Patterson, U.S. Department of the Interior (June 1987). Concerning the attached notification form.
2. Letter from Merrill S. Hohman, EPA Region I to Sharon Christopherson, National Oceanic and Atmospheric Administration (June 1987). Concerning the attached notification form.

17.0 Site Management Records

17.4 Site Photographs/Maps

Site photographs and maps may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

17.7 Reference Documents

1. U.S. Department of the Interior. Fish and Wildlife Service. Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS-79/31), December 1979.
2. U.S. Department of the Interior. Fish and Wildlife Service. Habitat Suitability Index Models: Beaver (FWS/OBS-82/10.30 Revised), April 1983.
3. U.S. Army Corps of Engineers. District, New York. Evaluation of the 1980 Capping Operations at the Experimental Mud Dump Site. New York Bright Apex - Final Report, (Technical Report D-83-3), October 1983.
4. "Fact Sheet: A Five-Minute Look at Section 106 Review," Advisory Council on Historic Preservation (revised October 1984).
5. "Summary of ASTM DG38 Type IV Test - Specific Guidelines for Gundline HD Chemical Resistance," Gundle (1984).
6. "Town Gas - An Overview," The Brooklyn Union Gas Company (May 1985).
7. U.S. Army Corps of Engineers. Waterways Experiment Station. Effectiveness of Capping in Isolating Contaminated Dredged Material From Biota and the Overlying Water - Final Report, (Technical Report D-85-10), November 1985.
8. U.S. Department of the Interior. Fish and Wildlife Service. Polycyclic. Aromatic Hydrocarbon Hazards to Fish, Wildlife and Invertebrates: A Synoptic Review (Biological Report 85(1.11)), May 1987.
9. U.S. Army Corps of Engineers. Wetlands Research Program. Wetland Evaluation Technigue (WET) Volume II: Methodology (Operational Draft), October 1987.
10. "Co-Treatment of Manufactured Gas Plant Site Groundwaters with Municipal Wastewaters - Final Topical Reports," Gas Research Institute (June 1987-August 1988).
11. "Fact Sheet: Working With Section 106," Advisory Council on Historic Preservation (October 1988).
12. U.S. Army Corps of Engineers. Waterways Experiment Station. New Bedford Harbor Superfund Project, Acushnet River Estuary Engineering Feasibility Study of Dredging and Dredged Material Disposal Alternatives: Report 10, Evaluation of Dredging and Dredging Control Technologies (Technical Report EL-88-15), November 1988.
13. U.S. Army Corps of Engineers. Waterways Experiment Station. New Bedford Harbor Superfund Project. Acushnet River Estuary Engineering Feasibility Study of Dredging and Dredged Material Disposal Alternatives: Report 11. Evaluation of Conceptual Dredging and Disposal Alternatives (Technical Report EL-88-15), July 1989.
14. U.S. Environmental Protection Agency. Office of Research and Development. Requirements for Hazardous Waste Landfill Design, Construction and Closure, (EPA/625/4-89/022), August 1989.
15. U.S. Environmental Protection Agency. Bioremediation of Contaminated Surface Soils (EPA/600/9-89/073), August 1989.
16. U.S. Environmental Protection Agency. Seminar on Site Characterization for Subsurface

Remediations (CERI-89-224), September 1989.
17. "Engineering-Scale Demonstration of Thermal Desorption Technology for Manufactured Gas Plant Site Soils," Illinois Hazardous Waste Research and Information Center (November 1989).
18. Memorandum from Henry L. Longest and Bruce M. Diamond, EPA Headquarters to Patrick M. Tobin, EPA Region IV (June 21,1990). Concerning protective cleanup level for lead in ground water.
19. U.S. Department of the Interior. Fish and Wildlife Service. Evaluating Soil Contamination (Biological Report 90(2)), July 1990.
20. "MPG Update," Gas Research Institute Environment and Safety Research Department (August 1990).
21. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Solvent Extraction Treatment (EPA/540/2-90/013), September 1990.
22. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Slurry Biodegradation (EPA/54012-90/016), September 1990.
23. U.S. Environmental Protection Agency. Office of Research and Development Soliditech. Inc. Solidification/Stabilization Process: Applications Analysis Report (EPA/540/A5-89/005), September 1990.
24. U.S. Environmental Protection Agency. Risk Reduction Engineering Laboratory. Chemfix Technologies. Inc. Solidification/Stabilization Process - Volume I (EPA/540/5-89/011a), September 1990.
25. "Groundwater Contamination by Creosote," Waterloo Center for Groundwater Research (November 6, 1990).

Maps associated with entry number 26 may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

26. "Exxon/Flynn Avenue Terminal - An Environmental Assessment of Soils, Groundwater, and Warehousing Facilities," Wagner, Heindel and Noyes, Inc. (February 28, 1991).
27. "MGP Update," Gas Research Institute Environment and Safety Research Department (March 1991).
28. U.S. Environmental Protection Agency. Office of Research and Development. Dense Nonaqurous Phase-Liquids, March 1991.
29. U.S. Environmental Protection Agency. Robert S. Kerr Environmental Research Laboratory. Dense Nonaqueous-Phase Liquids--A Workshop Summary (EPA/600), April 16-18, 1991.
30. U.S. Environmental Protection Agency. Office of Research and Development. Handbook - Remadiation of Contaminated Sediments, (EPA/625/6-911028), April 1991.
31. U.S. Envirorimental Protection Agency. Innovative Treatment Technologies: Overview and Guide to Information Sources (EPA/540/9-91/002), October 1991.
32. Letter from Dean A. Grover, Wagner, Heindel, and Noyes, Inc. to Nancy Manley, Vermont Agency of Natural Resources (November 19, 1991) with attached map. Concerning a request for 1272 order.
33. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. The Superfund Innovative Technology Evaluation Program: Technology Profiles Fourth Edition (EPA/540/5-91/008), November 1991.
34. Letter from Dean A. Grover, Wagner, Heindel, and Noyes, Inc. to Nancy Manley, Vermont Agency of Natural Resources (December 6, 1991). Concerning the attached calculations for the groundwater pre-treatment system.
35. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Estimating Potential for Occurrence of DNAPL at Superfund Sites (9355.4-07FS), January 1992.
36. U.S. Environmental Protection Agency. Office of Research and Development. Dermal Exposure Assessment: Principles and Applications-Interim Report, (EPA/600/8-91/011B), January 1992.
37. U.S. Environmental Protection Agency. SITE Demonstration Bulletin: Slurry Biodegradation, IT Corporation (EPA/540/M5-91/009), February 1992.
38. Memorandum from Joseph E. Shefchek, Edison Electric Institute to EEI Manufactured Gas Plant Subcommittee and Task Force (March 18, 1992). Concerning the attached:
    A. Letter from C. Richard Bozek, Edison Electric Institute to Elizabeth W.LaPointe, EPA Headquarters (March 17, 1992). Concerning transmittal of the draft "Proposed MGP Remediation Waste Guidance."
    B . "Proposed MGP Remediation Waste Guidance."
39. U.S. Environmental Protection Agency. Office of Air Quality, Planning and Standards. Estimation of Air Impacts for the Excavation of Contaminated Sol Air/Superfund National Technical Guidance Study Series (EPA/450/1-92-004), March 1992.
40. Letter from Edward F. Neuhauser, Niagara Mohawk Power Corporation to Joseph M. Kwasnik, New England Power Service (April 8, 1992). Concerning the attached "South Glens Falls MGP Waste Disposal Site Source Removal Report Summary."
41. Memorandum from Don R. Clay, EPA Headquarters to Waste Management Division Directors, EPA Regions I, IV, V, VII; Emergency and Remedial Response Division Director, EPA Region II; Air and Waste Management Division Director, EPA Region II; Hazardous Waste Management Division Directors, EPA Regions III,IV,IX; Hazardous Waste Division Director EPA Region X; and Environmental Services Division Directors EPA Regions I, VI, VII (May 27, 1992). Concerning considerations in groundwater remediation (OSWER Directive 9283.1-06).
42. Utter from Brian D. Kooiker, Vermont Agency of Natural Resources to Kenneth Vogel, Exxon Company (July 16, 1992). Concerning the attached

"1272 Order - Findings of Fact."

43. "Organic Fluid Effects on the Permeability of Soil-Bentonite Slurry Walls," Jeffrey C. Evans, Woodward-Clyde Consultants, Hsai-Yang Fang and Irwin J. Kugelman, Lehigh University.

19.0 Resource Conservation and Recovery Act (RCRA) Records

19.1 Correspondence

1. Letter from E. Michael Thomas, Goodwin, Proctor & Hoar to Douglas Luckerman, EPA Region I (June 22, 1992). Concerning transmittal of attached map of GE Lakeside Avenue Facility.
2. Letter from David Webster, EPA Region I to John Begin, General Electric (July 9, 1992). Concerning RCRA corrective action permit
3. Letter from Gary P. Kjelleren, General Electric to Douglas Luckerman, EPA Region I (August 13, 1992). Concerning status of RCRA corrective action permit

19.4 RCRA Facility Inspection Reports

1 "Final RFA Sampling Visit Report - General Electric Facility Burlington, Vermont - RCRA Facility Assessment," Versar, Inc. (June 29, 1989).

19.6 Notifications of Hazardous Waste Activity

1 Letter from W.N. Aswad, General Electric to Sites Notification, EPA Region I (June 8, 1981). Concerning the attached notification form.

ADMINISTRATIVE RECORD ADDENDUM II INDEX

for the

Pine Street Canal NPL Site

3.0 Remedial Investigation (RI)

3.2 Sampling and Analysis Work

1. Letter from Clarence A. Callahan, EPA Region IX to Susan Svirsky, EPA Region I (March 30, 1993). Concerning the results of the earthworm and amphibian (FETAX) bioassays.

3.4 Interim Deliverables

1. "Technical Memorandum No. 14 - Pine Street Canal -Supplemental RI/FS,": Metcalf & Eddy, Inc. (November 23, 1992).

2. Quality Assurance Program Plan (QAPP) and Field Sampling Plan (FSP) addenda, Metcalf & Eddy, Inc. (February 16, 1993).

3. "Standard Guide for Conducting the Frog Embryo Teratogenesis Assay-Xenopus (Fetax), ASTM E 1439 91 and "Standard Procedures for the Earthworm, Eisenia Foetida Andrei (Annelida: Oligochaeta: Lumbricidae), Artificial Soil, Acute Toxicity Bioassay," David C. Wilborn, ManTech Environmental Technology, Inc. (March 1992)

4. "Technical Memorandum No. 17 -Supplemental RI/FS- Analyses and Toxicity Testing Results for Samples Collected in February, 1993, "Metcalf & Eddy, Inc. (April 1993)

3.9 Health Assessments

1. "What you need to know about toxic substances commonly found at Superfund hazardous waste sites...ATSDR Public Health Statement PAHs," U.S. Department of Health and Human Services. (December 1990) Concerning what PAHs are, how exposure may occur and possible health effects, medical tests available to determine exposure, and sources of further information.

2. "Agency for Toxic Substances and Disease Registry [ATSDR] Toxicology Profile Information Sheet," U.S. Department of Health and Human Services. (Fall 1992) Concerning the hazardous substances that have been found at National Priorities List (NPL) sites, and have been ranked based on frequency of occurrence, toxicity, and potential for human exposure.

3. ATSDR's Health Consultations on the Pine Street Canal," U.S. Department of Health and Human Services. (February 1993) Concerning what ATSDR is, how it got involved with the site, and ATSDR's Health Consultations.

4.0 Feasibility Study

4.5 Applicable or Relevant and Appropriate Requirements

1. Hazardous Materials Management Division Policy to Map Class IV Ground Water Areas (Revised), William E. Ahearn, Director (November 16, 1992).

2. Letter from David Butterfield, Chief, Resource Management Section, Water Supply Division, Vermont Agency of Natural Resources to Interested Parties (December 9, 1992). Inviting comments on revisions to Vermont's ground water protection rule and strategy.

3. Public Notice of Vermont Agency of Natural Resources Hearing on December 21, 1992 (undated).

4. Rationale for Reclassifying Groundwater at the Pine Street Barge Canal Site (undated).

5. Pine Street Barge Canal Class IV Groundwater Area, by Hazardous Materials Management Division, Vermont Department of Environmental Protection (undated). Concerning proposal to reclassify groundwater at the Site.

9.0 State Coordination

9.1 Correspondence

1. Letter from Curt McCormack, Chair, Vermont House Committee on Natural Resources and

Energy, to Julie Belaga, EPA Region I Regional Administrator. (November 24, 1993) Concerning a request for an extension of the review period for the proposed plan for the Pine Street Canal Superfund Site.

2. Letter from George E. Little, Chair, Vermont Senate Natural Resources and Energy Committee and Member, Lake Champlain Management Conference, to Julie Belaqa, EPA Region I Regional Administrator. (November 27, 1993) concerning a request for a postponement of the December 8, 1992 public hearing.

3. Letter from Julie Belaga, EPA Region I Regional Administrator to George E. Little, State of Vermont. (December 22, 1992) Concerning a request for an extension to the comment period and a delay in the public hearing date for the proposed cleanup plan.

4. Letter from Julie Belaga, EPA Region I Regional Administrator to Curt McCormack, State of Vermont. (December 22, 1992) Concerning a request for an extension to the comment period and a delay in the public hearing date for the proposed cleanup plan.

11.0 Potentially Responsible Party (PRP)

11.9 PRP-Specific Correspondence

City of Burlington

1. Letter from Peter Clavelle, Mayor of Burlington, to Julie Belaga, EPA Region I Regional Administrator. (August 27, 1992) Concerning the delivery of the FS and Proposed Plan.

2. Letter from David Webster, EPA Region I Maine and Vermont Waste Management Branch Chief to Peter Clavelle, Mayor of Burlington. (November 18, 1992) Concerning a request for an EPA representative to attend the City Council Meeting to listen to the discussion regarding the Site.

PRP Technical Committee

1. Letter from Sheila Eckman, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site, to Joseph M. Kwasnik, Water & Solid Waste Programs Manager for New England Power Service Company. (November 6, 1992) concerning 2 copies of the three (3) volume Feasibility Study Final Report for the PRP Technical Committee's use and distribution.

2. Letter from Christopher Crandall, Vice President, The Johnson Company, Inc., to Sheila Eckman, EPA Remedial Project Manager. (December 7, 1992). Concerning intended sampling at the site starting on December 10, 1992.

3. Letter from Margery Adams, EPA Region I Assistant Regional Counsel, to Christopher Crandall, The Johnson Company, Inc. (December 8, 1992) Concerning The Johnson Company's intention to undertake subsurface sampling at the Pine Street Canal Site on December 10, 1992.

4. Letter from Karen Krug O'Neill, Green Mountain Power Corporation, to Margery Adams, EPA Region I Assistant Regional Counsel. (December 23, 1992). Concerning response to Ms. Adams' December 8, 1992 letter to The Johnson Company.

5. Letter from Joseph Kwasnik, New England Power Service, to Ross Gilleland, EPA Remedial Project Manager. (January 11, 1993). Concerning the PRPs' relationship with EPA.

6. "Pine Street Superfund Site PRP/State/EPA/TAG meeting - 1/22/93 Notes," from Ross Gilleland (January 24, 1993). Concerning meeting with PRP Technical Committee and Vermont DEC.

7. Letter and attached workplan from A. Norman Terreri, Vice President, Green Mountain Power Corporation on behalf of the PRP Technical Committee, to Sheila Eckman, EPA Remedial Project Manager. (February 10, 1993). Concerning the PRPs Technical Committee's intention to collect soil samples, install piezometers, and sample all wells on the Site, beginning on February 22, 1993.

8. "Pine Street Superfund Site PRP/State/EPA/TAG meeting - 2/16/93 Notes," from Sheila Eckman (February 20, 1993) Concerning the areas the State is working on and what the PRPs are looking at.

9. Letter from Mary Jane O'Donnell, EPA Region I Maine and Vermont Waste Management to A. Norman Terreri, Green Mountain Power Corporation. (February 24, 1993). Concerning response to Mr. Terreri's February 10, 1993 letter.

10. Memorandum from Martin L. Johnson, The Johnson Company, Inc. to Pine Street Canal Potentially Responsible Parties, Ross Gilleland - U.S. EPA, Bill Ahearn - Vermont ANR, Lori Fisher - Lake Champlain Committee, Ken Carr - U.S. Fish and Wildlife, Al

McIntosh - Vermont Water Resources, and Lake Study Center - UVM. (March 8, 1993) Concerning the fax transmission list of names, list of upcoming meeting involving Pine Street, and agenda for the April 15, 1993 meeting at Green Mountain Power headquarters.

11. Memorandum from Martin L. Johnson, The Johnson Company, Inc. to U.S. EPA, ANR, LCC, U.S.F.W., Consultants, and PRPs. (March 18, 1993) Concerning the agenda for the March 29, 1993 scientific meeting and suggested topics for Future meetings.

12. Memorandum from Martin L. Johnson, The Johnson Company, Inc. to Pine Street Canal Potentially Responsible Parties, Ross Gilleland - U.S. EPA, Bill Ahearn - Vermont ANR, Lori Fisher - Lake Champlain Committee, Ken Carr - U.S. Fish and Wildlife, Al McIntosh - Vermont Water Resources, and Lake Study Center - UVM. (March 24, 1993) Concerning the fax transmission list of names, and list of updated meeting involving Pine Street.

13. Letter from Ross Gilleland, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site, to Joseph M. Kwasnik, Water & Solid Waste Programs Manager for New England Power Service Company. (March 25, 1993) Concerning the scheduling of upcoming PRP Technical Committee meetings with EPA, VT ANR, PCC, and USFWS.

14. Letter from Mary Jane O'Donnell, EPA Region I Maine and Vermont Waste Management Section Chief to A. Norman Terreri, Green Mountain Power Corporation. (March 25, 1993) Concerning the PRPs' plan to conduct sampling at the Pine Street Canal Site in order to develop a hydrologic model of groundwater flow.

15. Letter from Ross Gilleland, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site, to Martin L. Johnson, The Johnson Company, Inc. (March 26, 1993) Scheduling corrections and requests.

16. Memorandum from Stanley Corneille, Site Manager Pine street Barge Canal Superfund Site, State of Vermont Agency of Natural Resources, to Ross Gilleland, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site. (March 30, 1993) Concerning the synopsis of the scientific meeting held at the Green Mountain Power office Building on March 29, 1993.

17. Letter from Ross Gilleland, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site, to Joseph M. Kwasnik, Water & Solid Waste Programs Manager for New England Power service Company. (March 30, 1993) concerning a copy the Field Sampling Plan and Quality Assurance Project Plan for the earthworm and frog embryo toxicity testing, as requested by Sonja Schuyler of The Johnson Company, Inc.

Southern Union

1. Letter from Merrill S. Hohman, EPA Region I Director of the Waste Management Division, to George L. Lindemann, President of Southern Union Company. (November 24, 1992) Concerning a notice of potential liability at Pine Street Canal Superfund Site.

UGI Corporation

1. Letter from Merrill S. Huhman, EPA Region I Director of the Waste Management Division, to James A. Sutton, President of UGI Corporation. (November 24, 1992) Concerning a notice of potential liability at Pine Street Canal Superfund site.

Ultramar/LASMO

1. "Pine Street Superfund Site, EPA Meeting with Lasmo, March 18, 1993," from Margery Adams, EPA Region I Assistant Regional Counsel (March 24, 1993). Concerning Lasmo's proposal for additional studies at the Site.

2. Letter from Jerry L. Pickerill, President of LASMO America Limited, to Mr. A. Norman Terreri, Green Mountain Power Corporation. (March 29, 1993) Concerning the PRP Technical Committee Meeting LASMO held with EPA Region I on March 18, 1993; names, addresses and phone numbers attached.

Whiting Company

1. Letter from Robert R. Dill to Michael Jasinski and Ross Gilleland, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site. (July 24, 1992) Concerning comments on the Remedial Investigation and other subjects that were discussed at the July public meeting.

13.0 Community Relations

13.1 Correspondence

1 Letter from: Lori Fisher, Executive Director, Lake Champlain Committee; Ned Farquhar, Executive Director, Vermont Natural Resources Council; Susan Alden, Natural Resources

Chair, Champlain Valley League of Women Voters; Aaron J. Goldberg, Chairperson, Burlington Conservation Board; Ray Gonda, Chair, Vermont Group Sierra Club; and Joan Mulhern, Program Director, VPIRG, to Julie Belaga, EPA Region I Regional Administrator. (November 19, 1992) Concerning a request to postpone the public hearing on the proposed plan for the Pine Street Canal Superfund Site until April 15, 1993, and extend the comment period until May 15, 1993.

13.4 Public Meetings

1. "Minutes of Pine Street Public Meeting, November 16, 1992." Concerning the Site history, Remedial Investigation, Risk Assessment, Feasibility Study, presentation of EPA proposed plan, and questions and comments from the public followed by EPA response.

2. "6 March 1993, Pine Street Barge Canal Superfund Site Public Forum." Concerning the outline of times, speakers and presented subjects.

3. "Pine Street Canal Superfund Site Lake Champlain Committee Public Meeting...April 6, 1993," from Sheila Eckman. (April 13, 1993) Concerning LCC's preliminary comments on EPA’s human health and ecological risk assessment.

13.7 Technical Assistance Grants

1. Letter from Julie Belaga, EPA Region I Regional Administrator to Lori Fisher, Executive Director of the Lake Champlain Committee (LCC). (December 7, 1992) Concerning LCC's approval for a Technical Assistance Grant.

2. Letter from Roger C. Binkerd, Vice President of aquatec, Inc. to Lori Fisher, Executive Director of the Lake Champlain Committee (LCC). (January 12, 1993) Concerning a proposal to be advisor to LCC on the Pine Street Barge Canal Superfund Site.

3. Letter from Henry G. Burrell, EPA Region I Grants Information & Management Section Chief to Lori Fisher, Executive Director of the Lake Champlain Committee (LCC). (February 22, 1993) Concerning EPA support in the selection of aquatec, Inc. as Technical Advisor.

4. Letter from Lori Fisher, Executive Director of the Lake Champlain Committee (LCC), to Michael J. McGagh, EPA Region I TAG Program Manager. (August 7, 1992) Concerning LCC's intent to apply for a Superfund Technical Assistance Grant for work an the Pine Street Barge Canal Site.

5. "LAKE CHAMPLAIN COMMITTEE ISSUE ALERT The Barge Canal: At a Crossroads." (1993) Concerning the background of the site, Barge Canal Chronology, LCC's role, and how the public can become involved.

14.0 Congressional Relations

14.1 Correspondence

1. Letter from: Patrick Leahy, U.S. Senator; James Jeffords, U.S. Senator; Bernard Sanders, U.S. Representative; Howard Dean, M. D., Governor of Vermont; and Peter Clavelle, Mayor of Burlington, to Julie Belaga, EPA Region I Regional Administrator to George E. Little, State of Vermont. (November 24, 1992) Concerning a request to extend the public comment period until the Spring of 1993.

2. Letter from Bernard Sanders, Member of Congress of the United States House of Representatives, Vermont, At Large, to Sheila Eckman and Ross Gilleland, EPA Remedial Project Managers for Pine Street Barge Canal Superfund Site. (December 9, 1992) concerning public meetings on November 16, 1993, November 23, 1993, and December 8, 1993, which raised serious concerns from area residents and business owners about the potential for adverse effects on human health with EPA's proposed remediation plan for Pine Street Barge Canal Superfund Site.

3. Letter from Ross Gilleland, EPA Remedial Project Manager for Pine Street Barge Canal Superfund Site, to Jim Schumacher, Office of Congressman Bernard Sanders. (February 23, 1993) Concerning an update on the status of issues including: additional test results, the 1990 Draft PEER Risk Assessment, listing of EPA meetings with the State and public since November, and Upcoming Public Events.

4. "Statement of Merrill S. Hohman Director, Region I Waste Management Division United States Environmental Protection Agency before the Natural Resources Committee Vermont House of Representatives Montpelier, Vermont." (March 16, 1993) Concerning an appropriate remedy and EPA procedure in arriving at the proposed plan for the Pine Street Superfund Site in Burlington, Vermont.

ADMINISTRATIVE RECORD INDEX

ADDENDUM III

for the

Pine Street Canal NPL Site

4.0 Feasibility Study (FS)

4.9 Proposed Plans for Selected Remedial Action

The Proposed Plan is located in the November 6, 1992 "Pine Street Canal NPL Site Administrative Record Addendum I" cited as entry number 1 in 4.9 Proposed Plans for Selected Remedial Action.

Comments (cited alphabetically)

1. Comments Dated April 29, 1993 from William E. Ahearn, Vermont Agency of Natural Resources on the November 1992 Proposed Plan.
2. Comments Dated May 7,1993 from Katharine Palmer Antinozzi on the November 1992 Proposed Plan.

Attachments associated with entry number 3 may be reviewed, by appointment only, at the EPA Region 1 Records Center in Boston, Massachusetts.

3. Comments Dated May 13, 1993 from Michael G. Barsotti on the November 1992 Proposed Plan with attached:
   A. "Delta Park Field Guide," Trinity College (1989)
   B. "Drinking Water and Petroleum Hydrocarbon Product Contamination," Tighe & Bond, Inc. (March 18, 1993)
   C. Site photographs (March 1993)
   D. "Elemental Solution," Molten Metal Technology, Inc. (1993).
4. Comments Dated February 11, 1993 from Margaret Barnes on the November 1992 Proposed Plan.
5. Comments Dated April 20, 1993 from Alice C. Bassett on the November 1992 Proposed Plan.
6. Comments Dated February 14, 1993 from Thomas C. Bates on the November 1992 Proposed Plan.
7. Comments Dated December 10, 1992 from Marcel Beaudin on the November 1992 Proposed Plan.
8. Comments Dated February 12, 1993 from Wilfred and Ann Bilodeau on the November 1992 Proposed Plan.
9. Comments Dated May 12, 1993 from Samuel A. Hartwell, G.S. Blodgett Corporation on the November 1992 Proposed Plan.
10. Comments Dated February 12, 1993 from a Burlington Resident on the November 1992 Proposed Plan.
11. Comments Dated May 4, 1993 from City Council, City of Burlington on the November 1992 Proposed Plan.
12. Comments Dated May 17, 1993 from Peter C. Brownell, Mayor - City of Burlington on the November 1992 Proposed Plan.
13. Comments Dated May 17, 1993 from Tom Racine, City of Burlington - Public Works on the November 1992 Propose Plan.

4.9 Proposed Plans for Selected Remedial Action (cont'd.)

14. Comments Dated May 4, 1993 from Aaron J. Goldberg, Burlington Conservation Board on the November 1992 Proposed Plan.
15. Comments Dated May 13, 1993 from Wayne M. Senville, Burlington Planning Commission on the November 1992 Proposed Plan.
16. Comments Dated January 20, 1993 from Rich Newman, Burlington Transportation and Parking Council on the November 1992 Proposed Plan.
17. Comments Dated February 16,1993 from Ernest R. Carlson on the November 1992 Proposed Plan.
18. Comments Dated March 1, 1993 from Roland T. Limoge, Champlain Elementary School on the November 1992 Proposed Plan.
19. Comments Dated December 10, 1992 from Charles A. Cairns, Champlain Oil Company, Inc. on the November 1992 Proposed Plan.
20. Comments Dated February 19, 1993 from Walter D. Gundel et al, Champlain Valley Cardiovascular Associates on the November 1992 Proposed Plan.
21. Comments Dated February, 11, 1993 from Marcella C. Chapman on the November 1992 Proposed Plan.
22. Comments Dated May 3. 1993 from Marcella C. Chapman on the November 1992 Proposed

Plan.
23. Comments Dated February 12,1993 from David K. Boraker, Chromogen on the November 1992 Proposed Plan.
24. Comments Dated April 11, 1993 from Grant Crichfield on the November 1992 Proposed Plan.
25. Comments Dated February 22, 1993 from John Cunavelis on the November 1992 Proposed Plan.
26. Comments Dated March 5, 1993 from John Cunavelis on the November 1992 Proposed Plan.

Attachments associated with entry number 27 may be reviewed, by appointment only, at the EPA Region 1 Records Center in Boston, Massachusetts.

27. Comments Dated April 20, 1993 from Theodore D. Trowbridge, Dehydro-Tech Corporation on the November 1992 Proposed Plan.
    A. "Carver-Greenfield Process for a Cleaner Environment," Dehydro-Tech Corporation
    B. "Use of the Carver-Greenfield Process for the Cleanup of Petroleum-Contaminated Soils," Dehydro-Tech Corporation (October 1990)
    C. The Carver-Qreenfield Procgss. Dahydro-Tech Corporation - Applications Analysis Report, U.S. Environmental Protection Agency (EPA/540/AR-92/002) August 1992
    D. "The Carver-Green Process," El Digest (December 1992).
28. Comments Dated April 4,1993 from Brian Dempsey on the November 1992 Proposed Plan.
29. Comments Dated February 12,1993 from Robert and Cynthia Desseau on the November 1992 Proposed Plan.
30. Comments Dated December 10, 1992 from Maurice R. Diette on the November 1992 Proposed Plan.
31. Comments Dated March 23, 1993 from Charles Dillion Jr. on the November 1992 Proposed Plan.
32. Comments Dated May 1, 1993 from Ann G. Dinse on the November 1992 Proposed Plan.
33. Comments Dated January 21, 1993 from Peter Collins and David Gray, Downtown Burlington Development Association on the November 1992 Proposed Plan.
34. Comments Dated February 15, 1993 from Glenn R. Erickson on the November 1992 Proposed Plan.
35. Comments Dated April 13, 1993 from Glenn R. Erickson on the November 1992 Proposed Plan.
36. Comments Dated February 19, 1993 from Constance B. and Marshall H. Hall on the, November 1992 Proposed Plan.
37. Comments Dated February 16, 1993 from R.L. Hallen on the November 1992 Proposed Plan.
38. Comments Dated May 17, 1993 from Peter R. Hannah on the November 1992 Proposed Plan.
39. Comments Dated February 11, 1993 from Eloise R. Hedbor on the November 1992 Proposed Plan.
40. Comments Dated November 17, 1992 from Gregory S. Hennemuth on the November 1992 Proposed Plan.
41. Comments Dated February 15, 1993 from Fred G. Hill on the November 1992 Proposed Plan.
42. Comments Dated February 15, 1993 from Frances G. Hutchison on the November 1992 Proposed Plan.
43. Comments Dated March 4, 1993 from Edward S. Irwin on the November 1992 Proposed Plan.
44. Comments Dated March 10, 1993 from Edward S. Irwin on the November 1992 Proposed Plan.
45. Comments Dated March 25, 1993 from Edward S. Irwin on the November 1992 Proposed Plan.

Attachment associated with entry numnber 46 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

46. Comments Dated March 18, 1993 from Robert Warren, IWT Corporation on the November 1992 Proposed Plan with attached "Advanced Chemical Fixation."
47. Comments Dated March 28,1993 from Sally P. Johnson on the November 1992 Proposed Plan.

Attachment associated with entry number 48 may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

48. Comments Dated December 7, 1992 from Richard H. Turnbell, Kipin Industries, Inc. on the November 1992 Proposed Plan with attached company portfolio.
49. Comments Dated May 15, 1993 from Lori M. Fisher, Lake Champlain Committee on the November 1992 Proposed Plan.
50. Comments Dated February 12, 1993 from Zachary Leader on the November 1992 Proposed Plan.
51. Comments Dated May 4, 1993 from Susan Alden, League of Women Voters of the Champlain Valley on the November 1992 Proposed Plan.
52. Comments Dated April 2, 1993 from Derek Lefebvre on the November 1992 Proposed Plan.
53. Comments Dated February 11, 1993 from Jerold F. Lucey on the November 1992 Proposed Plan.
54. Comments Dated December 7, 1992 from Rafael Mares on the November 1992 Proposed Plan.
55. Comments Dated February 21, 1993 from Colin and Earla Sue McNaull on the November 1992 Proposed Plan.
56. Comments Dated February 12, 1993 from Rosemary O'Brien on the November 1992 Proposed

Plan.

57. Comments Dated March 16, 1993 from A. Joyce Shailor, OCF Associates on the November 1992 Proposed Plan.
58. Comments Dated April 10, 1993 from A. Joyce Shailor, OCF Associates on the November 1992 Proposed Plan.
59. Comments Dated March 3, 1993 from Dan O'Connell on the November 1992 Proposed Plan.
60. Comments Dated February 14, 1993 from Stephen Page on the November 1992 Proposed Plan.
61. Comments Dated April 29, 1993 from Pine Street Arts & Business Association on the November 1992 Proposed Plan.
62. Comments Dated February 18, 1993 from Jacqueline Proveneker on the November 1992 Proposed Plan.
63. Comments Dated February 13, 1993 from Beatrice J. Ramsey on the November 1992 Proposed Plan.
64. Comments Dated February 12, 1993 from Dennis R. Reichardt on the November 1992 Proposed Plan.
65. Comments Dated February 18, 1993 from Eugene H. Russell on the November 1992 Proposed Plan.
66. Comments Dated March 9, 1993 from Karle L. Snyder on the November 1992 Proposed Plan.
67. Comments Dated November 17, 1992 from Caroline Stoudt on the November 1992 Proposed Plan.
68. Comments Dated December 10, 1992 from James Smurro on the November 1992 Proposed Plan.
69. Comments Dated April 28, 1993 from Katherine Teetor on the November 1992 Proposed Plan.
70. Comments Dated February 17, 1993 from Betty G. Tucker on the November 1992 Proposed Plan.
71. Comments Dated May 14, 1993 from Christopher H. Marraro, Howrey & Simon (Attorney for Ultamar Petroleum) on the November 1992 Proposed Plan.
72. Comments Dated January 4, 1993 from Richard J. Bartlett, University of Vermont on the November 1992 Proposed Plan
73. Comments Dated May 4, 1993 from Richard J. Bartlett, University of Vermont on the November 1992 Proposed Plan.
74. Comments Dated May 14,1993 from Nancy J. Hayden, University of Vermont on the November 1992 Proposed Plan.
75. Comments Dated May 4, 1993 from Bernard Sanders, U.S. House of Representatives on the November 1992 Proposed Plan.
76. Comments Dated May 5, 1993 from Patrick J. Leahy and James Jeffords, U.S. Senate and Bernard Sanders U.S. House of Representatives on the November 1992 Proposed Plan.
77. Comments Dated May 14,1993 from Patrick J. Leahy, U.S. Senate on the November 1992 Proposed Plan.
78. Comments Dated December 2, 1992 from Ray Unsworth on the November 1992 Proposed Plan.
79. Comments Dated April 10, 1993 from Harry Varney Jr. on the November 1992 Proposed Plan.
80. Comments Dated April 9, 1993 from Charles R. Ross Jr. et al, Vermont House of Representatives on the November 1992 Proposed Plan.
81. Comments Dated April 28, 1993 from Donald M. Hooper, Vermont Secretary of State on the November 1992 Proposed Plan.
82. Comments Dated May 14, 199 3 from Lisa Borre, Vermont Citizens Advisory Committee on Lake Champlain's Future on the November 1992 Proposed Plan.
83. Comments Dated April 2, 1993 from Eugene Viens Sr. on the November 1992 Proposed Plan.
84. Comments Dated May 14,1993 from Eugene Viens Sr. on the November 1991 Proposed Plan.
85. Comments Dated February 12, 1993 from Dinny Weed on the November 1992 Proposed Plan.
86. Comments Dated February 15, 1993 from Lea Wood on the November 1992 Proposed Plan.

Comments from the PRP Technical Committee

87. Comments Dated April 5, 1993 from Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number One - Evaluation of EPA's Technical Assumptions Concerning the Potential for Migration of Free Product and Contaminated Ground Water).
88. Comments Dated May 10, 1993 from Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number Two - Evaluation of EPA's Technical Assumptions Concerning Human Health Risk Assessment).
89. Comments Dated May 10, 1993 from Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number Three - Evaluation of EPA's Technical Assumptions Concerning Ecological Preliminary Remediation Goals).
90. Comments Dated May 10, 1993 from Joseph K Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number Four - Evaluation of EPA's Technical Assumptions Concerning Wetland Preservation).
91. Comments Dated May 13, 1993 from Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number Five - Evaluation of the Implementability of EPA Proposed Remedial Alternative SR-2B).
92. Comments Dated May 13,1993 from Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number Six - Evaluation of the Proposed Remedy SR-2B Against the Feasibility Study (FS) Criteria).

93. Comments Dated May 13, 1993 from Joseph M. Kwasnik, New England Power Service for the PRP Technical Committee on the November 1992 Proposed Plan (Document Number Seven - Summary of PRP Technical Committee Comments and Recommended Response Alternative).

The map associated with entry number 94 is oversized and may be reviewed, by appointment only, at the EPA Region I Records Center in Boston, Massachusetts.

94. "Directed Feasibility Study Remedial Alternative SR-9," PRP Technical Committee (May 14,1993).

13.0 Community Relations

13.4 Public Meetings

1. Transcript, Public Hearing on the Proposed Plan (May 4, 1993).
Presenters: David Webster and Ross Gilleland, EPA Region I.
Commenters: William Ahearn
Susan Alden
Rich Bartlett
Michael Barsotti
Peter Brownell
Tom Burke
Sharon Bushor
Steve Conant
Peter Cook
Paul Cook
Dean Corren
Mark Eldridge
Barbara Felitti
Lori Fisher
Matthew Gardy
Aaron Goldberg
Mark Kanubluh
Gary Kelleren
Alan Quackenbush
Mary Sullivan
Karen Unsworth
Roger Verville
David Weinstein

Pine Street Canal

Administrative Record

Addendum IV

Index

Compiled: June 4, 1998

Prepared by EPA-New England

Office of Site Remediation and Restoration

With assistance from

ads
2070 Chain Bridge Road
Vienna, VA 22182

01.06 SITE ASSESSMENT - HAZARD RANKING SYSTEM PACKAGES

Title: Notice of NPL Site Listing.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: July 31, 1995
Format: MISCELLANEOUS No. Pgs: 2
AR No. 01.06.1 Document No. 000360

03.01 REMEDIAL INVESTIGATION - CORRESPONDENCE

Title: Fishing by Asian Community in the Pine Street Barge Canal.
Addressee: PHILIP HARTER
Authors: MARTY FELDMAN - LIGHTWORKS INC.
Date: June 3, 1994
Format: MEMORANDUM No. Pgs: 1
AR No. 03.01.1 Document No. 000632

Title: Completion of Phase I - ARI Field Work.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: December 16, 1994
Format: LETTER No. Pgs: 2
AR No. 03.01.2 Document No. 000326

Title: Estimate of Mass Flux of Benzene to the Lake through the Sand Lens.
Addressee: PINE ST FATE & TRANSPORT TECH WORK GROUP
Authors: SETH PITKIN - JOHNSON COMPANY
Date: February 17, 1995
Format: MEMORANDUM No. Pgs: 3
AR No. 03.01.3 Document No. 000003

Title: Muskrat Autopsy.
Addressee: ROSS GILLELAND EPA REGION I
Authors: GREGORY JOHNSON JOHNSON COMPANY
Date: April 24, 1995
Format: LETTER No. Pgs: 1
AR No. 03.01.4 Document No. 000334

Title: Mobilization of Phase IIA Studies by PRP's.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: April 25, 1995

Format: MEMORANDUM No. Pgs: 1
AR No. 03.01.5 Document No. 000335

Title: Response to Greg Johnson's April 25, 1995
Memorandum Regarding Mobilization for the 1995 Field Season.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: May 3, 1995
Format: LETTER No. Pgs: 2
AR No. 03.01.6 Document No. 000453

Title: Notice of Noncompliance.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: LINDA MURPHY - EPA REGION I
Date: April 22, 1996
Format: LETTER No. Pgs: 2
AR No. 03.01.7 Document No. 000345

Title: PRPs Noncompliance in Regards to the Data Validation Requirements
Addressee: DR. MARTIN JOHNSON JOHNSON COMPANY
Authors: MARY JANE O'DONNELL ENVIRONMENTAL PROTECTION AGENCY
Date: April 22, 1996
Format: LETTER No. Pgs: 2
AR No. 03.01.8 Document No. 000346

Title: Response to EPA's Notice of Noncompliance.
Addressee: LINDA MURPHY - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: April 25, 1996
Format: LETTER No. Pgs: 2
AR No. 03.01.9 Document No. 000622

Title: Urban Runoff Report.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN, ROSS GILLELAND, MARGERY ADAMS - ENVIRONMENTAL PROTECTION AGENCY
Date: May 1, 1996
Format: LETTER No. Pgs: 2
AR No. 03.01.10 Document No. 000347

Title: EPA's Letter Dated May 1, 1996 Regarding the Urban Runoff Report Data.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: DR. MARTIN JOHNSON - JOHNSON COMPANY
Date: May 3, 1996
Format: LETTER No. Pgs: 1
AR No. 03.01.11 Document No. 000348

Title: Followup On EPA's Letter of April 22 Regarding the
PRP's Noncompliance with Regard to the Data Validation Requirements.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: May 15, 1996
Format: LETTER No. Pgs: 2
AR No. 03.01.12 Document No. 000312

03.02 REMEDIAL INVESTIGATION - SAMPLING & ANALYSIS DATA

Title: Analytical Results of 15 Polynuclear Aromatic
Hydrocarbon Samples Recieved on September 20, 22, and 23, 1994.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: JEFFREY CURRAN - IEA
Date: October 28, 1994
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 11
AR No. 03.02.1 Document No. 000007

Title: Split Sampling Report, December 1994, ARI Phase I Summer 1994 Studies.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: METCALF & EDDY
Date: February 1995
Format: REPORT, STUDY No. Pgs: 60
AR No. 03.02.2 Document No. 000005

Title: Fish Testing of Young Bullheads.
Addressee: ALAN STRASSER - PINE ST CANAL ECOLOGICAL WORKINGROUP
Authors: KENNETH CARR - US FISH AND WILDLIFE SERVICE
Date: May 26, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 03.02.3 Document No. 000008

Title: Table of Co-Located Metals and PAH Results for Pine St. Canal.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: July 6, 1995
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 11
AR No. 03.02.4 Document No. 000009

Title: Data Summary for Focus Areas for Toxicity Testing
Requested by Ken Carr during 7/10 Conference Call.
Addressee: ECOLOGICAL WORK GROUP
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: July 14, 1995
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 7
AR No. 03.02.5 Document No. 000010

Title: Analytical Results for Samples Received by
Inchscape Testing Services - Aquatech Laboratories on October 19, 1995.
Addressee: KAREN WEDLOCK-HUNT - METCALF & EDDY
Authors: KAREN CHIRGWIN - INCHSCAPE TESTING SERVICES
Date: November 30, 1995
Format: LETTER No. Pgs: 10
AR No. 03.02.6 Document No. 000014

Title: Sediment Toxicity Analyses.
Addressee: SONJA SCHUYLER - JOHNSON COMPANY
Authors: JOHN WILLIAMS - INCHSCAPE TESTING SERVICES
Date: December 22, 1995
Format: REPORT, STUDY No. Pgs: 40
AR No. 03.02.7 Document No. 000011

Title: CADRE Data Review and Tier III Data Validation Deliverables.
Addressee: CHRISTINE CLARK - ENVIRONMENTAL PROTECTION AGENCY
Authors: CONSTANCE LAPITE, DR. BRIAN TUCKER - METCALF & EDDY
Date: January 29, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 19
AR No. 03.02.8 Document No. 000012

Title: Tier III Data Validation on Grain Size Analytical Data .
Addressee: CHRISTINE CLARK - ENVIRONMENTAL PROTECTION AGENCY
Authors: CONSTANCE LAPITE, DR. BRIAN TUCKER - METCALF & EDDY
Date: February 21, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 3
AR No. 03.02.9 Document No. 000013

Title: Tier III Validation on Inorganic Data From 10 Low Level Soil and 2 Aqueous Samples.
Addressee: CHRISTINE CLARK - ENVIRONMENTAL PROTECTION AGENCY
Authors: MEG HIMMEL, BRUCE LIVINGSTON - METCALF & EDDY
Date: February 26, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 10
AR No. 03.02.10 Document No. 000015

Title: CARDRE Data Review and Resubmittal of the Tier III Data Validation.
Addressee: CHRISTINE CLARK - ENVIRONMENTAL PROTECTION AGENCY
Authors: MEG HIMMEL, BRUCE LIVINGSTON - METCALF & EDDY
Date: March 18, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 15
AR No. 03.02.11 Document No. 000017
*Attached to Document No. 000013 In 03.02

Title: Region I Review of Inorganic Contract Laboratory Data Package.
Addressee: MEG HIMMEL - METCALF & EDDY
Authors: CHESTER LABNET
Date: March 20, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 22
AR No. 03.02.12 Document No. 000030

Title: Tier III Validation on Analytical Data from Reanalysis of Eight Sediment Samples.
Addressee: CHRISTINE CLARK - ENVIRONMENTAL PROTECTION AGENCY
Authors: MEG HIMMEL, BRUCE LIVINGSTON - METCALF & EDDY
Date: March 21, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 4
AR No. 03.02.13 Document No. 000018
*Attached to Document No. 000013 In 03.02

Title: Pine Street Biological Samples.
Addressee: KAREN WEDLOCK-HUNT - METCALF & EDDY
Authors: KENNETH CARR - US FISH AND WILDLIFE SERVICE
Date: May 13, 1996

Format: MEMORANDUM No. Pgs: 8
AR No. 03.02.14 Document No. 000019

Title: Review of Metcalf and Eddy Validation Letters of 2/26/96, 3/18/96, and 3/21/96.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: HUGO CAZON - JOHNSON COMPANY
Date: May 20, 1996
Format: LETTER No. Pgs: 2
AR No. 03.02.15 Document No. 000020

Title: User's Manual for the Pine Street Canal Site Database.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: TAMMY FORTIER - JOHNSON COMPANY
Date: June 1996
Format: LETTER No. Pgs: 20
AR No. 03.02.16 Document No. 000265

Title: Response to Johnson Company Review of M & E's Validation Letters.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: MARTHA ZIRBEL - METCALF & EDDY
Date: July 1, 1996
Format: LETTER No. Pgs: 4
AR No. 03.02.17 Document No. 000021

Title: Pine Street Canal Superfund Site, Data Validation Services.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: KIM WATSON - TRILLIUM, INC.
Date: August 1, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 13
AR No. 03.02.18 Document No. 000022

Title: Addendum to the Data Validation Report for Pine
Street Superfund Site, South Burlington, VT -metals in Soil Samples.
Addressee: J0HNSON COMPANY
Authors: TRILLIUM, INC.
Date: August 7, 1996
Format: REPORT, STUDY No. Pgs: 14
AR No. 03.02.19 Document No. 000023

Title: Addendum to the Data Validation Report for Pine Street Superfund Site,
South Burlington, VT- Inorganic Analysis Data - Metals in Soil.
Addressee: JOHNSON COMPANY
Authors: TRILLIUM, INC.
Date: August 7, 1996
Format: REPORT, STUDY No. Pgs: 15
AR No. 03.02.20 Document No. 000024

Title: Addendum to the Data Validation Report for Pine Street Superfund Site,
South Burlington, VT-Inorganic Analysis Data - Metals and Cyanide in Sediment
Addressee: JOHNSON COMPANY
Authors: TRILLIUM, INC.
Date: August 7, 1996
Format: REPORT, STUDY No. Pgs: 15
AR No. 03.02.21 Document No. 000025

Title: Addendum to the Data validation Report for Pine
Street Superfund Site, South Burlington, VT
Inorganic Analysis Data - Metals and Cyanide in soil.
Addressee: JOHNSON COMPANY
Authors: TRILLIUM, INC.
Date: August 7, 1996
Format: REPORT, STUDY No. Pgs: 28
AR No. 03.02.22 Document No. 000026

Title: Revised Addendum to the Data Validation Report for Pine Street -
Inorganic Analysis Data - Metals and Cyanide in Sediment.
Addressee: JOHNSON COMPANY
Authors: TRILLIUM, INC.
Date: August 14, 1996
Format: REPORT, STUDY No. Pgs: 14
AR No. 03.02.23 Document No. 000027

Title: Evaluated Data from Fish Tissue Analysis.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: METCALF & EDDY
Date: September 3, 1996
Format: LETTER No. Pgs: 12
AR No. 03.02.24 Document No. 000028

Title: Review of Johnson Company's Data Validation Memos and Comparison of Data with Results Presented in Risk Management Database.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: MARTHA ZIRBEL - METCALF & EDDY
Date: October 10, 1996
Format: LETTER No. Pgs: 4
AR No. 03.02.25 Document No. 000029

Title: Contract Laboratory Status Report.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: TEXAS A & M GEOCHEMICAL & ENVIRONMENTAL
Date: October 15, 1996
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 17
AR No. 03.02.26 Document No. 000031

Title: Fish Bile Data Analysis.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: BRUCE LIVINGSTON, MARTHA ZIRBEL - METCALF & EDDY
Date: October 17, 1996
Format: LETTER No. Pgs: 8
AR No. 03.02.27 Document No. 000032

Title: Split-Sampling Report for the Phase IIB Additional Remedial Investigation Sampling Round-October 1995.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: METCALF & EDDY
Date: December 1996
Format: REPORT, STUDY No. Pgs: 68
AR No. 03.02.28 Document No. 000033

Title: Results of Data Analysis Undertaken to Answer Outstanding Issues Discussed at the January 15th Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: February 24, 1997
Format: MEMORANDUM No. Pgs: 18
AR No. 03.02.29 Document No. 000034

03.03 REMEDIAL INVESTIGATION - SCOPES OF WORK

Title: Data Gap Analysis and Suggestions For Further Study--Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: October 13, 1993
Format: NOTES-GENERAL No. Pgs: 20
AR No. 03.03.1 Document No. 000039

Title: Outline for the Ecological Scope of Work - Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: March 22, 1994
Format: NOTES-MEETING No. Pgs: 15
AR No. 03.03.2 Document No. 000035

Title: Outline for the Ecological Scope of Work - Revised Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: May 12, 1994
Format: NOTES-MEETING No. Pgs: 20
AR No. 03.03.3 Document No. 000036

Title: Comments from the PRPs on the Draft Ecological Statement of Work.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: DANIEL FINKELSTEIN
Date: May 12, 1994
Format: MEMORANDUM No. Pgs: 7
AR No. 03.03.4 Document No. 000037

Title: Comments on the Statement of Work.
Addressee: PHILIP HARTER
Authors: LAPSE TEAM
Date: June 8, 1994
Format: MEMORANDUM No. Pgs: 6
AR No. 03.03.5 Document No. 000170

Title: Comments from Respondents on Appendix A (Draft #6 - 4/26/95) - Statement of Work - Additional Remedial Investigation and Feasibility Study - Phase II.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: May 12, 1995

Format: LIST No. Pgs: 4
AR No. 03.03.6 Document No. 000214

Title: Comments on the State of Vermont's Proposal for Fish Sampling in Pine Street Canal.
Addressee: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: May 15, 1995
Format: LETTER No. Pgs: 3
AR No. 03.03.7 Document No. 000038

Title: Modifications to the SOW Developed for the Phase II ARI Work Plan at the Pine Street Canal Site.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: DR. MARTIN JOHNSON - JOHNSON COMPANY
Date: October 9, 1995
Format: LETTER No. Pgs: 4
AR No. 03.03.8 Document No. 000627

Title: Potential Additional Work Under Administrative Order by Consent.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: June 3, 1996
Format: MEMORANDUM No. Pgs: 1
AR No. 03.03.9 Document No. 000349

Title: SOW for Drums Discovered at the Pine Street Canal Site.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: June 21, 1996
Format: LETTER No. Pgs: 2
AR No. 03.03.10 Document No. 000350

Title: EPA Comments on SOW for Submerged Drums.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: June 22, 1996
Format: LETTER No. Pgs: 2
AR No. 03.03.11 Document No. 000351

03.04 REMEDIAL INVESTIGATION - INTERIM DELIVERABLES

Title: Status Report of Phase I Submerged Drum Investigation.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: November 20, 1996
Format: LETTER No. Pgs: 3
AR No. 03.04.1 Document No. 000625

03.06 REMEDIAL INVESTIGATION - REMEDIAL INVESTIGATION REPORTS

Title: Disapproval of Additional Remedial Investigation Report - May, 1996.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - EPA REGION I
Date: June 5, 1996
Format: LETTER No. Pgs: 1
AR No. 03.06.1 Document No. 000314

Title: Comments on the ARI Phase II Report.
Addressee: JOHNSON COMPANY
Authors: AL MCINTOSH, MARY WATZIN - LAPSE TEAM
Date: October 11, 1996
Format: MEMORANDUM No. Pgs: 10
AR No. 03.06.2 Document No. 000040

Title: Disapproval with Modification Required of Additional Remedial Investigation Report - August 1996.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: October 15, 1996
Format: LETTER No. Pgs: 40
AR No. 03.06.3 Document No. 000041

Title: Disapproval with Modifications of ARI.
Addressee: MARGERY ADAMS - EPA REGION I
Authors: DAVID LEDBETTER - HUNTON AND WILLIAMS
Date: November 14, 1996

Format: LETTER No. Pgs: 1
AR No. 03.06.4 Document No. 000337

Title: Comments on the Pine Street Barge Canal Site Additional Remedial Investigation - August 1996.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: November 15, 1996
Format: LETTER No. Pgs: 3
AR No. 03.06.5 Document No. 000042

Title: EPA Comments on the Additional Remedial Investigation Report Dated December 19, 1996.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: January 31, 1997
Format: LETTER No. Pgs: 6
AR No. 03.06.6 Document No. 000626

Title: PRP Responses to Comments on Draft Revision No.2 of the Additional Remedial Investigation Report - December 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: March 14, 1997
Format: LETTER No. Pgs: 15
AR No. 03.06.7 Document No. 000043

Title: EPA Comments to the PRP Responses to Comments on Draft Revision No. 2 of the Additional Remedial Investigation.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: March 26, 1997
Format: LETTER No. Pgs: 1
AR No. 03.06.8 Document No. 000044

Title: Final Revisions to the PRP Responses to Draft Revision No. 2 of the Additional Remedial Investigation.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: April 10, 1997
Format: MEMORANDUM No. Pgs: 4
AR No. 03.06.9 Document No. 000045

Title: EPA Comments to PRP Responses to Comments on the Draft Revision No. 2 of the Additional Remedial Investigation.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: April 14, 1997
Format: LETTER No. Pgs: 1
AR No. 03.06.10 Document No. 000046

Title: EPA Comments on the Revised Section 8.3.1 of the Draft Additional Remedial Investigation.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: May 1, 1997
Format: LETTER No. Pgs: 1
AR No. 03.06.11 Document No. 000047

Title: Additional Remedial Investigation - Volume I Report - Draft Final Revision No. 3.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: July 3, 1997
Format: REPORT, STUDY No. Pgs: 436
AR No. 03.06.12 Document No. 000260

Title: Additional Remedial Investigation - Volume II - Figures and Plates - Draft Final Revision No. 3.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: July 3, 1997
Format: REPORT, STUDY No. Pgs: 235
AR No. 03.06.13 Document No. 000261

Title: Additional Remedial Investigation - Volume III - Appendices - Draft Final Revision No. 3.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: July 3, 1997

Format: REPORT, STUDY No. Pgs: 867
AR No. 03.06.14 Document No. 000262

Title: Additional Remedial Investigation - Volume IV - Appendices - Draft Final Revision No. 3.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: July 3, 1997
Format: REPORT, STUDY No. Pgs: 953
AR No. 03.06.15 Document No. 000263

03.07 REMEDIAL INVESTIGATION - WORK PLANS AND PROGRESS REPORTS

Title: Standard Operating Procedure for Sediment and Sludge Sampling.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: October 1990
Format: REPORT, STUDY No. Pgs: 24
AR No. 03.07.1 Document No. 000049

Title: Final Report, Determination of Analytical Methods for PAHs.
Addressee: ANGELO CARASEA - ENVIRONMENTAL PROTECTION AGENCY
Authors: MICHAEL ZIMMERMAN - ICF TECHNOLOGY
Date: January 28, 1994
Format: REPORT, STUDY No. Pgs: 26
AR No. 03.07.2 Document No. 000050

Title: Monthly Progress Report for Phase I ARI Studies - July 1994.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: July 1994
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.3 Document No. 000057

Title: Response to Johnson Company's Letter Requesting Approval to Send Samples from the Site to QUANTIX.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: JEFF PADGETT - ENVIRONMENTAL PROTECTION AGENCY
Date: July 26, 1994
Format: LETTER No. Pgs: 3
AR No. 03.07.4 Document No. 000002

Title: Partial Approval with Conditions of Phase I ARI Work Plan--Mobilization.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: July 26, 1994
Format: LETTER No. Pgs: 10
AR No. 03.07.5 Document No. 000054

Title: Monthly Progress Report for Phase I ARI Studies - August 1994, Minutes for the Monthly Progress Meeting.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: August 1994
Format: LETTER No. Pgs: 6
AR No. 03.07.6 Document No. 000207

Title: Partial Approval with Conditions of Phase I ARI Work Plan Activities - Comments/Conditions Set #2.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: August 10, 1994
Format: LETTER No. Pgs: 17
AR No. 03.07.7 Document No. 000056

Title: Use of Quantix Immunoassay Methodology at Pine Street Barge Canal Superfund Site.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: August 12, 1994
Format: LETTER No. Pgs: 13
AR No. 03.07.8 Document No. 000629

Title: Response to the Comments/Conditions Set # 2.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: August 17, 1994
Format: LETTER No. Pgs: 7

AR No. 03.07.9 Document No. 000333

Title: Response to the Comments/Conditions Set # 2.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: August 19, 1994
Format: LETTER No. Pgs: 37
AR No. 03.07.10 Document No. 000332

Title: Partial Approval of Phase I ARI Work Plan--Procedures for Field Data Collection of Storm Water Sediment Investigations and Preliminary Air Assessment.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: August 30, 1994
Format: LETTER No. Pgs: 3
AR No. 03.07.11 Document No. 000058

Title: Monthly Progress Report for Phase I ARI Studies - September 1994.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: September 1994
Format: REPORT, STUDY No. Pgs: 5
AR No. 03.07.12 Document No. 000060

Title: Partial Approval with Conditions of Preliminary Air Assessment Portions of Phase I ARI Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: September 1, 1994
Format: LETTER No. Pgs: 5
AR No. 03.07.13 Document No. 000055

Title: Comments on Certain Activities in the Phase I Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: September 2, 1994
Format: LETTER No. Pgs: 14
AR No. 03.07.14 Document No. 000052

Title: Response to the Comments/Conditions Sets #3 and #4 of the Draft ARI Phase I Work Plan Documents.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: September 13, 1994
Format: LETTER No. Pgs: 32
AR No. 03.07.15 Document No. 000053

Title: Field Operations Plan, Revision 1, Draft Additional Remedial Investigation Phase I.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: September 20, 1994
Format: REPORT, STUDY No. Pgs: 46
AR No. 03.07.16 Document No. 000630

Title: Monthly Progress Report for Phase I ARI Studes - October 1994.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: October 1994
Format: REPORT, STUDY No. Pgs: 30
AR No. 03.07.17 Document No. 000063

Title: Full Approval of Phase I ARI Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: October 12, 1994
Format: LETTER No. Pgs: 11
AR No. 03.07.18 Document No. 000059

Title: Comments on the Stormwater Inlet Sampling Plan.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: AL MCINTOSH - UNIVERSITY OF VERMONT
Date: October 21, 1994
Format: MEMORANDUM No. Pgs: 1
AR No. 03.07.19 Document No. 000191

Title: Response to Comments/Conditions Set #5, Phase I ARI Work Plan.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY

Date: October 28, 1994
Format: LETTER No. Pgs: 9
AR No. 03.07.20 Document No. 000061

Title: Monthly Progress Report for Phase I ARI Studies - November 1994.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: November 1994
Format: REPORT, STUDY No. Pgs: 26
AR No. 03.07.21 Document No. 000064

Title: Phase I Additional Remedial Investigation
Groundwater Sampling Methodology at the Pine Street Canal Site.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: SETH PITKIN - JOHNSON COMPANY
Date: November 1, 1994
Format: LETTER No. Pgs: 4
AR No. 03.07.22 Document No. 000062

Title: Issues Pertaining to Field Work Associated with
the Pine Street Barge Canal Superfund Site Phase I ARI.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: November 18, 1994
Format: LETTER No. Pgs: 3
AR No. 03.07.23 Document No. 000628

Title: Monthly Progress Report for Phase I ARI Studies - December 1994.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: December 1994
Format: REPORT, STUDY No. Pgs: 4
AR No. 03.07.24 Document No. 000066

Title: Completion of Phase I ARI Field Work.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: December 16, 1994
Format: LETTER No. Pgs: 2
AR No. 03.07.25 Document No. 000065

Title: Monthly Progress Report for Phase I ARI Studies - January 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: January 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.26 Document No. 000051

Title: Monthly Progress Report for Phase I ARI Studies - February 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: February 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.27 Document No. 000067

Title: Working Paper on Alternative Approach to Toxicity Testing.
Addressee: SUSAN SVIRSKY - EPA REGION I
Authors: AL MCINTOSH, MARY WATZIN - UNIVERSITY OF VERMONT
Date: March 22, 1995
Format: MEMORANDUM No. Pgs: 3
AR No. 03.07.28 Document No. 000257

Title: Monthly Progress Report for Phase I ARI Studies - April 1995.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: April 1995
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.29 Document No. 000208

Title: Fish Sampling and Analysis.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: April 21, 1995
Format: MEMORANDUM No. Pgs: 3
AR No. 03.07.30 Document No. 000068

Title: Monthly Progress Report for Phase IIA ARI Studies - May 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY

Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.31 Document No. 000075

Title: EPA's Comments on Vermont's Proposal for Fish Sampling.
Addressee: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Authors: SHEILA ECKMAN - EPA REGION I
Date: May 1, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.32 Document No. 000069

Title: EPA Comments on Phase IIA Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: May 4, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.33 Document No. 000070

Title: Review of Avian Dietary Study Work Plan and Phase II - Ecological Statement of Work.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: AL MCINTOSH, MARY WATZIN - UNIVERSITY OF VERMONT
Date: May 10, 1995
Format: MEMORANDUM No. Pgs: 2
AR No. 03.07.34 Document No. 000071

Title: Response to Comments Received from EPA on Avian Dietary Study.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 19, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.35 Document No. 000073

Title: Letter Concerning Format for Work Plan - Phase IIB.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 19, 1995
Format: LETTER No. Pgs: 1
AR No. 03.07.36 Document No. 000074

Title: Monthly Progress Report for Phase IIA ARI Studies - June 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: June 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.37 Document No. 000079

Title: Additional Remedial Investigation, Draft Phase IIB Work Plan, Pine Street Canal Site, Burlington, VT.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: June 30, 1995
Format: WORK PLAN No. Pgs: 76
AR No. 03.07.38 Document No. 000076

Title: Comments on the Johnson Co. Suggestions for Toxicity Test Sites.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: AL MCINTOSH - UNIVERSITY OF VERMONT
Date: June 30, 1995
Format: MEMORANDUM No. Pgs: 2
AR No. 03.07.39 Document No. 000223

Title: Monthly Progress Report for Phase IIA ARI Studies - July 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: July 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.40 Document No. 000089

Title: Approval of Phase IIA Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: July 6, 1995
Format: LETTER No. Pgs: 2
AR No. 03. 07.41 Document No. 000078

Title: Letter Approving Phase IIA Additional Remedial Investigation Work Plan with Conditions
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY

Authors: MARY JANE O'DONNELL - EPA REGION I
Date: July 6, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.42 Document No. 000591

Title: Sampling Locations for Toxicity Tests.
Addressee: ECOLOGICAL WORK GROUP
Authors: SHEILA ECKMAN, SUSAN SVIRSKY - EPA REGION I
Date: July 11, 1995
Format: MEMORANDUM No. Pgs: 2
AR No. 03.07.43 Document No. 000225

Title: Comments on the Selection of Sample Sites for Toxicity Testing.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: KENNETH CARR - US DEPARTMENT OF INTERIOR
Date: July 12, 1995
Format: LETTER No. Pgs: 3
AR No. 03.07.44 Document No. 000224

Title: Biotoxicity Method Summaries for Toxicity Evaluations.
Addressee: SONJA SCHUYLER - JOHNSON COMPANY
Authors: JOHN WILLIAMS - INCHSCAPE TESTING SERVICES
Date: July 14, 1995
Format: REPORT, STUDY No. Pgs: 24
AR No. 03.07.45 Document No. 000080

Title: Review Comments--Additional Remedial Investigation Phase IIB Work Plan.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: METCALF & EDDY
Date: July 20, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 03.07.46 Document No. 000081

Title: Comments on the Phase IIB Workplan.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: July 25, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.47 Document No. 000083

Title: Disapproval of Phase IIB Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: July 27, 1995
Format: LETTER No. Pgs: 7
AR No. 03.07.48 Document No. 000084

Title: Review of Protocols from Inchscape Testing Services.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: AL MCINTOSH, MARY WATZIN - UNIVERSITY OF VERMONT
Date: July 27, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 03.07.49 Document No. 000085

Title: Phase IIB Sediment and Toxicity Tests--Areas for Discussion.
Date: July 27, 1995
Format: NOTES-GENERAL No. Pgs: 3
AR No. 03.07.50 Document No. 000218

Title: Comments Regarding the Biomarker Study.
Addressee: SONJA SCHUYLER - JOHNSON COMPANY
Authors: AL MCINTOSH, MARY WATZIN - UNIVERSITY OF VERMONT
Date: July 31, 1995
Format: MEMORANDUM No. Pgs: 2
AR No. 03.07.51 Document No. 000086

Title: Monthly Progress Report for Phase IIA and B ARI Studies - August 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: August 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.52 Document No. 000094

Title: Schedule for Resubmittal of Phase IIB Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - EPA REGION I
Date: August 2, 1995
Format: LETTER No. Pgs: 1

AR No. 03.07.53 Document No. 000320

Title: Technical Memorandum--Review Comments--Biotoxicity Method Summaries for Toxicity Evaluations.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: METCALF & EDDY
Date: August 3, 1995
Format: MEMORANDUM No. Pgs: 3
AR No. 03.07.54 Document No.000087

Title: Comments on Fish Biomarker Study Protocols.
Addressee: GREGORY JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - EPA REGION I
Date: August 3, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 03.07.55 Document No. 000319

Title: Review of Biotoxicity Method Summaries (Standard Test Conditions and Procedures) for Toxicity Evaluations.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: PATTI LYNNE TYLER - ENVIRONMENTAL PROTECTION AGENCY
Date: August 9, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 03.07.56 Document No. 000088

Title: EPA Comments on Biotoxicity Method Summaries (Standard Test Conditions and Procedures) for Toxicity Evaluations.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: August 21, 1995
Format: LETTER No. Pgs: 5
AR No. 03.07.57 Document No. 000219

Title: Approval of Phase IIB Work Plan - Part I.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: August 21, 1995
Format: LETTER No. Pgs: 1
AR No. 03.07.58 Document No. 000318

Title: Toxicity Test Sample Location Revisions.
Addressee: ECOLOGICAL WORK GROUP
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: August 28, 1995
Format: SAMPLING AND ANALYSIS DAT No. Pgs: 11
AR No. 03.07.59 Document No. 000090

Title: Final Sampling and Analysis Plan, Pine Street Canal Site, Burlington, VT.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: METCALF & EDDY
Date: September 1995
Format: REPORT, STUDY No. Pgs: 141
AR No. 03.07.60 Document No. 000092

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - September 1995.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: September 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.61 Document No. 000317

Title: Toxicity Testing.
Addressee: ECOLOGICAL WORK GROUP
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: September 12, 1995
Format: MEMORANDUM No. Pgs: 6
AR No. 03.07.62 Document No. 000093

Title: Toxicity Testing Proposal.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: September 21, 1995
Format: MEMORANDUM No. Pgs: 9
AR No. 03.07.63 Document No. 000173

Title: Comments on the Draft Post-Screening Field Investigation Work Plan and the ARI Phase IIB Work Plan.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY

Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: September 29, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.64 Document No. 000091

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - October 1995.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: October 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.65 Document No. 000316

Title: Approval of Phase IIB Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: October 3, 1995
Format: LETTER No. Pgs: 2
AR No. 03.07.66 Document No. 000095

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - November 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: November 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.67 Document No. 000098

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - December 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: December 1995
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.68 Document No. 000101

Title: Pine Street Canal Work Plan for Supplemental Baseline Ecological Risk Assessment - 2nd Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: December 4, 1995
Format: WORK PLAN No. Pgs: 11
AR No. 03.07.69 Document No. 000096

Title: Pine Street Canal Work Plan for Supplemental Baseline Ecological Risk Assessment (Attachments A & B) - 2nd Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: December 4, 1995
Format: WORK PLAN No. Pgs: 105
AR No. 03.07.70 Document No. 000097

Title: Comments on Work Plan for Supplemental Baseline Risk Assessment - Draft.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: December 4, 1995
Format: LETTER No. Pgs: 5
AR No. 03.07.71 Document No. 000100

Title: Comments on Supplemental Baseline Ecological Risk Assessment - Draft.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: LAPSE TEAM
Date: December 19, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 03.07.72 Document No. 000099

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - January 1996.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: January 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.73 Document No. 000309

Title: Draft Agenda for Ecological Work Group Meeting and Draft Response to Comments Received on the Supplemental Baseline Ecological Risk Assessment.
Addressee: PHILIP HARTER - PINE ST CANAL ECOLOGICAL WORKINGROUP
Authors: SHEILA ECKMAN, SUSAN SVIRSKY - ENVIRONMENTAL PROTECTION AGENCY
Date: January 18, 1996
Format: LETTER No. Pgs: 8
AR No. 03.07.74 Document No. 000102

Title: Request for Comments on the Ecological Risk Assessment Work Plan.
Addressee: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION

Authors: SHEILA ECKMAN - EPA REGION I
Date: January 25, 1996
Format: LETTER No. Pgs:
AR No. 03.07.75 Document No. 000315

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - February 1996.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: February 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.76 Document No. 000103

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - March 1996.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: March 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.77 Document No. 000104

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - April 1996.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: April 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.78 Document No. 000105

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - May 1996.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.79 Document No. 000313

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - June 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: June 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.80 Document No. 000106

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - July 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: July 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.81 Document No. 000107

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - August 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: August 1996
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.82 Document No. 000108

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - September 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: September 1996
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.83 Document No. 000109

Title: Work Plan for Investigation, Retrieval, and Disposal of Submerged Drums.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: September 16, 1996
Format: WORK PLAN No. Pgs: 13
AR No. 03.07.84 Document No. 000110

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - October 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: October 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.85 Document No. 000048

Title: Comments on the Work Plan for Investigation, Retrieval, and Disposal of Submerged Drums.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY

Date: October 10, 1996
Format: LETTER No. Pgs: 2
AR No. 03.07.86 Document No. 000352

Title: Response to Comments to the Work Plan for
Investigation, Retrieval, and Disposal of Submerged Drums.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: October 30, 1996
Format: MEMORANDUM No. Pgs: 3
AR No. 03.07.87 Document No. 000353

Title: Monthly Progress Report for Phase IIA and IIB ARI and the AFS - November 1996.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: November 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.88 Document No. 000111

Title: Monthly Progress Report for the ARI and the AFS - December 1996.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: December 1996
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.89 Document No. 000112

Title: Monthly Progress Report for the ARI and the AFS - January 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: January 1997
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.90 Document No.000311

Title: Monthly Progress Report for the ARI and the AFS - February 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: February 1997
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.91 Document No. 000310

Title: Monthly Progress Report for the ARI and the AFS - March 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: March 1997
Format: REPORT, STUDY No. Pgs: 4
AR No. 03.07.92 Document No. 000308

Title: Monthly Progress Report for the ARI and the AFS - April 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: April 1997
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.93 Document No. 000282

Title: Monthly Progress Report for the ARI and the AFS - May 1997.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.94 Document No. 000113

Title: Monthly Progress Report for the ARI and the AFS - June 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: June 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.95 Document No. 000200

Title: Monthly Progress Report for the ARI and the AFS - July 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: July 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.96 Document No. 000275

Title: Monthly Progress Report for the ARI and the AFS - August 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY

Date: August 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.97 Document No. 000274

Title: Monthly Progress Report for the ARI and the AFS - September 1997.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: September 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.98 Document No. 000193

Title: Monthly Progress Report for the ARI and the AFS - October 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: October 1997
Format: REPORT, STUDY No. Pgs: 2
AR No. 03.07.99 Document No. 000228

Title: Monthly Progress Report for the ARI and the AFS - November 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: November 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.100 Document No. 000227

Title: Monthly Progress Report for the ARI and the AFS - December 1997.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: December 1997
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.101 Document No.000269

Title: Monthly Progress Report for the ARI and the AFS - January 1998.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: January 1998
Format: REPORT, STUDY No. Pgs: 1
AR No. 03.07.102 Document No.000270

Title: Monthly Progress Report for the Pine Street Phase IIA and the AFS for February 1998, with Transmittal Letter.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: March 13, 1998
Format: LETTER No. Pgs: 3
AR No. 0:3.07.103 Document No. 000592

Title: Monthly Progress Report for the Pine Street Phase IIA ARI and the AFS for the Month of March 1998.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: April 15, 1998
Format: LETTER No. Pgs: 2
AR No. 03.07.104 Document No. 000593

Title: Monthly Progress Report for the Phase IIA ARI and the AFS for April 1998, with Transmittal Letter.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 15, 1998
Format: LETTER No. Pgs: 2
AR No. 03.07.105 Document No. 000594

03.09 REMEDIAL INVESTIGATION - HEALTH ASSESSMENTS

Title: Health Consultation.
Addressee: SUZANNE SIMON - AGENCY FOR TOXIC SUBSTANCES AND DISEASE
Authors: TAMMY MCCRAE US DEPT OF HEALTH HUMAN SERVICES
Date: October 29, 1992
Format: MEMORANDUM No. Pgs: 6
AR No. 03.09.1 Document No. 000114

Title: ATSDR's Health Consultations on the Pine Street Canal.
Authors: AGENCY FOR TOXIC SUBSTANCES AND DISEASE
Date: February 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 03.09.2 Document No. 000525

03.10 REMEDIAL INVESTIGATION - ENDANGERMENT/BASELINE RISK ASSESSMENTS

Title: Framework for Ecological Risk Assessment.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: February 1992
Format: REPORT, STUDY No. Pgs: 94
AR No. 03.10.1 Document No. 000222

Title: Statement of Work for Further Study-Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: July 30, 1993
Format: WORK PLAN No. Pgs: 9
AR No. 03.10.2 Document No. 000115

Title: Rationale for Selection of Compounds of Concern in Fish Tissue.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: ANNE-MARIE BURKE - EPA REGION I
Date: October 4, 1993
Format: MEMORANDUM No. Pgs: 1
AR No. 03.10.3 Document No. 000116

Title: Meeting Notes of Inhalation Risks from Industrial Use of Groundwater.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: BARBARA WEIR, JOHN YOUNG - METCALF & EDDY
Date: May 12, 1994
Format: MEMORANDUM No. Pgs: 17
AR No. 03.10.4 Document No. 000117

Title: Screening Calculations for Whole Fish Consumption.
Addressee: PINE STREET HUMAN HEALTH WORK GROUP
Authors: SHEILA ECKMAN, ANNE-MARIE BURKE - EPA REGION I
Date: February 3, 1995
Format: MEMORANDUM No. Pgs: 7
AR No. 03.10.5 Document No. 000118

Title: Bounding Calculations for Consumption of Fish - Draft.
Addressee: HUMAN HEALTH RISK ASSESSMENT TECHNICAL W
Authors: DEE HULL, DAVID BURMASTER - ALCEON CORPORATION
Date: February 6, 1995
Format: MEMORANDUM No. Pgs: 9
AR No. 03.10.6 Document No. 000119

Title: Comments on Draft Supplemental Baseline Ecological Risk Assessment.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: January 6, 1996
Format: MEMORANDUM No. Pgs: 14
AR No. 03.10.7 Document No. 000184

Title: Comments on the Work Plan for the SBERA.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: ALAN QUACKENBUSH, STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: January 30, 1996
Format: LETTER No. Pgs: 1
AR No. 03.10.8 Document No. 000192

Title: PRP Comments on the Draft Analysis Phase Version I, Supplemental Baseline Ecological Risk Assessment.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: October 10, 1996
Format: LETTER No. Pgs: 7
AR No. 03.10.9 Document No. 000342

Title: Memorandum Concerning Comments on Analysis Phase of SBERA; Work Plan for Retrieval and Disposal of Submerged Drums; and December Retreat.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: October 17, 1996
Format: MEMORANDUM No. Pgs: 2
AR No. 03.10.10 Document No. 000180

Title: Comments on the Draft Pine Street Barge Canal Supplemental Baseline Ecological Risk Assessment.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: AL MCINTOSH, MARY WATZIN - UNIVERSITY OF VERMONT
Date: January 6, 1997

Format: MEMORANDUM No. Pgs: 2
AR No. 03.10.11 Document No. 000340

Title: Comments on the Draft Supplemental Ecological Risk Assessment.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: January 22, 1997
Format: LETTER No. Pgs: 1
AR No. 03.10.12 Document No. 000341

Title: Memoranda Concerning Fish Memos from the State of Vermont and Conference Call of March 11, 1997.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: March 3, 1997
Format: MEMORANDUM No. Pgs: 6
AR No. 03.10.13 Document No. 000120

Title: Comments on the Final Supplemental Baseline Ecological Risk Assessment - Draft.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: SONJA SCHUYLER, CHRIS CRANDELL - JOHNSON COMPANY
Date: May 30, 1997
Format: LETTER No. Pgs: 4
AR No. 03.10.14 Document No. 000121

Title: Supplemental Baseline Ecological Risk Assessment - Volume II - Appendices and Plates.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: ROY WESTON INC.
Date: July 1997
Format: REPORT, STUDY No. Pgs: 280
AR No. 03.10.15 Document No. 000259

Title: Memorandum: Analysis of the Day Care Scenario for Selected Areas of the Pine Street Site.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: ANNE-MARIE BURKE - EPA REGION I
Date: July 10, 1997
Format: MEMORANDUM No. Pgs: 2
AR No. 03.10.16 Document No. 000595

Title: Supplemental Baseline Ecological Risk Assessment - Volume I - Text.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: ROY WESTON INC.
Date: July 15, 1997
Format: REPORT, STUDY No. Pgs: 243
AR No. 03.10.17 Document No. 000258

Title: "Hot Spot" Evaluation for Ecological Risk.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: SONJA SCHUYLER - JOHNSON COMPANY
Date: August 7, 1997
Format: MEMORANDUM No. Pgs: 4
AR No. 03.10.18 Document No. 000631

04.01 FEASIBILITY STUDY - CORRESPONDENCE

Title: Request for Extension to Due Date Additional Feasibility Study, Initial Screening of Alternatives Report.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: JEFFREY KLAIBER GEI CONSULTANTS
Date: August 7, 1995
Format: LETTER No. Pgs: 2
AR No. 04.01.1 Document No. 000124

Title: Post Screening Field Investigation.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: SHEILA ECKMAN - EPA REGION I
Date: September 5, 1995
Format: LETTER No. Pgs: 2
AR No. 04.01.2 Document No. 000300

Title: Update on EPA's Involvement on the Feasibility Study and Southern Connector.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: ROSS GILLELAND - EPA REGION I
Date: April 4, 1996
Format: MEMORANDUM No. Pgs: 4
AR No. 04.01.3 Document No. 000284

Title: Identification of Hot Spots.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: AL MCINTOSH, MARY WATZIN - UNIVERSITY OF VERMONT
Date: June 20, 1997
Format: MEMORANDUM No. Pgs: 1
AR No. 04.01.4 Document No. 000281

Title: Additional Feasibility Study Regarding EPA's Oct. 21st Letter.
Addressee: MARY JANE O'DONNELL - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: October 28, 1997
Format: LETTER No. Pgs: 2
AR No. 04.01.5 Document No. 000336

04.03 FEASIBILITY STUDY - SCOPES OF WORK

Title: Post Screening Field Investigation Scope of Work - Additional Feasibility Study.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: ROSS GILLELAND - EPA REGION I
Date: September 27, 1995
Format: LETTER No. Pgs: 3
AR No. 04.03.1 Document No. 000271

04.04 FEASIBILITY STUDY - INTERIM DELIVERABLES

Title: Natural Biodegradation Evaluation--Summary of Results.
Authors: RETEC
Format: PUBLIC MEETING RECORDS No. Pgs: 13
AR No. 04.04.1 Document No. 000122

Title: In-Situ Capping of Contaminated Sediments, A Primer for Environmental Professionals.
Authors: HAZARDOUS SUBS. RESEARCH CTR/SO & SO WES
Format: REPORT, STUDY No. Pgs: 18
AR No. 04.04.2 Document No. 000596

Title: Response to EPA Comments on the Draft Additional Feasibility Study - Post-Screening Field Investigation: Intrinsic & Enhanced Bioremediation Assessm
Authors: GREGORY JOHNSON
Format: CORRESPONDENCE No. Pgs: 13
AR No. 04.04.3 Document No. 000601
*Attached to Document No. 000599 In 04.04

Title: Response to EPA Comments on the Additional Feasibility Study Post-Screening Field Investigation.
Authors: JOHNSON COMPANY
Format: CORRESPONDENCE No. Pgs: 4
AR No. 04.04.4 Document No. 000602
*Attached to Document No. 000599 In 04.04

Title: Results of Preliminary Microbial Screening.
Addressee: PINE ST REMEDIAL ALTERNATIVES WORK GROUP
Authors: BENJAMIN GENES - RETEC
Date: November 28, 1994
Format: MEMORANDUM No. Pgs: 4
AR No. 04.04.5 Document No. 000123

Title: Comments on Remedial Alternatives.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: AL MCINTOSH - UNIVERSITY OF VERMONT
Date: September 26, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 04.04.6 Document No. 000299

Title: Comments Regarding the Post-Screening Field Investigation Work Plan and Initial Screening Report.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: November 8, 1995
Format: MEMORANDUM No. Pgs: 6
AR No. 04.04.7 Document No. 000297

Title: Conditional Approval of FS Post-Screening Field Investigation Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: November 14, 1995
Format: LETTER No. Pgs: 10

AR No. 04.04.8 Document No. 000296

Title: Disapproval with Modifications Required of the Additional Feasibility Study--Initial Screening of Alternatives Report - 9/8/95.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: December 4, 1995
Format: LETTER No. Pgs: 10
AR No. 04.04.9 Document No. 000125

Title: Objections and Response of Performing Respondents to December 4 Disapproval with Modifications Required of the Remedial Alternatives Report.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: DAVID LEDBETTER - HUNTON AND WILLIAMS
Date: December 8, 1995
Format: LETTER No. Pgs: 5
AR No. 04.04.10 Document No. 000293

Title: Request for Extension - Revised AFS Initial Screening of Remedial Alternatives Report and Response to Comment Letter.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: JEFFREY KLAIBER - GEI CONSULTANTS
Date: December 21, 1995
Format: LETTER No. Pgs: 1
AR No. 04.04.11 Document No. 000295

Title: Response to Comments Letter and Post Screening Field Investigation Work Plan - Revision 2.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: JEFFREY KLAIBER - GEI CONSULTANTS
Date: December 22, 1995
Format: LETTER No. Pgs: 13
AR No. 04.04.12 Document No. 000294

Title: Extension of Time in Due Date for the AFS Initial Screening of Alternatives Report, Revision 1.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: January 2, 1996
Format: LETTER No. Pgs: 2
AR No. 04.04.13 Document No. 000292

Title: Informal Submittal - Draft Additional Feasibility Study - Initial Screening of Remedial Alternatives Report.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: JEFFREY KLAIBER - GEI CONSULTANTS
Date: January 10, 1996
Format: LETTER No. Pgs: 20
AR No. 04.04.14 Document No. 000291

Title: Summary of Remedial Alternatives Subjected to Initial Screening.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: GEI CONSULTANTS
Date: January 22, 1996
Format: REPORT, STUDY No. Pgs: 74
AR No. 04.04.15 Document No. 000126

Title: Comments on Revision I of the Initial Screening of Remedial Alternatives Report (January 10, 1996).
Addressee: JEFFREY KLAIBER - GEI CONSULTANTS.
Authors: ROSS GILLELAND - EPA REGION I
Date: January 29, 1996
Format: MEMORANDUM No. Pgs: 6
AR No. 04.04.16 Document No. 000290

Title: Additional Evaluation of Remediation Technologies for Manufactured Gas Plant Sites.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: DR. MARTIN JOHNSON - JOHNSON COMPANY
Date: February 2, 1996
Format: MEMORANDUM No. Pgs: 1
AR No. 04.04.17 Document No. 000289

Title: Response to Comments Letter and Initial Screening of Remedial Alternatives - Revision 2 Additional Feasibility Study.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: RIDGELY MAUCK - GEI CONSULTANTS
Date: February 8, 1996
Format: LETTER No. Pgs: 8

AR No. 04.04.18 Document No. 000288

Title: Additional Bioremediation Sampling.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: February 14, 1996
Format: MEMORANDUM No. Pgs: 2
AR No. 04.04.19 Document No. 000287

Title: Supplemental Submittal to the Initial Screening of Remedial Alternatives Report."
Addressee: ROSS GILLELAND - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: March 1, 1996
Format: LETTER No. Pgs: 2
AR No. 04.04.20 Document No. 000286

Title: Response to EPA Comments on the Draft Review of
Additional Remedial Technoogies, March 27, 1996.
Authors: JOHNSON COMPANY
Date: March 27, 1996
Format: CORRESPONDENCE No. Pgs: 4
AR No. 04.04.21 Document No. 000600
*Attached to Document No. 000599 In 04.04

Title: Comments on the Post Screening Field Investigation: Intrinsic and Enhanced
Bioremediation Assessments - Additional Feasibility Study.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: January 3, 1997
Format: LETTER No. Pgs: 13
AR No. 04.04.22 Document No. 000278

Title: Letter with Comments on Draft Review of Additional Remedial Technologies, March 27, 1996.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: ROSS GILLELAND - EPA REGION I
Date: January 3, 1997
Format: LETTER No. Pgs: 4
AR No. 04.04.23 Document No. 000597

Title: Letter with EPA Comments on Investigations to Support Detailed Evaluation
of a Subaqueous Capping Remedial Alternative, GEI, August 8, 1996. 1996.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: ROSS GILLELAND - EPA REGION I
Date: January 3, 1997
Format: LETTER No. Pgs: 3
AR No. 04.04.24 Document No. 000598

Title: Transmittal Letter for Attached Response to EPA Comments.
Addressee: ROSS GILLELAND EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: May 15, 1997
Format: LETTER No. Pgs: 1
AR No. 04.04.25 Document No. 000599

04.06 FEASIBILITY STUDY - FEASIBILITY STUDY REPORTS

Title: Submission of PRP Technical Committee Supplemental Information - Rough Draft I.
Addressee: MICHAEL JASINSKI - ENVIRONMENTAL PROTECTION AGENCY
Authors: NORM TERRERI - GREEN MOUNTAIN
Date: August 5, 1992
Format: LETTER No. Pgs: 26
AR No. 04.06.1 Document No. 000128

Title: Submission of PRP Technical Committee Supplemental Information - Rough Draft II.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: NORM TERRERI - GREEN MOUNTAIN
Date: August 26, 1992
Format: LETTER No. Pgs: 69
AR No. 04.06.2 Document No. 000267

Title: Review of "Feasibility-Like Analysis - Proposed Remedial Action Plan."
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ROBERT RAMEY - BURLINGTON PLANNING COMMISSION
Date: September 1, 1992
Format: LETTER No. Pgs: 16
AR No. 04.06.3 Document No. 000129

Title: Announcement that the State will be Submitting Comments on the Draft Detailed Screening Phase - Additional Feasibility Study.
Addressee: PHILIP HARTER
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: May 15, 1997
Format: LETTER No. Pgs: 1
AR No. 04.016.4 Document No. 000279

Title: Comments on Additional Feasibility Study for Consideration at the May 19 Coordinating Council Meeting.
Addressee: PHILIP HARTER
Authors: E. MICHAEL THOMAS - MC DERMOTT, WILL AND EMERY
Date: May 15, 1997
Format: LETTER No. Pgs: 2
AR No. 04.06.5 Document No. 000280

Title: Comments on Feasibility Study.
Addressee: PHILIP HARTER - ENVIRONMENTAL PROTECTION AGENCY
Authors: LAPSE TEAM
Date: May 16, 1997
Format: MEMORANDUM No. Pgs: 3
AR No. 04.06.6 Document No. 000242

Title: Responses to USEPA General Comments on Draft Revision No. 2 of the Additional Feasibility Study, Pine Street Canal.
Authors: RETEC
Date: June 16, 1997
Format: CORRESPONDENCE No. Pgs: 6
AR No. 04.06.7 Document No. 000603

Title: EPA General Comments - Additional Feasibility Study - April 14 and July 7, 1997.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: July 31, 1997
Format: LETTER No. Pgs: 31
AR No. 04.06.8 Document No. 000276

Title: Response to Comments on the Draft Additional Feasibility Study (Rev. 1).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: BENJAMIN GENES - RETEC
Date: August 29, 1997
Format: CORRESPONDENCE No. Pgs: 47
AR No. 04.06.9 Document No. 000604

Title: Memo Concerning Additional Feasibility Study Comments - Revised Draft.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: SHEILA ECKMAN - EPA REGION I
Date: September 15, 1997
Format: MEMORANDUM No. Pgs: 9
AR No. 04.06.10 Document No. 000230

Title: Text from AFS Draft Revision I Concerning Wetland Impacts from Remedial Actions.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: September 22, 1997
Format: MISCELLANEOUS No. Pgs: 7
AR No. 04.06.11 Document No. 000229

Title: Comments on Revised Draft - Additional Feasibility Study.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: October 1997
Format: MISCELLANEOUS No. Pgs: 25
AR No. 04.06.12 Document No. 000638

Title: EPA Comments on the Revised Draft - Additional Feasibility Study.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: October 20, 1997
Format: LETTER No. Pgs: 65
AR No. 04.06.13 Document No. 000272

Title: Letter Disapproving the Additional Feasibility Study Dated August 1997, with modifications Required.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: October 20, 1997
Format: LETTER No. Pgs: 1
AR No. 04.06.14 Document No. 000605

Title: Objections and Response of Performing Respondents to October 20 Disapproval with Modifications Required of the Additional Feasibility Study.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: DAVID LEDBETTER - HUNTON AND WILLIAMS
Date: October 28, 1997
Format: LETTER No. Pgs: 4
AR No. 04.06.15 Document No. 000273

Title: Letter Concerning EPA's Review of the Additional Feasibility Study, Dated August 1997.
Addressee: MARY JANE O'DONNELL - EPA REGION I
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: October 28, 1997
Format: LETTER No. Pgs: 2
AR No. 04.06.16 Document No. 000606

Title: Response to Comments on the August 1997 Revision of the Additional Feasibility Study.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: BENJAMIN GENES - RETEC
Date: November 7, 1997
Format: CORRESPONDENCE No. Pgs: 60
AR No. 04.06.17 Document No. 000607

Title: Letter Providing Additional Modifications to the Additional Feasibility Study.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: January 21, 1998
Format: LETTER No. Pgs: 3
AR No. 04.06.18 Document No. 000608

Title: Response to USEPA January 1998 Comments on the Draft Additional Feasibility Study (Revision 3).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: BENJAMIN GENES - RETEC
Date: February 12, 1998
Format: CORRESPONDENCE No. Pgs: 24
AR No. 04.06.19 Document No. 000609

Title: Letter Containing Additional Modifications Required to the Additional Feasibility Study.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: April 20, 1998
Format: LETTER No. Pgs: 3
AR No. 04.06.20 Document No. 000610

Title: Draft Final Additional Feasibility Study, Volume 1 (of 2), Report.
Authors: RETEC
Date: May 1998
Format: REPORT, STUDY No. Pgs: 286
AR No. 04.06.21 Document No. 000613

Title: Draft Final Additional Feasibility Study, Volume 2 of 2, Appendices A - E.
Authors: RETEC
Date: May 1998
Format: REPORT, STUDY
AR No. 04.06.22 Document No. 000614

Title: Letter Concerning Required Modifications to the ARARs.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: May 1, 1998
Format: LETTER No. Pgs: 1
AR No. 04.06.23 Document No. 000611

Title: Response to EPA Comments on the Draft Final Additional Feasibility Study.
Addressee: ROSS GILLELAND - EPA REGION I
Authors: BENJAMIN GENES - RETEC
Date: May 18, 1998
Format: CORRESPONDENCE No. Pgs: 44
AR No. 04.06.24 Document No. 000612

04.07 FEASIBILITY STUDY - WORK PLANS AND PROGRESS REPORTS

Title: Work Plan for Natural Biodegradation Evaluation at the Pine Street Canal Site, Burlington, Vermont.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: RETEC
Date: September 19, 1994

Format: MEMORANDUM No. Pgs: 69
AR No. 04.07.1 Document No. 000152

Title: Comments on Work Plan for Natural Biodegradation Evaluation.
Addressee: RETEC
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: September 20, 1994
Format: CORRESPONDENCE No. Pgs: 7
AR No. 04.07.2 Document No. 000153
*Attached to Document No. 000639 In 04.07

Title: Work Plan for Natural Biodegradation EvaluationVermont.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: RETEC
Date: October 1994
Format: WORK PLAN No. Pgs: 88
AR No. 04.07.3 Document No. 000633

Title: Transmitting EPA Comments on the Draft Biodegradation Work Plan.
Addressee: BENJAMIN GENES - RETEC
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: October 3, 1994
Format: LETTER No. Pgs: 1
AR No. 04.07.4 Document No. 000639

Title: EPA's Comments on the Draft Biodegradation Work Plan.
Addressee: BENJAMIN GENES - RETEC
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION, AGENCY
Date: October 3, 1994
Format: LETTER No. Pgs: 19
AR No. 04.07.5 Document No. 000658

Title: Screening Samples for Natural Biodegradation Evaluation.
Addressee: PINE ST REMEDIAL ALTERNATIVES WORK GROUP
Authors: BENJAMIN GENES - RETEC
Date: October 18, 1994
Format: MEMORANDUM No. Pgs: 2
AR No. 04.07.6 Document No. 000655

Title: EPA's Comments on the Memorandum "Screening
Samples for Natural Biodegradation Evaluation."
Addressee: BENJAMIN GENES - RETEC
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: October 21, 1994
Format: LETTER No. Pgs: 2
AR No. 04.07.7 Document No. 000154

Title: EPA's Comments on RECTEC's Memo entitled
"Screening Samples for Natural Biodegradation Evaluation" dated October 18, 1994.
Addressee: BENJAMIN GENES - RETEC
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: October 21, 1994
Format: LETTER No. Pgs: 2
AR No. 04.07.8 Document No. 000657

Title: Response to Comments on the "Draft Treatability
Work Plan for Natural Biodegradation Evaluation."
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: RETEC
Date: November 17, 1994
Format: CORRESPONDENCE No. Pgs: 11
AR No. 04.07.9 Document No. 000155

Title: Response to Comments on the "Draft Treatability Work Plan for
Natural Biodegradation Evaluation for the Pine Street Barge Canal Site."
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: BENJAMIN GENES - RETEC
Date: November 17, 1994
Format: LETTER No. Pgs: 12
AR No. 04.07.10 Document No. 000656

Title: Approval of Natural Biodegradation Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: December 14, 1994
Format: LETTER No. Pgs: 3
AR No. 04.07.11 Document No. 000307

Title: Progress of Natural Biodegradation Evaluation.
Addressee: PINE ST REMEDIAL ALTERNATIVES WORK GROUP
Authors: BENJAMIN GENES - RETEC
Date: January 17, 1995
Format: MEMORANDUM No. Pgs: 6
AR No. 04.07.12 Document No. 000156

Title: Draft--Additional Feasibility Study Work Plan--Comments.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: June 1, 1995
Format: LETTER No. Pgs: 11
AR No. 04.07.13 Document No. 000157

Title: Response to EPA Comments on Draft AFS Work Plan.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHNSON COMPANY
Date: June 26, 1995
Format: CORRESPONDENCE No. Pgs: 16
AR No. 04.07.14 Document No. 000158

Title: Memo Concerning the Addendum to Draft APS Work Plan Dated April 17, 1995.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: June 27, 1995
Format: MEMORANDUM No. Pgs: 2
AR No. 04.07.15 Document No. 000160

Title: Additional Feasibility Study Work Plan - Draft,
Pine Street Canal Site, Burlington, Vermont, Revision 1.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: GEI CONSULTANTS
Date: June 30, 1995
Format: WORK PLAN No. Pgs: 38
AR No. 04.07.16 Document No. 000159

Title: Approval of Additional Feasibility Study Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: July 6, 1995
Format: LETTER No. Pgs: 2
AR No. 04.07.17 Document No. 000303

Title: Extension of FS Initial screening of Alternatives
Report and Post-Screening Field Investigation Work Plan.
Addressee: DR. MARTIN JOHNSON - JOHNSON COMPANY
Authors: MARY JANE O'DONNELL - EPA REGION I
Date: August 14, 1995
Format: LETTER No. Pgs: 3
AR No. 04.07.18 Document No. 000302

Title: Comments on GEI Proposed Post-Screening Field Investigation Workplan.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: LAPSE TEAM
Date: September 20, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 04.07.19 Document No. 000636

Title: Comments on the Draft Post-Screening Field
Investigation Work Plan and the ARI Phase IIB Work Plan.
Addressee: CHRIS CRANDELL - JOHNSON COMPANY
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: September 29, 1995
Format: LETTER No. Pgs: 2
AR No. 04.07.20 Document No. 000634

Title: Draft Post - Screening Field Investigation Work Plan.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: GEI CONSULTANTS
Date: December 22, 1995
Format: REPORT, STUDY No. Pgs: 183
AR No. 04.07.21 Document No. 000637

Title: Comments - Additional Feasibility Study - Post Screening Field Investigation.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: August 8, 1996
Format: MISCELLANEOUS No. Pgs: 4
AR No. 04.07.22 Document No. 000635

04.09 FEASIBILITY STUDY - PROPOSED PLANS FOR SELECTED REMEDIAL ACTION

Title: Cleanup Plan Proposed for Pine Street Barge Canal Superfund Site.
Authors: EPA REGION I
Date: May 1998
Format: FACT SHEET, PRESS RELEASE No. Pgs: 11
AR No. 04.09.1 Document No. 000615

05.01 RECORDS OF DECISION - CORRESPONDENCE

Title: Request to Continue Classifying the Groundwater Underneath the Pine Street Site as Not a Suitable Source of Potable Water.
Addressee: JAY RUTHERFORD - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: August 12, 1998
Format: LETTER No. Pgs: 3
AR No. 05.01.1 Document No. 000671

Title: Groundwater Reclassification - Pine Street Barge Canal Site.
Addressee: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Authors: GEORGE DESCH - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: September 14, 1998
Format: LETTER No. Pgs: 2
AR No. 05.01.2 Document No. 000672

05.02 RECORDS OF DECISION - APPLICABLE OR RELEVANT & APPROPRIATE REQUIREMEN

Title: ARARs Specific to Remedial Alternative 3a: Capping Subareas 1, 2, 3, 7 and 8.
Format: MISCELLANEOUS No. Pgs: 5
AR No. 05.02.1 Document No. 000666

Title: Section 18-79 of Burlington Code of Ordinances: Plumbing Connections.
Addressee: BETH TENSASELLO - ENVIRONMENTAL PROTECTION AGENCY
Authors: ROBERT RAMEY - BURLINGTON PLANNING COMMISSION
Date: August 20, 1992
Format: MISCELLANEOUS No. Pgs: 1
AR No. 05.02.2 Document No. 000640

Title: Notification of EPA Disagreement with the State of Vermont over State Standards Qualifying as ARARs.
Addressee: WILLIAM AHERN - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: November 9, 1992
Format: LETTER No. Pgs: 2
AR No. 05.02.3 Document No. 000151

05.03 RECORDS OF DECISION - RESPONSIVENESS SUMMARIES

Title: Comments on the Proposed Plan for the Pine Street Barge Canal Superfund Site.
Addressee: KAREN LUMINO - ENVIRONMENTAL PROTECTION AGENCY
Format: FORM No. Pgs: 1
AR No. 05.03.1 Document No. 000646

Title: Comments on the Proposed Plan for the Pine Street Barge Canal Superfund Site.
Addressee: KAREN LUMINO - ENVIRONMENTAL PROTECTION AGENCY
Authors: FRED HILL
Date: June 9, 1998
Format: CORRESPONDENCE No. Pgs: 1
AR No. 05.03.2 Document No. 000648

Title: Pine Street Barge Canal Public Hearing.
Authors: CAROL BOONE - COURT REPORTERS ASSOCIATES
Date: June 24, 1998
Format: PUBLIC MEETING RECORDS No. Pgs: 17
AR No. 05.03.3 Document No. 000641

Title: Resolution that EPA Accept Settlement.
Addressee: ENVIRONMENTAL PROTECTION AGENCY
Authors: BURLINGTON CITY COUNCIL
Date: June 26, 1998
Format: MISCELLANEOUS No. Pgs: 3
AR No. 05.03.4 Document No. 000645

Title: Comments on the Proposed Plan for the Pine Street Barge Canal Superfund Site.

Addressee: KAREN LUMINO - ENVIRONMENTAL PROTECTION AGENCY
Authors: LINDEN WITHERELL
Date: July 8, 1998
Format: LETTER No. Pgs: 5
AR No. 05.03.5 Document No. 000644

Title: Comments on the Proposed Plan for the Pine Street Barge Canal Superfund Site.
Addressee: KAREN LUMINO - ENVIRONMENTAL PROTECTION AGENCY
Authors: WAYNE SENVILLE - BURLINGTON PLANNING COMMISSION
Date: July 8, 1998
Format: FORM No. Pgs: 1
AR No. 05.03.6 Document No. 000647

Title: Comments on the Proposed Plan for the Pine Street Barge Canal Superfund Site.
Addressee: KAREN LUMINO - ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHN BRABANT - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: July 10, 1998
Format: CORRESPONDENCE No. Pgs: 2
AR No. 05.03.7 Document No. 000643

Title: Comments on the Proposed Plan for the Pine Street Barge Canal Superfund Site.
Addressee: KAREN LUMINO - ENVIRONMENTAL PROTECTION AGENCY
Authors: HAROD CARSLON
Date: July 24, 1998
Format: FORM No. Pgs: 2
AR No. 05.03.8 Document No. 000642

Title: Pine Street Canal Superfund Site Responsiveness Summary.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: September 1998
Format: PUBLIC MEETING RECORDS No. Pgs: 50
AR No. 05.03.9 Document No. 000668

05.04 RECORDS OF DECISION - RECORD OF DECISION

Title: Record of Decision for the Pine Street Canal Superfund Site.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: September 29, 1998
Format: REPORT, STUDY No. Pgs: 312
AR No. 05.04.1 Document No. 000669

9.01 STATE COORDINATION - CORRESPONDENCE

Title: Joint Resolution Relating to the Burlington Barge Canal Site.
Addressee: CAROL BROWNER - ENVIRONMENTAL PROTECTION AGENCY
Authors: DONALD HOOPER - VERMONT SECRETARY OF STATE
Date: April 28, 1993
Format: LETTER No. Pgs: 4
AR No. 09.01.1 Document No. 000344

Title: Cancelation of the Proposed Plan.
Addressee: DONALD HOOPER - VERMONT SECRETARY OF STATE
Authors: PAUL KEOUGH - EPA REGION I
Date: June 22, 1993
Format: LETTER No. Pgs: 1
AR No. 09.01.2 Document No. 000343

10.01 ENFORCEMENT/NEGOTIATION - CORRESPONDENCE

Title: Agreement -- Pine Street Barge Canal Coordinating Council.
Authors: PINE STREET COORDINATING COUNCIL
Date: May 27, 1998
Format: MISCELLANEOUS No. Pgs: 1
AR No. 10.01.1 Document No. 000621

10.07 ENFORCEMENT/NEGOTIATION - EPA ADMINISTRATIVE ORDERS

Title: Administrative Order by Consent for Additional
Remedial Investigation Study (Phase I) - USEPA Docket No. I-94-1065.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Format: LITIGATION No. Pgs: 55
AR No. 10.07.1 Document No. 000171

Title: Administrative Order by Consent for Additional

Remedial Investigation/Feasibility Study - USEPA Docket No. I-95-1048.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: June 30, 199S
Format: LITIGATION No. Pgs: 222
AR No. 10.07.2 Document No. 00516

11.05 POTENTIALLY RESPONSIBLE PARTIES - MULTIPLE PRP DOCUMENTS

Title: Pine Street Barge Canal Superfund Site Property Owners.
Date: June 1991
Format: LIST No. Pgs: 2
AR No. 11.05.1 Document No. 000359

Title: Notification of Meeting on February 11, 1994 for Potentially Responsible Parties.
Addressee: JAMES ROBEAR - BLODGETT COMPANY
Authors: MERRILL HOHMAN - ENVIRONMENTAL PROTECTION AGENCY
Date: January 12, 1994
Format: LETTER No. Pgs: 8
AR No. 11.05.2 Document No. 000354

Title: PRP Meeting Notes - February 11, 1994.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: February 11, 1994
Format: NOTES-MEETING No. Pgs: 10
AR No. 11.05.3 Document No. 000355

Title: PRP Meeting Summary of February 11, 1994.
Addressee: AL SMITH - MURTHA, CULLINA, RICHTER, AND PINNEY
Authors: MARGERY ADAMS - ENVIRONMENTAL PROTECTION AGENCY
Date: March 7, 1994
Format: LETTER No. Pgs: 8
AR No. 11.05.4 Document No. 000356

Title: PRP's Agreement Concerning Allocation of Responsibility.
Addressee: MARGERY ADAMS - ENVIRONMENTAL PROTECTION AGENCY
Authors: DAVID LEDBETTER - HUNTON AND WILLIAMS
Date: March 16, 1994
Format: LETTER No. Pgs: 2
AR No. 11.05.5 Document No. 000358

Title: PRP Internal Settlement.
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: March 30, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 11.05.6 Document No. 000357

11.09 POTENTIALLY RESPONSIBLE PARTIES - PRP-SPECIFIC DOCUMENTS

Title: Responses to Comments on the Draft SEIS (VTAOT)
Authors: ENVIRONMENTAL PROTECTION AGENCY
Format: REPORT, STUDY No. Pgs: 10
AR No. 11.09.1 Document No. 000399

Title: Draft #2 - Statement of Work - Site Investigation on the Burlington Department of Public Works Property for Contract 6 (City of Burlington).
Format: REPORT, STUDY No. Pgs: 28
AR No. 11.09.2 Document No. 000402

Title: Objectives Required by EPA/Superfund - Draft SEIS Comments (Vermont Agency of Transportation).
Format: NOTES-MEETING No. Pgs: 6
AR No. 11.09.3 Document No. 000422

Title: Operating Log of the Gas Plant, January 10-16, 1926.
Format: NOTES-GENERAL No. Pgs: 1
AR No. 11.09.4 Document No. 000650

Title: Gas Plant Photographs Associated with Green Mountain Power Co.
Format: PHOTO, MICROFORM, VIDEO No. Pgs: 28
AR No. 11.09.5 Document No. 000654

Title: Proposed Plan (Leverage Group).
Addressee: RICHARD GRUNDLER - LEVERAGE GROUP
Authors: MERRILL HOHMAN - EPA REGION I
Date: November 6, 1992
Format: LETTER No. Pgs: 2

AR No. 11.09.6 Document No. 000581

Title: Building Permit (Martin Marietta).
Authors: GARY KJELLEREN - MARTIN MARIETTA ARMAMENT SYSTEMS
Date: August 24, 1993
Format: LETTER No. Pgs: 1
AR No. 11.09.7 Document No. 000381

Title: Alternative Southern Connector/Burlington Street Department Property.
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: PAUL CRAVEN - VERMONT RAILWAY
Date: August 24, 1993
Format: MEMORANDUM No. Pgs: 4
AR No. 11.09.8 Document No. 000649

Title: Removing a Property from Superfund Status When
the Property is not Contaminated (Davis Development).
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: DERRICK DAVIS - DAVIS COMPANY
Date: September 24, 1993
Format: LETTER No. Pgs: 3
AR No. 11.09.9 Document No. 000379

Title: Draft Statement of Work for City of Burlington; Champlain Parkway
(Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Date: November 9, 1994
Format: WORK PLAN No. Pgs: 20
AR No. 11.09.10 Document No. 000194

Title: Comments on Statement of Work - Draft (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: SHEILA ECKMAN - EPA REGION I
Date: December 13, 1994
Format: MEMORANDUM No. Pgs: 2
AR No. 11.09.11 Document No. 000196

Title: Comments on the Statement of Work - Draft (Vermont Agency of Transportation).
Addressee: STANLEY CORNEILLE - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Authors: ROSS GILLELAND - EPA REGION I
Date: January 4, 1995
Format: LETTER No. Pgs: 4
AR No. 11.09.12 Document No. 000195

Title: Burlington Southern Connector (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: BETH ALAFAT
Date: April 25, 1995
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.13 Document No. 000448

Title: C2 and C6 Alignment Project - Early Coordination (Vermont Agency of Transportation).
Addressee: BETH ALAFAT - ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHN NAROWSKI - VERMONT AGENCY OF TRANSPORTATION
Date: April 25, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 11.09.14 Document No. 000449

Title: Burlington Southern Connector/Champlain Park Way;
Notification of Agency Review Meeting (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ROBERT KLIMM, STERLING WALL - HMM ASSOCIATES INC.
Date: May 10, 1995
Format: MEMORANDUM No. Pgs: 4
AR No. 11.09.15 Document No. 000451

Title: Southern Connector and Pine Street Canal
Superfund Site Meeting - May 16, 1995 (Vermont Agency of Transportation).
Addressee: BARBARA BUCKLEY - EARTHTECH
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: May 11, 1995
Format: LETTER No. Pgs: 4
AR No. 11.09.16 Document No. 000450

Title: Burlington Southern/Champlain Park Way Agency
Meeting Notes - May 16, 1995 (Vermont Agency of Transportation).
Authors: HMM ASSOCIATES INC.

Date: May 16, 1995
Format: NOTES-MEETING No. Pgs: 4
AR No. 11.09.17 Document No.000444

Title: Response to Request as to Whether Pine Street is Considered Part of the Pine Street Canal Superfund Site (City of Burlington).
Addressee: SUSAN COMPTON - MCNEIL LEDDY, AND SHEAHAN
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: May 18, 1995
Format: LETTER No. Pgs: 3
AR No. 11.09.18 Document No. 000369

Title: Progress Updates - Pine Street Coordinating Council (Vermont Agency of Transportation).
Addressee: STERLING WALL - EARTHTECH
Authors: ROSS GILLELAND - EPA REGION I
Date: June 6, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 11.09.19 Document No.000447

Title: Minutes of the May 18, 1995 Monthly Meeting Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: June 9, 1995
Format: MEMORANDUM No. Pgs: 8
AR No. 11.09.20 Document No. 000446

Title: Stormwater Sampling Equipment at the Pine Street Canal Site (Vermont Railway).
Addressee: DAVID WULFSON - VERMONT RAILWAY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: June 26, 1995
Format: LETTER No. Pgs: 1
AR No. 11.09.21 Document No. 000361

Title: Discussion with Stephen John, EPA Regarding SEIS Document for VAOT Burlington Connector/Champlain Park Way Project (Vermont Agency of Transportation).
Addressee: JOHN NAROWSKI - VERMONT AGENCY OF TRANSPORTATION
Authors: ROBERT KLIMM - HMM ASSOCIATES INC.
Date: July 3, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 11.09.22 Document No. 000445

Title: Construction of the New Railway Bridge (Vermont Railway).
Addressee: JOHN PENNINGTON - VERMONT RAILWAY
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: July 7, 1995
Format: LETTER No. Pgs: 2
AR No. 11.09.23 Document No. 000362

Title: Rail Work Around the Pine Street Canal Superfund Site (Vermont Railway).
Addressee: JOHN PENNINGTON - VERMONT RAILWAY
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: July 7, 1995
Format: LETTER No. Pgs: 2
AR No. 11.09.24 Document No. 000363

Title: Minutes of the June 21, 1995 Monthly Meeting Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: July 12, 1995
Format: MEMORANDUM No. Pgs: 8
AR No. 11.09.25 Document No. 000440

Title: Description of Railwork Performed at the Pine Street Canal Superfund Site (Vermont Railway).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHN PENNINGTON - VERMONT RAILWAY
Date: July 20, 1995
Format: LETTER No. Pgs: 2
AR No. 11.09.26 Document No. 000364

Title: Burlington Southern Connector/Champlain Park Way Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: ROBERT KLIMM - HMM ASSOCIATES INC.
Date: July 21, 1995
Format: LETTER No. Pgs: 15

AR No. 11.09.27 Document No. 000439

Title: Minutes of the July 19, 1995 Monthly Meeting
Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: August 9, 1995
Format: MEMORANDUM No. Pgs: 8
AR No. 11.09.28 Document No. 000438

Title: Draft Administrative Order By Consent for Highway
Study - EPA Docket No. I-95 (City of Burlington)
Addressee: SUSAN COMPTON - MCNEIL AND MURRAY
Authors: MARGERY ADAMS - ENVIRONMENTAL PROTECTION AGENCY
Date: August 15, 1995
Format: LETTER No. Pgs: 59
AR No. 11.09.29 Document No. 000404

Title: Minutes of the August 23, 1995 Monthly Meeting
Regarding the Burlington C2 and C6 Projects (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: August 23, 1995
Format: MEMORANDUM No. Pgs: 8
AR No. 11.09.30 Document No. 000406

Title: Brownfields Action Agenda (Maltex Partnership)
Addressee: LINDA MURPHY - ENVIRONMENTAL PROTECTION AGENCY
Authors: DERRICK DAVIS - DAVIS COMPANY
Date: September 18, 1995
Format: LETTER No. Pgs: 2
AR No. 11.09.31 Document No. 000378

Title: Minutes of the September 13, 1995 Monthly Meeting
Regarding the Burlington C2 and C6 Projects (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Date: September 19, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 11.09.32 Document No. 000407

Title: Comments on the Southern Connector/Champlain Park Way - Draft Supplemental
Environmental Impact Statement (Vermont Agency of Transportation).
Addressee: DONALD WEST - FEDERAL HIGHWAY ADMINISTRATION
Authors: JOHN DE VILLARS - EPA REGION I
Date: September 25, 1995
Format: LETTER No. Pgs: 11
AR No. 11.09.33 Document No. 000441

Title: Draft #3 - Statement of Work - Site Investigation on the Burlington
Department of Public Works Property for Contract 6 (City of Burlington).
Date: October 12, 1995
Format: REPORT, STUDY No. Pgs: 28
AR No. 11.09.34 Document No. 000403

Title: Meeting Summary of October 17, 1995 Regarding Hazardous Waste Materials Testing
at Champlain Park Way (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Date: October 19, 1995
Format: MEMORANDUM No. Pgs: 2
AR No. 11.09.35 Document No. 000554

Title: Minutes of the October 18, 1995 Monthly Meeting
Regarding the Burlington C2 and C6 Projects (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Date: October 23, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 11.09.36 Document No. 000408

Title: Draft - Field Activities Work Plan - CG Alignment Construction, Southern
Connecter/Champlain Parkway Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: BARBARA BUCKLEY - EARTHTECH
Date: November 1, 1995
Format: REPORT, STUDY No. Pgs: 21
AR No. 11.09.37 Document No. 000400

Title: Decision Regarding Vermont Agency of Transportation and City of Burlington's Proposal to Conduct Environmental Investigations (VTAOT).
Addressee: SUSAN COMPTON - MCNEIL LEDDY, AND SHEAHAN
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTIONAGENCY
Date: November 7, 1995
Format: LETTER No. Pgs: 2
AR No. 11.09.38 Document No. 000370

Title: Comments on the October 19, 1995 and October 23, 1995 Meeting Summaries Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Authors: ROSS GILLELAND - EPA REGION I
Date: November 8, 1995
Format: LETTER No. Pgs: 5
AR No. 11.09.39 Document No. 000443

Title: Comments on the Draft - Field Activities Work Plan - C6 Alignment Construction (Vermont Agency of Transportation).
Addressee: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Authors: ROSS: GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: November 14, 1995
Format: LETTER No. Pgs: 5
AR No. 11.09.40 Document No. 000409

Title: Minutes of the November 15, 1995 Monthly Meeting Regarding the Burlington C2 and C6 Projects (Vermont Agency of Transportation).
Addressee: ROSE GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Date: November 27, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 11.09.41 Document No.000410

Title: B.E.D. Pine Street Facility Site Work Summary Report (City of Burlington).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: ROGER DONEGAN - BURLINGTON ELECTRIC DEPARTMENT
Date: November 29, 1995
Format: LETTER No. Pgs: 32
AR No. 11.09.42 Document No. 000371

Title: Comments on Revision 1 of the Field Activities Work Plan - C6 Alignment Construction (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: BARBARA BUCKLEY - EARTHTECH
Date: December 1995
Format: REPORT, STUDY No. Pgs: 23
AR No. 11.09.43 Document No. 000401

Title: Comments on the Draft - Revision I - Field Activities Work Plan - Champlain Parkway Contract 6.
Addressee: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Authors: ROSS GILLELAND - EPA REGION I
Date: December 13, 1995
Format: LETTER No. Pgs: 5
AR No. 11.09.44 Document No. 000424

Title: Southern Connector - E-Mail Message (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: January 18, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.45 Document No. 000411

Title: Southern Connector - Reply - E-Mail Message (Vermont Agency of Transportation).
Addressee: KATE QUINN
Authors: ROSS GILLELAND - EPA REGION I
Date: January 18, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.46 Document No.000412

Title: Field Activities Workplan Received - E-Mail Message (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: January 22, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.47 Document No.000413

Title: Questions Regarding the C6 Interim Alignment Project (Vermont Agency of Transportation).

Addressee: KATE QUINN
Authors: ROSS GILLELAND - EPA REGION I
Date: January 24, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.48 Document No.000414

Title: Review of the Field Activities Workplan (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: January 24, 1996
Format: CORRESPONDENCE No. Pgs: 2
AR No. 11.09.49 Document No.000417

Title: Field Activities Workplan - Response - E-Mail Message (Vermont Agency of Transportation).
Addressee: KATE QUINN
Authors: ROSS GILLELAND - EPA REGION I
Date: January 25, 1996
Format: CORRESPONDENCE No. Pgs: 2
AR No. 11.09.50 Document No.000416

Title: Comments on the Field Activities Workplan - E-Mail Message (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: January 25, 1996
Format: CORRESPONDENCE No. Pgs: 2
AR No. 11.09.51 Document No.000437

Title: Comments on Revision II- Draft Field Activities Work Plan - C6 Alignment Construction (Vermont Agency of Transportation).
Addressee: ALEC PORTALUPI - VERMONT AGENCY OF TRANSPORTATION
Authors: ROSS GILLELAND - EPA REGION I
Date: February 2, 1996
Format: LETTER No. Pgs: 8
AR No. 11.09.52 Document No. 000421

Title: Meeting Agenda - To Discuss the Status of the Burlington MEGC - M5000 (1) Project (Vermont Agency of Transportation).
Date: February 26, 1996
Format: NOTES-MEETING No. Pgs: 1
AR No. 11.09.53 Document No. 000423

Title: Minutes of the January 17, 1996 Monthly Meeting Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: February 27, 1996
Format: MEMORANDUM No. Pgs: 4
AR No. 11.09.54 Document No. 000428

Title: Vermont AOT Febrary 28 Meeting Notes - E-Mail (Vermont Agency of Transportation).
Addressee: KATE QUINN
Authors: ROSS GILLELAND - EPA REGION I
Date: February 28, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.55 Document No. 000429

Title: Monthly Meeting Regarding the C2 and C6 Alignment Project Canceled, Meeting Rescheduled for April 1, 1996 (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: March 18, 1996
Format: MEMORANDUM No. Pgs: 1
AR No. 11.09.56 Document No. 000431

Title: Minutes of the February 28, 1996 Monthly Meeting Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation)
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: March 22, 1996
Format: MEMORANDUM No. Pgs: 7
AR No. 11.09.57 Document No. 000432

Title: Vermont AOT Meeting Notes - Reply - E-Mail (Vermont Agency of Transportation) .
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: April 2, 1996

Format: CORRESPONDENCE No. Pgs: 2
AR No. 11.09.58 Document No. 000430

Title: Minutes of the April 1, 1996 Monthly Meeting Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: April 17, 1996
Format: MEMORANDUM No. Pgs: 8
AR No. 11.09.59 Document No. 000433

Title: Minutes of the May 1, 1996 Monthly Meeting Regarding the C2 and C6 Alignment Project (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: May 21, 1996
Format: MEMORANDUM No. Pgs: 8
AR No. 11.09.60 Document No. 000434

Title: EPA's Comments on the April Environmental Report - E-Mail (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: May 29, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.61 Document No. 000435

Title: Reply to EPA's Comments on the April Environmental Report - E-Mail (Vermont Agency of Transportation).
Addressee: ROSS GILLELAND - EPA REGION I
Authors: KATE QUINN
Date: May 30, 1996
Format: CORRESPONDENCE No. Pgs: 1
AR No. 11.09.62 Document No. 000436

Title: Final Supplemental Environmental Impact Statement (Vermont Agency of Transportation).
Authors: FEDERAL HIGHWAY ADMINISTRATION
Date: February 1997
Format: REPORT, STUDY No. Pgs: 575
AR No. 11.09.63 Document No. 000456

Title: Environmental Data on Pine Street Canal (Vermont Transit).
Addressee: JOHN SHARROW - VERMONT TRANSIT COMPANY
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: May 1, 1997
Format: LETTER No. Pgs: 16
AR No. 11.09.64 Document No. 000372

Title: Approval of Zoning Permit (Vermont Transit).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHN SHARROW - VERMONT TRANSIT COMPANY
Date: May 6, 1997
Format: MISCELLANEOUS No. Pgs: 1
AR No. 11.09.65 Document No. 000373

Title: Land Use - Pine Street Canal Superfund Site (Vermont Transit).
Addressee: JOHN SHARROW - VERMONT TRANSIT COMPANY
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: May 9, 1997
Format: LETTER No. Pgs: 5
AR No. 11.09.66 Document No. 000365

Title: Comments on the Southern Connector/Champlain Park Way - Final Supplemental Environmental Impact Statement (Vermont Agency of Transportation).
Addressee: FREDERICK DOWNS - FEDERAL HIGHWAY ADMINISTRATION
Authors: ELIZABETH HIGGINS - OFFICE OF ENVIRONMENTAL REVIEW
Date: May 20, 1997
Format: LETTER No. Pgs: 13
AR No. 11.09.67 Document No. 000442

Title: Redevelopment of the Pine Street Barge Canal Site (City of Burlington).
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PETER CLAVELLE - BURLINGTON OFFICE OF THE MAYOR
Date: June 16, 1997
Format: LETTER No. Pgs: 2
AR No. 11.09.68 Document No. 000367

Title: Redevelopment at the Pine Street Canal Superfund Site (City of Burlington).

Addressee: JOHN DE VILLARS - ENVIRONMENTAL PROTECTION AGENCY
Authors: PETER CLAVELLE - BURLINGTON OFFICE OF THE MAYOR
Date: July 1, 1997
Format: LETTER No. Pgs: 2
AR No. 11.09.69 Document No. 000368

Title: Redefinition of the Boundary Lines for the Pine Street Canal Superfund Site (City of Burlington).
Addressee: PETER CLAVELLE BURLINGTON OFFICE OF THE MAYOR
Authors: JOHN DE VILLARS ENVIRONMENTAL PROTECTION AGENCY
Date: August 6, 1997
Format: LETTER No. Pgs: 9
AR No. 11.09.70 Document No. 000366

Title: Building Permit to the City of Burlington (City of Burlington).
Addressee: ROSS GILLELAND ENVIRONMENTAL PROTECTION AGENCY
Authors: JOHN SHARROW - VERMONT TRANSIT COMPANY
Date: August 21, 1997
Format: LETTER No. Pgs: 11
AR No. 11.09.71 Document No. 000374

Title: Response to Civil Engineering Associates, Inc. Letter Dated August 28, 1997 Regarding the Central Fueling Depot (City of Burlington).
Authors: ROSS GILLELAND - EPA REGION I
Date: September 11, 1997
Format: MEMORANDUM No. Pgs: 9
AR No. 11.09.72 Document No. 000199

Title: City of Burlington Central Fueling Depot (City of Burlington).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: JEFF PADGETT - CIVIL ENGINEERING ASSOCIATES INC.
Date: September 24, 1997
Format: LETTER No. Pgs: 4
AR No. 11.09.73 Document No. 000375

Title: EPA's Concerns with Respect to Development and Land Use at the Pine Street Canal Superfund Site (City of Burlington).
Addressee: JEFF PADGETT - CIVIL ENGINEERING ASSOCIATES INC.
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTTON AGENCY
Date: October 20, 1997
Format: LETTER No. Pgs: 2
AR No. 11.09.74 Document No. 000376

Title: Record of Decision for Champlain Parkway (Vermont Agency of Transportation).
Addressee: ELIZABETH HIGGINS - ENVIRONMENTAL PROTECTION AGENCY
Authors: TINA BOHL - VERMONT AGENCY OF TRANSPORTATION
Date: October 20, 1997
Format: REPORT, STUDY No. Pgs: 62
AR No. 11.09.75 Document No. 000457

Title: October 20, 1997 Letter Regarding the City of Burlington's Proposed Central Fueling Depot (City of Burlington).
Addressee: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Authors: CHRIS CRANDELL - JOHNSON COMPANY
Date: November 7, 1997
Format: LETTER No. Pgs: 1
AR No. 11.09.76 Document No. 000377

13.01 COMMUNITY RELATIONS - CORRESPONDENCE

Title: Request that the Burlington Board of Health Be Made a Full Member of the Pine Street Canal Coordinating Committee.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: ZARA ZSIDO - BURLINGTON BOARD OF HEALTH
Format: LETTER No. Pgs: 2
AR No. 13.01.1 Document No. 000651

Title: Nomination of Pine Street Canal Superfund Site for Non-Binding Alternative Dispute Resolution.
Addressee: WILLIAM WHITE ENVIRONMENTAL PROTECTION AGENCY
Authors: HARLEY LAING ENVIRONMENTAL PROTECTION AGENCY
Date: June 17, 1993
Format: MEMORANDUM No. Pgs: 2
AR No. 13.01.2 Document No. 000001

Title: Memorandum Concerning a Revised Copy of the Press Release on Superfund Process.
Addressee: LEO KAY - EPA REGION I

Authors: LORI FISHER - LAKE CHAMPLAIN COMMITTEE
Date: November 18, 1993
Format: MEMORANDUM No. Pgs: 1
AR No. 13-01.3 Document No. 000576

Title: Pine Street Canal - No Fishing Posting.
Authors: STEVEN GOODKIND - BURLINGTON DEPARTMENT OF PUBLIC HEALTH
Date: July 18, 1994
Format: MEMORANDUM No. Pgs: 1
AR No. 13.01.4 Document No. 000474

13.03 COMMUNITY RELATIONS - NEWS CLIPPINGS/PRESS RELEASES

Title: Plan in Progress.
Authors: BETSEY KRUMHOLTZ
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.1 Document No. 000496

Title: Residents Discuss Southern Connector.
Authors: MEGHAN MC MENIMEN - BURLINGTON FREE PRESS
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.2 Document No. 000497

Title: Southern Connector Debate.
Authors: BURLINGTON FREE PRESS
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.3 Document No. 000498

Title: Pine Street Detour.
Authors: RAY UNSWORTH - BURLINGTON FREE PRESS
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.4 Document No. 000500

Title: Connector Takes Curves.
Authors: SONA IYENGAR - BURLINGTON FREE PRESS
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.5 Document No. 000501

Title: NEES Zapped by Cost of Toxic Cleanups.
Authors: DAN ROSENFELD
Date:
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.6 Document No. 000523

Title: Southern Connector Still Snagged.
Authors: ANN DONIAN - BURLINGTON FREE PRESS
Date: March 18, 1990
Format: NEWS CLIPPING No. Pgs: 4
AR No. 13.03.7 Document No. 000521

Title: EPA Tells Pine St. Residents Don't Worry, Be Happy.
Authors: GEORGE LAYING - VERMONT TIMES
Date: December 13, 1990
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.8 Document No. 000589

Title: Lake Champlain Committee to Apply for EPA Grant
to Oversee Pine St. Barge Canal Superfund Project.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: August 20, 1992
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.9 Document No. 000139

Title: EPA Proposes Contaminant and Limited Excavation
of Coal Tar - Contaminated Wastes at Pine Street Barge Canal Superfund Site.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: November 6, 1992
Format: FACT SHEET, PRESS RELEASE No. Pgs: 3
AR No. 13.03.10 Document No. 000132

Title: Clavelle Seeks More Time for Comment on Cleanup.
Authors: PAUL TEETOR - BURLINGTON FREE PRESS
Date: November 24, 1992
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.11 Document No. 000587

Title: EPA Postpones Hearing, Opts for Availability

Session on Pine Street Barge Canal Cleanup Proposal.
Authors: EPA REGION I
Date: December 4, 1992
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.12 Document No. 000588

Title: EPA Extends Comment Period Until May 15, 1993 on Cleanup Proposal for Pine St. Barge Canal.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: December 7, 1992
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.13 Document No. 000133

Title: EPA Awards $50,000 Grant to Lake Champlain Committee to Oversee Pine St. Barge Canal Superfund Project.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: December 8, 1992
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.14 Document No. 000134

Title: Barge Canal to be Discussed at January Meeting.
Authors: WARD FIVE NEIGHBORHOOD ASSEMBLY NEWS
Date: January 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 4
AR No. 13.03.15 Document No. 000145

Title: Mother Nature Will Clean Up the Barge Canal.
Authors: RICHARD BARTLETT - BURLINGTON FREE PRESS
Date: January 3, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13-03.16 Document No. 000524

Title: Superfund Proposes Super-foolish Solution.
Authors: BURLINGTON FREE PRESS
Date: February 11, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.17 Document No. 000526

Title: A Dump as Big as the Mall.
Authors: BURLINGTON FREE PRESS
Date: February 12, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.18 Document No. 000527

Title: Dean, EPA Official to Discuss Barge Canal.
Authors: BURLINGTON FREE PRESS
Date: February 18, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.19 Document No. 000528

Title: Agency Tells Lawmakers Not to Interfere with Superfund Plan.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: February 20, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.20 Document No. 000529

Title: Lawmakers Asked to Stay Neutral on Barge Canal
Authors: RUTLAND HERALD
Date: February 21, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.21 Document No. 000530

Title: Mother Nature 10, EPA 0 (Various Authors).
Authors: TH0MAS BATES, MIKE BARSOTTI, ERNST CARLSON, JOHN POOLE - BURLINGTON FREE PRESS
Date: February 21, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.22 Document No. 000531

Title: Silence Won't Stop Barge Canal Plan.
Authors: BURLINGTON FREE PRESS
Date: February 23, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.23 Document No. 000532

Title: EPA Flexible on Barge Canal.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: February 26, 1993
Format: NEWS CLIPPING No. Pgs: 1

AR No. 13.03.24 Document No. 000533

Title: EPA Open to Canal Alternatives.
Authors: BARRE TIMES-ARGUS
Date: February 26, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.25 Document No. 000534

Title: Today's Public Forum Focuses on Barge Canal.
Authors: BURLINGTON FREE PRESS
Date: March 6, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.26 Document No. 000535

Title: Residents Blast Barge Canal Plan.
Authors: TOM HACKER - BURLINGTON FREE PRESS
Date: March 7, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.27 Document No. 000536

Title: EPA Concerned about Barge Canal Cleanup.
Authors: WILLIAM KEOUGH - BURLINGTON FREE PRESS
Date: March 15, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.28 Document No. 000537

Title: Barge Canal Risks Reported.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: March 16, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.29 Document No. 000538

Title: Vermont Must Learn to Live with Superfund Law.
Authors: JEFFREY KIMMEL - BARRE TIMES-ARGUS
Date: March 25, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.30 Document No. 000539

Title: Barge Canal Tests Challenged.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: April 7, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.31 Document No. 000542

Title: Panel Blasts Barge Canal Site.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: April 10, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.32 Document No. 000541

Title: Delay Asked in Vt. Cleanup.
Authors: BOSTON GLOBE
Date: April 11, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.33 Document No. 000543

Title: Hitting Solid Ground in the Barge Canal.
Authors: BURLINGTON FREE PRESS
Date: April 11, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.34 Document No. 000544

Title: Learning an EPA Lesson.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: April 12, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.35 Document No. 000545

Title: Barge Canal Resolution Backed - In Brief .
Authors: BURLINGTON FREE PRESS
Date: April 15, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.36 Document No. 000546

Title: EPA and the $50 Million Worm.
Authors: GAYLE HANSON - INSIGHT ON THE NEWS
Date: April 18, 1993
Format: NEWS CLIPPING No. Pgs: 8

AR No. 13.03.37 Document No. 000547

Title: EPA Plan Called Mall Size Error.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: April 28, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.38 Document No. 000548

Title: State Suggests Alternatives to Barge Canal Plan.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: April 30, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.39 Document No. 000549

Title: Vermont Official Disputes Need for EPA Mandated Landfill.
Authors: MAINE TELEGRAM
Date: May 2, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.40 Document No. 000550

Title: $50 Million Molasses Cleanup.
Authors: BURLINGTON FREE PRESS
Date: May 3, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.41 Document No. 000551

Title: Council, Panel Oppose Barge Canal Cleanup Plan.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May 4, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.42 Document No. 000552

Title: EPA Scraps Barge Canal Cleanup Plan.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May 5, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.43 Document No. 000553

Title: Agency to Propose Barge Canal Plan.
Authors: BETSY LILEY - BURLINGTON FREE PRESS
Date: May 6, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.44 Document No. 000555

Title: UVM Study Blasts EPA Research.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May 6, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.45 Document No. 000590

Title: Next on Pine Street?
Authors: BURLINGTON FREE PRESS
Date: May 7, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.46 Document No. 000556

Title: Earth to EPA Regulators: Drop Dead.
Authors: BURLINGTON FREE PRESS
Date: May 12, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.47 Document No. 000557

Title: Barge Canal Comments Filed.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May 17, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.48 Document No. 000558

Title: Drums Leak on Canal Waste Site.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May 28, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.49 Document No. 000559

Title: Media Advisory.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: June 3, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1

AR No. 13.03.50 Document No. 000560

Title: EPA Drops Barge Canal Cleanup Plan in Response to Community Concerns.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: June 4, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.51 Document No. 000561

Title: $50 Million Barge Canal Plan Killed.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: June 5, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.52 Document No. 000562

Title: Superfund Cleanup - Editorial Page.
Authors: BURLINGTON FREE PRESS
Date: June 6, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.53 Document No. 000563

Title: Drums to be Removed from Pine Street Canal Site.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: August 12, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.54 Document No. 000147

Title: Vt. Taps Residents Opinions about State's Waters Policy.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: August 12, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.55 Document No. 000564

Title: EPA Alters Approach to Canal.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: September 6, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.56 Document No. 000665

Title: Coordinating Council Forms to Address Pine Street Barge Canal Superfund Site.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: September 17, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.57 Document No. 000566

Title: In Vt., EPA Chief Urges Flexible Review Process.
Authors: RUTLAND HERALD
Date: September 19, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.58 Document No. 000583

Title: EPA Chief Gives and Takes.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: September 19, 1993
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.59 Document No. 000584

Title: EPA Head Calls for More Environmental Cooperation.
Authors: WILSON RING - CALEDONIAN RECORD
Date: September 20, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.60 Document No. 000585

Title: EPA Launches Pilot Project to Increase Public Input into Superfund.
Authors: INSIDE EPA
Date: September 24, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.61 Document No. 000567

Title: Barge Canal Cleanup Plan a Challenge.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: September 28, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.62 Document No. 000568

Title: EPA Extends Burlington Citizen's Group Grant.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: October 12, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2

AR No. 13.03.63 Document No. 000148

Title: City has Plan to Make Southern Connector a Go.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: October 15, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.64 Document No. 000570

Title: Superfund Panel's in Spotlight and Cleanup Committee Receives Another Grant.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: October 15, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.65 Document No. 000571

Title: EPA Agrees to Work on City's Access Road.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: October 27, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.66 Document No. 000572

Title: Pine Street Coordinating Council to Review Risk
Assessment Process - LAN Message and Public Safety Announcement Attached.
Date: November 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 3
AR No. 13.03.67 Document No. 000573

Title: Ward Five Neighborhood Planning Assembly News -
November 10, 7:30 P.M. at South Meadows Community Room.
Authors: WARD FIVE NEIGHBORHOOD ASSEMBLY NEWS
Date: November 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.68 Document No. 000574

Title: Pine Street Coordinating Council to Review Superfund Process - Rough Draft.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: November 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.69 Document No. 000577

Title: Two Vermonters: Superfund Law Needs Cleaning Up.
Authors: BURLINGTON FREE PRESS
Date: November 9, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.70 Document No. 000575

Title: Vermont Develops "First in Nation" Superfund Coordinating Council - Draft.
Date: November 18, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.71 Document No. 000578

Title: Pine Street Coordinating Council to Review Superfund Process.
Authors: PINE STREET COORDINATING COUNCIL
Date: November 23, 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.72 Document No. 000579

Title: Superfund Site Poses More Questions.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: December 2, 1993
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.73 Document No. 000580

Title: Pine Street Barge Canal Update.
Authors: DOUG HOFFER - BURLINGTON BEAT
Date: 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.74 Document No. 000459

Title: Panel Lists Questions About Barge Cleanup, Urges Study.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: January 7, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.75 Document No. 000460

Title: Dean Says Editorials Nice But Can't Vote.
Authors: CANDACE PAGE - BURLINGTON FREE PRESS
Date: January 9, 1994
Format: NEWS CLIPPING No. Pgs: 1

AR No. 13.03.76 Document No. 000461

Title: Administration Pushes for Superfund Fix.
Authors: JOSEF HEBERT - BURLINGTON FREE PRESS
Date: February 4, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.77 Document No. 000464

Title: Notice of Schedule of Meetings of the Pine Street Canal Coordinating Council (Federal Register Announcement.)
Authors: FEDERAL REGISTER
Date: March 2, 1994
Format: MISCELLANEOUS No. Pgs: 1
AR No. 13.03.78 Document No. 000664

Title: Road Still Pushed for Waste Site.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: March 3, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.79 Document No. 000466

Title: EPA Launches New Superfund Approach at Cleanup Site.
Authors: MATTHEW WITTEN - NEW HAMPSHIRE MONITOR
Date: March 30, 1994
Format: NEWS CLIPPING No. Pgs: 4
AR No. 13.03.80 Document No. 000463

Title: Undisturbed Barge Site Believed Safe.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: March 31, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.81 Document No. 000468

Title: Barge Canal Group to Meet.
Authors: BURLINGTON FREE PRESS
Date: April 17, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.82 Document No. 000469

Title: GMP Rates will Rise 2. 9%.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May 17, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.83 Document No. 000470

Title: EPA to Probe Waste Site Again.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: May :20, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.84 Document No. 000471

Title: Bugs Might Help take a Bite Out of Waste.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: June 29, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.85 Document No. 000472

Title: Testing to Resume in August.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: July 16, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.86 Document No. 000473

Title: New Round of Studies to Begin at Pine Street Barge Canal.
Date: July 22, 1994
Format: FACT SHEET, PRESS RELEASE No. Pgs: 2
AR No. 13.03.87 Document No. 000475

Title: The Canal Quandary.
Authors: BURLINGTON FREE PRESS
Date: July 23, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.88 Document No. 000476

Title: New Round of Studies to Begin at Pine Street Barge Canal.
Date: August 15, 1994
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.89 Document No. 000477

Title: Superfund Studies Begin Next Week.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: August 18, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.90 Document No. 000478

Title: Studies on Barge Canal Start Late.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: September 10, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.91 Document No. 000479

Title: Residents Speak Out on Barge Canal.
Authors: SONA IYENGAR - BURLINGTON FREE PRESS
Date: November 16, 1994
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.92 Document No. 000480

Title: Pine Street Detour.
Authors: RAY UNSWORTH
Date: 1995
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.93 Document No. 000481

Title: Southern Connector Gets in Gear.
Authors: JEFFREY MACDONALD - BURLINGTON FREE PRESS
Date: February 3, 1995
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.94 Document No. 000482

Title: Still a Slow Road.
Authors: BURLINGTON FREE PRESS
Date: February 8, 1995
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.95 Document No. 000483

Title: EPA - New England Announces Major Superfund Reform Initiative.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: February 21, 1995
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.96 Document No. 000484

Title: Barge Cleanup Plan Nears Final Stage.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: February 26, 1995
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.97 Document No. 000485

Title: Connector to Veer from Barge Canal.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: June 8, 1995
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.98 Document No. 000487

Title: Environmental Investigations have Resumed at the Pine Street Canal Superfund Site.
Date: July 6, 1995
Format: FACTSHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.99 Document No. 000488

Title: City's Junk Winds its Way into the Lake.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: July 13, 1995
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.100 Document No. 000489

Title: Experts Test Air Over Barge Canal.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: July, 14, 1995
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.101 Document No. 000490

Title: Lake Cleanup: Currents Shift.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: July 25, 1995
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.102 Document No. 000492

Title: Lake Cleanup Chronology.

Authors: BURLINGTON FREE PRESS
Date: July 25, 1995
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.103 Document No. 000493

Title: Road, Waste Site Might Intersect.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: December 6, 1995
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.104 Document No. 000494

Title: Southern Connector Design Concerns Residents.
Authors: SONA IYENGAR - BURLINGTON FREE PRESS
Date: December 8, 1995
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.105 Document No. 000495

Title: Residents Share Concerns About 4 - Lane Strip.
Authors: SONA IYENGAR - BURLINGTON FREE PRESS
Date: January 5, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.106 Document No. 000502

Title: Connector Paves Way into the Future.
Authors: CLARENCE MEUNIER - BURLINGTON FREE PRESS
Date: January 16, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.107 Document No. 000503

Title: "Earth to Planners"
Authors: BURLINGTON FREE PRESS
Date: January 16, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.108 Document No. 000504

Title: Readers Forum - Money Blinds and Road to Nowhere - Seperate Editorials.
Authors: FRED HILL, NANCY DES RAULT - BURLINGTON FREE PRESS
Date: February 4, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.109 Document No. 000506

Title: Drive On for the Connector.
Authors: WILLIAM KEOUGH - BURLINGTON FREE PRESS
Date: February 7, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.110 Document No. 000505

Title: Readers Forum - Forget Connector.
Authors: TODD LOCKWOOD - BURLINGTON FREE PRESS
Date: February 24, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.111 Document No. 000507

Title: Readers Forum - Gutting Waste.
Authors: TIM LAVIGNE - BURLINGTON FREE PRESS
Date: February 24, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.112 Document No. 000508

Title: Barge Cleanup Plan Nears Final Stage.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: February 26, 1996
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.113 Document No. 000509

Title: Residents Discuss Southern Connector Plan.
Authors: MEGHAN MC MENIMEN - BURLINGTON FREE PRESS
Date: February 27, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.114 Document No. 000510

Title: Connector is Critical.
Authors: LISA VENTRISS - BURLINGTON FREE PRESS
Date: February 28, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.115 Document No. 000511

Title: 3 Road Projects Face Delay.

Authors: MATT SUTKOSKI - BURLINGTON FREE PRESS
Date: March 13, 1996
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.116 Document No. 000512

Title: Burlington Plans Decision on Coal Tar by Fall.
Authors: SONA IYENGAR - BURLINGTON FREE PRESS
Date: March 9, 1997
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.117 Document No. 000513

Title: Southern Connector Design OK'd.
Authors: SONA IYENGAR - BURLINGTON FREE PRESS
Date: April 1997
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.118 Document No. 000514

Title: EPA Congratulates Vermont Transit on New Terminal - Applauds Reuse of Superfund Site.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: August 13, 1997
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.03.119 Document No. 000143

Title: Barge Canal: Fill It.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: September 23, 1997
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.120 Document No. 000515

Title: Coordinating Council Mulls Supplemental Environmental Projects, Prepares for Public Comment Period.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: September 24, 1997
Format: FACT SHEET, PRESS RELEASE No. Pgs: 3
AR No. 13.03.121 Document No. 000142

Title: Cleanup Backed by EPA.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: September 24, 1997
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.03.122 Document No. 000518

Title: Barge Canal Cleanup Totals $30 Million.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: December 20, 1997
Format: NEWS CLIPPING No. Pgs: 2
AR No. 13.0-3.123 Document No. 000519

Title: Progress Update #3: Council Reaches Concensus on Cleanup at the Barge Canal Environmental Projects Proposed.
Authors: PINE STREET COORDINATING COUNCIL
Date: May 1998
Format: FACT SHEET, PRESS RELEASE No. Pgs: 6
AR No. 13.03.124 Document No. 000619

Title: Agreement Reached on Burlington, VT Superfund Site.
Authors: ASSOCIATED PRESS
Date: May :28, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.125 Document No. 000616

Title: Canal Cleanup Finalized.
Authors: BURLINGTON FREE PRESS
Date: May :28, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13. 03.126 Document No. 000617

Title: Canal: EPA Announces $7.3 Million Cleanup.
Addressee: BURLINGTON FREE PRESS
Date: May 28, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.127 Document No. 000618

Title: Barge Canal Plan Hailed.
Authors: FREDERICK BEVER - RUTLAND HERALD
Date: May 28, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.128 Document No. 000662

Title: Officials Reach Agreement on Canal Hazardous Waste Cleanup.
Authors: DAVID GRAM - BRATTLEBORO REFORMER
Date: May 28, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.129 Document No. 000663

Title: United States Environmental Protection Agency
Proposes Cleanup Plan at the Pine Street Canal Superfund, Site.
Authors: BURLINGTON FREE PRESS
Date: May 29, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.130 Document No. 000652

Title: A Good Solution.
Authors: RUTLAND HERALD
Date: May 31, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03-131 Document No. 000661

Title: Strengthen Superfund.
Authors: BURLINGTON FREE PRESS
Date: June 25, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.132 Document No. 000660

Title: Canal Cleanup Plan Backed at Hearing.
Authors: NANCY BAZILCHUK - BURLINGTON FREE PRESS
Date: June 28, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.133 Document No. 000659

Title: Extention of Time to Comment on the Proposed
Cleanup Plan for the Pine Street Superfund Site.
Authors: BURLINGTON FREE PRESS
Date: July 20, 1998
Format: NEWS CLIPPING No. Pgs: 1
AR No. 13.03.134 Document No. 000653

13.04 COMMUNITY RELATIONS - PUBLIC MEETINGS/HEARINGS

Title: Barge Canal Goals Statement--Revised.
Authors: BURLINGTON INTRA CITY WORK GROUP
Format: PUBLIC MEETING RECORDS No. Pgs: 3
AR No. 13.04.1 Document No. 000190

Title: Summary of September 27-28 Meeting; Meeting of October 13-14, 1993.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: October 4, 1993
Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.2 Document No. 000239

Title: Meeting Summary of October 13-14, 1993.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: October 19, 1993
Format: MEMORANDUM No. Pgs: 6
AR No. 13.04.3 Document No. 000231

Title: Summary of Meeting--October 26, 27, 1993; Agenda for Next Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: October 31, 1993
Format: MEMORANDUM No. Pgs: 4
AR No. 13.04.4 Document No. 000232

Title: Summary of Meeting--November 9; Agenda for Next Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: November 15, 1993
Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.5 Document No. 000233

Title: Summary of Meeting December 1 and 2; Meeting of December 16;
Cancellation of December 15 Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER

Date: December 6, 1993
Format: MEMORANDUM No. Pgs: 9
AR No. 13.04.6 Document No. 000234

Title: Issue Spotting; Meetings of January 26-27; Cancellation of January 27 Coordinating Council Meeting; Summary of January 6 Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: January 13, 1994
Format: MEMORANDUM No. Pgs; 26
AR No. 13.04.7 Document No. 000235

Title: Council Meetings of March 2-3; Technical Expert Meetings of March 1-4.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: February 22, 1994
Format: MEMORANDUM No. Pgs: 38
AR No. 13.04.8 Document No. 000236

Title: Council Meeting of March 30, 31; Workgroup Meetings March 29-31, April 14-15; Summaries of Previous Council and Workgroup Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: March 16, 1994
Format: MEMORANDUM No. Pgs: 25
AR No. 13.04.9 Document No. 000237

Title: Organizational Protocols.
Authors: PINE STREET COORDINATING COUNCIL
Date: March 22, 1994
Format: NOTES-MEETING No. Pgs: 4
AR No. 13.04.10 Document No. 000382

Title: Council Meeting of April 19 and 21; Workgroup Meetings April 14-15 and 19-21; Summaries of Previous Council and Workgroup Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: April 8, 1994
Format: MEMORANDUM No. Pgs: 20
AR No. 13.04.11 Document No. 000238

Title: Human Health Work Group--Meeting Summary, April 20-21, 1994.
Authors: PINE: STREET COORDINATING COUNCIL
Date: April 21, 1994
Format: PUBLIC MEETING RECORDS No. Pgs: 3
AR No. 13.04.12 Document No. 000161

Title: Schedule Changes and Meeting Summaries.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: May 1, 1994
Format: MEMORANDUM No. Pgs:13
AR No. 13.04.13 Document No. 000181

Title: Abbreviated Meeting Summary.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: May 23, 1994
Format: MEMORANDUM No. Pgs: 2
AR No. 13-04.14 Document No. 000211

Title: Summer Schedule and Meeting Summary for June 8, 1994.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: June 21, 1994
Format: PUBLIC MEETING RECORDS No. Pgs: 4
AR No. 13.04.15 Document No. 000169

Title: Meeting Summary--June 28-29, 1994.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: July 7, 1994
Format: MEMORANDUM No. Pgs: 12
AR No. 13.04.16 Document No. 000188

Title: Cancellation of September 19 Meeting; Future Meetings, Meeting Summaries for September 7, 8 9, 1994.
Addressee: PINE STREET COORDINATING COUNCIL

Authors: PHILIP HARTER
Date: September 14, 1994
Format: MEMORANDUM No. Pgs: 9
AR No. 13.04.17 Document No. 000189

Title: Summary of Meeting October 6, 1994.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: DANIEL FINKELSTEIN
Date: October 20, 1994
Format: MEMORANDUM No. Pgs: 4
AR No. 13.04.18 Document No. 000187

Title: Cancellation of Council Meeting December 8; Summaries of November 3 Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, DANIEL FINKELSTEIN
Date: November 22, 1994
Format: PUBLIC MEETING RECORDS No. Pgs: 7
AR No. 13.04.19 Document No. 000168

Title: Summary of January.S Meeting; Future Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: January 17, 1995
Format: MEMORANDUM No. Pgs: 6
AR No. 13.04.20 Document No. 000243

Title: Meeting Summary and Schedule.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: February 22, 1995
Format: MEMORANDUM No. Pgs: 11
AR No. 13.04.21 Document No. 000244

Title: Summary of ECO Workgroup Meeting March 3, 1995.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER
Date: March 3, 1995
Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.22 Document No. 000245

Title: Schedule and Summary of Meetings--March 9 and 17.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: March 23, 1995
Format: MEMORANDUM No. Pgs: 9
AR No. 13.04.23 Document No. 000246

Title: Summary of June 8, 1995, Remedial Alternatives Workgroup, and Coordinating Council Meetings and the Ecological Workgroup Meeting of June 14, 1995.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: June 22, 1995
Format: MEMORANDUM No. Pgs: 8
AR No. 13.04.24 Document No. 000215

Title: Meetings of July 27 and 28, 1995.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: July 19, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 13.04.25 Document No. 000248

Title: Meetings of July 27 and 28, 1995: Summary and Next Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: August 3, 1995
Format: MEMORANDUM No. Pgs: 10
AR No. 13.04.26 Document No. 000249

Title: Ecological Conference Call on Preliminary Remedial Goal #1 Clarifications.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: PHILIP HARTER, ALAN STRASSER
Date: August 10, 1995
Format: MEMORANDUM No. Pgs: 8
AR No. 13.04.27 Document No. 000204

Title: September 19 Meeting.
Addressee: PINE STREET COORDINATING COUNCIL

Authors: MEG HIMMEL
Date: August 29, 1995
Format: MEMORANDUM No. Pgs: 5
AR No. 13.04.28 Document No. 000220

Title: Summary of October 17, 1995 Meetings.
Authors: PINE STREET COORDINATING COUNCIL
Date: October 17, 1995
Format: MEMORANDUM No. Pgs: 6
AR No. 13.04.29 Document No. 000174

Title: Meeting Summary of October 17, 1995; Scheduling Next Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: November 3, 1995
Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.30 Document No. 000250

Title: Summary of the Conference Call Regarding Comments to the Post-Screening Field Investigation Work Plan and Initial Screening Report.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: November 13, 1995
Format: MEMORANDUM No. Pgs: 3
AR No. 13.04.31 Document No. 000175

Title: Ecological Workgroup Meeting Proposed for December 5, 1995 to Discuss Ecological Risk Assessment Work Plan; Correction to Meeting Summary of 10/17/95.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: November 14, 1995
Format: MEMORANDUM No. Pgs: 1
AR No. 13.04.32 Document No. 000251

Title: Summary of December 4, 1995 Council Meeting.
Authors: PINE STREET COORDINATING COUNCIL
Date: December 4, 1995
Format: PUBLIC MEETING RECORDS No. Pgs: 3
AR No. 13.04.33 Document No. 000162

Title: Meeting Summary of December 4, 1995; January Council Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: December 8, 1995
Format: MEMORANDUM No. Pgs: 3
AR No. 13.04.34 Document No. 000252

Title: Meeting Summaries--January 22-23, 1996.
Authors: PINE STREET COORDINATING COUNCIL
Date: January 23, 1996
Format: PUBLIC MEETING RECORDS No. Pgs: 14
AR No. 13.04.35 Document No. 000163

Title: Meeting Summaries of January 22-23, 1996; Scheduling of Meetings.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: February 7, 1996
Format: MEMORANDUM No. Pgs: 15
AR No. 13.04.36 Document No. 000253

Title: Ecological Workgroup Summary of March 19, 1996.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: PHILIP HARTER, ALAN STRASSER
Date: March 19, 1996
Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.37 Document No. 000203

Title: Technical Work Group Meeting Summary of March 28, 1996.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: March 28, 1996
Format: MEMORANDUM No. Pgs: 10
AR No. 13.04.38 Document No. 000176

Title: Summary of April 9, 1996 Council Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: May 3, 1996

Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.39 Document No. 000177

Title: Meeting Summary of May 22, 1996.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: May 22, 1996
Format: MEMORANDUM No. Pgs: 3
AR No. 13.04.40 Document No. 000178

Title: Meeting Summary of September 16, 1996.
Authors: PINE STREET COORDINATING COUNCIL
Date: September 16, 1996
Format: NOTES-MEETING No. Pgs: 6
AR No. 13.04.41 Document No. 000383

Title: Summary of September 16, 1996 Eco Workgroup Meeting and Schedule of Upcoming Events.
Addressee: ECOLOGICAL WORK GROUP
Authors: PHILIP HARTER, ALAN STRASSER
Date: September 23, 1996
Format: MEMORANDUM No. Pgs: 8
AR No. 13.04.42 Document No. 000179

Title: Summary of November 6, 1996 Council and Workgroup Meetings; Eco Workgroup, Meeting of December 11, 1996.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: November 21, 1996
Format: MEMORANDUM No. Pgs: 13
AR No. 13.04.43 Document No. 000186

Title: Ecological Work Group Summary of December 10, 1996 Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: December 31, 1996
Format: MEMORANDUM No. Pgs: 7
AR No. 13.04.44 Document No. 000185

Title: Summary of February 25th Meeting, Agenda for March 18 Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: March 11, 1997
Format: MEMORANDUM No. Pgs: 15
AR No. 13.04.45 Document No. 000164

Title: Meeting Summary of March 18, 1997.
Authors: PINE STREET COORDINATING COUNCIL
Date: April 1997
Format: NOTES-MEETING No. Pgs: 8
AR No. 13.04.46 Document No. 000384

Title: Agenda for Council and Work Group Meeting of April 15, and Meeting Summary of March 18, 1997.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: April 3, 1997
Format: MEMORANDUM No. Pgs: 12
AR No. 13.04.47 Document No. 000165

Title: Tentative Agenda for Meeting on May 19, and Meeting Summary of April 15, 1997.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: May 6, 1997
Format: PUBLIC MEETING RECORDS No. Pgs: 13
AR No. 13.04.48 Document No. 000166

Title: Meeting Summary of April 15, 1997.
Authors: PINE STREET COORDINATING COUNCIL
Date: May 6, 1997
Format: NOTES-MEETING No. Pgs: 8
AR No. 13.04.49 Document No. 000385

Title: Meeting Summary of May 19; Agenda for June 16 Meeting.
Addressee: SHEILA ECKMAN - ENVIRONMENTAL PROTECTION AGENCY
Authors: PHILIP HARTER, ALAN STRASSER
Date: June 13, 1997
Format: MEMORANDUM No. Pgs: 5
AR No. 13.04.50 Document No. 000167

Title: Summary of Technical Work Group Meeting of July 15, 1997.
Authors: PINE STREET COORDINATING COUNCIL
Date: July 15, 1997
Format: PUBLIC MEETING RECORDS No. Pgs: 6
AR No. 13.04.51 Document No. 000182

Title: Summary of Meeting - July 15, 1997 - Technical Workshop Meeting.
Addressee: PINE STREET COORDINATING COUNCIL
Authors: PHILIP HARTER, ALAN STRASSER
Date: July 15, 1997
Format: MEMORANDUM No. Pgs: 6
AR No. 13.04.52 Document No. 000255

Title: List of Meeting Summaries for EPA Docket.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: PHILIP HARTER, ALAN STRASSER - MEDIATION CONSORTIUM
Date: January 7, 1998
Format: LETTER No. Pgs: 4
AR No. 13.04.53 Document No. 000240

13.05 COMMUNITY RELATIONS - FACT SHEETS/INFORMATION UPDATES

Title: The Barge Canal: At a Crossroads.
Authors: LAKE CHAMPLAIN COMMITTEE
Format: FACT SHEET, PRESS RELEASE No. Pgs: 4
AR No. 13.05.1 Document No. 000520

Title: Fresh Start at Pine Street Canal.
Date: 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.05.2 Document No. 000522

Title: Ecological Risk at the Pine Street Superfund Site.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: April 1993
Format: FACT SHEET, PRESS RELEASE No. Pgs: 8
AR No. 13.05.3 Document No. 000146

Title: Council Moving Ahead on Further Studies for Pine Street - Progress Update #1.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: March 1994
Format: FACT SHEET, PRESS RELEASE No. Pgs: 4
AR No. 13.05.4 Document No. 000149

Title: New Studies Underway at Pine Street Barge Canal Site - Progress Update #2.
Authors: PINE STREET COORDINATING COUNCIL
Date: October 1994
Format: FACT SHEET, PRESS RELEASE No. Pgs: 6
AR No. 13.05.5 Document No. 000150

Title: Superfund Update - EPA Region I Promises Reforms will Prompt Faster Cleanups.
Authors: ENVIRONMENTAL PROTECTION AGENCY
Date: March 6, 1995
Format: FACT SHEET, PRESS RELEASE No. Pgs: 1
AR No. 13.05.6 Document No. 000486

Title: Council Proposes Cleanup Plan, Additional Projects for Pine Street Barge Canal Site.
Authors: LEO KAY, LORI FISHER, PHILIP HARTER - EPA REGION I
Date: May 28, 1998
Format: FACT SHEET, PRESS RELEASE No. Pgs: 3
AR No. 13.05.7 Document No. 000620

13.07 COMMUNITY RELATIONS - TECHNICAL ASSISTANCE GRANTS

Title: Lake Champlain Committee Public Survey on the Barge Canal Clean - Up.
Format: LIST No. Pgs: 2
AR No. 13.07.1 Document No. 000395

Title: Lake Champlain Committee Proposal for Public and Scientific Review Committees.
Date: May 1993
Format: NOTES-GENERAL No. Pgs: 2
AR No. 13.07.2 Document No. 000455

Title: Protocol for Taking Water Samples at the PSCB.
Addressee: LORI FISHER - LAKE CHAMPLAIN COMMITTEE
Authors: AL MCINTOSH - UNIVERSITY OF VERMONT

Date: May 10, 1993
Format: MEMORANDUM No. Pgs: 1
AR No. 13.07.3 Document No. 000386

Title: TAG Quarterly Progress Report.
Addressee: LORI FISHER - LAKE CHAMPLAIN COMMITTEE
Date: May 15, 1993
Format: REPORT, STUDY No. Pgs: 3
AR No. 13.07.4 Document No. 000198

Title: Surface Water Sampling.
Addressee: LORI FISHER - LAKE CHAMPLAIN COMMITTEE
Authors: ROSS GILLELAND - ENVIRONMENTAL PROTECTION AGENCY
Date: June 16, 1993
Format: LETTER No. Pgs: 3
AR No. 13.07.5 Document No. 000387

Title: TAG Quarterly Progress Report.
Addressee: LORI FISHER - LAKE CHAMPLAIN COMMITTEE
Date: August 31, 1993
Format: REPORT, STUDY No. Pgs: 2
AR No. 13.07.6 Document No. 000197

Title: Community Involvement Focus Groups.
Authors: DIANE HAMMER - ENVIRONMENTAL PROTECTION AGENCY
Date: June 2, 1994
Format: MEMORANDUM No. Pgs: 2
AR No. 13.07.7 Document No. 000388

Title: Local Advisory Panel for Scientific Evaluation
Component of the Pine Street Coordinating Council to Receive Environmental Merit Award.
Addressee: MARTY FELDMAN - LIGHTWORKS INC.
Authors: JOHN DE VILLARS - ENVIRONMENTAL PROTECTION AGENCY
Date: April 7, 1997
Format: LETTER No. Pgs: 1
AR No. 13.07.8 Document No. 000389

Title: Local Advisory Panel for Scientific Evaluation
Component of the Pine Street Coordinating Council to Receive Environmental Merit Award.
Addressee: MARY WATZIN - UNIVERSITY OF VERMONT
Authors: JOHN DE VILLARS - ENVIRONMENTAL PROTECTION AGENCY
Date: April 7, 1997
Format: LETTER No. Pgs: 1
AR No. 13.07.9 Document No. 000390

Title: Local Advisory Panel for Scientific Evaluation
Component of the Pine Street Coordinating Council to Receive Environmental Merit Award.
Addressee: AL MCINTOSH - UNIVERSITY OF VERMONT
Authors: JOHN DE VILLARS ENVIRONMENTAL PROTECTION AGENCY
Date: April 7, 1997
Format: LETTER No. Pgs: 1
AR No. 13.07.10 Document No. 000391

Title: Local Advisory Panel for Scientific Evaluation
Component of the Pine Street Coordinating Council to Recieve Environmental Merit Award.
Addressee: WILLIAM HOWLAND - GREEN MOUNTAIN AUDOBON SOCIETY
Authors: JOHN DE VILLARS - ENVIRONMENTAL PROTECTION AGENCY
Date: April 7, 1997
Format: LETTER No. Pgs: 1
AR No. 13.07.11 Document No. 000392

Title: Local Advisory Panel for Scientific Evaluation
Component of the Pine Street Coordinating Council to Receive Environmental Merit Award.
Addressee: JOHN AKEY
Authors: JOHN DE VILLARS - ENVIRONMENTAL PROTECTION AGENCY
Date: April 7, 1997
Format: LETTER No. Pgs: 1
AR No. 13.07.12 Document No. 000393

Title: Local Advisory Panel for Scientific Evaluation
Component of the Pine Street Coordinating Council to Recieve Environmental Merit Award.
Addressee: LORI FISHER - LAKE CHAMPLAIN COMMITTEE
Authors: JOHN DE VILLARS - ENVIRONMENTAL PROTECTION AGENCY
Date: April 7, 1997
Format: LETTER No. Pgs: 1
AR No. 13.07.13 Document No. 000394

14.01 CONGRESSIONAL RELATIONS - CORRESPONDENCE

Title: Status of Leverage Partners as PRP's.
Addressee: AMES JEFFORDS - UNITED STATES SENATE
Authors: MERRILL HOHMAN - EPA REGION I
Date: March 1, 1993
Format: LETTER No. Pgs: 3
AR No. 14.01.1 Document No. 000582

16.01 NATURAL RESOURCE TRUSTEE - CORRESPONDENCE

Title: Invitation to Join in PRP Negotiations to Fund and Work on Phase II of the ARI/AFS Statement of Work.
Addressee: JACK LONG - VT DEPT. OF ENVIRONMENTAL CONSERVATION
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: November 23, 1994
Format: LETTER No. Pgs: 4
AR No. 16.01.1 Document No. 000396

Title: Invitation to Join in PRP Negotiations to Fund and Work on Phase II of the ARI/AFS Statement of Work.
Addressee: WILLIAM PATTERSON - US DEPARTMENT OF INTERIOR
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: November 23, 1994
Format: LETTER No. Pgs: 4
AR No. 16.01.2 Document No. 000397

Title: Invitation to Join in PRP Negotiations to Fund and Work on Phase II of the ARI/AFS Statement of Work.
Addressee: KENNETH FINKELSTEIN
Authors: MARY JANE O'DONNELL - ENVIRONMENTAL PROTECTION AGENCY
Date: November 23, 1994
Format: LETTER No. Pgs: 4
AR No. 16.01.3 Document No. 000398

17.02 SITE MANAGEMENT RECORDS - ACCESS RECORDS

Title: Access to Property on or Adjoining the Pine Street Canal Site.
Addressee: DAVID DUBRUL - JACKSON TERRACE APARTMENTS
Authors: SETH PITKIN - JOHNSON COMPANY
Date: August 12, 1994
Format: LETTER No. Pgs: 2
AR No. 17.02.1 Document No. 000623

Title: Access to Property on or Adjoining the Pine Street Canal Site.
Addressee: WILLIAM DUNCAN - BURLINGTON PUBLIC SCHOOLS
Authors: SETH PITKIN - JOHNSON COMPANY
Date: August 12, 1994
Format: LETTER No. Pgs: 1
AR No. 17.02.2 Document No. 000624

Title: Access to Property on or Adjoining the Pine Street Canal Site.
Addressee: SKIP FARRELL - L.E. FARELL COMPANY
Authors: SETH PITKIN - JOHNSON COMPANY
Date: August 12, 1994
Format: LETTER No. Pgs: 1
AR No. 17.02.3 Document No. 000670

17.07 SITE MANAGEMENT RECORDS - REFERENCE DOCUMENTS

Title: Bibliography for the Pine Street Canal Site.
Addressee: SHEILA ECKMAN - EPA REGION I
Authors: GREGORY JOHNSON - JOHNSON COMPANY
Date: March 21, 1996
Format: MISCELLANEOUS No. Pgs: 114
AR No. 17.07.1 Document No. 000226

APPENDIX E

RESPONSIVENESS SUMMARY

PINE STREET CANAL SUPERFUND SITE

RESPONSIVENESS SUMMARY

SEPTEMBER 1998

TABLE OF CONTENTS

PINE STREET CANAL RESPONSIVENESS SUMMARY

PREFACE

The U.S. Environmental Protection Agency (EPA) held a 60-day public comment period from June 5 to August 7, 1998, to provide an opportunity for public input on the Additional Remedial Investigation (ARI), Additional Feasibility Study (AFS) and Proposed Plan to address contamination at the Pine Street Canal Superfund Site in Burlington, Vermont. The EPA prepared the Proposed Plan based on the results of the ARI, AFS, Supplemental RI (SRI), Baseline Risk Assessment, Supplemental Baseline Ecological Risk Assessment (SBERA), other documents. The ARI was conducted to supplement the SRI in identifying the nature and extent of site contamination and in supporting the Baseline Risk Assessment and the SBERA which identify potential risks to human health and the environment. The AFS examined and evaluated various options, or alternatives, for addressing the contamination. The Proposed Plan, issued on May 29, 1998, presented the EPA's preferred alternative for the site. All documents that were used in the EPA's selection of the preferred alternative were placed in the Administrative Record which is available for public review in Burlington at the Fletcher Free Public Library and Bailey Howe Library at the University of Vermont, and at the EPA Records Center in Boston, Massachusetts

The purpose of this Responsiveness Summary is to document the EPA's responses to the questions and comments raised during the public comment period. The EPA considered all of the comments summarized in this document before selecting a final remedial alternative to address contamination at the site.

This Responsiveness Summary is organized into the following sections:

I. Overview of remedial alternatives considered in the AFS and Proposed Plan. This section briefly outlines the remedial alternatives evaluated in the AFS and the Proposed Plan, including the selected remedy.

II. Site history and background on community involvement and concerns. This section provides a brief history of the site and an overview of community interests and concerns regarding the site.

III. Summary of comments received during the public comment period. This section summarizes and provides the EPA's responses to the oral and written comments received from the public during the public comment period.

A copy of the transcript from the public hearing held on Wednesday, June 24, 1998, in Burlington, Vermont, is included as Attachment A. The written comments received during the comment period are included in Attachment B.

I. OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE AFS AND PROPOSED PLAN

Using information gathered during the Supplemental RI, Additional RI, Baseline Risk Assessment, and Supplemental Baseline Ecological Risk Assessment, the EPA identified several cleanup objectives for the Pine Street Canal Site.

The primary cleanup objectives are to reduce risks to public health and the environment by 1) preventing direct exposure to contaminated materials on site; 2) minimizing the movement of contamination away from the site; and 3) preventing the use of groundwater that might pose a risk to human health.

After identifying the cleanup objectives, the EPA developed and evaluated potential cleanup alternatives to address the contamination. The AFS describes the nine criteria the EPA used to narrow the list to eight potential alternatives to control sources of contamination and address migration of contaminants off site.

The EPA's selected remedy (Alternative 3a), includes the following features:

- Capping contaminated sediments in Canal and Wetlands Subareas 1, 2, 3, 7 and 8;
- Institutional controls for groundwater below the site;
- Institutional controls for land-use development;
- Site boundary definition;
- Long-term performance monitoring; and,
- Five-year reviews.

The estimated net present worth of the remedy is $4,3379,000. This alternative was selected because it achieved the best balance among the nine criteria that the EPA is required by law to use to evaluate the cleanup options. The selected remedy provides an effective reduction in human health and ecological risk through a combination of source control (capping), institutional controls to prevent future risks, and long-term performance monitoring to ensure the remedy continues to be protective of human health and the environment in the future. The remedy attains Federal and State requirements that are applicable, or, relevant and appropriate for this remedial action, reduces the mobility of hazardous substances through containment, and utilizes permanent solutions to the maximum extent possible.

The following other alternatives were considered to address the contamination at the site:

- Alternative 1: No Action Groundwater, Subareas 1-8, and Uplands/Wetlands; Long- term Monitoring. Under this alternative, no treatment or containment of contaminated sediments in Subareas 1, 2 and 8 (canal and turning basin) or Subareas 3, 4, 5, 6, and 7 (surrounding uplands and wetlands) would occur, no effort would be made to control the migration of contamination, and no institutional controls regulating groundwater use or future land use would be put in place.

- Alternative 2a: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 1, 2, 3, 7, and 8; Long-term Monitoring. Under this alternative, a variety of institutional and administrative controls for groundwater and uplands/wetlands areas. No treatment or containment of contaminated sediments at the site would occur, and no effort would be made to control the migration of contamination.

- Alternative 2b: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 1, 2, 7, and 8; Capping in Subarea 3; Long-term Monitoring. Alternative 2b is identical to 2a with the addition of a sand and silt cap over the emergent wetlands in Subarea 3.

- Alternative 2c: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 3 and 7; Capping in Subareas 1, 2, and 8; Long-term Monitoring. Alternative 2c is identical to 2a, however, this one provides for capping the contaminated sediments in Subareas 1, 2 and 8 (the canal and turning basin) with sand and silt.

- Alternative 2d: Institutional Controls for Groundwater and Uplands/Wetlands; No Action in Subareas 3 and 7; Excavation and Off-site Treatment and Disposal for Subareas 1, 2, and 8; Long-term Monitoring; Dewatering. This alternative includes all the components of Alternative 2, except instead of capping Subareas 1, 2, and 8, the contaminated sediments would be excavated and taken off site for treatment and disposal.

- Alternative 3a: Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 1, 2, 3, 7, and 8; Long-term Monitoring. The remedy in the Proposed Plan and selected by the EPA in the Record of Decision.

- Alternative 3b: Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 3 and 7; Excavation and Off-site Treatment/Disposal for Subareas 1, 2, and 8; Long-term Monitoring; Dewatering. This alternative includes all the components of Alternative 2d, with the addition of a sand/silt cap in Subareas 3 and 7.

- Alternative 3c: Institutional Controls for Groundwater and Uplands/Wetlands; Capping in Subareas 1, 2, 3, and 8; No Action in Subarea 7; Long-term Monitoring. This is similar to the selected remedy, 3a, however Subarea 7 would not be capped.

II. SITE HISTORY AND BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Site History

The site has been used for various industrial and commercial purposes since the mid-1800s, when the railroad on the western edge of the canal was built. The barge canal and turning basin were first dredged in 1868 to provide access to Lake Champlain for several lumber companies, a coal company and a boat builder. Around 1895, Burlington gas works, a manufactured gas plant (MGP), was constructed near Pine Street, just north of what is now the Burlington Electric Department. The plant used a coal gasification process to manufacture gas for the community. The Burlington gas works reportedly disposed of large quantities of coal gasification wastes, such as coal tar, fuel oil, cyanide, contaminated wood chips, iron oxide, cinders and metals at its former location along Pine Street and in the wetland areas behind the plant. The gas plant ceased operations in 1966 and was dismantled in 1967. These waste materials are the primary source of contamination at the site.

The first observation of visible contamination on surface water was documented in 1926, when a daily log book for the MGP noted that light tar from the plant's tar well was running into the lake. A series of oily releases to the canal occurred in the late 1960's and early 1970's. In 1977 and 1978, the State of Vermont took exploratory borings for the Southern Connector highway that was proposed for the site. The borings revealed extensive sub-surface contamination. In 1981, the State of Vermont nominated the Pine Street Canal Site for the newly-created Superfund program. The site was proposed for the CERCLA National Priorities List on October 23, 1981, and listed on September 8, 1983. The Vermont Agency of Transportation investigated the site,primarily along the proposed Southern Connector right-of-way, until 1988, when the EPA took the lead for site investigations and broadened its scope.

In 1987, 1988 and 1992, the EPA notified parties who owned portions of the site, were former owners or operators of the gas plant, or had succeeded to the liability of former operators of the gas plant, of their potential liability and responsibility for cost of environmental response actions under CERCLA. The EPA entered into negotiations with PRPs for the performance of the Remedial Investigation and Feasibility Study (RI/FS) and reimbursement of the EPA's response costs in 1988, but no agreement was reached. On June 27, 1988, the EPA began the RI/FS, financed by the Superfund program. In December, 1988, the EPA filed suit against three PRPs who had owned and/or operated the gas plant from 1930-1968, seeking reimbursement of past costs incurred by the EPA. In 1990, the EPA reached a settlement for

$945,000 in past response costs and reserved the right to seek the cost of future response actions from the parties. The settlement was approved by the United States District Court for the District of Vermont on December 26, 1990.

In November of 1992, the EPA proposed a cleanup plan for the site. The plan called for (1) the construction of a containment/disposal facility (CDF) over the most heavily contaminated portion of the site (wetlands west of the former MGP); (2) dredging, contaminated sediments from the canal and turning, basin and placing the sediments in the CDF, (3) collecting mobile coal tar and coal oil; (4) on-site restoration or replication of wetlands; and, (5) institutional controls to protect the integrity of the CDF and prevent ingestion of groundwater. Public comment on the 1992 Proposed Plan was overwhelmingly negative. Commenters raised several concerns about the studies, including questions about the nature and extent of ecological risk at the site, the migration of contaminated groundwater, and air quality. Commenters were also concerned about the short-term health effects of excavation, and the construction of a landfill on the shores of Lake Champlain. After a six-month comment period, the EPA withdrew the proposed cleanup plan due to community opposition.

Following the withdrawal of the EPA's 1992 Proposed Plan, the EPA and the State of Vermont issued an Administrative Order on Consent in 1994 (U.S. EPA Docket No. I-94-1065), and a second Administrative Order on Consent in 1995 (U.S. EPA Docket No. I-95-1048), under which certain PRPs agreed to undertake an Additional Remedial Investigation (ARI) and Additional Feasibility Study (AFS), and to compensate the EPA and the State of Vermont for the costs of oversight on the ARI and AFS.

Community Involvement and Concern

Community concern and involvement with the site has varied over time. The EPA's Community Relations Plan, released in December 1990, outlined a program to keep citizens informed about and involved in activities during the remedial process. Between the time of the site's listing on the NPL in 1983, and the 1992 Proposed Plan, the EPA held meetings, and issued fact sheets and press releases to keep the community and other interested parties apprized of activities at the site. The public's interest peaked in 1992 when the EPA proposed a cleanup plan. In response to requests from the community, the EPA extended the formal comment period on the proposed cleanup plan from 30 days to six months. The EPA held numerous public informational meetings and a public hearing during those six months to discuss and receive comments on the proposed remedy. The EPA received hundreds of comments, generally opposing the 1992 Proposed Plan. The EPA withdrew the Proposed Plan in June 1993.

After the EPA's withdrawal of the proposed cleanup plan in 19933, environmental regulators, the PRPs, and citizens and groups who had been active in commenting on the 1992 Proposed Plan, formed the Pine Street Barele Canal Coordinating Council (PSBCCC). The purpose of the council was to provide for more meaningful public involvement in the selection of a remedy. Specifically, the PSBCCC's mission was to design and oversee the implementation of additional studies to fill in data gaps from prior studies, and to recommend a proposed remedy for the site to EPA management. The PSBCCC consists of representatives of the EPA, Vermont DEC, City of Burlington, US Fish & Wildlife Service, Lake Champlain Committee, Pine Street Arts and Business Council, Ward 5 Planning Association, and PRPs. The Lake Champlain Committee received a Technical Assistance Grant under Section 117(e) of CERCLA, and used the funds to hire technical experts to advise the community representatives on the Council. The EPA retained its statutory responsibility for final remedy selection.

The PSBCCC retained a neutral facilitator and agreed on Organizational Protocols to guide the decision-making process. Decisions were made with consensus from each party on the Coordinating Council. The Council formed technical work groups to direct each phase of the ARI/AFS which was being conducted by the PRPs contractor. The Council and the work groups had an opportunity to comment on all interim and draft technical documents. The Coordinating Council formed a Public Participation Committee, issued published progress updates, and held community informational meetings. PSBCCC meetings were announced in the Federal Register and to local news media, and open to the public. The informal summaries of the PSBCCC meetings are available as part of the Administrative Record for this Record of Decision.

On May 27, 1998, the PSBCCC formally recommended to the EPA New England Regional Administrator a cleanup plan for remediation of the Pine Street Canal Site. The Agency, in the 1998 Proposed Plan, adopted the PSBCCC's recommendation as the proposed preferred alternative. This proposed preferred alternative is the selected remedy in the September 1998 Record of Decision.

III. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES

The 1992 Proposed Plan

As discussed above, the EPA proposed a remedy in 1992, which was withdrawn after a six month public comment period due to community opposition. The comments received on the 1992 Proposed Plan are included in the Administrative Record for the Pine Street Canal Site. Commenters raised several objections. In general, commenters believed that the proposed cleanup plan, which called for dredging contaminated sediments and disposal on site in a landfill, was too intrusive, that there would be unacceptable short-term human-health risks associated with excavation, and that the proposal was too costly. In addition, commenters questioned the adequacy of the ecological risk assessment, and raised questions about gaps in the data.

This responsiveness summary does not include detailed responses to comments on the 1992 Proposed Plan, as the plan has been withdrawn. However, the ARI and AFS reports, as well as other material in

Administrative Record Addendum IV, are responsive to the concerns raised during that six-month public comment period.

The 1998 Proposed Plan

This Responsiveness Summary addresses comments pertaining to the Proposed Plan that were received by the EPA during the extended public comment period (June 5 to August 7, 1998). Seven individuals, including representatives of Vermont DEC, the City of Burlington, and area residents, submitted written comments. Five individuals, including representatives of city and state government, the Lake Champlain Committee and the PRPs, submitted oral comments at the
public hearing (June 24, 1998). A copy of the public hearing transcript is included as Attachment A. Copies of the written comments are included as Attachment B.

Comment 1: We endorse the selected cleanup plan, and the work of the Pine Street Barge Canal Coordinating Council.

EPA Response: Of the l2 sets of comments received during the public comment period, six were endorsements of the selected remedy and/or the Coordinating Council process. These commenters were State Representative Mary Sullivan, George Desch of the State of Vermont, Martin Johnson on behalf of the PRPs, Wayne Senville on behalf of the Burlington Planning Commission, and Fred G. Hill. The City Council of the City of Burlington passed a resolution endorsing the plan, and urging work to begin as quickly as possible.

Comment 2: Who controls the site? Who maintains the controls and facilities?

EPA Response: Under the Superfund law, the remedy selected in the Record of Decision may be performed either by the EPA, or by the potentially responsible parties (PRPs), under the oversight of the EPA and Vermont DEC. In this case, the EPA plans to negotiate with the PRPs and enter into a consent decree (which must be approved by the federal court) that will require the PRPs to perform the remedy.

During the construction of the remedy, the PRPs would control the areas of the site where work will be undertaken, sectiring access and maintaining safety. In areas of the site where work is not conducted, as well as after completion of the construction, the owners of the various parcels will control their properties, subject to certain restrictions that will be imposed by the EPA. As part of the remedy, the EPA. is requiring certain land- and water-use restrictions (known as institutional controls) to be in place to prevent or limit exposures to contaminants that could be a significant risk to human health, such as excavations below five feet, or use of the groundwater for drinking. The PRPs will be required to work with the EPA to obtain the deed restrictions, conservation easements, zoning ordinances or legislation needed to impose these controls. The institutional controls will include a provision allowing the EPA, State of Vermont, or other responsible entity(ies) to enforce the restrictions needed to protect human health. The EPA or the State will be able to take action to prevent unsafe uses of the site.

The selected remedy does not call for construction of facilities, other than the subaqueous cap. If the PRPs perform the remedy, they will be responsible for ensuring that the cap remains intact and is not disturbed after construction is complete. If the EPA performs the remedy, EPA and Vermont DEC would assume that responsibility.

Finally, the EPA and Vermont DEC will oversee the PRPs' performance to ensure that the remedy remains protective iin the long term. The EPA will require regular monitoring of the site after construction is complete to ensure that the remedy remains effective. This monitoring will take place quarterly or semi-annually in the first several years after construction, and will continue on a regular basis thereafter as long as necessary. 1 Because the remedy calls for a large volume of wastes to be left in place under the surface at the site, long-term monitoring will be needed for the indefinite future to insure that site conditions do not change over time and cause a risk to health or the environment. Long-term monitoring will also confirm among other things, that contaminated groundwater does not migrate to Lake Champlain and that the subaqueous cap provides an effective barrier against exposure of wildlife to contaminants. Under Section 121(c) of CERCLA, the EPA must conduct a formal review of the remedy every five years to ensure that the remedial action continues to protect human health and the environment.

Comment 3: The plan does not provide adequate safeguards to require the PRPs to take corrective action if the proposedplan does not work.

EPA Response: The EPA will not allow the PRPs to perform the site remedy unless adequate legal safeguards are included. The EPA will negotiate with the PRPs to enter into a consent decree, enforceable in court, that will require the PRPs to perform the remedy, attain the performance standards set out in the ROD, and continue long-term monitoring for as long as the EPA and the State of Vermont deem necessary. If the PRPs do not agree to the EPA's conditions for the consent decree, the EPA will either unilaterally order the PRPs to perform the remedy as the EPA requires, or the federal government will perform the remedy, and the EPA will sue the PRPs for costs.

EPA consent decrees require the PRPs to provide financial assurances (such as establishing a trust fund, or posting a bond) showing that they can perform the remedy that is described in the Record of Decision (ROD). In addition, under the consent decree, the PRPs must agree to perform additional work consistent with the scope of the remedy selected in the ROD to make sure that the performance standards are attained and to maintain the effectiveness of the remedy. Thus, for example, if the subaqueous cap becomes recontaminated through the upward flow of contaminants, the PRPs will be required under the

consent decree to repair or redesign it.

EPA consent decrees, however, do not require the PRPs to agree at this time to perform an entirely new remedy (or to post a bond to fund an entirely new remedy) if the remedy in the ROD is ultimately ineffective. Rather, the United States reserves the right to reopen the lawsuit against the PRPs for performance of a new remedy at any time if, based on new information, the EPA determines that the remedy selected in the ROD does not protect human health and the environment. Under the law, the public would be involved in selection of any remedy that is a fundamental change from the remedy set out in the ROD. As a matter of national Superfund policy, the EPA uses this "reopener" approach to deal with the possibility -- which we consider unlikely at Pine Street -- that an entirely new remedy is required. In this case, given the number of large entities that are, PRPs at Pine Street and the strength of the EPA's case against them, this approach should provide that funds will be available if a fundamentally new remedy is needed.

1 It is important to note that the monitoring period is not limited to thirty years. A 30-year monitoring period was assumed in the AFS for the sole purpose of deriving a present worth of the cost of monitoring, to be used in comparing various alternative remedial approaches.

Comment 4: The plan does not result in a cleanup of the site, but rather merely, covers up the hazardous waste on site resulting in continuing serious ecological and puhlic health hazards.

EPA Response: While the National Contingency Plan (NCP) does identify a preference for treatment (cleanup) that would reduce the toxicity, mobility and volume of contaminants, other forms of response actions are acceptable, so long as they reduce the risks posed by the contamination. The selected remedy contains the contaminants and reduces the contact or exposures between the contaminants and environmental and human receptors, thus reducing the risks to acceptable levels.

The Additional Feasibility Study evaluated a range of alternatives including, no action, treatment, and containment alternatives. The EPA is required by law to evaluate these alternatives against nine criteria. These criteria fall in three categories: threshold, primary balancing and modifying. There are two threshold criteria which must be met in order for an alternative to be considered for selection. These are overall protection of human health and the environment, and, compliance with applicable or relevant and appropriate federal and state requirements. The five primary balancing criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost) are used to evaluate and compare the elements of alternatives that meet the two threshold criteria. Finally, state acceptance and community acceptance are used on the final evaluation of remedial alternatives.

The selected remedy meets the threshold criteria, provides the best balance of long-term and short-term effectiveness and permanence, implementability, cost, and reduction of toxicity, mobility or volume through treatment, has concurrence from the State of Vermont, and, as exhibited during the comment period, has wide community acceptance. It is the remedy endorsed by the Pine Street Barge Canal Coordinating Council, a group whose membership is representative of different "wedges" of the community such as the Pine Street Arts and Business Council, Ward 5 Planning Association, The Lake Champlain Committee, the City of Burlington, and the PRPs. As such, the selected remedy is an acceptable response action as envisioned by the Superfund statute and the NCP.

Comment 5: Hazardous wastes are not presently in contact with the environment and present no human health or ecological hazard and will continue to remain isolated from the environment and microorganisms will, given time, break down the wastes into harmless materials.

EPA Response: The EPA disagrees with this statement. The underlying basis of the remedy is that contamination is, in fact, in contact with the environment and does present unacceptable risks to human health and the environment. The selected remedy will provide the means to protect people and other wildlife from the unacceptable risks associated with contaminated environmental media. Biodegradation is not a component of the selected remedy.

Comment 6: The site is located upstream of the water supply for the City of Burlington.

EPA Response: The EPA and the PSBCCC are extremely concerned with protecting the natural resources provided by Lake Champlain, EPA's 1992 Proposed Plan included active measures to ensure that no contamination would migrate to Lake Champlain. The PSBCCC reevaluated the potential for contaminate migration to the lake and determined that there is no negative effect. The selected remedy includes monitoring requirements to ensure that the site does not have a negative impact on the lake in the future.

Comment 7: It is not known how much time will he required to break this material down into harmless material. More information is needed before reliance is placed on the theory that a silt/sand cap will contain the wastes and microorganisms will allow the site to "heal " itself.

EPA Response: Remedial investigations and feasibility studies done at the site looked into the question of bioremediation/biodegradation and the extent to which the site is "healing" itself. It was determined that although limited biodegradation may be occurring along the fringe areas of the site, and may assist in preventing further migration, it was not considered to be a viable alternative for

remediation. Site-related contamination does not appear to be leaving the site at concentrations of concern. The primary risks are on site, and are from ecological and human exposure to contaminated sediments and soils, and human consumption of contaminated groundwater. The remedy, which calls for capping contaminated sediments and institutional controls to prevent human exposure to contaminated environmental media, does not rely on biodegradation.

Comment 8: There was limited opportunity for true public input and review before the completion of the proposed plan. The work of the Council was flawed because the City of Burlington and the State of Vermont Agency of Transportation were PRPs.

EPA Response: The EPA disagrees with this comment. As detailed in Section III of the Record of Decision, the EPA agreed to an intensive community participation process, known as the Pine Street Barge Canal Coordinating Council. The Council's involvement over a five year period (1993-1998) in the development of the Additional Remedial Investigation, the Additional Feasibility Study, and opportunity for comment on the proposed plan goes far beyond the legal requirements of the National Contingency Plan, 40 C.F.R. 300 et seq.

The EPA took extraordinary steps to ensure that the entire Coordinating Council process was fair and open to the public. The Council evolved out of a core group of parties who had been active in commenting on the EPA's original 1992 Proposed Plan (which was later withdrawn). The representatives of the Lake Champlain Committee on the Council had submitted comments on behalf of many environmental organizations in Vermont in 1992 and 1993. Likewise, the PRPs' representatives had been very involved in the 1992 proposal. When the EPA decided to expand upon this core group to initiate a consensus-building council, the EPA hired a neutral facilitator to convene a group representing all parties interested in the site. Based on the suggestions made by the local community, the facilitator solicited additional citizen representatives for the Council, including a representative of the City of Burlington, the Ward 5 Neighborhood Planning Association, and the Pine Street Arts and Business Council. The intent of the Council was to have a broad spectrum of members -- from environmental groups to responsible parties to local residents to federal and state environmental regulators -- that could be representative of the major interests in the community at large.

The Coordinating Council adopted a set of protocols governing its conduct, which expressly included the idea that each member on the council represented a larger "wedge" of people with similar interests in the community. Each council member was responsible for checking back with his or her constituencies periodically. The Ward 5 Planning Association member frequently conferred with local residents about issues that had arisen during the Council, and reported back their responses to the Council. Similarly, the representative of the Pine Street Arts and Business Association frequently briefed local businesses and others about the environmental and land use issues raised in the Council.

Although the EPA did not issue a formal open solicitation for members on the Council, public attendance and participation at Coordinating Council meetings was encouraged. The Council had scores of public sessions which were announced to the press and published in the Federal Register. Many of the meetings were broadcast on local cable television, and there were numerous press stories about the workings of the Council between 1993 and 1998. As the meeting minutes show, several Council meetings included the active participation of non-Council members. The Coordinating Council maintained two mailing lists. The larger mailing list of over 900 names received periodic updates including three Progress Updates and a copy of the Proposed Plan. A smaller mailing list received copies of summaries of Council meetings prepared by the facilitator. The Progress Updates included instruction for being added to the smaller mailing list of those desiring summaries of each meeting.

The non-PRP members of the Council had significant technical resources available to them. The EPA gave the Lake Champlain Committee a $150,000 grant for technical assistance. The Lake Champlain Committee hired the LAPSE team, a group of scientists from UVM and elsewhere to help develop, critique and oversee the ARI and AFS studies. These technical advisers were key players in evaluating several issues, including the likelihood that PAH contamination would ever reach Lake Champlain at levels of concern, and the significance of the ecological risk at the site, The LAPSE team members worked closely with all the citizen members of the Council.

The EPA disagrees that the work of the Council was flawed because the City of Burlington and the State of Vermont Agency of Transportation were PRPs. The fact that a city or state may be both a regulator and a potentially responsible party is not uncommon. (In fact, the State of Vermont would have a regulatory role to play in selection of a remedy under the National Contingency Plan even if the Coordinating Council did not exist.) Furthermore, the State had separate representatives on the Council representing the Department of Environmental Conservation and the Vermont Agency of Transportation (represented by the landowner PRPs.) The City has a larger perspective than simply environmental outcomes; to that end, it is appropriate that the City considered not only environmental issues, but also transportation, land use and economic development issues in its work on the Council.

In sum, the EPA believes that the Pine Street Coordinating Council and the presentation of the Proposed Plan to the public for comment has been extraordinarily open, and that the 1998 Proposed Plan is the result of good science, policy and public participation.

Comment 9: Please consider creating a small outlet to Lake Champlain to enhance water circulation to overcome the problem of stagnant, scummy water in the barge canal in the winter.

EPA Response: The surface water of the Pine Street Barge Canal receives nutrients from the stormwater inflow from three storm sewers. These nutrients stimulate and support growth of vegetation in the canal and turning basin. Large mats of vegetation sometimes form on the water's surface, giving the

appearance of scum.

We expect the cap placed on the canal's contaminated sediments to isolate many nutrients presently in the sediments, reducing nutrient availability for plant growth. In addition, the selected remedy will enhance nutrient retention in a stormwater basin near the south end of the canal, thereby reducing the level of nutrients entering the canal. However, not all sources of nutrients entering the canal can be controlled, and the rich plant growth typical of summer conditions will eventually reoccur.

Creation of an additional hydrologic connection with Lake Champlain would be counter to the goals of the selected remedy which is to isolate and contain contaminants in place, thereby protecting Lake Champlain. Based on extensive study, there is currently no adverse migration of contamination from the site to the lake. Another outlet to Lake Champlain could jeopardize that desirable situation. Further, Lake Champlain benefits from better stormwater treatment that results from the stormwater passing through the entire length of the canal before it enters the lake. Since there does not appear to be any adverse impact from these mats, aside from aesthetics, and given the benefits of having thriving vegetative growth (including fish habitat), the remedy will not change to address this concern.

Comment 10: Please extend the public comment period

EPA Response: In response to this request, the EPA extended the public comment period from 30 to 60 days (June 5, 1998 to August 7, 1998).

Comment 11: Was bioturbation considered during the development of the cleanup plan? If so, on what basis it was decided that bioturbation over the longer term it will not be a concern?

EPA Response: Yes, bioturbation was a key factor that had to be considered. Based on the depositional environment, fine sediments and benthic organisms found in the canal, the zone of bioturbation in the fine sediment layer is approximately 0-10 cm below the sediment surface. Therefore, a clean sediment layer greater than this thickness is required to prevent the exposure of benthic organisms to contaminants through bioturbation.

Two factors provide assurance that bioturbation will not become a concern in the future. First, the cap itself will be constructed to provide approximately one foot of clean cap material and the final layer will contain silt to recreate a benthic environment similar to the natural condition. Second, the canal will continue to be a depositional environment over time, thus further isolating the benthic community from the buried contaminated sediments. Bioturbation may mix the newly-deposited material with the cap material, but the cap will be designed to provide considerably more than 10 cm of clean material over the present sediment surface, so the bioturbation will not mix the old contaminated material into the new material.

Comment 12: Does the proposed remediation plan take into account the preferred permanent route of the Southern Connector through the Barge Canal?

EPA Response: Between 1993 and 1998, the Coordinating Council worked closely with the City of Burlington and the State of Vermont to coordinate planning for the Southern Connector and the Superfund remedy. The name of the Coordinating Council reflects the original intent of the participants to coordinate the many interests affecting the site, including the potential building of the proposed Southern Connector along a route that might pass through a portion of the Pine Street Canal Superfund Site. Several members of the Coordinating Council continually advocated that the AFS evaluate an alternative(s) that would integrate the remediation of the site with the building of a highway. However, such an alternative could not be developed and evaluated without specific highway design details, including the preferred route. The City of Burlington and Vermont AOT could not provide such details, indicating that the preferred permanent route of the highway may not, in fact, be the original C-8 alignment. The original alignment proposed in the late 1970s, which would cut through the wetland areas, would likely not be consistent with current regulations and policies aimed at protecting such environments. The City of Burlington preferred to focus its resources on the proposed detour. The EPA and other members of the Coordinating Council assisted the City of Burlington and Vermont AOT with work plans to study the detour alignment, including providing detailed comments on the draft Environmental Impact Statement.

Comment 13: Does the proposed remediation plan preclude construction of the preferred permanent route of the Southern Connecior through the Barge Canal?

EPA Response: Recognizing that the Southern Connector project is a priority for the City of Burlington, the Coordinating Council developed a Remedial Action Objective which states that the remedy should: "Ensure to the extent practical that the remedy itself does not reduce the suitability of the site for current and future uses, including a highway." The Council did not want to recommend an alternative, if others are available, that would itself prevent the construction of a highway. In order to protect the integrity of the remedy, the selected remedy contains certain institutional controls which will require developers to assess the impacts any proposed development, including a highway, may have on the selected remedy.

Comment 14: Will the institutional controls preclude any construction activities involving pilings or any sort of work greater than five feet deep where the C8 segment is proposed?

EPA Response: Excavations to depths greater than five feet (including those below the water table) on the some properties will be prohibited unless one or more of the following exceptions apply: (a) the excavation is performed to install, repair, maintain, service or remove underground utility components,

conduits, installations or channels, which may presently be in place deeper than five feet and which may be below the water table; (b) drilling, driving or boring to install pilings for otherwise allowable construction is permitted; or, (c) the excavation is performed in a location on the property in which current contaminant concentrations at depths greater than five feet are below 140 mg/kg total PAH. In the case of exceptions (a) and (b), workers conducting the excavations and working in the area must use appropriate personal protective equipment as required by the Occupational Health and Safety Administration or its successor agencies, unless a site-specific risk assessment is performed and its results have been approved by EPA prior to the excavation.

ATTACHMENT A

Transcript of Public Hearing
June 24, 1998

STATE OF VERMONT
CHITTENDEN COUNTY, S.S.

PINE STREET BARGE CANAL

PUBLIC HEARING

WEDNESDAY, JUNE 24, 1998

7:15 P.M.

CONTOIS AUDITORIUM, CITY HALL

BURLINGTON, VERMONT

Carol A. Boone
COURT REPORTERS ASSOCIATES
117 Bank Street
Burlington, Vermont

INDEX

WEDNESDAY, June 24, 1998; 7:15 P.M.

MS. O'DONNELL: Good evening, everyone. I'd like to welcome you to the public hearing of the Pine Street Superfund Canal Project. My name is Mary Jane O'Donnell. I'm from the Environmental Protection Agency in Boston and I will act as the moderator for tonight's meeting.

I'd like to start off by introducing a couple of people that are with me tonight. Karen Lumino is EPA's Project Manager; John Desch works for the State of Vermont and he has his waste program plan. In the back of the room most of you have met Sara White who is EPA's project coordinator. Carol Boone is a court stenographer who, as you see, is transcribing tonight's meeting.

I want to accomplish a couple of things tonight. First of all, the major purpose of tonight's meeting is to fully receive your comments of EPA's proposed cleanup plan. For those of us who were at the June 4th meeting, tonight's meeting is a bit more structured than that meeting. In terms of format, I'm going to start off by outlining a few ground rules. Upon conclusion of that, Karen is going to give a short presentation of what our proposed

cleanup plan is. Once we do that, I will open the floor to any comments or Statements for the record that you might have, and I understand that three people have stepped forward and said that they would like to make a statement.

In terms of what we'll do with these comments, there are two ways people can make comments on the proposed cleanup plan: One is to make a statement at tonight's meeting; the second way is to submit written comments to EPA by the end of our comment period which ends on July 8th. We'll use those comments to make revisions and hopefully potentially any improvements to our cleanup plan, and then we are required by law to respond in writing to those comments, and we'll develop a written summary at that time we make our final decision on the cleanup.

In terms of another logistical type item during the formal part of this hearing because it is a hearing we won't be in a position to answer any questions or comment on any statement you might make, but we'll be here for the remainder of the evening and can answer any questions you might have after the close of our public hearing.

Again, as I said before, the entire conference will be transcribed for the record.

With that as background, I will turn things over to Karen.

MS. LUMINO: Thanks, Mary Jane. Good evening. As Mary Jane said, my name is Karen Lumino and I'm the Project Manager at EPA in charge of the cleanup here at Pine Street.

I'm actually encouraged by the low turnout tonight. That might seem odd to you, but although I wasn't here the last time we proposed a plan, I understand there were people up in the rafters who

were hanging by their paperwork; people were obviously very upset with the plan that we proposed, so over the five years after that we worked very hard, we had a consensus approach to come to a new remedy that the public would like better. We have had lots of opportunity for public input along the way, so the fact that there are so few people here tonight means we have done a really good job.

Why don't I, because most of you I think are quite familiar with the site, so I'm going to cut right to the chase and get into what the proposed plan actually is.

There are four components to the proposed plan. First is, what we call the physical component and this addresses the ecological risks that we found at

the site. This will involve placing a combination of silt and sand cap over five of the eight areas where we determined there were ecological risks. These are areas one, two, three, seven and eight. We have a nice schematic over here which shows just how that cap would be put in place. We have got kind of a loader picking things up, we mix the slurry and then it will be piped out to a barge and then applied over these areas so this would address the ecological risks that we found at the site.

The second component is the institutional controls and these are the two which address the human health risk. When we did our studies we found the risks to human health included risk from consumption of ground water, risk of exposure to soils greater than below five feet. We determined that this probably would not be a good place for a children's daycare, so we are going to address that in our remedy. And that is it.

The way we are addressing these is through institutional controls. We are going to have deed

restrictions, we are going to have language actually in deeds so that people will not be allowed to dig below five feet to, say, put in a base foundation for a building.

We didn't need to address the ground water, consumption of ground water because the state had already taken care of that by reclassifying the aquifer to Class 4 which is non-potable so no one will be able to place a drinking water well there.

The third component is what we are calling a long-term monitoring component. We are leaving contamination in place. We need to be assured that any contamination doesn't get into Lake Champlain or get into the surface water of the Barge Canal. We need to insure that the sand and silt cap that we are placing over the areas of high risk are maintained in good condition, so that is what we are calling the long-term monitoring component.

Then the fourth component is what we are calling the site boundary where you can see the original area of focus for the study included this whole general area with Lake Champlain on the west, we had Pine Street on the east, Lakeside Avenue to the south, and up in here are the Burlington Street Department buildings.

With this remedy we are redefining the site boundary to include just this area inside the red dashed and dotted lines that were affected by gas plant wastes. Anything outside of that we are

placing with institutional controls and we are doing this to monitor redevelopment at the site.

So that is a quick rundown of the four components of the remedy that we are proposing here tonight.

I'm doing overheads without an overhead machine so it's a little tricky.

Mary Jane already went into what some of the next steps are during the public comment period. We did hold a public information meeting which was well attended on June 4th. Tonight's meeting is formal and the purpose is to take oral comments. If anybody is either too bashful to make comments tonight or on the way home you think of something else you want to say, we are accepting written comments. Written comments must be postmarked by July 8th. We have handouts in the back with the address where you should send those written comments as well as we will accept things through E-mail.

I wanted to quickly run down a couple of the things you might expect to see happen at the site over the next few years. As I said, our public comment period will close on July 8th. After that we will reevaluate our proposed remedy based on the comments that we received during the public comment

period and we will make our final selection. That selection will be announced and this is called a record decision on the ROD. Along with the ROD we will issue what is called a responsiveness summary which is a written response to all the comments received during the public comment period. We expect that to happen in the fall of this year, that is the fall of 1998.

After that we will work with the responsible parties to implement the remedy. We'll reach an agreement with them after a period of negotiations that will run through the winter of 1998. After that we have a year of design. We'll design -- we know generally what our remedy will look like but this is a chance to get into the details, the nitty-gritty of what this thing will actually look like. After that in the spring of 2000 we hope to begin construction.

Thank you.

MS. O'DONNELL: Thank you, Karen. I guess what I'd like to do now is open it up for public comment. In terms of order, what I'd like to do is first have the state and the elected officials and those people who have signed up for comment, so I will turn it over to George.

MR. DESCH: Thank you. I'm George Desch. George Desch, State of Vermont. I have been involved in Pine Street for about five years now since the time when the proposed plan was originally withdrawn and we adopted the coordinating council. I would like to simply state for the record that the State supports the remedy and the proposed plan as it's being presented over the last couple of weeks, and that is it.

MS. O'DONNELL: Thank you, George. Mary Sullivan. If you could just state your name and your association with the State.

MS. SULLIVAN: I'm Mary Sullivan and I'm a state representative and I represent the district where the Barge Canal is located. I want to say how thrilled I was to really review the plan and to see the molding of it is such a different reaction from what I had five years ago. That is a plan that really works for Burlington. I believe it protects the beauty of our area and so forth down there and I realize it's quite a beautiful area. It's a plan I think that really developed from citizens here who lived here and really they participate in the area and it really shows in the plan, so I was really happy with it. And I was also

happy with the fact that -- my husband and I live on Flynn Avenue and I happened to see a real component in the things that we are doing and I have spoken with a number of my neighbors and they were quite thrilled about it, too. So I'd like to be a representative from that area.

MS. O'DONNELL: Thank you, Mary.

Wayne Senville?

MR. SENVILLE: Wayne Senville. I'm here as a resident of Burlington.

First of all, I want to commend everybody involved in this project over the last couple of years. It looks like you did a really good job. The areas that I wanted to raise questions about and hopefully I will refer to responses on your formal record involve the relationship between the mediation plan and the Southern Connector Highway.

Just by way of brief background, the original plan for the Southern Connector as identified I believe way back in 1979 by the Environmental Impact Statement had the Connector going through the Barge Canal site. Obviously that got sidetracked pending all the studies that EPA has done, and in the meantime the City and State developed an interim solution to route traffic on Pine Street, a

temporary solution.

In the record of this prcceeding there are many documents referencing the relationship between the Southern Connector and the cleanup of the Barge Canal.

My first question is whether the remediation plan that is being proposed takes into account the preferred permanent route of the Southern Connector through the Barge Canal?

The second question that relates to that, I have it, there was an article in the Burlington Free Press on September 23, 1997, and I'll quote one sentence from it.

"Susan Compton, a lawyer representing the City of Burlington on the council," referring to the Citizens Coordinating Council, "said the action plan makes it possible that the Southern Connector might someday be built through the Barge Canal."

My question is does the remediation plan preclude construction of the Southern Connector, specifically the CA line through the site?

And as a subsidiary question to that, in the summary document for the plan of May 1998 report, there is a statement that through legal mechanisms place restrictions on portions of the site to

prevent residential use, excavations and highly contaminated soil below five feet.

My question is would this statement if that is part of the plan preclude any construction activity involving pilings or any sort of work greater than five feet deep where the CA segment is proposed?

Thank you.

MS. O'DONNELL: Thank you, Wayne. As I mentioned in my introductory comments, because this is a formal hearing we will not be responding to your questions, but I will be happy to talk about it afterwards.

MR. SENVILLE: Thank you.

MS. O'DONNELL: Martin Johnson.

MR. JOHNSON: I have a short statement just like George does. My name is Martin Johnson, I'm speaking for the PRPs and I want to say the PRPs support and endorse your proposed cleanup plan for the site.

MS. O'DONNELL: Thank you very much. Anyone else like to step forward and make a comment?

MS. FISHER: I'm Lori Fisher and I am the Director of the Lake Champlain Committee and I'm also a member of the Pine Street Barge Canal

Coordinating Council.

Just over five years aco when the Lake Champlain Committee stood in this room we tried to pack this room with opponents, and we advocated strenuously against the EPA Barge Canal proposal for the site. And at the same time that we were vocal in our opposition, we also urged EPA to begin the process of finding a remedy for the Barge Canal anew, this time in partnership with the community that was going to live with that decision. That was the message that was echoed by others and it was listened to by EPA.

I think its often difficult for us as individuals to own our mistakes and make changes. I think it's even more rare that institutions do it, but that is what EPA did in June of 1993 when they shelved their proposed remedy and again in September of that same year when they raised the formation of a coordinating council which was the first time in this nation where a public group making decisions by consensus has been used to develop and recommend a Superfund remedy. And in their response I think EPA acted not like a bureaucracy but like a true steward of the environment and a protector of the community health.

The Coordinating Council's process has been one that has involved a lot of deliberation and patience and perseverance. The Lake Champlain Committee believes and wants to go on the record that after five years and the hundreds of meetings have really borne fruit with a remedy that is based on some science, that is environmentally protected, economically sound and responsive to community needs.

In 1993 the citizens of this region asked for a remedy that was not intrusive, that was protective of Lake Champlain, and that to the extent possible returned the plant back to the community. The coordinating council has chosen and EPA has endorsed a remedy that does just that. Not only will it deal with contamination of the past, but it will also protect water quality for the future. We have really been very pleased to move beyond our role, the 1992 role as a critic to a partner in developing this solution, and we commend you and the community members who hung in there through five years, and also the PRPs, particularly those with a base in this region for trying to find a solution and responding to community needs. I think this is one case where both the environmental bottom line and

the economic bottom line merged, and I think it is a good remedy. Thanks.

MS. 0'DONNELL: Thank you, Lori.

Is there anyone else who would like the make to statement?

Seeing there are no hands coming forth, the meeting is now closed.

(The hearing concluded at 7:30 p.m.)

C E R T I F I C A T E

I, Carol A. Boone, Notary Public and Court Reporter, hereby certify that the foregoing pages, numbered 2 through 16 inclusive, are a true and accurate transcription to the best of my ability of the hearing of THE PINE STREET BARGE CANAL PROJECT, taken before me on the 24th day of June, 1998, at Contois Auditorium, City Hall, Burlington, Vermont, in this matter now pending before the EPA.

I further certify that I am not related to counsel nor any party to the case in this matter, nor do, I have any interest in the outcome of the case.

<IMG SRC 98130K>

ATTACHMENT B

Written Comments Received during the Public Comment Period
June 5 - August 7, 1998

<IMG SRC 98130L>
<IMG SRC 98130M>
<IMG SRC 98130N>

From: Fred G Hill <hill@lemming.uvm.edu>
To: R1CANAL. R1WMD (LUMINO-KAREN)
Date: 6/9/98 7:42am
Subject: Barge Canal Cleanup

Ms Lumino;

I was a critic of the initial measures proposed for cleaning up the Burlington (VT) Barge Canal area and should therefore register an opinion about the current, revised plan. Thanks very much for keeping me on your mailing list and updated with information. The current plan seems quite reasonable, less drastic and more in keeping with the realities.

Fred G Hill
61-C Church St, Burlington, VT 05401
PO Box 503, Burlington, VT 05402
802-864-4385
hill@lemming.uvm.edu

cc: Fred G Hill <hill@lemming.uvm.edu>

Write your comments below and mail to EPA...

EPA wants your written comments on the options under consideration for dealing the Pine Street Canal Superfund site. You can use the form below to send written comments. If you have questions about how to comment, please call EPA Community Involvement Coordinator Sarah White at 617/565-9260 or EPA's toll free number at comments, postmarked no later than July 8, 1998 to:

Karen Lumino
Remedial Project Manager
U.S. Environmental Protection Agency
Region 1, HBT
JFK Federal Building
Boston, MA 02203-0001
or E-Mail to: lumino.karen@epamail.epa.gov
FAX: 617/573-9662

At its meeting of June 25, 1998, the Burlington Planning Commission endorsed in concept the proposed remediation plan for the Barge Canal site. It is far superior and more cost effective than the 1992 proposal which the Commission unanimously rejected. We are appreciative of the hard work of the members of the Pine Street Barge Canal Coordinating Council and for EPA's support in allowing this level of citizen involvement in devising an approriate soluton

<IMG SRC 9813010>

From: John Brabant COHNE.dec.anr.state.vt.us>
To: R1CANAL R1WMD (LUMINO-KAREN)
Date: 7/10/98 12:51pm
Subject: (Fwd) Pine St. Barge Canal Comment - Bioturbation

Ms. Lumino, below is a copy of an email I sent to Stan Corneille at VTANR...FYI.

------- Forwarded Message Follows -------
From: "John Brabant" <JOHNB@dec.anr.state.vt.us>
To: Stan Corneille <stanc@dec>
Date: Thu, 9 Jul 1998 17:30:35 -0500
Subjict: Pine St. Barge Canal Comment - Bioturbation
cc: Skip Flanders <skipf@dec>,
George Desch <georged@dec>,
Chuck Schwer <chucks@dec>
Bcc: johnk@anrimsgis,
Johnb
Priority: normal

Stan, in followup to our discussion in the hallway a few weeks ago regarding the remediation plan of the Pine St. Barge canal project, I am writing you this email so that you can include in the record an issue that comes to mind. As we discussed, I saw the diagram in the Burlington Free Press and read the associated article on the cleanup plan. The diagram and text indicated that the contaminated bottom sediments would be isolated from the environment by virture of a layer of clean sediment (clay, silt??) being distributed across the canal bottom at a prescribed thickness. My concern is whether the issue of whether this "fix" took into account the possibility of bioturbation moving the contaminated sediments the plan hopes to permanently isolate up into and throughout the confining layer. When I did consulting work on PCB contaminated sediments in the Hudson River, the big discussion up in EPA land was that the PCB's that were anticipated to have long since been buried under the continuing deposition of river sediment, were being found on top and throughout the bottom sediments. It was concluded that this was the result of burrowing organisms such as worms, clams and the like, continually mixing the sediments and redistributing the PCB's. This process is what has been termed "bioturbation". It has caused serious complications for the Hudson River PCB cleanup and is now a major factor that has to be addressed in any plan to deal with the PCB contamination problem.

My questions and comments are as follows:

1. Was bioturbation considered during the development of the cleanup plan??

2. If so, on what basis was it decided that bioturbation over the longer term will not be a concern??

3. If bioturbation was considered and was considered to be a concern, what measures does the cleanup plan contain to address this concern??

4. Have you received the record of other projects where bioturbation was a concern to find out what the level(s) of concern should be and how these concerns were addressed (or are being addressed) at these other projects?

Would you please include the above comments/concerns with the comments received from the general public and make sure that the Barge Canal Coordinating Council has a chance to review them. Would you also see that I am placed on the mailing list for any responses issued to comments received. Thanks. -John

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July 8, 1998

FACSIMILIE TRANSIMISSION TO 617.573.9662

Karen Lumino
Remedial Project Manager
U.S. Environmental Protection Agency
Region 1 (HBT)
JFK Federal Building
Boston, MA 02203-0001

Re: Pine Street Canal Superfund Site

Dear Ms. Lumino:

I am writing to document my concerns regarding the "Cleanup Plan Proposed for Pine Street Barge Canal Superfund Site Burlington, Vermont."

After reviewing all of the available information, attending meetings of the Pine Street Barge Canal Coordinating Council, and participating in the public meeting on June 4, 1998, I have the following concerns:

- The plan does not result in a cleanup of the site, but rather merely covers-up the hazardous material on-site resulting in continuing serious ecological and public health hazards.
- The plan does not provide adequate safeguards to require the Potentially Responsible Parties (PRPs) to take corrective action if the proposed plan does not work.
- There was limited opportunity for true public input and review before completion of the plan.

Concern With Proposed "Cleanup" at the Barge Canal Plan

As proposed, a sand/silt cap would be placed on the manufactured gas plant (MGP) residue wastes and all of the contaminants would remain on site. The theory is that the hazardous wastes are not presently in contact with the environment and present no human health or ecological hazard. Further, the theory is that the hazardous materials will continue to remain isolated ftom the environment and microorganisms will, given time, break down the wastes into harmless materials.

I have several concerns with the concept of "covering-up" the problem with a silt/sand cap, rather than cleaning up the site. First, the volume of wastes resulting from the production of coal gas on the site is immense. The volume is in excess of 600,000 cubic yards which, at the June 4, 1998 public meeting, was described as the largest MGP site in the nation. MGP residue wastes are a complex mixture of many harmful substances including heavy metals, such as lead and mercury, that were in the coal stock and organic chemicals, such as polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) created during the gasification process.

At the meeting, a representative of Johnson Company (JOCO), a firm hired by some of the PRPs, estimated that of the 600,000 cubic yards câ wastes, at least 200,000 cubic yards are PAHs. These compounds are carcinogenic. Further, it was revealed at the meeting that many VOCs are present in the wastes including benzene, a known carcinogen and neurotoxin. Unfortunately, there is little information on the volume of VOCs at the site. When asked about the volume of benzene on site, the JOCO representative didn't know if there were ounces, quarts, gallons, or thousands of gallons on site.

Not only is there a very large volume of hazardous material at this site, but this material is on the shore of Lake Champlain. In fact, much of this hazardous material is just under the surface of the bottom of the Barge Canal inlet of Lake Champlain. This site is upstream of the water supply intake for the City of Burlington.

The theory that microorganisms will ultimately break this material down to harmless material is also of concern. How much time is required to accomplish this? None of the PRPs technicians at the June 4 meeting knew the answer. It is known that some of the coal tar residual waste has been on site since

1895 and has not broken down into harmless substances yet.

Of greatest concern with the theory of microorganism breakdown is that the exact process of degradation is not fully known. Further information is needed on the intermediate degradation products (IDPs). Will any of the IDPs be less dense than the existing compounds with resulting escape of this material tip through the silt/sand cap? Will any of the IDPs be more soluble with resultant escape into the water column? What is the toxicity of the IDPs? The answers to these questions are needed before reliance is placed on the theory that a silt/sand cap will contain the wastes and microorganisms will allow the site to "heal" itself. Unfortunately, it may not be possible to answer these questions and future work along these lines would result in even more resources being wasted.

It would appear that tile safest course of action given the volume of the wastes, the hazardous nature of the wastes, and the location of these wastes would be to remove the wastes to a safe site that will not result in release to the environment. The first ill-conceived attempt for dealing with this site, the 1992 Plan. envisioned the removal of the wastes with storage on-site which resulted in a continued threat to public health and the environment. The present ill-conceived plan of leaving the material on-site under a silt/sand cap is obviously much less costly but it does not result in any less long term threat to public health and the environment.

Concerns with the lack of adequate safeguards to reguire the PRPs to take corrective action if the proposed plan does not work.

For the reasons stated above, there are serious questions about the long-term threat presented to the public health and environment by the present "cleanup" plan. I have concerns about the adequacy of funds for long term monitoring of the site and corrective action if the proposed solution doesn't work.

As I understand the 1998 Plan, monitoring of the site is for only 30 years. However, there is no estimate of how long it will take for the site to "heal" itself through microorganisms breaking down the wastes. It certainly appears that wastes deposited at the site as early as 1895 still remain hazardous. It may take centuries, not decades, for the site to "heal" itself. If the 1998 Plan is accepted, the PRPs should be requited to provide funds for the monitoring for a period equal to the time estimated for the site to fully "heal" itself.

If the theory that a silt/sand cap will contain the wastes while microorganisms provide natural "healing" doesn't work, corrective action such as removal of the wastes to a safe site will be needed. Because of the long-term nature of the concept of natural "healing", recognizable failure may not occur for decades or longer. The time period for recognition of failure becomes very apparent when one considers that it took from 1995 (when the MGP began operation) until the late 1980s until it was recognized that "natural" on-site disposal of wastes was a failure.

Not only must one consider the long-term aspect of recognition of the failure, if it occurs, but attention must also be given to the long-term economic viability of the private PRPs. One of the largest PRPs, an electric power company, faces serious economic uncertainty with energy deregulation. Another large PRP, a defense contractor, faces serious economic uncertainty and has undergone so many reorganizations in recent years that most don't even know its current name.

In view of the long term nature of recognition of failure, if it occurs, of the 1998 Plan and the uncertainty of the long term viability of some, if not all, of the private PRPs, bonding for future corrective action, if required, should be required from the private PRPs at this time. Why should taxpayers pay for cleanup in the future if failure does occur and the private PRPs no longer exist?

It would be irresponsible for EPA to accept a "cleanup" plan with as much uncertainty and risk as the 1998 Plan without allocating the risk to the private PRPs by requiring bonding at this time. It is understood that bonding is not routinely required but this is an "innovative" plan and the requirement for bonding should be thought of as an innovative concept of allocating future risk. In any event, if the plan is as good as has been proclaimed by the PRPs and their consultants, the cost of bonding should be very reasonable.

Concern about limited public input into the 1998 Plan

In spite of the wide spread favorable publicity from the EPA concerning the Pine Street Barge Canal Coordinating Council, there were several possible problems with this approach.

True public input by means of the Council was very limited. Membership on the Coordinating Council was restricted. There was no public announcement by EPA calling for volunteers to serve on the Council. It appears that membership on the Council was by invitation only.

The majority of members on the Council were PRPs. Some of the Council members, such as the City of Burlington and the State of Vermont, which would appear to represent the public, were in fact PRPs. Unfortunately, the PRPs had an inherent conflict of interest because of possible concern about the costs of clean-up.

In addition to limiting the costs of clean up, there were other conflicts of interest with some of the Council members. At the June 4th public meeting, the City of Burlington's representative seemed most interested in getting increased development at the site.

The effectiveness of the Council was also limited because of the limited technical resources of the non-PRP members. In a conversation with John Akey, he mentioned that the non-PRP members were almost totally dependent on the information provided by the consultants hired by the PRPS. For example, John said alternatives such as cold weather removal of the wastes to lessen the escape of VOC's and rail transportation for removal of the wastes were not even introduced.

Another limitation uf ihe Council was the adoption of a consensus process for development of the 1998 Plan. The consensus process can result in solutions, which represent the lowest common denominator. In addition, a consensus process is very time consuming and can result in wearing participants down.

Although the meetings of the Council were open to the public, public input was not encouraged. I attended several meetings of the Council and found them to be extremely bureaucratic. There was little opportunity to find out what was planned and even less opportunity to participate. It was as if the Council was a club and outsiders could come and observe, but not participate, in the activities of the club

Unfortunately, the EPA has provided limited public input into this matter. It almost seems that EPA, after spending years on this project, is now trying to rush the project to completion. I feel that the June 4, 1998 public information meeting was the first real opportunity for the public to find out what was planned. However, that public meeting, plus the formal hearing on June 24, have not allowed sufficient time for true public input into this process.

In summary, I urge the EPA to:

- Carefully review the proposed containment by silt/sand cap with natural "healing" concept put forth in the 1998 Plan,
- Require a monitoring period consistent with the time necessary for the site to be rendered harmless by natural "healing", if the 1998 Plan is accepted by EPA,,
- Require the private PRPs to provide a construction bond at this time to cover the costs for removal and proper disposal of the wastes if failure occurs during the projected "healing" period, if the 1998 Plan is accepted by EPA, and
- Allow for true public input by increasing the time for public comments.

Please feel free to contact me if you have any questions.

<IMG SRC 98130P>
<IMG SRC 98130Q>

WHEREAS. the site known as the Barge Canal in the City's South End has been contaminated by industrial waste, resulting in its designation by tile Environmental Protection Agency of the United States of America (EPA) as a hazardous waste site, and

WHEREAS. the site is close to neighborhoods and some of the City's most utilized recreational facilities, namely, the Bike Path and Oakledge Park, and

WHEREAS. the restoration of the Barge Canal lands is a fundamental part of the long-term Waterfront usage plan, and

WHEREAS. the Barge Canal Coordinating Council, which includes members of the community representatives of tile Lake Champlain Committee and the Pine Street Arts and Business Association the City of Burlington the EPA the Vermont Agency of Natural Resources, and the various corporations who have operated varied industries on the site known as the Barge Canal in the City's South End have agreed in principal to a settlement which ensures the safe containment of the environmental contamination in a fiscally responsible way, and

WHEREAS. the Barge Canal Coordinating Council endorses the proposed settlement agreement;

NOW THEREFORE BE IT RESOLVED that the City Council of Burlington urges the EPA to accept this settlement as best for the community and the City.

AND BE IT FURTHER RESOLVED that the City of Burlington urges the EPA to begin work on the agreed-upon containment strategy as quickly as possible.

<IMG SRC 98130QA>
<IMG SRC 98130R>