United States
Environmental Protection
Agency

Region 1
1 Congress Street, Suite 1100
Office of the Regional
Administrator (RAA)
Boston, MA 02114-2023

Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

SDMS DocID 452193
July 2000

EPA

Evaluation Report on the Pine Street Barge Canal Coordinating Council, Burlington, VT:

Lessons Learned from this Region 1 Community Advisory Group

Evaluation Report on the Pine Street Barge Canal Coordinating Council, Burlington, VT:

Lessons Learned from this Region 1 Community Advisory Group

Office of the Regional Administrator (RAA)
Region 1
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100
Boston, MA 02114-2023

July 2000

Table of Contents

Evaluation Report on the Pine Street Barge Canal Coordinating Council, Burlington, Vermont

Lessons Learned from this Region 1 Community Advisory Group

Background

The Pine Street Barge Canal Coordinating Council is a 11-member Community Advisory Group formed in 1993 to address the complex issues regarding cleanup of the Pine Street Barge Canal Superfund site in Burlington, Vermont. The group includes a cross-section of stakeholders—citizens, environmental groups, potentially responsible parties (PRPs), the City of Burlington, State of Vermont, EPA, and the U.S. Fish and Wildlife Service. It was established in response to nearly unanimous community opposition to the original remedy proposed by EPA in 1992, which was withdrawn in 1993. Working as an EPA pilot project for more effective community involvement, the group planned additional studies to fill data gaps and recommended a final cleanup remedy to the EPA in 1998. (A copy of the Cleanup Plan Proposed for the Pine Street Barge Canal Superfund Site, May 1998, is included as Appendix A). EPA accepted the Council's recommendations and released a cleanup proposal for public comment in June 1998. A Record of Decision containing the remedy recommended by the Coordinating Council was signed on September 29, 1998. The remedy is expected to be implemented by the potentially responsible parties during the year 2000 field season.

Evaluation Methodology

EPA contacted members of the Coordinating Council by letter to invite them to contribute to an evaluation of the Coordinating Council by participating in telephone interviews conducted by a contractor. The contractor then contacted members by telephone to schedule interviews with those who wished to participate in the review. This report is based on telephone interviews with the following Council members: George Desch, Vermont Department of Environmental Conservation; Karen Lumino, Ross Gilleland, Margery Adams, Sheila Eckman, U.S. Environmental Protection Agency; Marty Feldman, Pine Street Arts & Business Council; William Howland, Lake Champlain Committee; Gary Kjelleren, Potentially Responsible Party (PRP); and Philip Harter, Facilitator. At the request of several participants, comments are summarized here without attribution.

Council Formation and Organization

The Pine Street Barge Canal Coordinating Committee was formed in 1993 in response to widespread public opposition after EPA's proposed $50 million cleanup plan for the site was met with strong and widespread opposition from community stakeholders and potentially responsible parties. EPA extended the public comment period on the proposed plan, and, in response to those comments, decided to withdraw it. According to EPA and community representatives interviewed for this evaluation, community and environmental groups led by the Lake Champlain Committee and PRP representatives met informally during the summer of 1992 following release of EPA's proposed cleanup plan. At their invitation, representatives of EPA and the State of Vermont also regularly attended the meetings. At EPA's suggestion, the group decided to coalesce and to establish a formal organization in Fall 1993, under the condition that it include broad representation from all stakeholder interests, and that it meet under the direction of a neutral facilitator who would be retained under EPA's alternate dispute resolution (ADR) contract.

Under the direction of a neutral facilitator, the group began by defining a decisionmaking process. They spent about a year developing a goal for the organization and a set of standard operating procedures, or "organizational protocols" to guide their deliberations. According to this document, the stated goal of the Council was "to reach consensus on the scope of work for further studies of the Pine Street site, recommendation of a remedy that is both acceptable to the community and satisfies EPA's and the State of Vermont's statutory and regulatory obligations, and such other subjects as the Council may by consensus agree to consider." The *Organizational Protocols* also defined Council participants, the decisionmaking process, and the form that agreements would take; outlined procedures for meetings, caucus deliberations, and the role of the facilitator; and put into writing that all parties agreed to act in good faith in all aspects of the discussions, and would not characterize or make public comments regarding the position of any other member of the council. However, the *Organizational Protocols* never were signed and formally adopted by the Council. While they agreed that the protocols were consulted only rarely during the course of Council deliberations, some of the Council members interviewed said these principles nonetheless guided the conduct of Council business, while others thought, in retrospect, that the agreements should have been adhered to more stringently. (A copy of the *Organizational Protocols* is included as Appendix B).

The Council organized itself into caucuses representing each segment or "wedge" of stakeholders (*i.e.* community, PRPs, regulators), and invited any parties that would be significantly affected by decisions or agreements made by the Council to join with other allied interests to form a caucus to be represented by one or more individuals. Work was accomplished via four subcommittees focusing on major site issues: Ecological Risk, Contaminant Fate and Transport, Human Health Risk, and Community Involvement. Participants agreed that the subcommittee system worked extremely well and allowed the Council to tackle in depth a variety of complex technical issues that probably could not

have been as efficiently addressed by the full Council.

Council Meetings and Community Outreach

In general, community and PRP representatives interviewed felt that the Council was broadly representative of the community and that the Council did a good job of reaching out to the community at-large. EPA staff were less confident that the Council was fully representative of all interests, but could not cite groups they thought had been left out of the process.

The Council met on a regular basis throughout its five-year history; twice a month at first, and then on a monthly basis. All meetings were open to the public and citizens were encouraged to express their views. All upcoming meetings were announced in the local newspaper, and, while attendance by the public at-large varied according to site events and the issues being addressed, there were several citizens in attendance at most Council meetings. The Council's deliberations also were widely reported in the *Burlington Free Press*, and many meetings were broadcast on the local cable system's public access channel. In addition to public meetings and media coverage, Council members reported on a regular basis to their "wedge" or constituency by disseminating information from the Council at meetings of other community groups and gathering their input and feedback for the Council. A Council newsletter also was published on a periodic basis. Whenever a specific benchmark or important decision was reached (a decision to conduct additional studies, or when results were available, for example), the Council made a special effort to get the word out to the public at-large through local media. In general, EPA and State staff thought community outreach could have been more organized and aggressive. (Copies of the Council's press releases, *Progress Update* newsletters, EPA press releases, and press coverage clippings are included as Appendix C).

Third-Party Neutral Facilitation

From the start, the group met under the direction of a neutral third-party facilitator hired by EPA. EPA staff said that they originally proposed that a mediator be hired to guide the group, but community representatives wanted the group to be guided by a facilitator, rather than a mediator. EPA identified and retained an individual with mediation and facilitation experience who also had experience working with environmental issues in the State of Vermont.

Everyone interviewed agreed that facilitation was extremely valuable to the Council's decisionmaking process, and the Council would not have been able to operate had it not been guided by a neutral third-party. They praised the facilitator's skill conducting the preliminary needs assessment, identifying a broad array of stakeholders that needed to be represented, guiding the organizational process, and working with individual caucuses behind-the-scenes when internal issues threatened to derail progress in the Council as a

whole. However, several people noted that the skills and style of the individual who acted as facilitator may not have been well-suited to this particular group. They said he was more at home in the "mediator" role at times, which limited his effectiveness as a facilitator. Several members expressed frustration at his facilitation style, particularly his refusal to develop agendas in advance of meetings or to write on flip charts, and his inability or unwillingness to keep meetings on-agenda and discussions on track or to bring closure to issues before moving on.

While frustration with the facilitator surfaced early in the process, community members interviewed for the evaluation said that the group was reluctant by then to "change horses in mid-stream." They suggested that next time, EPA allow a group to interview facilitator candidates rather than accept someone already hired to do the job. EPA representatives also said that it may have been worthwhile to change facilitators after the group had gotten through the convening stage, even if the process was slowed down a bit while a new facilitator was brought up to speed. They suggested that in future cases, it may make sense to hire one individual to facilitate the convening stage and another person to act as facilitator for meetings once the organization is fully established.

Technical Assistance

The Pine Street Barge Canal is a technically complex site, and public opposition to EPA's first proposed remedy hinged in large part on technical issues related to gaps in data collected at the site. For this reason, understanding complex data and technical issues was critical for meaningful community involvement. The Council spent much of its time analyzing data and conferring with technical experts from EPA and the PRP group. Community representatives said they had all the technical assistance they needed because the group received a Technical Assistance Grant (TAG) from EPA that allowed them to hire their own technical advisor to analyze site data. One of the community members interviewed said the TAG was critical because it enabled the community to be an equal player in deliberations on technical issues.

Consensus and the Decisionmaking Process

Everyone interviewed for this evaluation agreed that the decision to work by consensus was "a given" from the start, and that although working by consensus often was slow and frustrating for participants, it probably was the only way the group could have reached an agreement acceptable to all parties involved. According to the *Organizational Protocols,* the Council defined consensus as "...the decisions are made only with the concurrence of all members present at the meeting where the issue is considered."

According to one community member, the process encouraged participants to listen and to talk openly and left no room for dogmatic responses. Evaluation participants emphasized that consensus worked only because everyone involved was fully committed

to reaching agreement, and because the membership of the Council was steady throughout the process. In fact, virtually everyone who sat on the Council at the start stayed active throughout the five-year process. It was frequent turnover in EPA staff that most often was cited as problematic. Not only did it take time to bring a new Council member "up to speed" on site issues, it was necessary to educate him or her about the consensus process. Evaluation participants expressed frustration that new EPA staff sometimes were not as invested in, or—at least initially—did not seem to be as committed to, the consensus process as were their predecessors.

Council members praised EPA staff for their commitment to the consensus process and for their flexibility and diligence in making the process work in the context of a regulatory role that they recognized often was not conducive to consensus-based decisionmaking. They also recognized that the Council was forging new ground through its involvement in the Superfund program decisionmaking process. This understanding was codified in the *Organizational Protocols*, which state: "...it is EPA's sole responsibility to make various decisions under CERCLA. Any final agreement of the Council represents a good faith statement of the action that EPA intends to take, and not the final Agency decision on the matter. EPA intends to make its final decisions in a manner consistent with the final agreements of the Council, subject to its legal obligations and any limitations on its discretion imposed by law." (Also, see "Participant Competencies in Deliberative Discourse: Cases of Collaborative Decision-Making in the Superfund Program," an abstract of a study of the decision making process used by communities at two Superfund sites, including the Pine Street Barge Canal site, which is included as Appendix D).

Effectiveness and Outcomes

While EPA held regular public meetings prior to issuing its first $50 million cleanup plan in 1992, community interest in the site apparently lay dormant until the EPA announced the proposed remedy. The Pine Street Barge Canal Coordinating Committee provided a mechanism for active community involvement in decisionmaking that led to development and acceptance of a far less costly and less intrusive alternative that won support from all stakeholder groups in the community.

The Record of Decision (ROD) signed on September 29, 1998 contains a $4.3 million remedy that includes placement of a cap on the contaminated canal and wetland sediments and institutional controls for the most contaminated parts of the site, as well as monitoring and five-year reviews. In an agreement independent of the ROD, PRPs agreed to undertake a series of additional projects valued at $3 million to improve the environment in the greater Burlington area. Participants in the evaluation agreed that the additional projects became a key to acceptance of the plan by the community members on the Council.

There is no doubt that release of EPA's first proposed cleanup plan in 1992 left the

Agency's credibility with the community in tatters, nor is there any question that the relationship between EPA and the community improved dramatically through its work with the Pine Street Barge Canal Coordinating Council. Community members were unanimous in their praise of the dedication, skill, and commitment of EPA Region 1, particularly Agency staff who participated in the Council at various points in the process. They said that they and the community at-large now consider EPA to be a responsive partner willing to listen to the community and work together to find mutually beneficial solutions to environmental problems.

Summary

The major points raised in telephone interviews with participants in the evaluation of the Pine Street Barge Canal Coordinating Council included the following:

- Community advisory groups can help organize community involvement in decisionmaking that often is essential to winning public support for cleanup plans at some Superfund sites. Even though EPA held public meetings prior to issuing its 1992 cleanup plan for the Pine Street Barge Canal site, community interest and opposition apparently lay dormant until it was released. Community acceptance of a remedy was gained only after stakeholders became actively involved in decisionmaking through the Coordinating Council.

- Participants were satisfied with the role EPA played in the Council's formation and operation. EPA encouraged the group to organize formally and to have a broadly representative membership. EPA also provided for neutral third-party facilitation of the group. However, evaluation participants from the community said that EPA's most important contribution to the Council was the "good faith" the Agency brought to the table.

- The group's technical assistance grant (TAG) from EPA allowed them to hire a technical advisor to analyze site data. Having a TAG was critical because it enabled the community to participate in discussions on technical issues "on a level playing field" with the regulatory agencies and with PRPs.

- While most community advisory groups do not operate by consensus, members of the Pine Street Barge Canal Coordinating Committee were sure that consensus-based decisionmaking was the only way an agreement could have been reached at the Pine Street site.

- All participants in evaluation interviews agreed that, although the consensus-based decisionmaking process was very costly and time- and resource-intensive, the benefits to the community outweighed these additional costs. The community was empowered by becoming a partner in decisionmaking at the site and the community agreed on a remedy acceptable to all parties.

- Consensus-based decisionmaking is time consuming and resource intensive and

is appropriate only in special circumstances. Several factors specific to the Pine Street Barge Canal site may have made consensus-based decisionmaking the appropriate choice for the Coordinating Council, including the following:

- All segments of the community were united in opposition to EPA's first proposed cleanup plan.
- The community included an unusual coalition of community groups, environmental groups, and potentially responsible parties.
- PRPs at the site were local companies with ties to the community and who could make their own decisions based entirely on site issues.
- The idea of consensus-based decisionmaking is a natural extension of the New England Town Meeting concept that is part of the prevailing tradition and culture of the community.

- In addition to site-specific factors that made consensus-based decisionmaking a good fit for the Pine Street site, other essential factors also were present. Most important were the following:
  - All Council members were fully committed to the same goal: reaching a mutually acceptable agreement and remedy.
  - There was virtually no turnover in Council membership over the five-years the Council met. Members remained committed to the Council's overall goal and to the consensus process. Stability in Council membership allowed members to build trusting relationships that enabled them to reach agreement.

- Council members said frequent turnover in EPA staff was frustrating. Not only did it take time to bring a new Council member "up to speed" on site issues, but new EPA staff sometimes were not as invested in, or did not seem to be as committed to, the consensus process as were their predecessors.

- Neutral third-party facilitation was essential to guide deliberations of the community advisory group at this contentious site, where multiple segments of the community and of the regulatory community were present at the table.

- The experience of the Pine Street Coordinating Council prompted members to offer several suggestions to EPA when considering the use of a contractor to provide facilitation services to a community advisory group. These include:
  - Carefully consider whether you need someone to fulfill the role of "mediator" or "facilitator" and choose a candidate with that specific skill. Be clear about which role you expect the individual to play.
  - A skilled facilitator will prepare agendas, keep meetings on-agenda and discussions on track, record important points and decisions for participants, and help the group resolve conflicts that arise and to come to closure on important issues and milestones during the process of reaching its goals.

- One size does not fit all. Make an effort to ensure that style and personality of the facilitator is appropriate for the group. If possible, allow the community to interview more than one candidate so they can choose someone with whom they are comfortable.
- In some cases, it may be best to hire one individual to facilitate the convening of the organization and another person to act as facilitator for meetings once the organization is under way.
- Don't be afraid to change facilitators if it becomes apparent that the fit between the facilitator and the group is not a good one.

- Even though the Pine Street Canal Barge Coordinating Council's *Operational Protocols* were consulted infrequently during the course of Council deliberations, reaching agreement on a Council goal and a set of standard operating procedures was an important first step that guided the Council as it worked through contentious issues throughout the process.

- The Council did not have a specific procedure for resolving conflicts that arose within the group. Some of the people interviewed said that often unresolved conflicts simply faded away over time. However, the lack of closure on other issues allowed conflicts to fester and may have helped lengthen the time it took for the Council to finish its work.

- One participant noted that the Council rarely marked or celebrated important milestones and accomplishments in a formal way, and suggested that doing so may have helped the group share a greater sense of accomplishment at important points during its long history. He asked if it was too late for the group to reconvene to celebrate achievement of its ultimate goal.

APPENDIX A

Cleanup Plan Proposed for Pine Street Barge Canal Superfund Site

Burlington, Vermont

Pine Street Cleanup History/ Council Background...

The Pine Street Barge Canal Superfund Site is a 70-acre site between Pine Street and Lake Champlain. The site includes contains 21 acres of wetlands, including an old canal. A manufactured gas plant, which made "town gas" for street lights from coal and oil, operated at the site from 1895 to 1966. During that period, wastes from the gas plant were disposed in the canal and wetlands at the site.

EPA added the site to the national list of high priority Superfund sites in 1983. EPA conducted environmental studies at the site during the 1980's, which revealed high levels of organic contaminants associated with gas plant wastes in the canal and groundwater.

In 1992 EPA proposed a cleanup plan that would have involved excavating contaminated soil and sediment from the canal and wetland, disposing this material in a containment facility to be built at the site, and containing contaminated groundwater. The public's comments (Continued on page 2)

Council and EPA Develop Proposed Plan... EPA Seeks Comment

The Pine Street Barge Canal Coordinating Council reached consensus on the cleanup approach for the Pine Street Barge Canal Superfund site. This consensus approach is detailed in this document.

While the Council consensus on this proposed plan is significant, EPA is seeking further review by the community before EPA makes the final cleanup decision.

You are invited to participate!

Information Session
Start of 30-day comment period
7:00 pm
Thursday, June 4, 1998

Contois Auditorium
City Hall
211 Central Avenue
Burlington, VT

Formal Public Hearing
Wednesday, June 24, 1998
7:00 pm
Contois Auditorium

Comments due no later than July 8, 1998

The Cleanup Proposal...

After careful study of the Pine Street Barge Canal Superfund site, and following the recommendation of the Pine Street Barge Canal Coordinating Council, EPA proposes the following plan to reduce risk from site contamination to protect human health and the environment:

- **Place an underwater cap over the canal sediments that present the highest risk to the environment.**
- **Cover several wetland areas of contaminated soil and sediment near the canal.**
- **Set in place land-use restrictions to prevent residential use, unsafe contact with contaminated soil below five feet, use of water for drinking, and use of the site for children's day care in the future.**
- **Redirect and monitor the storm water inflow to the site.**
- **Monitor groundwater, surface water, soils and sediments at the site.**

More on page 3

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act (Section 117) the law that established the Superfund program, this document summarizes EPA's cleanup proposal. For detailed information on the options evaluated for use at the site, see the Pine Street Feasibility Study (prepared by Metcalf and Eddy) and Additional Feasibility Study (prepared by the Johnson Company and Remediation Technologies, Inc.). These documents are available for review at the information repositories at the Fletcher Free Public Library in Burlington, the UVM Bailey-Howe Library and at the EPA's Record Center, 90 Canal Street, Boston, Massachusetts.

1.

Coordinating Council Background (cont.)

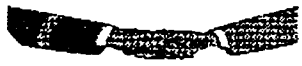
on the proposed plan were overwhelmingly negative; in response, EPA withdrew its proposed plan in 1993.

After withdrawing the 1992 proposed plan, EPA agreed with the many local residents who believed that a new community-based process was needed to solve the problem of environmental contamination at the Pine Street Site. In 1993, representatives of environmental groups, local citizens, the potentially responsible parties, EPA, the Vermont Department of Environmental Conservation and the City of Burlington all joined together to form the "Pine Street Coordinating Council." This group was created to design studies to fill data gaps regarding the site and consider potential cleanup technologies, and to develop a consensus on a cleanup proposal designed to protect health and the environment in a way that is acceptable to the community.

The Pine Street Site is one of the first in the country where a public consensus group has been used to develop and recommend a Superfund remedy. The Coordinating Council has had technical support from scientists at UVM, as well as from EPA, VTDEC and consultants hired by the potentially responsible parties. The Coordinating Council operates by consensus, so that the views of all council members are fully heard and disputes are resolved before the Council recommends a particular study or cleanup proposal.

The members of the Pine Street Coordinating Council include Lori Fisher and Bill Howland of the Lake Champlain Committee, Marty Feldman of the Pine Street Arts and Business Association, John Akey of the Neighborhood 5 Planning Association, Susan Compton for the City of Burlington, Gary Kjelleren of General Dynamics representing landowners at the Pine Street Site, Martin Johnson of Green Mountain Power Corp. and Allyson Donohoe of New England Electric System for the potentially responsible parties, Ross Gilleland and Karen Lumino of EPA, Stan Corneille and George Desch of VTDEC, and Ken Carr of the U.S. Fish & Wildlife Service. Other members of the public have attended and are invited to attend meetings of the Coordinating Council as well.

Over the last five years the Coordinating Council has done a tremendous amount of hard work. The Council has designed additional environmental investigations at the site and evaluated their results, has debated and reached consensus on key scientific questions and what the goals of cleanup should be, and has evaluated cleanup technologies. EPA extends the greatest thanks to all members of the Coordinating Council -- and especially the citizen members who volunteered to attend countless meetings during the workday and at night -- in pulling together the cleanup plan which is now proposed.



2.

Closer Look at the Pine Street Cleanup Proposal...

1. **Construct an underwater cover over canal sediments that present the highest risk to the environment.**

- Place a suitable material over the contaminated canal sediments to prevent aquatic life from coming into contact with contaminants. This type of remedy has been used at several other contaminated sediment sites. Since this will be done while water is in the canal, measures will be taken to prevent sediment from moving to Lake Champlain during cap placement. Potentially historic sunken barges will be further buried under the cap but will be photographed or documented first.

2. **Construct a permanent weir at the canal outlet to Lake Champlain to keep the canal at a level which will maintain the wetlands and still allow fish to use the canal for spawning habitat.**

3. **Place a soil cap over several wetland areas with contaminated soil near the canal.**

4. **Restrict land use at portions of the site to protect people from coming in contact with contaminants, to avoid interfering with the site remedy, and to prevent contamination from migrating.**

- Through legal mechanisms, place restrictions on portions of the site to prevent residential use, excavations of highly contaminated soil below 5 feet, the use of groundwater for drinking, and use as a children's day care center in the future.

5. **Redirect and monitor storm water inflow.**

- Construct a spreader to evenly distribute storm water throughout the wetlands at the southern end of the canal. This will reduce erosion and allow the existing wetlands to be more effective in collecting and removing sediment and contaminants before they enter the canal and the lake.
- Monitor storm water quality and quantity.

6. **Monitor the site.**

- Sample to ensure the cap is working and remains effective over the long term.
- Sample the surface water and the groundwater to make sure that contamination is not migrating offsite and is not migrating to Lake Champlain.

7. **Define Superfund site boundary to reflect nature and extent of contamination and risks found.**

- EPA proposes to define the boundary of the Superfund site as shown in Figure 1. The site boundary encompasses the area where the manufactured gas plant wastes were found and removes the Superfund designation as a barrier to developing certain parcels along the Pine Street corridor.

Why Does EPA Recommend this Proposed Plan?

The cleanup plan, which uses capping for containment of contaminated soil and sediments, and land use controls to prevent groundwater use and exposure to contaminated subsurface soil is proposed because it:

✓ Was developed through an intensive community involvement process and has the consensus support of the Pine Street Barge Canal Coordinating Council;

✓ Allows for protection of the environment and human health with minimal disturbance of site contaminants;

✓ Is the best balance of the 9 criteria (listed on page 6), including protecting public health and the environment;

✓ Restores and protects a valuable and uncommon urban ecosystem in the City of Burlington;

✓ Allows for reuse of the developable portions of the Pine Street area, with restrictions to insure that people are protected from contaminants remaining on the site and that future development does not cause contaminants to migrate;

✓ Minimizes potential risks to residents and the environment during construction. Excavation and off-site disposal or treatment of canal sediments were ruled out because of short-term human health risks and cost. Even if EPA were to select these more invasive remedial alternatives, the site would still have to be monitored over the long term.

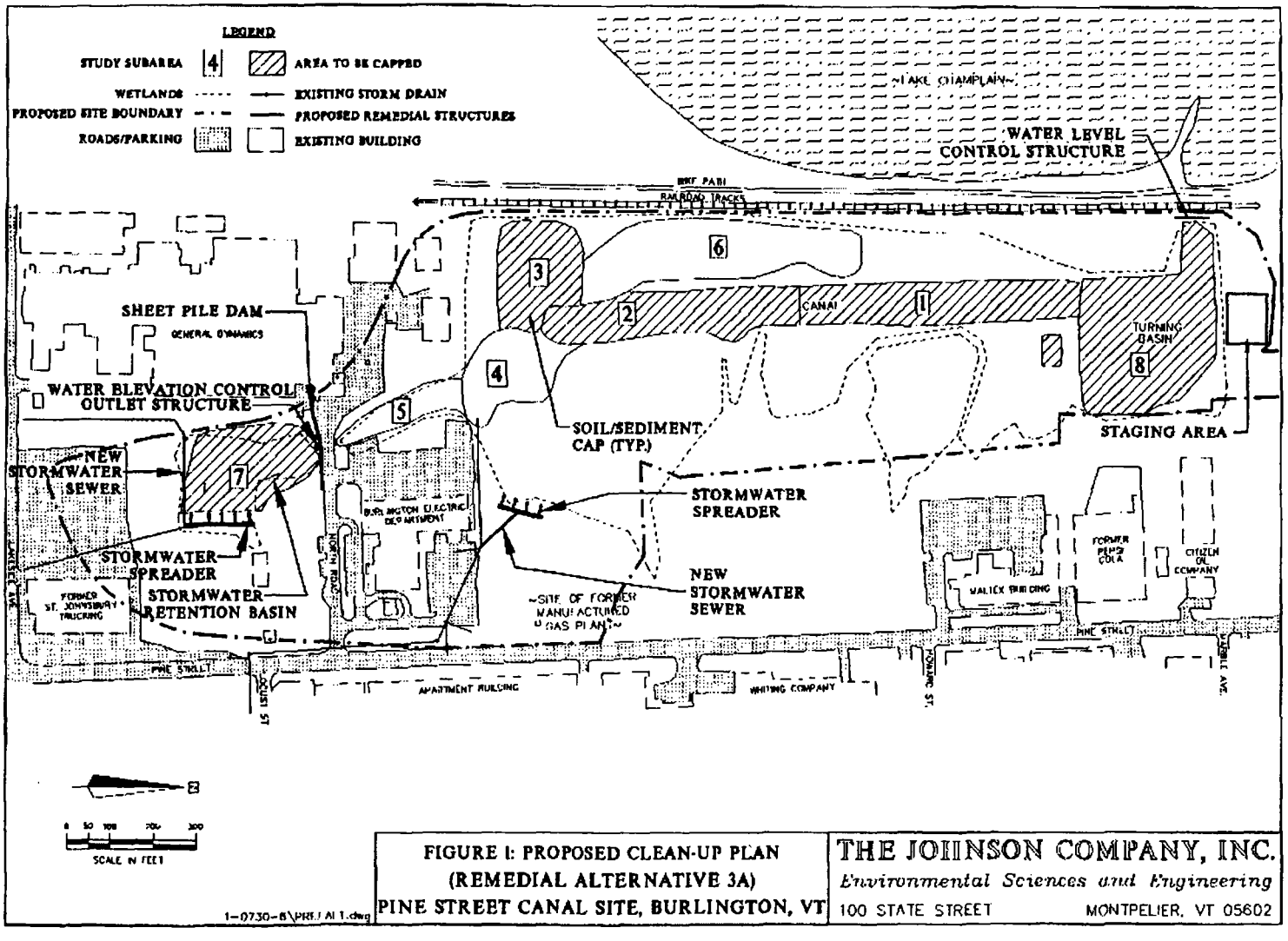


FIGURE 1: PROPOSED CLEAN-UP PLAN
(REMEDIAL ALTERNATIVE 3A)
PINE STREET CANAL SITE, BURLINGTON, VT

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering
100 STATE STREET MONTPELIER, VT 05602

Why is cleanup needed?

The Pine Street Barge Canal site is an example of an uncommon and valuable wetland set in the midst of an urban landscape. It is contaminated with high levels of potentially harmful chemical constituents. The contaminants of most concern are PAHs (polycyclic aromatic hydrocarbons), metals, and VOCs (volatile organic chemicals) at levels that are harmful to human health and the environment.

- Canal sediments contain contaminants at concentrations higher than levels established to protect aquatic life and the ecosystem.
- Contamination in a portion of the canal sediments is causing significant harm to organisms that live in the sediment and form the basis of the aquatic food chain. These organisms were selected by technical experts for the Coordinating Council to represent the overall health of the ecosystem.
- Fish in the canal show evidence of exposure to contaminants from the sediments, but significant harm to fish populations has not been shown. It is not likely that people who occasionally eat fish caught in the canal are being harmed by site contaminants.
- Potential risk to human health would occur if the groundwater were to be used for drinking. However, because of City and State restrictions and low yield, this use is unlikely.
- Frequent or long-term exposure to soils below 5 feet that are highly contaminated could possibly harm site workers or visitors. People who presently visit or work at the site are not at risk.
- The canal serves as a nesting and feeding area for birds, and spawning and nursery habitat for fish.

To protect the nearby community, site workers, and the Pine Street ecosystem, the EPA is formally proposing the capping remedy recommended by the Coordinating Council, which would reduce the likelihood that people and animal life would be exposed to the site contaminants.

NEXT STEPS

In 1998, EPA expects to review all comments received during this comment period and issue the Record of Decision document describing the chosen cleanup plan. The Record of Decision and a summary of responses to public comment will then be made available to the public at the Fletcher Free Library, UVM's Bailey Howe Library and the EPA Record Center in Boston. The EPA will announce its formal final decision through local media and the community mailing list.

An Historic Overview of the Pine Street Barge Canal Site

The study area of the Pine Street Barge Canal Superfund Site consists of

- a 6-acre Canal and Turning Basin connected to Lake Champlain
- approximately 15 acres of vegetated wetland
- approximately 17 acres of undeveloped upland
- approximately 32 acres currently developed

Pre-1900: The site is used for a variety of industrial activities including lumber yards, coal/oil storage, and boat building.

1868: The Barge Canal and Turning Basin are dredged.

1895-1966: Manufactured gas plant (MGP) operates near Pine Street. Plant converted oil and coal into gas. Coal gasification wastes (by-products) such as coal tar, fuel oil, tar-saturated wood chips, cinders, cyanide, and metals were reportedly disposed of in wetlands behind the plant.

1926: First documented report of floating oil from the site.

1966-1969, 1975: Several documented reports of an oil-like material in the canal and lake.

1977-1978: Exploratory borings for the proposed Southern Connector highway reveal extensive sub-surface contamination.

1983: Site placed on the Superfund National Priorities List.

1981-1986: Vermont Agency of Transportation conducts environmental studies in proposed highway right-of-way.

1985: At request of Vermont Agency of Environmental Conservation, EPA removes 1500 tons of coal tar contaminated material and installs a cap on part of the site known as Maltex Pond.

1989-1992: EPA conducts site studies and proposes a cleanup plan to contain contamination on site.

1993: EPA's cleanup plan withdrawn following public comment. The Pine Street Barge Canal Coordinating Council established to fill data gaps and recommend a cleanup plan to EPA.

1993: State classifies groundwater at Pine Street as Class IV: non-potable.

1993-1997: Potentially Responsible Parties conduct studies designed by the Coordinating Council under EPA oversight.

The Nine Criteria for Choosing a Cleanup

EPA uses nine criteria to evaluate the pros and cons and to compare cleanup alternatives. The Additional Feasibility Study (AFS) evaluated how well each of the cleanup alternatives developed for the Pine Street Canal site meets the first seven criteria (See table on page 8). In addition, the proposal reflects significant community input received through the Pine Street Canal Coordinating Council. Once final comments from the state and the community are received, EPA will select the cleanup plan.

1. **Overall protection of human health and the environment:** Will it protect you and the plant and animal life on and near the site? EPA will not choose a plan that does not meet this basic criterion.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** Does the alternative meet all federal and state environmental statutes, regulations and requirements?
3. **Long-term effectiveness and permanence:** Will the effects of the cleanup plan last or could contamination cause future risk?
4. **Reduction of toxicity, mobility or volume through treatment:** Does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?
5. **Short-term effectiveness:** How soon will site risks be adequately reduced? Could the cleanup cause short-term hazards to workers, residents or the environment?
6. **Implementability:** Is the alternative technically and administratively feasible? Are the right goods and services (e.g., treatment machinery, space at an approved disposal facility) available for the plan?
7. **Cost:** What is the total cost of an alternative over time? EPA must find a plan that gives necessary protection for a reasonable cost.
8. **State acceptance:** Do state environmental agencies agree with EPA's proposal?
9. **Community acceptance:** What objections, suggestions or modifications does the public offer during the comment period?

Four Kinds of Cleanup

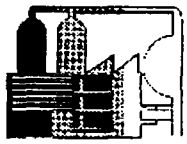
The EPA and the Coordinating Council looked at numerous technical approaches to determine the best way to reduce the risks present at the Superfund site. The possibilities were then narrowed down to approaches that would protect human health and the environment. Although reducing risks often involves combinations of highly technical processes, there are really only four basic alternatives.

Categories of Alternatives

Take limited or no action: Leave the site as it is, or just restrict access and monitor it.

Contain contamination: Leave contamination where it is and cover or contain it in some way to prevent exposure to and migration of contaminants. This method reduces risks from exposure to contamination, but does not destroy or reduce it.

Move contamination off site: Remove contaminated material (soil, groundwater etc.) and dispose of it or treat it elsewhere.



Treat contamination on site: Use a chemical or physical process at the site to destroy or remove the contaminants. Treated material can be left on site. Contaminants captured by the treatment process are disposed in an off-site hazardous waste facility.

6.

Cleanup Alternatives for the Pine Street Barge Canal Site

The Pine Street Barge Canal Additional Feasibility Study (AFS) report reviewed all of the options the Coordinating Council considered for cleanup. The options, referred to as "cleanup alternatives," are different combinations of plans to restrict access to the site, or contain, move, or treat contamination to protect public health and the environment.

The AFS developed separate sets of options to deal with sediment, soil and groundwater contamination. These options were then combined into site-wide cleanup alternatives summarized below. Please consult the AFS for more detailed information.

Limited or no action

Alternative 1: *No action*
Leave the site as it is. Contaminants would remain at the site and be monitored.

Alternative 2a: ***Limited action/Institutional controls***

- Place legal controls on site land use to prevent use of groundwater for drinking, limit exposure to soils greater than 5 feet deep, prevent activities that may result in migration of subsurface contamination, prevent residential use and prevent future use as a childrens day care center.
- Monitor for at least 30 years to detect any change that would require intervention.

Contain contaminants

Alternatives 2b, 2c, 3a, and 3c: ***Partial Capping/Institutional Controls***

- These alternatives are identical except for areas to be capped. (See Figure 1 for a map of the different areas.)
  Alternative 2b: Capping subarea 3 only
  Alternative 2c: Capping subareas 1,2, and 8
  Alternative 3a: Capping subareas 1,2,3,7 and 8. This is EPA's and the Council's preferred alternative.
  Alternative 3c: Capping subareas 1,2,3, and 8.
- Cover the bottom of the canal and some wetland areas with a suitable material (e.g. sand, silt and/or clay) to prevent aquatic life from being harmed by contaminated sediments.
- Place a soil cap over several wetland areas near the canal.
- Redirect and monitor storm water inflow by installing a spreader to evenly distribute water over the wetlands and raising North Road to prevent flooding.
- Monitor the canal cap and the site groundwater, surface water, sediment and storm water inflow for as long into the future as needed.
- Place legal controls on land use to prevent use of groundwater for drinking, prevent exposure to soil greater than 5 feet deep, prevent activities that may result in migration of subsurface contamination, prevent residential use and prevent future use as a children's day care center.

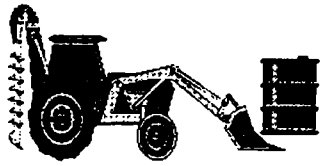
Move contaminants off site

Alternatives 2d and 3b: ***Off-site Disposal/ Institutional Controls/Partial Capping***

- These alternatives are similar, except for the areas to be excavated or capped.
  Alternative 2d: Excavation in Subareas 1,2, and 8 with off-site disposal; no action in Subareas 3 and 7.
  Alternative 3b: Excavation in Subareas 1,2, and 8 with off-site disposal; capping in Subareas 3 and 7.
- Excavate contaminated sediments from the bottom of the canal and wetlands and transport them off-site for treatment or disposal.
- Redirect and monitor storm water inflow by installing a spreader to evenly distribute water over the wetlands and raising North Road to prevent flooding.
- Monitor the site groundwater, surface water, sediment and storm water inflow for as long in the future as needed.
- Place legal controls on land use to prevent use of groundwater for drinking, prevent exposure to soil greater than 5 feet deep, prevent activities that may result in migration of subsurface contamination, prevent residential use and prevent future use as a children's day care center.

Treatment on site

None evaluated in detail. These alternatives were eliminated from further detailed consideration during the initial screening phase of the AFS.



7.

Comparison of Cleanup Alternatives

	No Action		Containment				Move Contamination Off Site	
Nine Criteria	**Limited or No Action**	**Limited Action/ Institutional Controls**	**Partial Capping/ Institutional Controls**				**Off-site Disposal/ Institutional Controls/ Partial Capping**	
	1	2a	2b	2c	3a*	3c	2d	3b
Protects human health and environment	✗	✗	✗	✗	✔	✗	✗	✔
Meets federal and State requirements	✗	✗	✗	✗	✔	✗	✔	✔
Provides long-term protection	✗	✗	✓	✓	✔	✓	✓	✔
Reduces mobility, toxicity and volume through treatment	✗	✗	✗	✗	✗	✗	✓	✓
Provides short-term protection	✗	✗	✔	✔	✔	✔	✓	✔
Implementability (Can it be done?)	✔	✔	✔	✔	✔	✔	✔	✔
Cost[1]	$1.39 million	$1.73 million	$2.17-$4.38 million				$40.6-$40.96 million	
State agency acceptance	VT DEC supports alternative 3a. Additional public input is being sought during comment period and will be considered in making final decision.							
Community acceptance	Coordinating Council supports alternative 3a. Additional public input is being sought during comment period and will be considered in making final decision.							
Time to reach cleanup goal	unknown	unknown	2-3 years				2-3 years	
Would include some reuse restrictions	no	yes	yes				yes	

* EPA's preferred alternative
✓ Partially meets criterion
✔ Meets or exceeds criterion
✗ Does NOT meet criterion

8.

[1]Costs are for comparative purposes only and may not reflect the final cost of implementing the remedy.

How you can comment on the plan ...

EPA will use public comments received during the 30-day public comment period, beginning June 5, 1998 and ending July 8, 1998, to improve the proposed cleanup plan. Written comments should be mailed, faxed or e-mailed to:

Karen Lumino
US EPA Region 1 (HBT)
JFK Federal Building
Boston, MA 02203 - 0001
Fax: 617/573-9662
lumino.karen@epamail.epa.gov

Additionally, EPA will accept verbal comments on the proposed plan only during the public hearing to be held on Wednesday, June 24, from 7:00pm to 9:00pm, at Contois Auditorium at Burlington City Hall.

Federal regulations require EPA to make a distinction between "formal" and "informal" comments. Only those written comments received during the public comment period, and verbal comments received during the public hearing will be regarded by EPA as formal, and will become part of the official public record. EPA will review all formal written comments and formal verbal comments before making a decision on the final cleanup plan for the Pine Street Barge Canal site. EPA will then prepare a written response to all formal comments that will be issued in a document called a Responsiveness Summary when the Record of Decision, which is the final cleanup plan, is released.

Please note that EPA will not be able to respond during the public hearing to verbal comments received during the formal portion of the hearing. Once the hearing officer announces that the formal portion of the hearing is closed, EPA staff will be available to answer informal questions. Informal questions and responses will not be part of the official public record, and will not be included in the Responsiveness Summary.

Where you can go for more information...

This publication summarizes a number of reports and studies. All of these technical reports as well as other public information publications are available at the following Pine Street Barge Canal Site information repositories:

Fletcher Free Public Library
235 College St.
Burlington, VT 05401
(802)863-3403
Hours:
M-F: 8:30am-5:30pm
Sat: 9:00am-5:30pm
Sun: 12:00am-5:45pm (Sept.-May)

Bailey/Howe Library
University of Vermont
Burlington, VT 05405
(802) 656-2023
Hours:
M-F: 8:00 am-12:00am
Sat: 9:00am-12:00am

EPA Records Center
90 Canal Street
Boston, MA 02203
(617)573-5729
Hours:
M-F: 10:00am-1:00pm
2:00pm-5:00pm
Note: The EPA Record Center is closed the first Friday of every month.

For general Superfund information, Internet users may visit the EPA web page at:
http://www.epa.gov/region01/superfund

9.

Write your comments below and mail to EPA ...

EPA wants your written comments on the options under consideration for dealing with the contamination at 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 1-888-EPA-REG1. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than July 8, 1998 to:

Karen Lumino
Remedial Project Manager
U.S. Environmental Protection Agency
Region I, HBT
JFK Federal Building
Boston, MA 02203 - 0001
or E-Mail to: lumino.karen@epamail.epa.gov
FAX: 617/573-9662

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Attach sheets as needed)

Comment Submitted by:_____

Mailing list additions, deletions or changes

If you did not receive this through the mail and would like to

- ☐ **be added to the site mailing list**
- ☐ **note a change of address**
- ☐ **be deleted from the mailing list**

Name:_____

Address:_____

_____

_____

Pine Street Canal Superfund Site
Public Comment Sheet (cont....)

Fold, tape, stamp, and mail

Place Stamp Here

Karen Lumino
Remedial Project Manager
U.S. Environmental Protection Agency
Region I (HBT)
JFK Federal Building
Boston, MA 02203 -0001

APPENDIX B

PINE STREET BARGE CANAL
COORDINATING COUNCIL

ORGANIZATIONAL PROTOCOLS

GOAL OF THE COUNCIL

The goal of the Council is to reach consensus on the scope of work for further studies of the Pine Street Site, recommendation of a remedy that is both acceptable to the community and satisfies EPA's and the State of Vermont's statutory and regulatory obligations, and such other subjects as the Council may by consensus agree to consider.

PARTICIPANTS

Interests Represented. Any interest that would be significantly affected by decisions or agreements made by the Council may be represented. Organizations, agencies, companies, and individuals may join with other allied interests to form a caucus to be represented by one or more individuals.

The Coordinating Council. Each organization or interest caucus that is represented on the Council will be deemed a party to the Council and will appoint a designated number of Members of the Coordinating Council.

Alternates for Council Members. Each party may designate one or more alternates for each of its Council Members. Alternates may substitute for Council Members in the event a Member cannot attend a session of the Coordinating Council.

Additional Parties. Additional parties may join the Council after its initial formation only with the concurrence of the Council.

Constituents' Interests. Members are expected to consult with their constituents and colleagues and to raise their interests and concerns during the discussions of the Council.

DECISION MAKING

Decisions by Consensus. The Council will make decisions by consensus. For these purposes, consensus means that decisions are made only with the concurrence of all Members present at the meeting where the issue is considered. Unless otherwise determined by the Council, consensus agreements reached during the course of deliberations will be considered tentative agreements until the Council has reached final agreement on the scope of work and such other subjects as the Council agrees to consider. Members will be given reasonable opportunity to consult with their constituents prior to a final agreement.

EPA Responsibility and Intent. The parties recognize that under the Appointments

Clause of the Constitution, governmental authority may be exercised only by officers of the United States and that it is EPA's sole responsibility to make various decisions under CERCLA. Any final agreement of the Council represents a good faith statement of the action that EPA intends to take, and not the final Agency decision in the matter. EPA intends to make its final decisions in a manner consistent with the final agreements of the Council, subject to its legal obligations and any limitations on its discretion imposed by law.

If the Coordinating Council reaches a final decision as to a matter which EPA is required to publish formally for public comment (for example, a proposed plan for remedial action), the Council will reconvene as necessary following the close of the public comment period to consider significant comments received. Following the Council's consideration of those comments, and fully considering any recommendations that the Council may make, to the extent consistent with EPA's legal responsibilities, EPA will consider and respond to significant comments received during the public comment period and will make such modifications as are appropriate under the circumstances (for example, in issuing a Record of Decision). When the Council considers the comments, EPA will participate in the discussions, but EPA's concurrence shall not be required for the Council to make a recommendation.

Agenda. A draft agenda for each meeting will be prepared by the facilitator after consultation with the Council Members. The agenda will be approved by consensus.

Workgroups. Workgroups may be formed to address specific issues and to make recommendations to the Council as a whole. Workgroups are open to any Council Member or the Member's designee, plus such other individuals as the Council agrees will enhance the functioning of the workgroup. Workgroups are not authorized to make decisions for the Council. All Council Members will be notified of all workgroup meetings.

AOC Negotiations. Representatives of the PRPs, the State, and EPA will periodically inform the Council of the status of their independent concurrent negotiations of an Administrative Order of Consent (AOC).

AGREEMENT

Written Statement. Any final agreement will take the form of a written statement that will be signed by the Members who are appropriately authorized by the parties they represent.

Support of Agreements. The Members and the parties represented by the Members agree to proceed in good faith to support and effect the terms of any final agreement reached pursuant to these protocols. Each such party agrees not to file formal comments which are inconsistent with the express terms of a final agreement.

PROCEDURES

Open Meetings. Meetings of the Council will be open to the public.

Attendance at Meetings. Each Member of the Council agrees to make a good faith effort to attend every meeting. The Member may be accompanied by such other individuals as the Member believes is appropriate to represent the interests of the Member's constituents. Only the Member will have the privilege of sitting at the table and speaking during the discussions without the approval of the Council, except that a Council Member may call upon an adviser to elaborate on a relevant point. The Council may invite others to attend the meetings when resource people are needed or for other purposes.

Meeting Summaries. Meeting summaries will be prepared for the convenience of the Council. Such summaries will not be approved by the Council, and such summaries and any electronic recordings of meetings will not be construed as representing the official position of the Council or any Member of the Council as to what transpired at the Council meetings. In addition, the summaries will announce future meetings of the Council. The summaries will be made available to the public on request unless the Council agrees that summaries of specific meetings or parts of meetings be held as confidential.

Caucus. Two or more members of the Council may confer privately during or after a Council meeting as they consider appropriate. The facilitator may also confer privately with members of the council during or after Council meetings.

Good Faith. All parties agree to act in good faith in all aspects of these discussions. Specific offers, positions, or statements made during the discussions may not be offered or admitted into evidence or the record of any judicial or administrative proceeding by other parties for any other purpose not previously agreed to in writing by the parties involved. It is the intent of the Council that other attendees of the meetings voluntarily comply with this provision in order to support the dialogue process by encouraging the free and open exchange of ideas, views, and information prior to achieving consensus. Personal attacks and prejudiced statements will not be tolerated.

Right to Withdraw. Any party may withdraw from the discussions at any time without prejudice. The remaining Council Members will then decide whether to continue the discussions.

Others' Positions. No Member will characterize or make a comment publicly concerning the position of any other Member even if that Member withdraws from the Council.

Facilitator. A neutral facilitator will work with all the participants to ensure that the process runs smoothly. The facilitator serves at the will of the Council and may be replaced by another or the role eliminated entirely as determined by the Council. The role of the facilitator usually includes developing draft agendas, focusing meeting discussions, working to resolve any impasses that may arise, preparing meeting summaries, assisting in the location and circulation of background materials and materials the Council develops, acting as a spokesperson for the Council as a whole, and such other functions as the Council requests.

SIGNATORIES

The undersigned signatory is appropriately authorized to execute these protocols on behalf of the party or parties listed beneath the signature.

Name: _____

Party: _____

Date: _____

APPENDIX C

Pine Street Barge Canal Coordinating Council

Progress Update #1

March 1994

John Akay
Community Representative
(802)863-1765

Ken Carr
U.S. Fish & Wildlife Service
(603)225-1411

Susan Compton
City of Burlington
(802)863-4531

George Desch
Vt. Dept. of Env. Conservation
(802)241-3888

Sheila Eckman
Environmental Protection Agency
(617)573-5783

Marty Feldman
Pine Street Arts & Business Assoc.
(802)658-6815

Lori Fisher
Lake Champlain Committee
(802)658-1414

Ross Gilfoland
Environmental Protection Agency
(617)573-5766

William Howland
Lake Champlain Committee
(802)388-3711 x5210

Martin Johnson
Potentially Responsible Parties
(802)229-4600

Gary Kjellerup
Potentially Responsible Parties
(802)657-6876

Sheri Larsen
Potentially Responsible Parties
(802)863-4511

Philip J. Harter
Facilitator
(802)763-2815

Council moving ahead on further studies for Pine Street

This Progress Update is the first of several reports the Coordinating Council will be making to keep interested citizens informed about activities at the Pine Street Barge Canal Superfund Site.

The Pine Street Barge Canal Coordinating Council is a coalition of community, government and business members whose immediate goal is to reach agreement by consensus on what studies need to be done on the Pine Street Barge Canal Superfund Site in Burlington, Vermont. Ultimately, the Coordinating Council hopes to develop a solution for the site that is acceptable to the community, is based upon sound science, and meets state and federal requirements. This collaborative effort in which the interested parties seek common ground is a clear departure from the adversarial approach often taken in the past on environmental matters.

If the Coordinating Council approach is successful in Burlington, the process may be duplicated around the country at other Superfund locations.

Using such broad community involvement is a new idea, and the Barge Canal site is considered a pilot project. If the Coordinating Council approach is successful in Burlington, the process may be duplicated around the country at other Superfund locations. The community has worked hard to organize a Vermont response to the Barge Canal problem, and now has the opportunity to be directly involved in effecting an environmentally sound and cost-effective solution.

The Coordinating Council was organized in the summer of 1993 after the EPA withdrew its proposed remediation plan for the site in June 1993. Public opposition to the proposed plan led to the discussions that have

See ***Council,*** *page two*

Champlain Parkway given priority

The Coordinating Council has agreed to work with the City of Burlington, the Vermont Agency of Transportation and Vermont Railway if a decision is made by the three agencies to build a Champlain Parkway interim highway. The detour would cut across a corner of the Pine Street Superfund Site at the Burlington Street Department property.

The current proposal for the Champlain Parkway involves an alignment that uses Lakeside Avenue, Pine Street and portions of the Burlington Street Department and Vermont railway properties. If the proposed plan for the highway is approved, any potential contamination on the Street Department property would be addressed ahead of the rest of the Superfund site, thus allowing the roadway to be built and used while the remaining site is evaluated.

Resolving ecological, human health issues

The central goal of the Coordinating Council is to identify the technical questions and data gaps that need to be resolved in order to determine what remedial action is needed at the Pine Street Barge Canal Site. To facilitate this process, a Technical Issues Work Group has been created. The Work Group has representation from the Potentially Responsible Parties (PRPs), EPA, State of Vermont, U.S. Fish and Wildlife Service, the City of Burlington, and the Lake Champlain Committee.

The Work Group has been meeting since mid-November 1993 to identify relevant technical issues. The first task tackled by the Work Group has been to review public comments received by the EPA during the Public Comment Period. Working from these comments, the Work Group has incorporated a list of potentially relevant issues and/or data gaps into a working document called the "Technical Issues Document". This document will be debated and amended during Work Group and Coordinating Council meetings.

The issues identified in the Technical Issues Document fall into four major categories: Human Health impact, Ecological Risks, Fate & Transport of Contaminants, and Remedial Alternatives. In order to address these topics the EPA, the PRPs, and the Lake Champlain Committee have assembled teams of technical experts in each of these subject areas.

The Human Health and technical experts began meeting in early March. The Ecological Risk and Fate & Transport technical experts will begin meeting in March, and the Remedial Alternatives technical experts will begin meeting in May. The resulting product from each group of technical experts is a draft "Statement of Work" for that particular technical subject. The Coordinating Council will review and approve the separate draft Statements of Work and combine them into an overall Statement of Work composed of all the technical issues that need to be studied.

Under the current schedule, the draft Statement of Work will be completed in August 1994 at which time it will be released for community review and comment. Individual draft Statements of Work for the specific technical topics will be presented to the Council as they are developed and will also be available for review by the community in the context of the Council meetings and its documentation.

The overall Statement of Work will ultimately become an attachment to a legal agreement between the PRPs and the EPA called the Administrative Order on Consent (AOC). The AOC provides the basis for the PRPs to perform the necessary additional studies.

Legal update

While members of the Coordinating Council's technical work groups collaborate on determining what additional studies need to be done at the site, negotiations have begun that are intended to determine who will fund the work.

The EPA, Vermont Department of Environmental Conservation and the Potentially Responsible Parties (PRP's) met in early February to initiate an agreement under which the PRPs would fund or perform additional studies at the site. The scope of the additional studies will be agreed upon by the Coordinating Council in the coming months.

In the next month, the PRPs will be meeting to determine how to allocate among themselves the costs of the site studies and any necessary cleanup activities. The talks will run concurrently with the Coordinating Council's discussions and decisions on technical issues, and therefore won't delay additional studies or potential clean up activities.

Council, from page one

resulted in the formation of the Coordinating Council. The Council's emphasis on public participation, a neutral facilitator, pooling of data and the combination of all participating parties' scientists should result in a plan for the site that we can all support.

Meetings of the Coordinating Council are open to the public and are announced in advance (see page 3 of this update for a list of upcoming meetings). Comments from the public concerning the Barge Canal are encouraged and can be made at a Coordinating Council meeting or to any Council member. See the back page if you wish to receive meeting summaries.

What's next ...

The following is a schedule of all the Coordinating Council meetings for the next five months. All sessions begin at 5:30 p.m., and, unless stated otherwise, will be held at Burlington Electric Department, 585 Pine Street, Burlington, Vermont.

The results of the Technical Work Group meetings held during the day are summarized at each evening Coordinating Council meeting. For a listing of the scheduled Work Group meetings (which are also open to the public) and locations, please contact the facilitator or any Council member.

Finally, please note that this schedule is subject to change. You may contact any Council member to verify meetings.

March 30
Fate & Transport

March 31
Human Health and Ecological Update

April 19
Presentation by George Pinder on Fate & Transport

April 21
Human Health and Fate & Transport Update

May 18-19
Fate & Transport Update

June 8-9
Remedial Alternatives Update
Green Mountain Power,
25 Green Mountain Power Dr.,
South Burlington

June 28-29
Discuss Statement of Work

July 13-14
Statement of Work
Green Mountain Power,
25 Green Mountain Power Dr.,
South Burlington

August
Public comment period on draft Statement of Work

Coordinating Council members deliberate on an issue.

Community participation encouraged

An objective of the Coordinating Council is to increase general community involvement up front in the process.

All Coordinating Council and Technical Work Group meetings are open to the public. Council meetings are held in the evening in order to enable more citizens to attend. The results of the day Work Group meetings are summarized at the Council meetings. Advance notice will be provided on the upcoming Council meetings that focus on the Council's study recommendations for Human Health, Ecological Risks and Fate & Transport of Contaminants. When the draft Statement of Work has been prepared, the Council will hold an informational meeting and public comment period to solicit community input.

Written meeting summaries of all the Coordinating Council meetings are available at the repositories at the University of Vermont and Fletcher's Free Libraries in Burlington, and also the EPA Records Center in Boston. Videotapings of Coordinating Council meetings held after March 31 will be available at the Burlington libraries.

Community Outreach

Council members have sent out letters, surveyed meeting attendees, held informational meetings, and made presentations on current issues in an effort to meaningfully involve the community in developing a new cleanup plan for the site. If you would like to have a presentation made to your group or if you have suggestions for ways we can keep you abreast of our progress, please contact a Council member (see page 1 of this *Progress Update* for names and phone numbers).

Mailing list questions?

The Coordinating Council maintains two mailing lists. People on the "Pine Street Mailing List" receive copies of periodic *Progress Updates*, and relevant media releases - enough information to keep most people current with the issues. Those who would like additional information can be added to the "Coordinating Council Mailing List" and receive all the Council's meeting summaries. (If you received this Progress Update in the mail, you are already on one of the mailing lists. Please check your address label: a "CC" indicates that you are on the Coordinating Council Mailing List; otherwise you are on the Pine Street Mailing List.)

☐ I would like my name placed on the Pine Street Mailing List

☐ I would like my name placed on the Coordinating Council Mailing List

Please check the box of the mailing list you would like to be on and mail this form to:

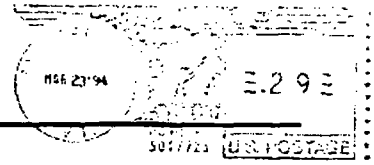
Pine Street Barge Canal Coordinating Council
PO Box 4632
Burlington, VT 05406-4632

NAME _____

ADDRESS _____

CITY, STATE, ZIP CODE _____

Pine Street Barge Canal Coordinating Council
PO Box 4632
Burlington, VT 05406-4632



Mailing Labels go here

Pine Street Barge Canal Coordinating Council

Progress Update #2

October 1994

John Akey
Community Representative
(802)863-1765

Ken Carr
U.S. Fish & Wildlife Service
(603)225-1411

Susan Compton
City of Burlington
(802)863-4531

George Desch
Vt. Dept. of Env. Conservation
(802)241-3888

Sheila Eckman
Environmental Protection Agency
(617)573-5783

Marty Feldman
Pine Street Arts & Business Assoc.
(802)658-6815

Lori Fisher
Lake Champlain Committee
(802)658-1414

Ross Gilliland
Environmental Protection Agency
(617)573-5766

William Howland
Lake Champlain Committee
(802)388-3711 x5210

Martin Johnson
Potentially Responsible Parties
(802)229-4600

Gary Kiellgren
Potentially Responsible Parties
(802)657-6876

Sheri Larsen
Potentially Responsible Parties
(802)863-4511

Philip J. Harber
Facilitator
(802)763-2835

The Pine Street Coordinating Council represents a first-of-its-kind effort that includes a diverse cross section of local citizens, environmental groups, the potentially responsible parties and local, state and federal representatives working together to reach consensus on issues of concern at the site. If the Coordinating Council approach is successful in Burlington, the process may be duplicated around the country at other Superfund locations.

New studies underway at Pine Street Barge Canal Site

This Progress Update is the second of several reports the Coordinating Council will be making to keep interested citizens informed about activities at the Pine Street Barge Canal Superfund Site.

Field teams have started in on a new round of studies that are designed to fill in data gaps concerning the Pine Street Superfund Site. Contractors for the potentially responsible parties moved a trailer and various testing equipment on the site in early September and began testing soon afterward.

The studies will build upon the data the Environmental Protection Agency collected during its original assessment of the site from 1989 through 1992. Pine Street Coordinating Council members and their scientific experts have been meeting several times a month for the past year to determine what additional studies need to be conducted before deciding on a new plan that is acceptable to the community, is based on sound science and meets state and federal requirements.

The studies have been designed to answer the following questions:

See Council, page two

Public meeting set for November

The Pine Street Coordinating Council will host a public meeting beginning at 7 p.m. Nov. 15 at the Contois Auditorium in the Burlington City Hall to discuss progress at the site and to field any questions from the audience. Community attendance is strongly encouraged. For more information, contact one of the council members listed on the left.

Two scientists come ashore after taking sediment samples from the Pine Street Barge Canal.

Council, from page one

1) Is the site contamination affecting Lake Champlain?

To answer this question, scientists will measure groundwater levels for one year to evaluate groundwater flow directions across the site. In addition, groundwater samples will be collected and analyzed from the area between the canal and the lake using a device that allows for the discrete sampling of groundwater at different depths. This study will test the hypothesis that a groundwater divide between the canal and the lake prevents contaminated groundwater from reaching the lake. Field teams will also be testing to determine whether contaminated sediments are moving from the canal during a storm.

2) Is the air safe to breathe under current undisturbed conditions?

In 1992 the EPA determined that it was very unlikely for the contaminants to pose a threat to human health by being released into the air. This position is generally accepted by the scientists of the Coordinating Council; however, because of the strong public concern, a study will be performed to collect further air samples during "worst case" meteorological conditions: warm temperatures and calm atmosphere. When deciding on a remedy, concerns relating to air emissions from the remedy will be carefully evaluated.

See page 4 for an introduction to the scientific experts working behind the scenes

3) Does the contaminated soil pose a risk to people on the site?

Although the site is not used extensively, the possibility exists that people could come in contact with the shallow soils. Approximately 50 soil samples will be taken in the more accessible areas and in an area of stressed vegetation and stained soil. These soil samples will be screened for contaminants and this data will be used to insure that occasional use of the site will not present a risk to human health. This information will also allow for localized cleanup of certain areas if warranted.

See Council, page three

A scientist checks a sampling collection device that measures stormwater discharges into the lake.

Council, from page two

4) How significant is the ecological risk at the site?

The ecological issues work group recommended an evaluation of the toxicity of the shallow soils and sediments, where the vast majority of animals and plants live. In order to select the optimum locations for the toxicity tests, detailed mapping of the contaminant distribution is to take place. In a cost-saving effort, more than 300 samples will be collected and analyzed at the site with a field screening technique. This will be followed by toxicity tests at specific locations with high, medium and low contaminant levels. The results of these tests will provide relatively detailed understanding of areas where contaminants are affecting the local ecosystem.

5) Is the site "healing" naturally and is the contamination contained?

Natural biological processes are known to provide significant cleanup of a number of different types of contaminated sites. Experts have hypothesized that this type of natural or "intrinsic" bioremediation is occurring in certain areas of the Pine Street Site. Although it is unlikely that such processes would cleanse the site in the reasonably foreseeable future, there is the possibility that intrinsic bioremediation may contain the contaminants and significantly reduce the ongoing risks to humans and the environment. A preliminary study is proposed to determine if such a process is active at the Pine Street Site.

6) How will these studies relate to an overall remedy selection for the site?

Major concerns expressed by the public in the past have been whether the risk to the environment at the site warrants an intrusive cleanup, and whether such an action can minimize costs and disturbance to the site. The studies mentioned above should address both of these issues.

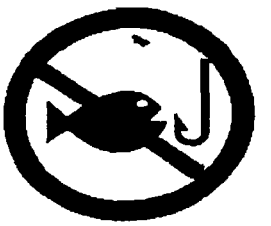
The soil sampling and follow-up toxicity tests will use actual site soils to evaluate how much the contaminants are affecting the environment. If no unacceptable effects are found and the site is not affecting Lake Champlain, the remedy will most likely focus on land use restrictions and monitoring. If unacceptable risks to the environment or human health are found through this testing program, the detailed soil data will allow us to focus remediation on the most contaminated areas and result in a less costly, less intrusive remedy than what was proposed in 1992.

The parties funding the investigations have selected The Johnson Company of Montpelier as the contractor to perform the first round of studies. The data generated from these studies will be analyzed and evaluated by these parties and their contractor. The EPA, U.S. Fish and Wildlife Department, the State, the Lake Champlain Committee and the other members of the Coordinating Council and their technical experts will also participate in the evaluation.

On an on-going basis, the Coordinating Council will continue to evaluate alternatives for a remedy for this site, and possibly begin developing details for a particular remedy in 1995 depending upon the results of the additional studies.

'No Fishing' signs posted at canal

City of Burlington Health Officer Steve Goodkind has posted "NO FISHING" signs at the Pine Street Site. The decision to post the site resulted from concerns raised by the Coordinating Council that residents of Burlington were using the site as a fishing area and might be eating fish caught in the Barge Canal.



NO FISHING

PER ORDER OF THE BURLINGTON HEALTH OFFICER: FOR MORE INFORMATION CALL 863-9094

Previous studies performed by contractors for the EPA have concluded that there appears to be no human health risk posed by the site. Nevertheless, Goodkind decided to post the signs as a precautionary measure until the remaining site studies are completed and a determination is made as to the potential risks, if any, associated with the contamination at the site. In addition to posting signs at the site itself, notices have been sent to local bait and tackle shops and local markets, in various languages, warning citizens that fishing at the site is prohibited.

Diverse expert pool studying issues

The Coordinating Council has a wealth of scientific expertise to call on when technical issues arise that require in-depth professional debate. These experts represent a unique blend of scientists from academia, government research facilities and private consulting firms who sit down once a month to hash out pressing technical issues relating to the site. At the conclusion of their sessions, they report back to the Coordinating Council on their findings, recommendations and issues of debate.

The following highlights the careers and specialties of some of the experts studying the site:

•**Bill Bress** has served as the state toxicologist for the Vermont Department of Health since 1985. Certifiied by the American Board of Forensic Toxicology, he has worked in the field in various capacities for more than 20 years. Prior jobs include forensic toxicology work for private industry and law enforcement agencies in New York.

•**Anne Marie Burke**, a toxicologist,has served as the EPA's risk assessment coordinator for Superfund sites throughout New England since 1990. Prior to joining the EPA, she worked as a toxicologist for the Massachusetts Department of Public Health, where she developed public health consumption advisories for the statewide fish sampling program.

•**Dr. David Burmaster** works for the Alceon Corporation in Cambridge and holds degrees in biophysics and engineering. He specializes in human health and ecological risk assessments, as well as toxicology and exposure models.

•**Ken Carr** has worked as a biologist for the U.S. Fish and Wildlife Service for the past 20 years. He specializes in areas concerning wildlife damage control, wetland evaluation and protection, contaminants research in fish and wildlife in New England, and administration of natural resource trustee issues for hazardous materials and oil spills.

•**Dr. Nancy Hayden** is an assistant professor of environmental engineering at the University of Vermont. She brings to bear a working familiarity with how to deal with hazardous waste management. She has previous experience assessing groundwater and air quality issues at the Pine Street Site. Her expertise in remediation, environmental engineering and air quality will be particularly useful in addressing issues of public concern and in developing a solution that is publicly and environmentally acceptable.

•**Dr. Leslie King** is an associate professor of environmental studies and natural resources planning at the University of Vermont. She is a resource economist whose background includes dealing with hazardous waste managment issues. Her expertise in land use policy and strong interest in citizen involvement in decision-making will be helpful in resolving site issues.

•**Dr. Alan McIntosh** is an ecotoxicologist and director of the University of Vermont's Water Resources and Lake Studies Center. He has extensive experience addressing problems with hazardous waste and is currently heading a major toxic substance project on Lake Champlain.

•**Seth Pitkin** has worked for the Johnson Company for the past eight years as a hydrogeologist. He specializes in the transport of subsurface contamination in groundwater.

•**Alan Quackenbush** heads the aquatic toxicity testing program for the State of Vermont. He has been with the Vermont Department of Environmental Conservation since 1989 working in the state's lakes and ponds program, and also spending time studying the effects of acid rain on Vermont lakes and streams.

•**Mike Smith** joined the Vermont Department of Environmental Conservation in the mid-'80s after working as a geological and environmental consultant for several years. He currently works as a hydrogeologist in the state's hazardous materials management branch.

•**Susan Svirsky** has worked for the EPA since 1985 as the ecological risk assessor in the New England area. Prior to joining EPA New England, she worked for several years at EPA Headquarters studying water pollution issues, and also spent time working for the State of Maine in its inland fisheries and wildlife department.

•**Dr. John Teal** specializes in wetland ecology and petrochemical pollution. He splits his time between working at the Ecological Engineering Associates and the Woods Hole Oceanographic Institution.

Upcoming Meetings

In addition to the meeting listed on page one, the council has set forth a meeting schedule for the remainder of the year. All council meetings are open to the public and run anywhere from two to three hours.

The results of the technical work group meetings held during the day are summarized at each evening Coordinating Council meeting. For a listing of the scheduled work group meetings (which are also open to the public) and locations, please contact the facilitator or any Council member.

November 3
5:30 p.m.

Discussion of Statement of Work for Second Phase Studies
Burlington Electric Department,
585 Pine Street, Burlington

November 15
7-9 p.m.

Public Informational Meeting to Discuss Progress of the Council
Contois Auditorium,
Burlington City Hall

December 8
5:30 p.m.

Discussion of Statement of Work for Second Phase Studies
Burlington Electric Department

Input solicited on outreach efforts

Council members have sent out letters, surveyed meeting attendees, held informational meetings, and made presentations on current issues in an effort to meaningfully involve the community in developing a new cleanup plan for the site.

If you would like to have a presentation made to your group or if you have suggestions for ways we can keep you abreast of our progress, please contact a Council member (see page 1 of this *Progress Update* for names and phone numbers).

Champlain Parkway plans continue moving forward as Council works on site studies

The City of Burlington, State of Vermont, and the EPA have been working behind the scenes to discuss details necessary to reactivate the Champlain Parkway project (formerly known as the Southern Connector project). Although the project is still in its beginning stages, these initial steps have renewed confidence that the road will be built, at least in part, within the next several years.

The road will be built in two parts. The first part, referred to as "Contract 2," consists of a four-lane divided highway from Home Avenue to Lakeside Avenue. This section of roadway is already designed and rights-of-way have been obtained. Once the design has been reviewed, it can be put out to bid, provided that all approvals for both Contracts 2 and 6 have been obtained.

The second part, known as "Contract 6," consists of a "detour" along Pine Street and a connecting spur between Pine and Battery streets.

Originally, the roadway was to continue from Lakeside Avenue through roughly the middle of the Pine Street Barge Canal Site. Uncertainties about the extent of contamination and the remediation plan for the site, however, have resulted in a decision by both the City and the State to use Pine Street as an alternate route. There is a possibility that when contamination issues at the Superfund site have been resolved, the State and City might reconsider the use of a section of the site (not in the original alignment) for the final location of the roadway.

This spring, use of Pine Street as an alternate route received preliminary approval on traffic numbers from the District 4 Environmental Commission. This approval is the first step toward obtaining final consideration of this alternate route by the environmental commission, which will be scheduled when the City and the State submit complete design drawings for the entire project.

A more complicated portion of Contract 6 consists of a spur through property now owned by the City of Burlington, Vermont Railway and T.A. Haigh, linking Pine Street to Battery Street. This phase is more complicated because it requires the procurement of rights-of-way from the existing property owners. It is hoped that during the construction of Contract 2, the necessary rights-of-way and approvals will be obtained for the spur portion of Contract 6. If this is feasible, construction work could commence on Contract 6 immediately after Contract 2 is completed.

Although there is a lot of work that needs to be done before shovel is put to the ground, the State and the City are committed to doing everything possible to get the job done.

Mailing list questions?

The Coordinating Council maintains two mailing lists. People on the "Pine Street Mailing List" receive copies of periodic *Progress Updates*, and relevant media releases - enough information to keep most people current with the issues. Those who would like additional information can be added to the "Coordinating Council Mailing List" and receive all the Council's meeting summaries. (If you received this Progress Update in the mail, you are already on one of the mailing lists. Please check your address label: a "CC" indicates that you are on the Coordinating Council Mailing List; otherwise you are on the Pine Street Mailing List.)

☐ I would like my name placed on the Pine Street Mailing List

☐ I would like my name placed on the Coordinating Council Mailing List

Please check the box of the mailing list you would like to be on and mail this form to:

Pine Street Barge Canal Coordinating Council
PO Box 4632
Burlington, VT 05406-4632

NAME _____

ADDRESS _____

CITY, STATE, ZIP CODE _____

Pine Street Barge Canal Coordinating Council
PO Box 4632
Burlington, VT 05406-4632

Mailing Labels go here

Pine Street Barge Canal Coordinating Council

Progress Update #3
May 1998

John Akey
Community Representative
(802)863-1765

Ken Carr
U.S. Fish and Wildlife
(603)225-1411

Susan Compton
City of Burlington
(802)863-4531

George Desch
Vt. Dept. Of Env. Conservation
(802)241-3888

Ross Gilleland
Environmental Protection Agency
(617)573-5766

Marty Feldman
Pine Street Arts & Business Council
(802)658-6815

Lori Fisher
Lake Champlain Committee
(802)658-1414

William Howland
Lake Champlain Committee
(802)434-3068

Martin Johnson
Potentially Responsible Party
(802)229-4600

Gary Kjellgren
Potentially Responsible Party
(802)457-6876

Karen Lannino
Environmental Protection Agency
(617)573-5784

Phillip Harter
Facilitator
(802)763-2835

The Pine Street Coordinating Council represents a first-of-its-kind effort that includes a diverse cross section of local citizens, environmental groups, the potentially responsible parties and local state and federal representatives working together to reach consensus on a cleanup remedy. If the Coordinating Council approach is successful in Burlington, the process may duplicated in other cities around the country.

Council reaches Consensus on Cleanup at the Barge Canal... Environmental Projects Proposed

This Progress Update is the third report the Coordinating Council has provided to keep interested citizens informed about activities at the Pine Street Superfund Site.

In September 1997, the Pine Street Barge Canal Coordinating Council reached consensus on a remedy for the Pine Street Superfund site that will address risks posed by contamination at the site.

In addition, to satisfy the concerns of certain council members, if the proposed remedy is adopted, Potentially Responsible Parties have agreed to voluntarily contribute to additional projects that will benefit the greater Burlington area.

Site Remedy

1) Placement of a sand/silt cap on the contaminated canal and wetland sediments. The cap would isolate contamination from canal aquatic life. This would be done under water and with minimal disturbance to contaminated sediments. Underwater capping has been used at other Superfund sites with success.

2) Institutional controls for the most contaminated parts of the site. The proposed controls would prohibit residential use, specify construction techniques for major excavations greater than five feet, establish procedures for utility workers, and prevent land uses that cause recontamination of the site.

See Remedy, page 5

Public Meeting Scheduled

The Pine Street Barge Canal Coordinating Council will host a public meeting on June 4, 1998 at 7:00 pm at the Contois Auditorium in Burlington City Hall to discuss the Proposed Cleanup Plan and to field any questions from the audience. Community attendance is strongly encouraged.

For more information, contact one of the council members listed on the left.

Cleanup Objectives

- Prevent exposure to contaminated soils and sediments which pose a risk.
- Restore wetlands that are affected by the cleanup activities.
- Restrict the use of contaminated groundwater.
- Protect Lake Champlain
- Prevent Re-contamination
- To the extent practicable, ensure the remedy does not interfere with the current and future land uses.

1.

Results are in...Studies are Complete

The Pine Street Barge Canal Coordinating Council has completed evaluating the results of additional studies conducted in 1995 and 1996. The findings are presented in a series of reports most of which are available to the public. A list of these reports can be found on page 6.

When convened in 1993, the Coordinating Council developed a list of questions of questions based on the public's concerns which needed to be answered prior to choosing a cleanup plan for the Pine Street Superfund Site.

These questions were presented in Progress Update #2. A diverse group of technical experts was assembled to review all existing data. Some of the questions were answered after the technical experts discussed the data and reached scientific positions of agreement.

For the unresolved questions, the technical experts designed the additional studies needed to collect the necessary data. The Potentially Responsible Parties and their contractors then conducted field work, analyzed samples and evaluated data.

The Coordinating Council also developed objectives for an acceptable remedy. The Feasibility Study which evaluates the cleanup alternatives along with the rest of the administrative record will be available at the site repositories beginning June 5.

The culmination of this work marks major progress at the Barge Canal site and a significant accomplishment for the Coordinating Council, as consensus has been reached regarding the nature and extent of contamination and the risks it poses.

On June 24, 1998, there will be an official hearing and a 30-day public comment period on the proposed cleanup plan. The last day to submit comments is July 8, 1998.

The following are answers to some of the more frequently asked questions:

1) *Is site contamination currently affecting Lake Champlain?*

No. There are three possible ways that site contamination could reach Lake Champlain: surface water flow, groundwater flow and movement of contaminated sediments. Because previous investigations have shown that the surface water in the canal is clean, this route was not studied again in 1994-1995.

Questions did remain about whether contaminated groundwater from the site could reach Lake Champlain and whether contaminated sediments from the canal could be carried to Lake Champlain during storms.

To resolve the first issue, the groundwater level was measured for one year; groundwater samples were collected between the canal and the Lake; and "worst case" calculations of contaminant transport were performed.

These studies showed that a groundwater divide sometimes exists between the canal and the Lake which would prevent flow to the Lake. When the divide is not present, groundwater is able to flow to the Lake. However, most of the groundwater samples collected between the canal and the Lake were not contaminated. One sample did contain the compound benzene at concentrations exceeding drinking water standards. The technical experts concluded, however, that the amount of contaminated groundwater that reaches the Lake is not high enough to cause risk to people or the ecosystem.

To resolve the second issue, suspended sediment was collected hourly at the mouth of the turning basin during major storms. The experts also agreed that significant amounts of sediment are unlikely to move from the canal and turning basin into the Lake.

2) *Is the air safe to breathe under current, undisturbed conditions?*

Yes. Four 24-hour ambient air samples were collected at the site on several hot dry days with little wind. These conditions represented a "worst case" scenario. The results of these tests indicated that the site does not impact the ambient air quality of the area.

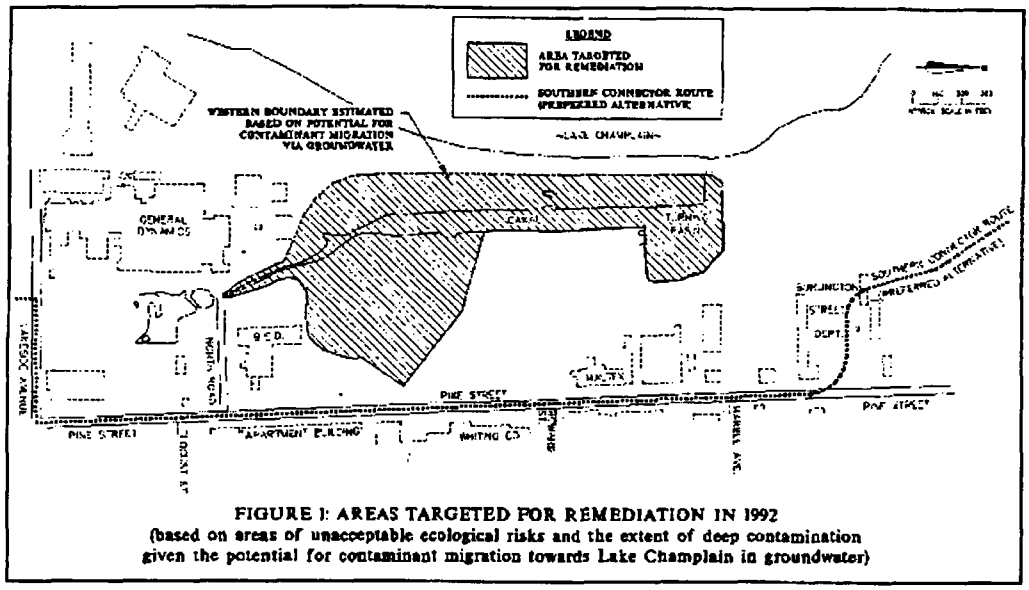


FIGURE 1: AREAS TARGETED FOR REMEDIATION IN 1992
(based on areas of unacceptable ecological risks and the extent of deep contamination given the potential for contaminant migration towards Lake Champlain in groundwater)

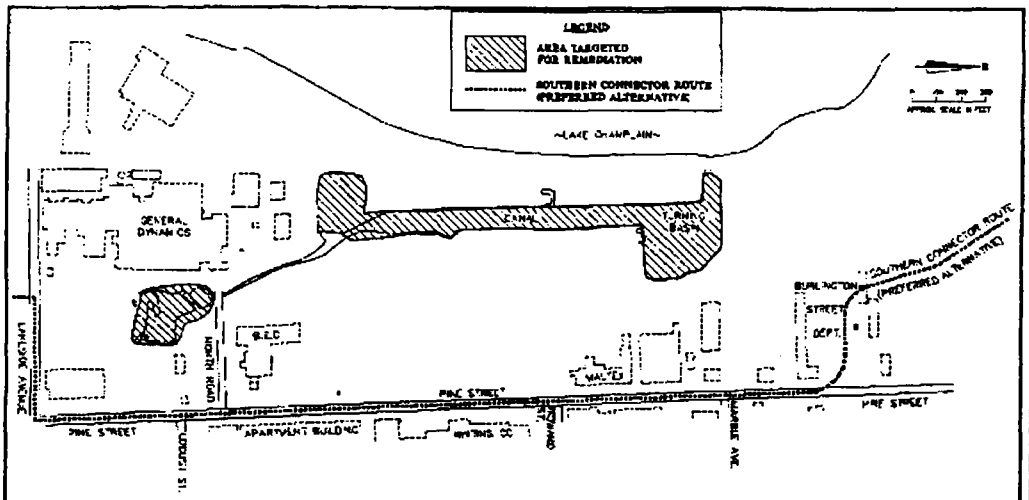


FIGURE 2: AREAS CURRENTLY BEING TARGETED FOR REMEDIATION
(based on areas of unacceptable ecological risks and the finding of no significant migration of contaminants)

PROGRESS UPDATE FIGURES PINE STREET CANAL SITE BURLINGTON, VERMONT	THE JOHNSON COMPANY, INC. *Environmental Sciences and Engineering* 100 STATE STREET MONTPELIER, VT 05602

3.

3) Does the contaminated soil pose a risk to people on the Site?

The Human Health Baseline Risk Assessment conducted by EPA in 1992 assumed the future use of the land would be commercial, not residential. The 1992 assessment did not find unacceptable risk to most workers at the site or visitors to the site who came in contact with surface soils, however, the Coordinating Council felt that an assessment of additional areas that are particularly accessible to the public should be done.

An additional fifty soil samples were tested. Testing did not reveal any areas that posed risk greater than that estimated in the original risk assessment.

The 1992 risk assessment did not evaluate the risk of exposures to soils at depths greater than five feet. The Coordinating Council agreed with the EPA that exposures were unlikely; as a result, a second risk assessment on subsurface soils was not performed.

However, because contamination does exist below five feet, institutional controls such as worker protection requirements, deed and zoning restrictions will be implemented.

4)How significant is ecological risk at the Site?

Significant ecological risk was found in some areas of the site, but not in others. The Supplemental Baseline Ecological Risk Assessment, completed in 1997, evaluated certain "indicators" which were selected to provide information regarding the overall health of the ecosystem.

The assessment examined the risk to birds eating insects and fish from the site; the risk to fish from exposure to contaminated sediments; and the risk to bottom dwelling invertebrates and amphibians from exposure to contaminated sediments. Some, but not all, of these organisms showed adverse impacts when exposed to soils and sediments from the site. The information shows that contaminants at the site are causing significant ecological risk in the areas shown in figure 2. These areas were the focus of the evaluation of cleanup alternatives.

5)Is the Site "healing" itself and is the contamination contained?

During 1994 and 1995, a series of test were run to answer these questions. The first test confirmed that microorganisms capable of breaking down organic contaminants were present at the site. The second phase of studies tested these microorganism's ability to break down the contamination found at the Pine Street site. The results of these two studies support the hypothesis that gradual "bioremediation" is occurring, particularly at the margins of the site where contamination is less concentrated.

OPPORTUNITY TO PARTICIPATE

In addition to the meeting on page one, the public may offer formal comment on the Pine Street Barge Canal Site proposed cleanup plan. The public comment period begins June 5, 1998 and ends July 8, 1998. Written comments may be sent to:

Karen Lumino
USEPA
JFK Federal Building/HBT
Boston, MA 02203
FAX:617/573-9662
e-mail:
lumino.karen@epamail.epa.gov

The public may also comment formally at the form hearing on June 24, 1998 at 7:00pm at the Contois Auditorium at Burlington City Hall.
All comments submitted will be included in the public record and responded to formally by the EPA.

This bioremediation along the margins may be helping to slow the spread of contamination. Microbial degradation may also help to explain why concentrations of organic compounds in surface water are low, despite high levels of sediment contamination.

Results, continued on pg 5

Results, continued from page 4

However, bioremediation by microorganisms cannot eliminate these organic contaminants within a reasonable time frame. Additionally, these microorganisms do not have any effect on metal contamination which is also present at the site.

Site Remedy, continued. from page 1

3) Monitoring to ensure that contamination left on-site does not reach Lake Champlain or diminish the longterm effectiveness of the cap.

4) Five year reviews would be conducted to insure the remedy remains protective.

The projected cost of the project is $4.3 million.

Additional Projects

If the Council's proposed remedy ultimately is adopted, the Potentially Responsible Parties represented on the Council will contribute to the following, independent additional projects:

1) Restoration of Englesby Brook. Erosion control measures, stormwater treatment devices, and source reduction measures would be put in place to reduce discharges of bacteria, sediment, and other pollutants to Englesby Brook and Lake Champlain thereby improving water quality.

2) Assessment of Water Quality of Burlington Bay. Funding would be used to determine the current status of the Bay and to track changes related to pollution prevention programs like the Englesby Brook restoration. The information developed during the assessment would be made available to citizens and policy makers through a series of outreach efforts.

3) Barge Canal Interpretive Trails. This project would provide safe access to certain portions of the site through a series of connected boardwalks and trails. The trails would include interpretive signs to educate visitors on the natural and cultural history of the area.

4) Economic Redevelopment. The project would fund a site-wide engineering study in order to encourage redevelopment and reuse of the Barge Canal site in a manner protective of the remedy.

The total estimated costs for implementing these additional projects is approximately $3 million to be spend over a 5-year period. The Potentially Responsible Parties have tentatively agreed to fund the projects in addition to paying for and implementing the cleanup remedy at the Pine Street Superfund site.

City of Burlington Receives Brownfields Grants

The EPA recently awarded the City of Burlington a second Brownfields grant of $200,000. To redevelop abandoned contaminated properties. This is the second $200,000 grant awarded to the City under EPA's Brownfields Initiative. The first was awarded in 1996.

Brownfields are defined as sites where real or perceived contamination have caused barriers to redevelopment. The aim of EPA's grant is to inventory, assess, and prepare strategies for redevelopment of brownfields.

The City will use the money will to assess sites such as the former Exxon headquarters on Flynne Avenue and to help plan for Riverside Eco-Park near the Burlington Intervale. The City also might use the money to study redevelopment of portions of the Pine Street Barge Canal Site.

The Pine Street Coordinating Council has proposed that portions of the Pine Street Superfund Site be redelineated to facilitate redevelopment of non-contaminated areas.

The brownfields grant is being administered by the Burlington Community and Economic Development Office. Project Manager Nick Warner can be reached at (802)865-7173 (faxes to (802)865-7024).

5.

Vermont residents recognized for hard work.

John Akey, Lori Fisher, Marty Feldman, Bill Howland, Al McIntosh, and Mary Watzin were awarded Environmental Merit Awards by the United States Environmental Protection Agency, Region I at the annual Earth Day awards ceremony on April 25 in Boston. These Vermonters were recognized for their dedication and hard work on the Pine Street Canal Superfund Site project. As advocates for Vermont citizens, business groups and environmental organizations, these individuals brought unique perspectives to the table in designing the studies that would be necessary for selecting an appropriate remedy for the site.

Available Reports

The following reports are, or will soon be available, along with all previous reports in the Administrative Record for the site, at the Fletcher Free and UVM (Reserve Section) libraries and at the EPA Region 1 Superfund Records Center, 90 Canal Street, Boston, MA 02203 phone: (617) 573-5729. The Administrative Record contains copies of technical reports as well as fact sheets and site updates.

Additional Remedial Investigative Report, Pine Street Canal Barge Superfund Site, Burlington, Vermont, Johnson Company, July 1997. This report evaluates the results of all previous field investigations conducted at the site to present the nature and extent of contamination found at Pine Street Barge Canal Site. This report also presents an in- depth description of the most recent work conducted in 1994 and 1995. In-depth discussion of previously conducted work is contained in the Administrative Record. Additionally, this report presents the position papers that address the human health exposure questions raised by the Coordinating Council. The data in this report provided the basis for the Supplemental Baseline Ecological Risk Assessment and Additional Feasibility Study (APS).

Supplemental Baseline Ecological Risk Assessment, Roy F. Weston, Inc. July 1997 This report evaluates the chemical, physical, and biological data from the Site, examines the results of the sediment toxicity tests, and, using a weight-of-evidence approach, draws conclusions about baseline ecological risk at the site. These results, along with those of the APS, are being used to identify remedies that may be appropriate.

Natural Biodegradation Evaluation at the Pine Street Canal Site, Burlington, VT, Remediation Technologies, Inc., April 1995. Soil, sediment, and water samples were collected from the site for a series of bacteriological tests to examine the hypothesis that microorganisms adapted to Site conditions and capable of breaking down the contaminants of concern exist at the Site.

Initial Screening of Remedial Alternatives, Pine Street Canal Site, Burlington, Vermont, GEI Consultants,Inc., February, 1996. This report represents the first step in the Additional Feasibility Study. It examines a list of possible remedial technologies and makes recommendations for those technologies that should be examined in more detail in the APS.

Intrinsic and Enhanced Bioremediation Assessments, Pine Street Canal Site, Burlington, Vermont, RETEC Remediation Technologies, Inc., December, 1996. This report builds on the Natural Biodegradation Evaluation and documents the results of bioremediation laboratory studies.

Draft Additional Feasibility Study Report, Pine Street Canal Site, Burlington, Vermont, RETEC Remediation Technologies, Inc. This report, which should be available to the public by November, will examine in detail remediation options that were identified in the initial screening report. It will also present the Remedial Action Objectives and Preliminary Remediation Goals developed by the Coordinating Council. The results will be used to recommend a remedy for the Site.

6.

Pine Street Barge Canal Coordinating Council

Progress Update #4

October 1998

John Akey
Community Representative
(802)863-1765

Ken Carr
U.S. Fish and Wildlife
(603)225-1411

Susan Compton
City of Burlington
(802)863-4531

George Desch
Vt. Dept. Of Env. Conservation
(802)241-3888

Ross Gilleland
Environmental Protection Agency
(617)573-5766

Marty Feldman
Pine Street Arts & Business Council
(802)658-6815

Lori Fisher
Lake Champlain Committee
(802)658-1414

William Howland
Lake Champlain Committee
(802)434-3068

Martin Johnson
Potentially Responsible Party
(802)229-4600

Gary Kjelleren
Potentially Responsible Party
(802)657-6876

Karen Lumino
Environmental Protection Agency
(617)573-5784

Philip Harter
Facilitator
(802)763-2835

The Pine Street Coordinating Council represents a first-of-its-kind effort that includes a diverse cross section of local citizens, environmental groups, the potentially responsible parties, and local state and federal representatives working together to reach consensus on a cleanup remedy. If the Coordinating Council approach is successful in Burlington, the process may duplicated at other sites around the country.

EPA Selects Cleanup Plan for the Pine Street Canal Superfund Site

The Cleanup Remedy

The EPA has officially adopted a $4.38 million cleanup plan for the Pine Street Canal Superfund site. The plan was developed in collaboration with the Pine Street Barge Canal Coordinating Council.

During a ceremony held last May, the Coordinating Council formally recommended to EPA-New England Regional Administrator John P. DeVillars, that the Agency adopt a cleanup plan for the site that includes capping, long-term monitoring and institutional controls for groundwater and land use development.

EPA accepted the Council's recommendation and on May 27, 1998 released the proposed plan.

Before being selected, the plan however still had to undergo broader public review and comment.

In June, the EPA and Council held an informational meeting at City Hall in Burlington which kicked off the public comment period.

From June and until the close of the comment period in August, the EPA solicited formal public comment. Overall, the public response to the plan was favorable. Having attained the public's acceptance, EPA approved the plan.

Questions and concerns about the cleanup process or schedule may be directed to EPA Project Manager Karen Lumino. Karen may be reached at EPA's toll free number at: 1-888-372-7341.

Coordinating Council member Lori Fisher presented the Council recommendation on the Pine Street cleanup plan to EPA Regional Administrator John DeVillars at a ceremony held at the Pine Street site in May.

Cover several wetland areas of contaminated soil and sediment

An Overview of the cleanup ...

Placing an underwater cap over the canal sediments that present the highest risk to the environment.

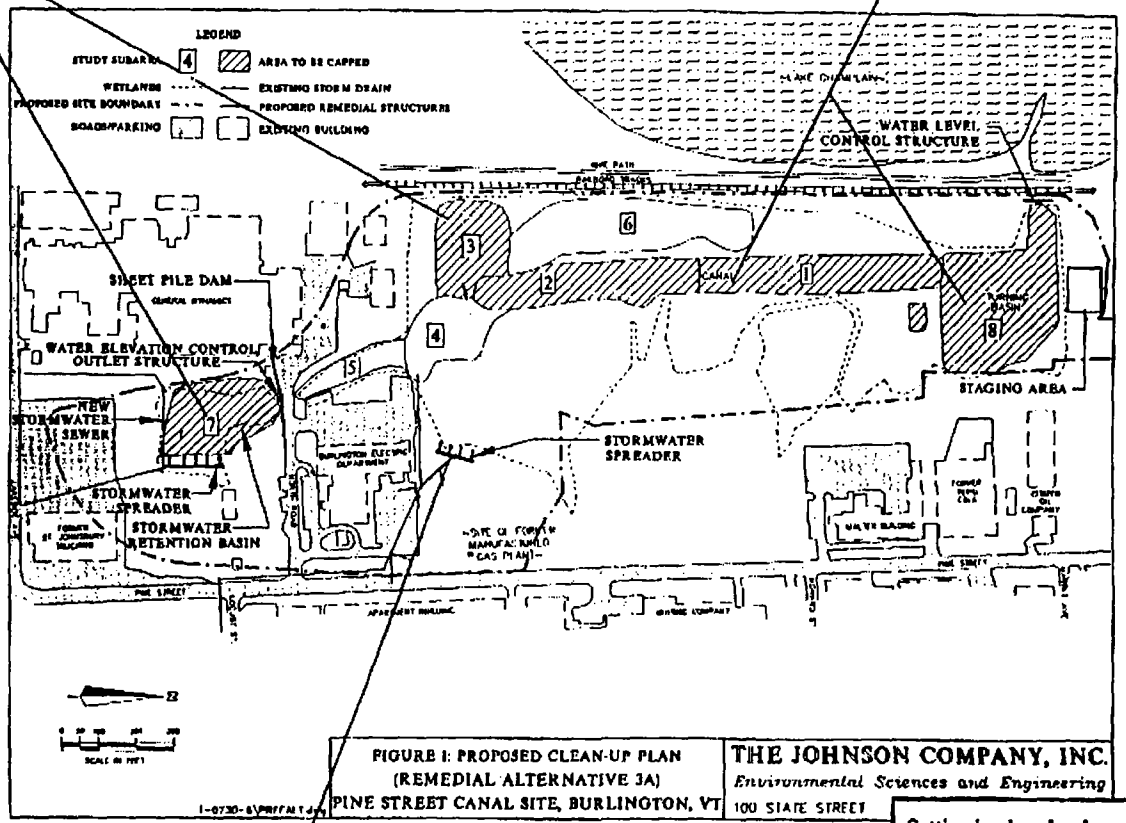


FIGURE 1: PROPOSED CLEAN-UP PLAN
(REMEDIAL ALTERNATIVE 3A)
PINE STREET CANAL SITE, BURLINGTON, VT

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering
100 STATE STREET

Redirecting and monitoring surface water, soils and sediment at the site.

Setting in place land-use restrictions to prevent residential use, unsafe contact with contaminated soils below five feet, use of water for drinking and future use of the site as a Children's Day care.

Community Based Environmental Decision Making
... A Success Story

Here and across the country, citizens are playing an increasingly active role in addressing major environmental problems in their communities.

Rather than make decisions without community input, Federal and State regulatory agencies are involving key stakeholders in the decision-making process. Partnering with people at the local level allows EPA to find cost effective sensible solutions to a variety of local environmental problems.

The Pine Street Barge Canal Coordinating Council are among the pioneers of community based decision making. Since 1993, members of the Burlington business, art and environmental community met regularly with the EPA, the US Fish and Wildlife Service and Vermont Department of Environmental Conservation, to develop a cleanup plan for the Pine Street site.

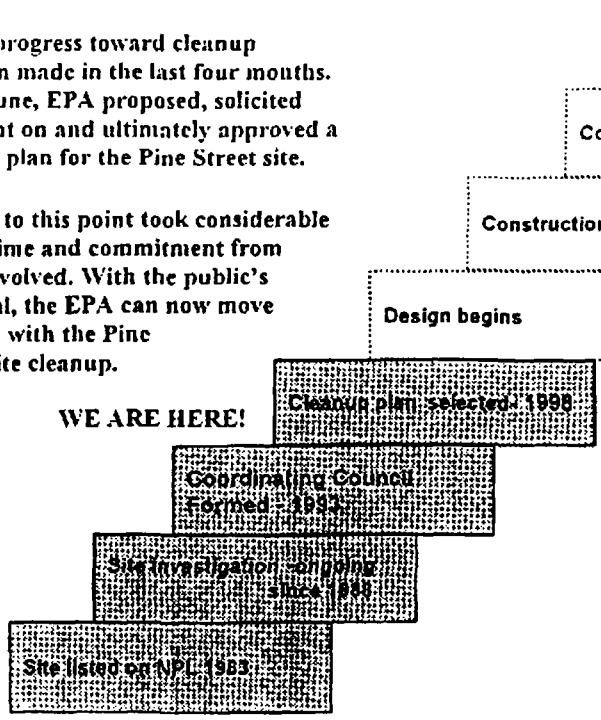
Five years later, we have a cleanup plan that is acceptable to the community and environmental regulators. EPA anticipates that the work on site will begin by the year 2000.

Cleanup Progress at Pine Street

Steps Taken...

Major progress toward cleanup has been made in the last four months. Since June, EPA proposed, solicited comment on and ultimately approved a cleanup plan for the Pine Street site.

Getting to this point took considerable effort, time and commitment from those involved. With the public's approval, the EPA can now move forward with the Pine Street site cleanup.



Next Steps...

The Potentially Responsible Parties (PRPs) are expected to begin Remedial Design this winter.

EPA expects the cap construction to begin during the spring/ summer of the year 2000.

Where you can go for more information...

This publication summarizes a number of reports and studies. All of these technical reports as well as other public information publications are available at the following Pine Street Canal site information repositories:

Fletcher Free Public Library
235 College St.
Burlington, VT 05401
(802)863-3403
Hours:
M-F: 8:30am-5:30pm
Sat : 9.00am-5:30pm
Sun: 12:00-5:45pm (Sept.-May)

Bailey/Howe Library
University of Vermont
Burlington, VT 05405
(802) 656-2023
Hours:
M-F: 8:00 am-12:00am
Sat: 9:00am-12.00am

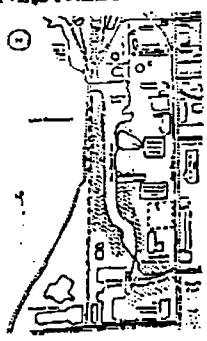
EPA Records Center
One Congress Street
Boston, MA 02203
(617)573-5729
Hours:
M-F: 10:00am-1:00pm
2:00pm -5:00pm
Note: The EPA Record center is closed the first Friday of every month.

For general Superfund information, Internet users may visit EPA's web page at: http://www.epa.gov/region01/superfund

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
JFK Federal Building/ RAA
Boston, MA 02203

First class mail
Postage and fees paid
EPA
Permit number
G-35

PINE STREET BARGE CANAL



COORDINATING COUNCIL

P.O. Box 4632
Burlington, VT 05406

FOR IMMEDIATE RELEASE

November 23, 1993

Contact People: Marty Feldman, (802) 658-6815
Lori Fisher, (802) 658-1414

PINE STREET COORDINATING COUNCIL TO REVIEW SUPERFUND PROCESS

BURLINGTON, VT -- Scientists from the U.S. Environmental Protection Agency will participate in the Pine Street Barge Canal Coordinating Council meetings at the Burlington Electric Department on Dec. 1 and 2 to give presentations on how risks to human health and the ecology affect decision-making at Superfund sites such as the Pine Street Barge Canal in Burlington, Vermont.

The EPA's risk assessments evaluate and quantify the risks to public health and the environment posed by specific chemicals at each site and comprise the foundation for all Superfund cleanups.

"It's really important to learn how and why risk assessments are done so we can truly understand their effect on our Barge Canal," said Marty Feldman, a local citizen representative on the Coordinating Council.

On Dec. 1, Margery Adams, EPA Assistant Regional Counsel, will provide an overview of the Superfund process and Anne Marie Burke, an EPA toxicologist, will talk about how to assess human health risks. On Dec. 2, Susan Svirsky, an EPA Ecological Risk Assessor, will give a presentation on how EPA assesses risks to the environment. Both Burke and Svirsky have had several risk assessment articles published in medical and scientific journals. The meetings will begin at 5:30 p.m. and the presentations will be followed by question and answer periods that will continue until 9 p.m.

The Pine Street Barge Canal Coordinating Council represents a first-of-its-kind effort that includes a diverse cross-section of local citizens, environmental groups, the potentially responsible parties, and state and federal representatives working together to reach consensus on issues of concern at the site. Since its formation, the Council has met regularly to discuss a wide variety of issues pertinent to the site.

- 30 -

For more information, contact:
Marty Feldman, Pine Street Arts and Business Ass', 658-6815
Alan McIntosh, University of Vermont, 656-8885
Gary Kjelleron, Martin Marietta, 657-6876

August 15, 1994

NEW ROUND OF STUDIES TO BEGIN AT PINE STREET BARGE CANAL

Burlington, Vt. -- Field teams will embark on a new round of studies next week that are designed to help answer remaining questions concerning the Pine Street Superfund Site in Burlington, Vt.

Contractors for Green Mountain Power Corporation, New England Electric Service, and Vermont Gas will be moving a trailer and various testing equipment on the site in preparation for studies which will build upon the data the Environmental Protection Agency collected during its original assessment of the site from 1989 through 1992. This year's studies constitute the first phase of action the council has decided on to fill data gaps at the site. A second phase will begin next year unless the Coordinating Council finds the first phase provided sufficient data to decide on a remedy.

Most of the site's contamination comes from coal tars and other by-products generated by a coal gasification plant that operated on the premises from the turn of the century through the '60s. Pine Street Coordinating Council members and their scientific experts have been meeting several times a month for the past year to determine what additional studies need to be conducted before deciding on a new cleanup plan. This council represents a first-in-the-nation effort to use a coalition of community, government and business members to reach consensus on contentious issues at the site.

More than 300 additional soil and sediment samples will be collected to further define the concentrations and locations of the contaminated sections of the site.

The scientists will gather information in an effort to determine whether the potential exists for the contaminants to move off the site into Lake Champlain. To measure this possible movement, groundwater at location between the canal and the lake analyzed.

An issue raised during last year's public comment period on the EPA's proposed plan entailed the air emissions emanating from the site under existing conditions. Field teams will install air monitors at various locations on the site to determine if such emissions are occurring under existing conditions, and if they present any type of a public health threat.

"As a council, we decided that it was very important that we start work on as many of the field studies as we possibly could before the snow flies," said Lori Fisher of the Lake Champlain Committee. "We hope to use the data we obtain to answer remaining questions as to whether the site presents a significant risk to human health or the environment."

The Pine Street Coordinating Council was formed in the summer of 1993 after local officials and residents overwhelmingly rejected the EPA's proposed plan to remediate the site.

Note to the media: The Pine Street Coordinating Council will be conducting media tours of the site and the equipment for members of the media at 2:00 on Wednesday, August 17.

-30-

For more information, contact:

Lori Fisher, Lake Champlain Committee, (802) 658-1414
Phil Harter, Pine Street Coordinating Council, (802) 763-2835
Leo Kay, EPA Press Office, (617)565-3383
George Desch, Vermont DEC, (802) 241-3888

Council Proposes Cleanup Plan,
Additional Projects for Pine Street Barge Canal Site

BURLINGTON, Vt. -- The Pine Street Barge Canal Coordinating Council announced today the proposed barge canal cleanup plan, along with a series of additional projects designed to improve the environment in the greater Burlington area.

The EPA will accept public comments on the proposed plan from June 5 through July 8. A public meeting to discuss the proposed plan only will be held at 7 p.m., June 4 at Contois Auditorium in Burlington City Hall, and a formal public hearing will be held June 24 in the same location. A copy of the plan will be available for review at the Burlington Public Library beginning June 4.

The additional projects -- valued at $3 million -- were agreed upon by the community and the potentially responsible parties, or PRPs. The PRPs agreed to the projects in discussions with the council separate from the federal Superfund process. The additional projects are not subject to public comment.

"This process -- the first-of-its-kind nationwide -- has trimmed the original proposed cleanup plan of $50 million down to $10 million. And with the additional special projects we're getting more environmental protection at less cost. That's smart,"said John P. DeVillars, administrator for the EPA New England office. "Bravo to the coordinating council for the members' perseverence, creativity and dedication in arriving at a fundamentally sound, economically sensible cleanup decision that will reap benefits far beyond the site itself. The council's groundbreaking work will serve as a blueprint for other communities who are struggling with Superfund cleanup decisions."

Quote from coordinating council

"This has been a long, tedious journey but we have arrived safely and I think the people of Vermont and of the nation should be proud of the work done by the EPA and the other groups and individuals who have worked on this process," said A. Norman Terreri, retired Chief Operating Officer for Green Mountain Power. "We have applied the right science, the right law, and the right financial analysis to this problem. We have also applied common sense, and I believe that this is the glue that held this agreement together. It was possible because, if I can paraphrase Vermont's most famous literary lion, 'we took the road less traveled by.'"

"In 1993, when I called EPA officials in to explain why their proposed remedy was unacceptable to Vermonters and Burlingtonians, they offered to work with us," said Sen. Patrick J. Leahy. "The result is a plan for the Barge Canal and additional environmental projects benefitting Lake Champlain that we can all support. Our thanks to the agency and the coordinating council members for their long years of work that have made this possible."

"The recent settlement reflects the ingenuity and dedication of Burlington residents to developing a comprehensive, affordable and realistic plan," said Sen. James Jeffords. "Their efforts will stand as a model to the nation and a lesson to Congress as we work to fix the Superfund program."

Cong. Sanders

"The proposed remedy for Pine Street represents an immense effort on the part of the coordinating council to reach consensus among a diverse group of interests," said Natural Resources Secretary Barbara G. Ripley. "I can't say enough about the dedication of this group, especially the citizen volunteers. In the best tradition of Vermonters working together, their perseverance forged a pragmatic proposal that protects our environment."

Mayor Clavelle

For the official site proposed plan, the coordinating council recommended and the EPA is proposing the following remedy:

* Placement of a sand/silt cap on the contaminated canal and wetland sediments to isolate contamination. The cap would be placed under-water causing minimal disturbance to the sediments. Underwater capping has been successfully used at other Superfund sites.

* Monitoring to ensure that contaminated groundwater does not reach Lake Champlain, monitoring surface water, and monitoring sediment migration to ensure the cap's effectiveness.

*Place legal controls on land use to prevent use of groundwater for drinking, prevent exposure to soil greater than five feet deep, prevent activities that may result in migration of subsurface contamination, prevent residential use and prevent future use as a children's day care center

* Five-year reviews to make sure the remedy is effective.

The total estimated cost of the remedy is between $4.3 - 6 million. After considering the comments received during the public comment period, the EPA will issue a formal decision on the remedy for the Barge Canal Site.

The council also agreed to re-delineate the site boundaries to help facilitate redevelopment near the site. The city of Burlington recently received its second $200,000 "brownfields" grant from the EPA to redevelop abandoned, contaminated properties. Some of the property the city is considering for reuse abuts the Barge Canal Site.

If the council's site remedy ultimately is adopted, the potentially responsible parties represented on the council will contribute to the following independent additional projects:

1. **Restoration of Englesby Brook**
Erosion control measures, stormwater treatment devices, and source reduction measures would be put in place to reduce discharges of bacteria, sediment, and other pollutants to Englesby Brook and Lake Champlain, thereby improving water quality.

2. **Assessment of Water Quality of Burlington Bay**

Funding would be used to determine the current status of the bay and to track changes related to pollution prevention programs like the Englesby Brook restoration. The information developed during the assessment would be made available to citizens and policy makers through a series of outreach efforts.

3. **Barge Canal Interpretive Trails**
This project would provide safe access to certain portions of the site through a series of connected boardwalks and trails. The trails would include interpretive signs to educate visitors on the natural and cultural history of the area.

4. **Economic Redevelopment**
The project would fund a site-wide engineering study in order to encourage redevelopment and reuse of the Barge Canal site in a manner protective of the remedy.

The total estimated costs for implementing these additional projects is approximately $3 million to be spent over a five-year period. The potentially responsible parties have tentatively agreed to fund the projects in addition to paying for and implementing the cleanup remedy at the Pine Street Barge Canal Site.

The 70-acre Pine Street Canal Site was used as a coal gasification plant from 1895 - 1966. Plant waste waters, coal tars, residual oil and wood chips saturated with organic compounds were discharged or disposed of in the Pine Street Canal wetland. The EPA added the site to its National Priorities List of Superfund sites in 1983.

###

Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont

United States Environmental Protection Agency Region I

Office of External Programs John F. Kennedy Federal Building Boston, Massachusetts 02203

Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont

EPA Environmental News

For more information call
Sheila Eckman, Project Manager, (617) 573-5784
Ross Gilleland, Project Manager, (617) 573-5766
Liza Judge, Community Relations, (617) 565-3419

FOR IMMEDIATE RELEASE Release # 93-6-4
June 4, 1993

EPA DROPS BARGE CANAL CLEANUP PLAN IN RESPONSE TO COMMUNITY CONCERNS

BOSTON -- The U.S. Environmental Protection Agency (EPA) announced today that in response to public comments it has decided not to pursue its current proposal to dredge and contain contaminated soil at the Pine Street Canal Superfund site, as presented in the November, 1992 Proposed Plan.

Paul G. Keough, Acting Regional Administrator stated, "A good Superfund remedy must balance a number of sometimes competing factors -- protecting public health, and the environment, ensuring technical feasibility, and minimizing cost. For the Barge Canal site, public involvement is essential to reaching the right balance. It's clear from the comments that we have not reached that balance, and should not go ahead with our proposed plan."

"We are carefully considering all comments and are currently working with the Lake Champlain Committee to identify the best way to involve Burlington citizens and the local scientific community," Keough said. The Lake Champlain Committee, EPA's Technical Assistance Grant recipient, and other community groups have suggested possible ways to better involve Burlington and local scientists. After reviewing the comments EPA and the LCC will be able to determine the best way to insure effective community input.

In response to requests from the public, EPA extended its comment period on its Proposed Plan to 6 months, the longest ever in the Region. Initial review of the extensive comments shows no support for the plan. Commentors raised concerns regarding EPA's

- more -

human and ecological risk assessment and the need for action. Other options were offered ranging from different cleanup proposals to further studies. A thorough review and evaluation of nearly 100 comments received by EPA will take several months.

Public and state acceptance of cleanup proposals are two of the nine criteria EPA uses to make final decisions about cleanup technologies for sites such as Pine Street.

The Pine Street Canal Superfund site is on the eastern shore of Lake Champlain in the City of Burlington, Vermont. The 50-acre site was historically industrial; however, residences, small shops, offices and public parks are located nearby. A coal gasification plant, generating coals tars and other by-products, operated on the site from the turn of the century until the late 1960s. In 1981, the site was proposed to EPA's National Priorities List (NPL) of hazardous waste sites making it eligible for action under the federal Superfund program. In 1983, the site was officially added to the NPL. In 1985, EPA removed approximately 1500 tons of coal tar, contaminated soil, and sediment from the Maltex Pond part of the site. In 1986, EPA assumed lead responsibility for investigation from the Vermont Department of Environmental Conservation. In 1988, EPA began a Remedial Investigation and Feasibility Study (RI/FS) to determine the nature and extent of contamination and evaluate the range of cleanup alternatives. Widespread contamination was found in the canal and wetlands. In November 1992, EPA proposed a cleanup plan to dredge and contain contamination. The site is connected to Lake Champlain which serves as a source of drinking water for Burlington and other lakeside communities.

####

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION I
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203

Forwarding and address correction requested

Region I
Office of External Programs (REA)
John F. Kennedy Federal Building
Boston, Massachusetts 02203

Official Business
Penalty for Private Use
$300

First Class Mail
Postage and Fees Paid
EPA
Permit no. G-35

United States
Environmental Protection Agency
New England Region

Office of External Programs
JFK Federal Building
Boston, MA 02203

Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont

EPA Region 1, New England

Environmental News

For more Information, contact: Margery Adams, 617/565-3746
Sheila Eckman, 617/573-5784

For Immediate Release: September 24, 1997 **Rel #:97-9-9**

Coordinating Council Mulls Supplemental Environmental Projects, Prepares for Public Comment Period

BOSTON -- A day after reaching a tentative agreement on a key component of the proposed remedy for the Pine Street Superfund Site, the Pine Street Barge Canal Coordinating Council explored a series of supplemental projects that could be undertaken by the potentially responsible parties (PRPs) as part of a larger plan to improve environmental conditions in and around Burlington.

"We've turned a $50 million Rube Goldberg contraption into an effective, affordable mechanism for environmental protection. And importantly, we've created an opportunity for urban development in a county where green space is being gobbled up at a record pace," said John P. DeVillars, administrator of the EPA's New England office.

DeVillars encouraged the Council to explore other side projects that would benefit the local environment beyond the site itself as part of an overall settlement regarding past pollution in the Barge Canal. He suggested the consideration of natural resource improvements of the Englesby Brook Watershed and a technical assistance program for small businesses in the Burlington area to reduce their use of toxics.

"In return for a more affordable cleanup we should explore other environmental benefits as part of this settlement," DeVillars said.

Senator Patrick Leahy, who requested that the EPA withdraw its earlier cleanup plan and establish the Coordinating Council, said, "I am monitoring the Council's deliberations closely since this is a test of innovative approaches under Superfund. The EPA has been very supportive in helping us find a consensus solution, so I would urge the Council members to keep up their collaborative effort, especially as we near its completion."

"I also want to applaud and commend Senator Leahy. Without his intervention at the beginning we never would have gotten on track, and without his continued vigilance we would not likely have reached this destination," DeVillars said. "We're very grateful for his substantial contributions."

(More)

"This diverse group of businesses, environmentalists and government officials is working hard to reach consensus on the best clean-up plan. I am also pleased that the EPA has defined the boundaries of the site so that the less contaminated areas are considered 'brownfields," and can be redeveloped to benefit Burlington's economy as well as the environment," said Senator James Jeffords.

"I am pleased that the EPA and the community worked together to come up with a preliminary agreement that is cost effective and responsible. I hope that the Coordinating Council will continue to work toward a final plan which addresses contamination risk," said Rep. Bernie Sanders.

While pleased with the preliminary agreement, Lori Fisher of the Lake Champlain Committee emphasized that a final agreement requires consensus on several additional components of the proposed remedy. "We're optimistic that we'll reach agreement and we look forward to a final holistic remedy that addresses the on-site ecological risks and includes off-site work to prevent pollution and reduce toxic contamination."

The original plan presented by the EPA in 1992 called for construction of a $50 million remedy at the site. Since the plan met strong public opposition, the EPA agreed to look at a new, less costly and less intrusive alternative.

The EPA and the Coordinating Council will formally issue a proposed plan that will go out for public review and comment later this year. During that time the EPA will hold an informational public meeting and a public hearing. In making the final decision on a remedy, comments taken from the community will be considered.

The points of the plan agreed to by the Council and for which the EPA will seek public comment include:

* Institutional controls for the most contaminated parts of the site. The proposed controls would prohibit residential use, limit construction techniques for major excavations greater than five feet, establish procedures to protect workers working on utilities, and prevent land uses that could cause recontamination of the site.

*Placement of a sand/silt cap on the contaminated canal and wetland sediments. The cap would isolate contamination from environmental receptors. This would be done underwater and with minimal disturbance of contaminated sediments. Underwater capping has been used at other Superfund sites with success.

* Monitoring to ensure that contaminated groundwater does not reach Lake Champlain, and monitoring of sediment migration to Lake Champlain, and monitoring to ensure effectiveness of the cap.

*Five year reviews to insure that the remedy remains protective.

*The projected cost of the remedy is $6-10 million.

VISIT EPA's WEB SITE HOME PAGE FOR NEWS AND INFORMATION: http://www.epa.gov/region01

The Pine Street Barge Canal Site is an 80-acre site that was used as a coal gasification plant from 1908-1966. Plant waste waters and residual oil and wood chips saturated with organic compounds were discharged or disposed of in the Pine Street Barge Canal wetland.

During the 1960's and 1970's an oil-like material was detected seeping from the Pine Street Canal wetland, the Turning Basin and Maltex Pond. In testing the sediments, the Vermont Agency of Natural Resources (ANR) detected high levels of organic compound associated with coal tar at several locations on site. Polycyclic Aromatic Hydrocarbons (PAHs) and Volatile Organic Compounds were also detected in the groundwater and sediments. Concerned that the site posed a significant threat to Lake Champlain, a public drinking water source, the Vermont ANR referred the site to EPA.

The Pine Street Barge Canal Site was listed on the EPA's National Priorities List (NPL) in 1983.

###

United States
Environmental Protection Agency
New England Region

Office of External Programs
JFK Federal Building
Boston, MA 02203

EPA Region 1, New England

Environmental News

Contact: Alice Kaufman, EPA Press Office, 617.565.4592

For immediate release: October 1, 1998 98-10-2

EPA APPROVES CLEANUP PLAN AS WORK MOVES FORWARD ON THE PINE STREET SITE

BOSTON-- The United States Environmental Protection Agency adopted today the $4.38 million cleanup plan developed in collaboration with the Pine Street Barge Canal Coordinating Council for the Pine Street Canal Superfund site in Burlington, Vermont. After being sent back to the drawing board in 1992, EPA sought advice and council from community residents to jointly redraw a plan for the barge site cleanup. EPA's New England Administrator John P. DeVillars said that the consensus building model used in Burlington stands as a national model for community-based decision-making. EPA's decision follows a 60-day public comment period.

"This works a victory for common sense and community involvement," said DeVillars. "The hard work of the Coordinating Council was fully endorsed by Burlington's citizens. It was a tough few years to get to this point and today we can applaud the success of the Council in representing the broader interests of the Burlington community. The public overwhelmingly endorsed the plan that EPA and the Council have hammered out over the last five years."

EPA's next step in the cleanup is to conclude negotiations with the Potentially Responsible Parties (PRPs) and to enter into a legally binding agreement for the PRPs to design and perform the cleanup work. EPA anticipates that design of the cleanup will be completed in 1999, and construction of the underwater cap and other cleanup work will begin spring of 2000. In addition to the cleanup work, the PRPs agreed in May to spend up to an additional $3 million for other environmental projects in the Burlington area.

Since being formed in 1993, the Pine Street Barge Canal Coordinating Council, a group of local community members, environmental activists, PRPs and representatives from the Vermont Department of Environmental Conservation, United States Fish and Wildlife Service and EPA have

-more-

worked together to examine technical data, evaluate cleanup options and ultimately formulate a cleanup plan that meets regulatory requirements and is acceptable to the community.

"After years of hard work, it is extremely satisfying to see the progress made this year at Pine Street. The Coordinating Council has been instrumental in developing this cleanup plan and has shown the difference active community involvement can make in environmental decision making." said DeVillars. "Rather than dictate what is best for communities, the EPA will continue to partner with community groups like the Council to find long term solutions to local environmental problems."

"I am pleased that EPA has formally adopted the cleanup plan announced earlier this year for the Barge Canal," said U.S. Senator Patrick Leahy. "This is an example of a federal agency listening to a community and demonstrating a willingness to work on an innovative solution. The resulting work product of the Coordinating Council is a Barge Canal plan and additional projects to benefit Lake Champlain with broad support."

Senator James M.. Jeffords commented that "the Coordinating Council has worked long and hard with the EPA during the last 6 years. They have produced a solid plan which provides a model of cooperation from which the rest of the country can learn."

"This is very good news for a community that has worked very hard to solve a difficult and frustrating problem," said Congressman Bernie Sanders. "I am particularly pleased that EPA has sought the active participation of Burlington residents, making this project an example of cooperative effort. I will continue to monitor the progress of the canal cleanup, and assist in any way I can to move this effort forward."

"This agreement proves that communities can play a crucial role in solving these difficult issues and that the federal government is willing to listen to the concerns of local residents. I applaud everyone who devoted countless hours of work toward moving this cleanup effort forward," said Governor Dean.

"I am extremely pleased with the cleanup plan arrived at by the Barge Canal Coordinating Committee. The Record of Decision (ROD) protects the environment, ensures public safety, and addresses the redevelopment potential of the Pine Street Corridor." said Mayor Peter Clavelle, "All this will be achieved at a reasonable costs, and was made possible only through diligent public process. Moreover, the ROD includes a site boundary definition that removes six important commercial properties in the study area. Once formally removed from the National Priorities List (NPL), these newly designated 'brownfield' properties will be redeveloped without the stigma of Superfund, turning liabilities into assets."

"The cleanup is the result of all parties setting aside differences and working together to create a common sense solution that is both environmentally protective and economically sound," said Lori Fisher, executive director of the Lake Champlain Committee. "We are especially pleased that the remedy includes funding for additional water quality restoration projects in the vicinity of the Superfund site."

-more-

The Coordinating Council reached consensus on the proposed plan last May. The EPA presented the plan to the public for comment in June. In sharp contrast to the negative reaction EPA received on the first cleanup plan proposed in 1992, and withdrawn after a 6-month public comment period, public response to this new plan has been overwhelmingly favorable.

The remedy selected by EPA to address contamination at the Pine Street site minimizes risks to public health, aquatic life, and birds by reducing potential exposure to site contaminants. Polycyclic aromatic hydrocarbons, volatile organic compounds, and metals are found in the site's groundwater, soils and sediments.

The key components of the cleanup plan include:

- Placement of an underwater cap over the canal sediments that present the highest risk to the environment;
- Covering several wetland areas of contaminated soil and sediment near the canal;
- Setting in place land-use restrictions to prevent residential use, unsafe contact with contaminated soil below five feet, use of water for drinking, and future use of the site as a children's day care.
- Redirecting stormwater inflow and monitoring surface water, soils and sediment at the site.
- Long term monitoring of site conditions, including monitoring of the canal and Lake Champlain, groundwater and sediments.
- Reviews of the remedy every five years to ensure that it continues to protect human health and the environment.

The Pine Street Canal Site, a manufactured gas plant, operated from 1895 to 1966. The contamination at the site is from coal gasification wastes. In the 1970's, an oily substance was discovered in the wetlands adjacent to the barge canal. EPA investigations at the site conducted from 1989 to 1992 revealed extensive coal tar contamination in the soils and an oil like substance in the canal wetlands, turning basin and Maltex Pond. Additional studies were conducted from 1994-1998 under the auspices of the Coordinating Council. The Pine Street Superfund site was listed on the Superfund National Priorities List in 1983.

A copy of the cleanup plan will be available next week in Burlington at the Fletcher Library and the Baily/Howe Library .

-30-

VERMONT

Residents speak out on Barge Canal

By Sona Iyengar
Free Press Staff Writer

Rod Rice is frustrated by the ongoing studies at a Burlington hazardous waste site on Lake Champlain.

"I just hate to see money wasted in this manner," said Rice, who lives in the South End, where the site is located.

He was one of about 40 to attend an informational meeting Tuesday at Burlington City Hall on the Pine Street Barge Canal Superfund site. An estimated 600,000 cubic yards of soil were contaminated there by wastes from a coal-gasification plant for nearly 60 years.

The Pine Street Barge Canal Coordinating Council sponsored Tuesday's meeting, which focused on the Barge Canal's history, proposed studies and residents' concerns. The council is a first-in-the-nation effort that allows residents to devise a cleanup plan.

The U.S. Environmental Protection Agency's proposed $50 million cleanup plan, which included building a landfill on the site, was withdrawn after residents objected.

An estimated $800,000 of scientific studies on air quality, soil and groundwater contamination and storm run-off at the Barge Canal started a month late in September.

Issues to be studied include whether any contamination is reaching Lake Champlain; if organisms that break down contamination are present; if heavy storms affect the surface water quality leaving the canal; and the effect upon fish, the ecosystem and human health.

"The purpose for these studies is to provide the basis for us to come to a solution for this site," said Chris Crandell, vice president of The Johnson Co., consultants doing the tests.

Council members said they may have a remedial solution in one to three years.

Barge Canal solution: Fill it

Cost put at one-tenth original figure

By Nancy Bazilchuk
Free Press Staff Writer

Vermont's first Superfund hazardous waste site, tangled in red tape for more than 10 years, will finally be sealed off from Lake Champlain under a $4.46 million plan chosen Monday.

The plan for Burlington's Pine Street Barge Canal Superfund site is not a cleanup; no waste will be removed. Instead, a foot-thick underwater layer of sand will be laid over the most contaminated parts of the canal, and an aboveground foot-thick sand layer will be laid over two smaller areas near the canal.

The proposal should keep contaminants out of nearby Lake Champlain and allow fish, insects and other creatures to move back to the 125-year-old canal.

It leaves open the possibility that less contaminated parts of the site might be developed. That includes eventual construction of the Southern Connector, a road designed more than two decades ago to speed traffic into downtown Burlington from the south.

The decision reached Monday by the Pine Street Barge Canal Coordinating Council is a drastically scaled-down plan compared to a proposal made by the U.S. Environmental Protection Agency in November 1992. At that time, the EPA said it would clean up the site with a $50 million, 25-foot high landfill the size of University Mall, built on the shore of Lake Champlain.

The Barge Canal was contaminated by wastes from a plant that converted coal into gas for heating and lighting between 1908 and 1966. Coal-tar wastes containing cancer-causing substances were dumped or spilled in the wetlands and the canal behind the plant. The EPA estimates that more than 600,000 cubic yards of soil is contaminated by the wastes; that's enough to fill a football field more than 100 feet deep.

Public outrage over the plan caused the EPA to withdraw its proposal in May 1993, in part because the $5 million of studies that preceded the cleanup plan never clearly established whether the plan would protect the lake.

In response to citizen frustration over the botched studies and cleanup delay, EPA Administra-

See CANAL, 4A

Solving the Pine Street Barge Canal Superfund question

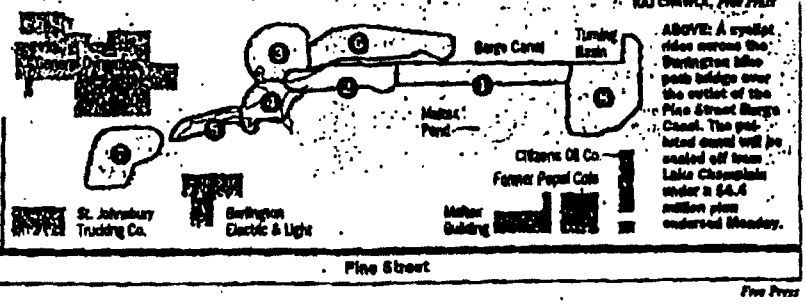
The total cost of preventing pollution from the contaminated Barge Canal will be $2.1 million, with another $2.3 million required over several decades to monitor the site to make sure contaminants stay in place.

■ **Areas 1,2 and 8:** These areas are underwater and would be covered with a sand and silt layer, or cap, designed to be a foot thick. Because the sand and silt will settle over time, the initial thickness of the cap will need to be 2.5 to 3 feet thick.

■ **Areas 3 and 7:** These upland and wetland areas also will be covered with a sand layer, but because they are not underwater the initial layer of sand will have to be only 1.5 feet thick. Wetlands will be reconstructed on the site over the cap.

■ **Areas 4, 5 and 6:** These areas would be protected with deeds and government restrictions limiting water and land uses in the defined area.

RAJ CHHABRA, *Free Press*



ABOVE: A cyclist rides across the Burlington bike path bridge over the outlet of the Pine Street Barge Canal. The polluted canal will be sealed off from Lake Champlain under a $4.4 million plan endorsed Monday.

Free Press

CANAL: Superfund site to be filled, possibly developed

Continued from Page 1A

tor Carol Browner established the coordinating council, a first-in-the-nation effort to allow the community, regulators and liable businesses to develop a plan to stop pollution from leaving the waste site.

Since September 1993, the coordinating council has been meeting at least once a month, first to come up with studies to plug the holes left by EPA's earlier studies. Once those studies were completed, the group spent time evaluating the actual risks posed by the site. The group concluded that the site poses minimal risk to humans, but that contaminated sediments in the canal were polluted enough to merit action.

The plan selected Monday involves pumping a foot-thick sand and clay cap over sediments in the canal itself. A foot-thick sand cap would be placed over a contaminated wooded wetland area to the west of the Barge Canal proper. The $4.46 million price tag includes monitoring the site for several decades to make sure that all the scientific studies are right and that contaminants do not pollute Lake Champlain.

The coordinating council's decision came one day short of the group's fourth anniversary; the agreement prompted spontaneous applause.

"We have a lot of hope for this process. We think we can do some good at the site," said Lori Fisher, executive director of the Lake Champlain Committee, a watchdog environmental group that has been represented on the coordinating council.

Susan Compton, a lawyer representing the city of Burlington on the council, said the action plan makes it possible the Southern Connector might someday be built through the Barge Canal. Early plans for the connector called for building the road right down the middle of the contaminated area. For the short term, however, the city will continue with its plan to route the road along Pine Street.

The earliest the sand cap could be installed would be sometime next year; before then the EPA must complete a document called a Record of Decision, which describes the rationale for the selection.

After this document is filed and approved by the federal government, additional engineering studies must be conducted to determine the exact details of the construction. If all goes well, workers could begin laying the cap of sand next summer.

...THE BURLINGTON FREE PRESS ■ WEDNESDAY, SEPTEMBER 24, 1997

ENVIRONMENT

Cleanup backed by EPA

Plan addresses Barge Canal site

By Nancy Bazilchuk
Free Press Staff Writer

EPA chief Carol Browner praised newly released plans for Vermont's first Superfund hazardous waste site Tuesday at a national conference of state environmental officials in Burlington.

"With the community's involvement, we rethought our approach to the cleanup" for the Pine Street Barge Canal, Browner told the gathering at the Radisson Hotel Burlington. "The community came to the table and came up with an idea that was cheaper and had widespread support."

The Environmental Council of the States, a national, nonpartisan coalition of environmental officials from 48 states and territories, will conclude its fourth annual meeting in Burlington today. The group's agenda has included discussion of everything from global climate change to air pollution regulation.

Browner's remarks came a day after the Burlington planning group she created four years ago agreed on a proposal to control wastes at the 70-acre Superfund site.

The $4.46 million proposal calls for sealing pollutants underground by spreading a layer of sand and silt over polluted sediments in the waters of the canal. Two nearby upland sites would be topped with a protective coating of sand.

Browner authorized the Pine Street Barge Canal Coordinating Committee, a group

See CLEANUP, 3B

Council

- WHAT: The EPA established the nation's first co-ordinating council in Vermont.
- WHEN: In 1993.
- WHO: The council is includes residents, state businesses and regulators.
- WHY: In response to the frustration of Vermonters over delays and botched studies in the clean up of the Pine Street Barge Canal site.

CLEANUP: Chief praises plan

Continued from Page 1B

of business leaders, government officials, environmental groups and interested citizens, after the U.S. Environmental Protection Agency's own plan to build a $50 million, 13-acre landfill on the site was overwhelmingly rejected by Vermonters in November 1992.

The Barge Canal is one demonstration of how cooperation can work, even with thorny issues such as hazardous waste sites, she said. State officials need to find ways to expand this approach to regulating pollution, she said.

"We need to focus on how to find cost-effective solutions, and how to provide more flexibility to those in the business community who may want to go further than the minimum standards require," she said.

New ways of tracking how much pollution is emitted by businesses, and how many permits have been issued by each of the states, will help state officials assess the effectiveness of environmental protection programs, she said.

"We are now able to look at not just the number of effluent permits issued, but how contaminated the water is and how much pollution is going into the water," she said.

Barge Canal cleanup totals $30 million

Plan bundles other projects

By Nancy Bazilchuk
Free Press Staff Writer

Cleaning up Burlington's polluted Pine Street Barge Canal Superfund site likely will total $30 million — half the original estimate.

And in an unusual and innovative approach, the federal Environmental Protection Agency is backing a community group's plan to include other Burlington pollution sources as part of the package.

The plan calls for leaving contaminants in the Barge Canal, instead of an expensive removal, so the group decided to attack other pollution in Burlington to make up for decades of lake pollution from the canal wastes. The approach has been endorsed by EPA New England Regional Director John DeVillars.

"In return for a more affordable cleanup we should explore other environmental benefits as part of this settlement," DeVillars said.

The EPA has spent 15 years and more than $5 million studying ways to clean up the canal, which was polluted by coal tar in the early 20th century.

The community group, the Pine Street Barge Canal Coordinating Council, wants to clean polluted Englesby Ravine in Burlington's South End. It is blamed for the permanent closure of Blanchard Beach. Also being considered is a technical assistance program for small Burlington-area businesses to reduce their use of toxics that would otherwise drain into the lake.

Since 1993, when outraged Vermonters rejected the EPA's $61 million Barge Canal project, the EPA has been using the site to test ways of involving the community in Superfund hazardous waste site cleanups.

If the Barge Canal experiment [illegible]ceeds, it will [illegible] of [illegible] cleanups of [illegible] in [illegible] history of the federal Superfund program. The law [illegible] require polluters to pay [illegible] of the project as [illegible] with the Barge Canal [illegible]

■ **WHERE:** An 80-acre site on Pine Street in Burlington between the Maltex Building and the Burlington Electric Department offices.

■ **WHAT:** Beginning in 1908, the area was the site of a coal-gasification plant, which turned coal into gas for heating and lighting. The plant operated until 1966. Wastes, chiefly coal tar, were spilled or dumped in the wetlands and canal behind the plant, contaminating about 600,000 cubic yards of soil.

■ **WHAT'S NEXT:** A group of citizens and businesses charged by the federal Environmental Protection Agency to come up with a cleanup plan has proposed to isolate the most toxic contaminants in the canal with a sand and silt cap. Because the pollutants will be left in place, the group also wants to tackle other area cleanup projects to improve Lake Champlain's water quality.

■ **COSTS:** For the underwater cap and associated monitoring, $6 million to $10 million; total costs, including scientific studies and EPA's legal expenses could top $30 million.

BARGE: Cleanup to cost $30 million

Continued from Page 1A

The Barge Canal Coordinating Council includes businesses that will pay for the project as well as Burlington residents and representatives of the Lake Champlain Committee, a watchdog group.

The EPA created the council in 1993 after Vermont officials condemned the federal agency's $50 million plan to clean up the canal. The proposal was to pile contaminated sediments and soil in a 25-foot high, 13-acre landfill on top of the most polluted part of the site. Another $11 million was spent for studies, bringing the total to $61 million.

For four years the council has been working on a solution for the Barge Canal, where more than 600,000 cubic yards of contaminated soil and sediment pollute an 80-acre site less than 100 yards from Lake Champlain.

In September, the council agreed the best solution was to leave contamination in place and cover the most polluted sediments on the canal bottom with a cap of sand and silt. That will allow mussels, clams, worms and other bottom dwellers to recolonize the canal.

That actual cleanup will cost $6 million to $10 million, the EPA says. The businesses responsible for the cleanup, chiefly Green Mountain Power Corp., have paid more than $5 million for studies and scientific consultants to develop the current proposal. They also will have to pay the $11 million for past studies.

Although no Superfund site is typical, EPA officials say the average total price of a Superfund cleanup is about $21 million.

Margery Adams, an EPA lawyer on the council, said when proposed by the Lake Champlain Committee, the cost of additional projects was about $9 million initially. That will be added to the $21 million to $26 million costs of the actual cleanup and studies.

"That is clearly subject to negotiation," Adams said. "The group has put a lot of effort into finding a solution that would accomplish those goals but wouldn't break the bank."

For several tense months, the council wrangled with finding a way to pay for the additional programs. Green Mountain Power Corp. settled the last of its insurance lawsuits in November for an undisclosed amount. The company already has $10.5 million for the Barge Canal cleanup that it received from previous insurance settlements and [illegible] payments, court records show.

[illegible] this month, in a [illegible] that lasted from 3 p.m. until after midnight, the group agreed, at least in concept, to additional projects for the [illegible]. Members did not want to discuss the funding details until they were final.

"We've made a preliminary verbal agreement," said Marty Feldman, owner of Lightworks and a representative of the Pine Street Arts and Business Association on the council. "We have to finalize it, but we've done the hard work."

Green Mountain Power spokeswoman Dorothy Schnure said they are committed to the additional projects even though they are not required by law.

"We believe it is in the public interest" to do the projects, she said. Whether Green Mountain's costs will be passed on to ratepayers or stockholders is yet to be determined, she said. Passing costs on to ratepayers might prove problematic, because the utility is under scrutiny for a 16.7 percent rate increase to cover the costs of Hydro-Quebec power.

Eagle Times
Claremont, NH
5/28/98

Pact reached for Barge Canal cleanup

By DAVID GRAM
The Associated Press

BURLINGTON, Vt. — Five years after public outcry killed a plan to bury the Barge Canal hazardous waste site under a landfill, officials have announced agreement on what they said was a better plan for less than one-fifth the cost.

Ten years from now, the 70-acre tract on Lake Champlain just south of downtown Burlington is envisioned to have new development and open spaces, complete with trails and signs depicting the area's history.

Federal, state and local officials gathered near the Barge Canal yesterday to announce they had reached agreement on a plan to clean up the first site in Vermont designated under the federal Superfund law.

John DeVillars, administrator of the Environmental Protection Agency's regional office in Boston, called the agreement the first of its kind in the country, in that it resulted from broad-based community participation, rather than being imposed by the EPA.

"The council's groundbreaking work will serve as a blueprint for other communities (that) are struggling with Superfund cleanup decisions," DeVillars said.

The Barge Canal became polluted when a plant that extracted gas for lighting and cooking from coal dumped its residues in the canal and the wetlands surrounding it.

Under the Superfund law, efforts are made to find the companies and individuals responsible for polluting a site and have them chip in to pay for cleaning it up.

DeVillars and other officials estimated Barge Canal cleanup — consisting mainly of covering the most hazardous spots with sand and-or silt — would cost $4.3 million under the new plan. About $11 million has been spent so far, much of it on legal fees and engineering studies.

In addition, potentially responsible parties, including General Dynamics, which owns some of the land, and Green Mountain Power Corp., which owned part of the land when coal tar was deposited there, have agreed to chip in voluntary contributions totaling $3 million.

The money will be used to restore the polluted Englesby Brook, which is near the Barge Canal, create walking paths with signs in the Barge Canal site itself and to study water quality in Lake Champlain near the site. The brook cleanup should allow reopening of a nearby swimming beach, officials said.

The Barge Canal's status as a hazardous waste site had been seen as a key stumbling block in the way of building the long-sought Southern Connector, a highway linking downtown Burlington with its suburbs to the south.

But political support for a major highway into the city has waned in recent years, and Mayor Peter Clavelle said he doubted it would be

Eagle Times
Claremont, N.H.

built unless it were modified. "I would be surprised if it were built in its original (proposed) corridor," he said, noting that much of the corridor lies in wetlands.

The plan announced Wednesday was the result of a five-year process that began when state and local officials and Burlington residents rose up in opposition to an earlier plan hatched by the EPA to put a 25-foot, 13-acre landfill over the hazardous waste site.

"I learned a new word," said Clavelle, recalling the debate. "Sarcophagus. A tomb. They wanted to bury the whole thing in a tomb."

Clavelle, Sen. Patrick Leahy, D-Vt., and a host of others blasted the $50 million plan as too expensive, likely to release coal tar gasses and create a bigger environmental problem than already existed.

Leahy said the Vermonters' message to the EPA was: "Be realistic. We Vermonters are by our very nature environmentalists. We're not trying to do something where we're trying to cheat the environment. But let's be reasonable."

A committee called the Pine Street Barge Canal Coordinating Council was formed, with representatives from the EPA, the state, the city, businesses likely to have to pay for cleanup, an environmental group and others.

The group met 100 times during the following five years. "I'd be overstating it if I said every one of those meetings was pleasant," said Norm Terrari, GMP's retired chief operating officer.

The cleanup plan now will go through a round of public comment before it is finalized in July.

Phil Harter, mediator for the Pine Street Barge Canal Coordinating Council, talks yesterday about five years work on a cleanup plan for the Superfund site on Pine Street in Burlington. (AP photo)

FRIDAY, MAY 29 1998

BURLINGTON FREE PRESS 5/29/98

Canal cleanup finalized

$7.3 million citizen plan sets standard

By Nancy Bazilchuk
Free Press Staff Writer

Vermont's first federal hazardous waste site, which for almost two decades blocked a proposed Burlington highway and caused worry about Lake Champlain pollution, stepped into environmental history Wednesday.

The federal Environmental Protection Agency announced a $7.3 million cleanup agreement for the Pine Street Barge Canal Superfund site, an agreement that will set national precedents.

It was crafted by a first-in-the-nation council of citizens, lake advocates, public officials and businesses who took on the task after Vermonters vehemently rejected the EPA's 1992 plan to build a huge $50 million landfill on the site.

EPA Regional Administrator John DeVillars, on hand Wednesday for the announcement, said he was using the Barge Canal approach elsewhere in New England, particularly at the troubled Otis Air Force Base hazardous waste site on Cape Cod.

And in Wednesday's agreement, the companies who by law must pay for cleanup have said they will do more than the legal requirements of Superfund, the federal program that governs how the site must be handled.

The companies, led by Green Mountain Power Corp., will pay an additional $3 million for cleanup of other pollution hot spots in Burlington, on top of the $4.3 million cleanup plan. The additional money is intended in part to make up for pollution that oozed out of the Barge Canal into the lake in decades past.

The proposal will be subject to public review until July 8, after which the EPA will issue a formal decision. Cleanup could begin as early as next summer.

The Barge Canal contains enough coal-tar contaminated soil to fill a football field more than 100 feet deep, the legacy of a plant that turned coal to gas for heating and lighting for more than 60 years. Coal-tar residues, some of which are cancer-causing, were dumped or spilled in the wetlands behind the facility while it was operating. The plant closed in 1966.

Wednesday's announcement was good news for Burlington residents who for years have watched and wondered how the Barge Canal nightmare would be resolved. Residents were worried that pollutants from the contaminated soils might be wafting into the air in nearby neighborhoods. Others were concerned that people might be swimming or fishing in the canal, which contains contaminated sediments although the canal water itself tests clean.

Jim Garrison has firsthand experience of how toxic the sediments in the bottom of the canal can be: While a teen-ager, the 35-year-old Burlington resident accidentally fell into the canal. His back erupted in boils that took several weeks to go away. While Garrison's experience was bad, state and federal officials agree the Barge Canal does not pose a human health risk.

"It's fantastic they're going to deal with this," Garrison said. "I see people still fishing down there."

And Clarence Meunier, a city alderman when Burlington first planned to build the Southern Connector highway through the site more than two decades ago, said he was glad to see progress on the cleanup.

"This is great," Meunier said. "Someone has needed to take the bull by the horns for years."

Meunier said he was frustrated, however, that the Connector would not follow its original path through the Barge Canal. Burlington Mayor Peter Clavelle said Wednesday he did not expect the road's route will ever go through the site.

As warbling vireos chirped in the background, the Pine Street Barge Canal Coordinating Council, the group that met 100 times in five years to develop the cleanup plan, signed its agreement at the canal site and for-

CONT.

BURLINGTON FREE PRESS 5/28/98

. . . CONT.

mally submitted it to DeVillars. The plan calls for:

■ Leaving in place the 600,000 cubic yards of contaminated materials found in sediments and soils.

■ Placing a clean sand and silt cap on contaminated sediments under the Barge Canal's waters and designing stormwater runoff controls to prevent the cap from being disturbed. The underwater cover will be 2 to 3 feet thick when laid down, but will eventually compress to a foot thick.

■ Covering a contaminated wetland with a 1½-foot-thick sand and silt cap and replanting it with wetland plants.

■ Continual testing of Lake Champlain to make sure the Barge Canal doesn't leak contamination into the lake. Tests indicate contamination is effectively locked in the peat soils underneath most of the site.

■ A $3 million package of additional projects, including a $1.3 million cleanup of Englesby Brook, just south of the Barge Canal, and $1 million to study Burlington Harbor, all designed to improve the lake's water quality in recognition of the fact that contaminants will remain on the site.

Lori Fisher, executive director of the Lake Champlain Committee, the advocacy group on the coordinating council, applauded the process and said she hoped other states could benefit from the council's success.

"It's a credit to all the people on the coordinating council that we are able to deliver a plan that is protective of the environment, a sound remedy for the site, and with $3 million set aside for projects to improve Lake Champlain," she said.

The Barge Canal had been leaking oily wastes into Lake Champlain off and on since at least 1928, but no one realized how badly the area was polluted until the Transportation Agency proposed building the Southern Connector across the 70-acre site. It was then that the extent of the contamination became clear: In places, the pool of poisoned peat soils is more than 40 feet thick.

But early efforts to devise a solution after the site was named to the federal Superfund list in 1981 were plagued by botched scientific studies and federal and state bungling. When the EPA finally withdrew its $50 million landfill plan in May 1993, more than $5 million had been spent on the failed effort.

Clavelle said Wednesday he remembered being stunned by the EPA's 1992 proposal.

"I learned a new word — sarcophagus ... they wanted to build a tomb on the site," Clavelle recalled, noting that the landfill would have been the largest structure in Burlington. "Vermonters said no way, and to our amazement, they listened."

The outcry reached EPA national headquarters in Washington, D.C., and EPA administrator Carol Browner came to Vermont to tell angry residents she was willing to try a different approach to the cleanup.

"When this proposal first came out, it looked like we were going to build the last Great Pyramid in Burlington," said Sen. Patrick Leahy, D-Vt., who with the rest of the Vermont congressional delegation, Gov. Howard Dean and the Legislature opposed the EPA proposal. "But the EPA and Carol Browner listened to the people of this city. We Vermonters are environmentalists ... we want to be reasonable, but let us design a system that will work."

CONT. . .

What's next

■ **INFORMATIONAL MEETING:** 7 p.m., June 4 at Contois Auditorium in Burlington City Hall.

■ **FORMAL HEARING:** 7 p.m., June 24 at Contois Auditorium in Burlington City Hall.

■ **TO COMMENT AND FOR MORE INFO:** The federal Environmental Protection Agency will accept comments on the proposed plan from June 5 to July 8. Comments should be sent to Karen Lumino, USEPA, JFK Federal Building/HBT, Boston, Mass. 02203; phone (617) 573-9662; email lumino.karen@epamail.epa.gov.

BURLINGTON FREE PRESS 5/28/98

...-CONT.

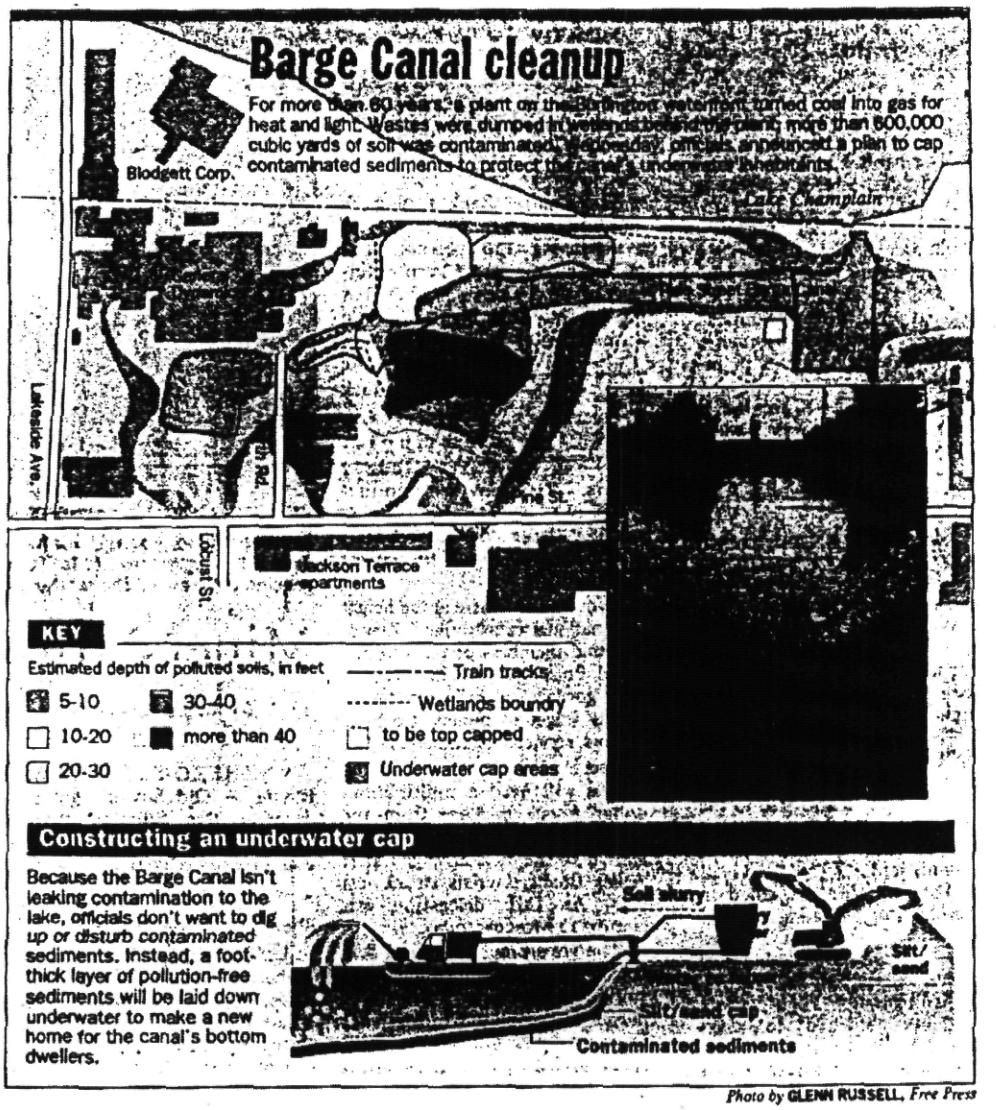


Photo by GLENN RUSSELL, *Free Press*

Rutland Daily Herald • Thursday, May 28, 1998

Barge Canal Plan Hailed

By FREDERICK REVER
Vermont Press Bureau

BURLINGTON — A $7.2 million deal to rehabilitate the contaminated Pine Street Barge Canal was hailed Wednesday as a sign of the Environmental Protection Agency's new attitude about enforcing the Superfund toxic waste site law.

The EPA had proposed six years ago that the coal tar contaminating the marsh be excavated and entombed in a 14-acre structure on the site, at a cost of $50 million. "It looked like we were trying to build the last of the great pyramids," recalled Sen. Patrick J. Leahy, one of several speakers at a signing ceremony held on Wednesday at the site.

The EPA backed away from the controversial plan after a community outcry and began working with the companies responsible for the pollution, local and state officials, and community activists.

"When it was just the EPA doing the job, we weren't doing it right," said John DeVillars, the EPA's regional administrator. "We learned something, finally, not just in Vermont, but across the country."

After the 1992 fiasco, the EPA convened a coordinating council of officials from responsible parties such as Green Mountain Power Corp., EPA, the state, environmental groups and the city of Burlington in an attempt to find consensus.

The plan that finally emerged included placement of an underwater

(See Page 14, Canal)

Canal

Continued from Page One

cap of silt and sand over the most polluted parts of the canal and nearby wetlands, construction of stormwater control structures, enactment of land use restrictions to control the site's use, and ongoing monitoring for pollution leaks.

The cost of those actions, which could be completed by the end of the year 2000, was estimated at $4.3 million. To sweeten the deal, GMP and other responsible parties agreed to spend another $3 million on related projects.

Those include $1.3 million to improve water quality in nearby Englesby Creek, a $1 million contribution to the University of Vermont's water research center, a $250,000 engineering study of ways to reuse the site, and $100,000 to build interpretive trails.

GMP Vice President Stephen Terry said the special projects package was meant to compensate for the century-long history of pollution that had severely limited the site's use. Plus, he said, the measure promoted goodwill among the negotiators.

"It's mitigation for past damage," Terry said. "And it was a very important part of the agreement that helped the parties come together and not spend the next 15 years in court."

GMP is on the hook for most of the costs, because it owned most of the site during much of its operating history. From 1895 to 1966, a plant at the site converted coal and oil into gas used for lighting — the toxic byproduct, coal tar, was dumped in the canal.

Although the site poses a relatively small danger to human beings, aquatic invertebrae, fish and other organisms have been exposed to contaminants. The new remedy would seal off most of the contaminated areas from aquatic life, and also prevent the contaminants from leaching into Lake Champlain.

In addition to GMP, there are a dozen other organizations that have had a close enough association with the site for the EPA to include them on its list of "potentially responsible parties," including the state, the city of Burlington and current property owner General Dynamics.

GMP officials would not say how much the company's portion of the costs would be. GMP President Chris Dutton did say, however, that the company would ask the state to allow some of the costs to be recovered through electricity rates.

The EPA also plans to bill the responsible parties for some of its expenditures on the site since it was first included on the Superfund list in 1983. GMP and the EPA have yet to agree on how to apportion the $11 million of previous costs.

Many of the speakers on Wednesday, including Leahy and Rep. Bernie Sanders, I-Vt., praised the EPA for backing away from heavy-handed regulation and implementing a process that truly involved the community.

About the new plan, Leahy said, "This is a case where they can say 'we're the federal government and we're here to help you' and really mean it."

DeVillars said the Burlington experience had provided a model for resolving disputes over cleanup of other Superfund sites in the country, including the General Electric site in Pittsfield, Mass., and the 14,000 acre Otis site in Cape Cod.

"One of the big challenges is trying to change the culture from within the EPA," DeVillars said in an interview. The Burlington project, he said, presented a first step toward trying to institutionalize a process that is more responsive to community needs.

"When we get the sweet taste of a success like this (EPA workers involved with the project) become the most effective internal ambassadors."

The EPA will not issue final approval of the plan until after a 30-day public comment period.

PM-VT--Barge Canal,760<
Agreement reached on Barge Canal hazardous waste cleanup<
By DAVID GRAM Associated Press Writer

BURLINGTON, Vt. (AP) Five years after public outcry killed a plan to bury the Barge Canal hazardous waste site under a landfill, officials have announced agreement on what they said was a better plan for less than one-fifth the cost.

Ten years from now, the 70-acre tract on Lake Champlain just south of downtown Burlington is envisioned to have new development and open spaces, complete with trails and signs depicting the area's history.

Federal, state and local officials gathered near the Barge Canal on Wednesday to announce they had reached agreement on a plan to clean up the first site in Vermont designated under the federal Superfund law.

John DeVillars, administrator of the Environmental Protection Agency's regional office in Boston, called the agreement the first of its kind in the country, in that it resulted from broad-based community participation, rather than being imposed by the EPA.

"The council's groundbreaking work will serve as a blueprint for other communities (that) are struggling with Superfund cleanup decisions," DeVillars said.

The Barge Canal became polluted when a plant that extracted gas for lighting and cooking from coal dumped its residues in the canal and the wetlands surrounding it.

Under the Superfund law, efforts are made to find the companies and individuals responsible for polluting a site and have them chip in to play for cleaning it up.

DeVillars and other officials estimated Barge Canal cleanup consisting mainly of covering the most hazardous spots with sand and-or silt would cost $4.3 million under the new plan. About $11 million has been spent so far, much of it on legal fees and engineering studies.

In addition, potentially responsible parties, including General Dynamics, which owns some of the land, and Green Mountain Power Corp., which owned part of the land when coal tar was deposited there, have agreed to chip in voluntary contributions totaling $3 million.

The money will be used to restore the polluted Englesby Brook, which is near the Barge Canal, create walking paths with signs in the Barge Canal site itself and to study water quality in Lake Champlain near the site. The brook cleanup should allow

SUNDAY RUTLAND
HERALD/SUNDAY TIMES ARGUS

RUTLAND, VT
SUNDAY 23,566

MAY 31 1998

A Good Solution

The perfect often becomes the enemy of the good, but perhaps nowhere so pointedly as in the area of environmental protection. Burlington's Pine Street Barge Canal represents an instructive example of how government zeal on behalf of an idealistic solution can actually work against lessening pollution.

The Pine Street site stands as the unfortunate result of many decades of abuse, as a plant transformed coal and oil into gas, and dumped coal tar into the canal. This posed a threat to aquatic life, especially the diversity of species in nearby Lake Champlain.

No one disagrees that the site needed to be cleaned up. But the real question was "How?"

□□□

When the Environmental Protection Agency proposed a $50 million project in 1992, the community howled in protest. The proposal, which would have dug out the coal tar and constructed a 14-acre covering for the polluted area, was widely viewed as an example of government overkill.

To the EPA's credit, it realized that its initial approach was not going to fly. That's when government decided it would be best to work with the community rather than in spite of its wishes.

The happy result was last week's $7.3 million agreement to bring the canal site a bit more closely back to life. The deal would cap the most badly polluted areas, control storm runoff and monitor the area for leaks.

At the agreement's signing ceremony, government officials conceded that their earlier overenthusiasm was in part responsible for the delay in righting environmental wrongs. EPA Regional Administrator John DeVillars noted that involving the community in an effort to find the best solution marked the turning point of the project.

"When it was just the EPA doing the job, we weren't doing it right," he said. "We learned something, finally, not just in Vermont, but across the country."

Let's hope this understanding leads to a quicker resolution of the impasse over the many other polluted sites that still seep poisons into the nation's landscape.

Those environmentalists who still refuse to concede even an inch of ground to the enemy may well be disappointed by the Pine Street Barge Canal deal. But if this episode has taught anything, it is that an uncompromising, confrontational approach actually costs more time and money (all those lawyers' fees) than entering into negotiations with the polluters.

At last the Burlington waterfront now has a plan in place to guard against further environmental damage. It may not be the perfect result, but it is a good one.

EPA has plan for 23 companies to pay to cleanup Pine Street Barge Canal

By Wilson Ring, Associated Press, 11/24/99 01:02

MONTPELIER, Vt. (AP) The Environmental Protection Agency and 23 companies have agreed on a plan to clean up Burlington's Pine Street Barge Canal Superfund hazardous waste site on the Lake Champlain shoreline.

The cleanup calls for the construction of an underwater cap in the canal to prevent aquatic life from being exposed to the contaminants, land-use restrictions to keep the contaminants in place and long-term monitoring of the area.

A consent degree filed in U.S. District Court Tuesday said the project would cost at least $12 million.

The money will be used to repay the EPA for past expenses and to pay for the cleanup itself, future monitoring and a project to create and enhance wetlands on almost nine acres of land.

"This is a great day for Lake Champlain and Vermont's environment," said Dorothy Schnure, a spokeswoman for Green Mountain Power, one of the companies paying for the cleanup. "This shows that the first-in-the-nation collaborative process involving local community members, environmental groups and businesses truly works."

The Pine Street Barge Canal was polluted by refuse from a coal gassification plant that operated from 1895 to 1968. The site is contaminated by a variety of polycyclic aromatic hydrocarbons, volatile organic compounds and metals.

The site was added to the federal Superfund hazardous waste cleanup list in 1983.

The cleanup plan was put together by the Pine Street Barge Canal Coordinating Council, a group of local community members, environmental activists, potentially responsible parties and state and federal environmental officials.

The public will get a chance to comment on the plan. The federal government will consider all the comments before deciding whether to finalize the plan.

Design work will begin this year and construction is expected to begin in 2001.

The work itself will be performed by the GMP, New England Electric System and Vermont Gas Systems.

The settlement "ensures that the responsible parties will pay

The settlement "ensures that the responsible parties will pay for an effective and sensible cleanup, and it compensates for the past damages to natural resources that were caused by poor management of hazardous wastes," EPA regional Administrator John DeVillars said in a statement. "Equally important, it is a victory for common sense and community involvement."

Appendix D

PARTICIPANT COMPETENCIES IN DELIBERATIVE DISCOURSE: Cases of Collaborative Decision-Making in the Superfund Program

Troy W. Hartley
University of Michigan
School of Natural Resources & Environment
1998

Collaboration is being employed more frequently in U.S. environmental policy decision-making, particularly in contentious public decisions. Collaborative decision-making consists of broad participation among stakeholders, in a sustained dialogue on a wide range of issues. All participants have a role in defining the problem and the solution, and share information freely. A facilitator is often present, as the participants seek consensus. Case studies were conducted on two highly collaborative processes to select Superfund cleanup remedies -- New Bedford Harbor, MA and Pine Street Barge Canal, VT. An analytical framework was developed from deliberative democracy and discourse to assess the participatory competencies of individuals. Competencies are an inter-related set of skills, cognitive abilities, and social behaviors that enable individuals to function in deliberative democracy and discourse. The competencies in these cases were identified using content analysis of interview and case documentation and dramaturgical analysis of videotaped and observed meetings for the time period December, 1993 - December, 1996.

The results showed all participants needed key **problem-solving skills** and **human engagement capabilities**. Problem-solving provided the ability to devise many options to solve social and technical problems, while human engagement capabilities supplied the civic will to deliberate. Problem-solving skills included several *communicative*, *learning*, and *knowledge and resource use skills*. Three communicative skills were required. All participants needed to express their thoughts and ideas in a manner that got issues on the table for deliberation. Many different communication styles were used, but all lead to deliberation among the group. Second, it was essential for someone among the government officials or consultants to be able to express sophisticated technical, scientific, and legal information in a manner understandable to lay persons. Third, it was essential that someone in the group have the communicative skills to capture emerging consensus. This person needed credibility across most of the others participants, and as such was not always the parties in the middle of past conflicts, i.e. government officials or citizens.

Learning skills were core skill required by all competent participants. This was particularly important for community members unfamiliar with the Superfund process, although government officials too had to acquire locally relevant information. With time and effort community members adequately learned sufficient technical, scientific, and legal information to participate effectively. All participants needed to learn about each other and how the collaborative decision-making process would function. They learned these features quickly and in generalities. The generalities provided sufficient behavioral predictability, although it occasionally produced misperceptions and premature judgment.

The third problem-solving skill related to the use of knowledge and resources -- it was not only what someone knew or resources they possessed that was important, but how they used what they knew and possessed. All participants had to use the knowledge they possessed or had acquired, while a subset of participants linked ideas in new ways, showing creativity. The way resources were used proved important in getting creative ideas implemented. It was essential for someone among the government participants to articulate and define an authority-sharing arrangement in an acceptable manner -- authority was not relinquished by government, although it was shared. Finally, it was essential for community participants to demonstrate new leadership skills to maintain community members' legitimacy. The nature of leadership changed from the adversarial days before employing collaborative processes. The new leadership tasks were shared

[redacted] several community participants. The skills maintained participation and engagement among the members of the community groups and involved networking for information and resources. The skills were also used to maintain old coalitions and/or build new ones, as well as retain and demonstrate leadership among increasingly less-interested constituencies.

Two types of human engagement capabilities were needed to enable participants to engage other people in public dialogue and stay at the table until a resolution was found -- *motivation* and the ability to *cope* with frustration and fatigue. How a participant achieved motivation and adequate coping abilities varied greatly, although all needed to do so. First, multiple motivations were present, including self-interested and community-interested concerns. In other words, a participant needed to be motivated by more than one interest; a single motive was not enough. In the order of their observation frequency in the data, motives included: suspicion of others; importance of tasks being conducted to the broader Superfund program; importance of individual's contribution to the decision-making process; personal enjoyment and satisfaction; opportunity presented by problem to the local community; and the hope and faith that an answer would emerge from the decision-making process.

Coping skills were needed by all participants. Collaborative decision-making takes time and resources. It can be fraught with aggressive and abrasive behavior and other frustrating challenges. Versatility was by far the most frequently observed means of coping, although patience was also widespread among participants. Versatility was the ability to wear different hats, serve multiple roles, as well as demonstrate the flexibility to try the unfamiliar. Patience was demonstrating resilience and perseverance during hard times, all the while working toward solving the problem. Finally, government participants, in particular, needed a non-defensiveness ability, in part because they and their ideas were often the target of other participants' concerns. While different techniques could be employed to not take things personally, those most effective government officials exhibited a sense of humor.

Together, problem-solving skills and human engagement capabilities produced competent participants who were committed and able to solve the problem in a deliberative manner. They gained the necessary skills to perform and would not give up in the collaborative decision-making process. The problem-solving skills enabled the group to derived an array of options to solve the problems, meeting social, technical, scientific, and legal demands. The human engagement capabilities provided the civic will and commitment to deliberate.