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RECORD OF DECISION

REMEDIAL ALTERNATIVE SELECTION

Site: Pollution Abatement Services, Inc. (PAS)
Oswego, New York

Documents Reviewed

I have reviewed the following documents describing the analysis of cost-effectiveness of remedial alternatives for PAS.

- PAS Remedial Investigation/Feasibility Study prepared by URS for the NYSDEC, January 1984
- Summary of Remedial Alternative Selection
- Responsiveness Summary prepared by the NYSDEC, May 1984

Description of Selected Remedy

- Limited excavation and removal of contaminated soil, subsurface tanks and drums to a RCRA approved landfill
- Construction of a perimeter slurry wall to lodgement till or bedrock, if necessary
- Site grading followed by installation of an impermeable cap in accordance with RCRA Part 264
- Ground water recovery
- Leachate collection
- On-site ground water and leachate treatment
- Ground water monitoring in accordance with RCRA Part 264

Declarations

Consistent with the Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the combined remedial measures designed to contain contaminants on-site, reduce the quantity of ground water on-site becoming contaminated, and the removal of gross contamination from PAS, is the lowest cost remedy which provides adequate protection of public health, welfare, and the environment. The State of New York has been consulted and agrees with the approved remedy.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. In addition, the off-site transport and secure disposition is more cost-effective than other remedial actions, and is necessary to protect public health, welfare, or the environment.

6/6/84
Date

Lee M. Thomas, Assistant Administrator
Office of Solid Waste and Emergency Response

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

PAS, Oswego, New York

SITE DESCRIPTION (See Figure 1)

PAS, a fifteen (15) acre site located in City of Oswego, Oswego County, New York, was formerly used as a chemical waste storage and processing facility. The site is bounded on the east, north and west by wetlands formed along the stream channels of White and Wine Creeks. These streams originate and flow through farmland to the south, flowing adjacent to the Oswego County Landfill before passing PAS. Just to the north of PAS, the two streams converge and flow into Lake Ontario approximately 1800 feet to the north. The point at which this tributary enters Lake Ontario is approximately one mile from the City of Oswego drinking water intake.

Properties adjacent to the site include a residence to the north, a union hall to the east, a solid waste transfer station (Oswego County Landfill) to the south, and a radio station to the west. The area north of the site is primarily undeveloped fields and woodlots. There are several residences on Mitchell Street approximately 1/3 mile north of the site and a residential community, Smith's Beach, consisting of twentyfive (25) dwellings approximately 1/2 mile north of PAS. A public water supply is available to Smith's Beach; however, several residents have opted to continue using private wells.

The area in which PAS is located is characterized by an abundance of surface water. Most of the site, including almost all of the formerly active area of the site, drains directly to White Creek through an on-site drainage ditch which flows northward through the center of the property.

Six (6) stratigraphic units have been defined at PAS. A surficial fill layer of variable depth and composition covers most of the site. This fill material consists largely of demolition debris probably brought to the site before PAS was in operation. The fill layer is underlain by ablation till over most of the site. Exceptions to this occur in a small area near the center of the site and near White Creek, where the fill is underlain by stratified sediments. Underlying the ablation till and stratified sediments is a lodgement till layer forms a continuous barrier of relatively low permeability between the upper formations and the bedrock beneath. The depth of lodgement till is apparently 10 feet. Significant exceptions to this occur in the central section of the site and near White Creek, where the occurrence of stratified sediments corresponds with a depression in the lodgement till surface. Typical permeabilities for the ablation till, lodgement till, and bedrock are 1 x 10-4 cm/sec, 5 x 10-5cm/sec, and 3 x 10-5 cm/sec, respectively.

Two aspects of site stratigraphy which are of particular importance are the apparently continuous layer of lodgement till overlying the bedrock, and the occurrence of a significant depression containing stratified sediment near the center of the site. The bedrock in this area is primarily sandstone and is slightly to moderately fractured.

Subsurface data and information obtained during the remedial investigation support the occurrence of a continuous, dense lodgement till layer overlying the bedrock across the site. However, some questions exist regarding the integrity and actual permeability of this layer because of evidence of ground water contamination in one of the monitoring wells which is in hydraulic contact with the bedrock. It is felt, however, that the contamination detected was the result of faulty drilling practices and that the till layer not only provides an adequate bottom confining layer but also deters contaminant flow from migrating into the bedrock.

The occurrence of stratified sediment at relatively great depths in the central section of the site reflect a depression in that area. Surface geophysical data suggests that this depression, which has been tentatively identified as a glacial kettle basin, is relatively small and localized, with a maximum depth of approximately 45 feet. It is recognized, however, that the lack of confirming borings and the potential effect of contaminants on geophysical data preclude firm conclusions regarding the nature and geometry of this geologic structure. The possiblity of a ground water outlet from the formation cannot be eliminated. Two ground water monitoring wells located within this formation are highly contaminated.

Investigation of the ground water indicated that there are two (2) ground water flow systems beneath the site. The upper, unconfined flow system, which extends down to the lodgement till, has a water table configuration closely reflecting the surface topography. The water table gradient in this system ranges from 0.02 to 0.13, and slopes generally northward toward Lake Ontario. The lower flow system is in the bedrock, the piezometric surface of which is lower than that of the overburden water table. This system also flows northward. Consideration of the water table configuration and stratigraphy of the site leads to the conclusion that White and Wine Creeks are effluent in nature, and intercept ground water flow through the surficial soils beneath PAS.

Four (4) drained, subsurface storage tanks, which formerly contained waste (including PCBs) remain on-site. Heavily contaminated soils, and black oily leachate in the vicinity of the tanks, indicate that the tanks may be a continuing source of contamination.

SITE HISTORY

In the early 1900's a concrete dam, which is still partially intact near the northwest property corner, was used to pond water for a private ice mill. Later, Oswego County assumed ownership of the property in lieu of unpaid taxes. During the late 1950's, rubble and demolition debris were disposed of on the site. In the late 1960's the site was given by the Port Authority/Oswego County to a group of local businessmen for the construction of a high temperature, liquid chemical waste incinerator facility. This facility, known as Pollution Abatement Services, Inc.(PAS), was constructed and became operational in 1969-1970. Throughout its active life, PAS experienced continuous operating problems, numerous air and water quality violations, and mounting public opposition. During its operating period from 1970 through 1977, a large number of drums containing various chemical wastes were collected and stored onsite. Tankloads of liquid waste were also received and stored in onsite lagoons. Beginning in 1973, a series of incidents, which included liquid waste spills and overflowing of lagoon waste into the adjacent White Creek, led to the involvement of the United States Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation (NYSDEC). This involvement included a number of limited and temporary remedial actions during the period from 1973 until 1976.

In December 1976, EPA constructed a dike to prevent overflow of one of the lagoons. In 1977, PAS was abandoned. In August 1977, EPA utilized the Federal Pollution Control Revolving Fund covered by Section 311 of the Clean Water Act for cleanup activities at PAS. These activities included:

- The treatment and disposal of all liquids in the lagoons.
- The closing, capping, and/or grading of all lagoons.
- The installation of a leachate filter system.
- The drainage and disposal of the liquid in two above-ground storage tanks.
- The drainage of one underground tank.
- The overpacking of deteriorating 55-gallon drums.

In November 1978, the DEC entered into a contract with SCA Chemical Waste Services (SCA) to characterize the approximately 14,000 drums on-site.

From May to August 1980, SCA, under a contract with NYSDEC, removed approximately 2,600 drums. During this period, samples were collected from two bulk storage tanks. Analytical results indicated concentrations of 754 ppm and 22 ppm of PCB-1248.

In the winter of 1980, liquid wastes were emptied from two large vertical storage tanks and disposed of off-site.

In 1980, the U.S. Geological Study installed nine (9) on-site monitoring wells.

In the summer of 1981, PAS was selected as one of the first sites in the nation to receive CERCLA Trust Fund monies to conduct cleanup actions. An immediate removal action was initiated which resulted in the repacking of 503 leaking drums, and the lining of a seep pit to control leachate. The removal action was deactivated in September of 1981 when it was realized that the tasks specified would greatly exceed available funds.

In September of 1981, EPA's contractor, Camp, Dresser & McKee, prepared plans and specifications for surficial cleanup of the site.

On March 12, 1982, a Cooperative Agreement covering the surficial cleanup and subsurface investigation was awarded by EPA to DEC.

In June of 1982, DEC hired SCA to perform the surficial cleanup of PAS, which included the demolition and disposal of on-site facilities, the removal of the remaining on-site drums, and the drainage and disposal of approximately 80,000 gallons of liquid chemical waste from ten (10) bulk storage tanks. This task was completed in November of 1982. In November of 1982, URS Company was selected to perform a complete site investigation, characterize remaining contamination, and recommend remedial actions at the site. A Remedial Investigation/Feasibility Study was submitted in final form to DEC and EPA in January 1984.

<u>CURRENT SITE STATUS</u>

The types and quantities of wastes recovered and disposed of during surficial cleanup activities completed at the site during 1982 are summarized in Table 1. As indicated, these wastes included waste acids and alkalis, PCB-contaminated solids and liquids, halogenated organics, organic resins, and heavy metal-laden wastewater. Many of these compounds are toxic and carcinogenic.

Based upon chemical analytical data generated during the remedial investigation, contamination at PAS has been characterized as follows:

- Soil contamination is significant, widespread and non-uniform across the site, suggesting multiple on-site sources of contamination. Analytical data, summarized in Table 2, indicates the presence of a wide range of organic and inorganic priority pollutants. PCBs were detected in eleven (11) of the twelve (12) soil samples. The two highest concentrations of PCB1248, 22,000 and 9,000 ppb, were obtained from samples collected near four subsurface tanks. Black, oily leachate has also been observed in this vicinity, suggesting that the tanks are a continuing source of PCB contamination. Interpretation of soil screening data revealed that soil contamination generally decreased with increasing depth, with 85% of all positive Volatile Organic Carbon (VOC) and 100% of all PCBs appearing in the upper ten (10) feet of soil. A depression, approximately 45 feet in depth, located in the central area of the site, has been found to contain contaminated stratified sediments.

- Ground water beneath the PAS site has been contaminated with a wide variety of priority pollutants which are summarized in Table 3. The pattern of ground water contamination, is widespread across the site. Two (2) wells located near a former lagoon location, and within the stratified sediment depression area, are contaminated. Examination of data generated from two (2) corresponding ground water monitoring wells located on opposite sides of White Creek indicate that the well on the PAS side is contaminated, while the well on the opposite side is not, implying that the stream is intercepting contaminated ground water.

- Chemical analytical results obtained from surface water and sediment samples, and summarized in Table 4, indicate high levels of contamination in the two on-site drainage ditches, but relatively low and non-persistent effects upon down-gradient water quality due to bonding of the contaminants to soil particles.

However, the impact of the site upon down-gradient water quality may have been obscured by the short winter sampling period, and by the filtering effect of the wetlands. The actual impact of the site on the adjacent stream system may be more accurately represented by a biological survey of the stream system which was conducted in May of 1983. Upstream samples collected from White and Wine Creeks indicated that both streams were moderately stressed, but within normal limits for streams of their size receiving agricultural run-off. Samples collected adjacent to and down stream from the site, however, indicated that the streams were severely stressed with the more pollution-sensitive species missing or greatly reduced in number.

The physical characteristics of the PAS site indicate that surface water, particularly White Creek, is the most likely pathway for contaminant migration from the site. Contaminated ground water flowing through the shallow ground water system under PAS appears to be intercepted by White Creek. Information to date indicates that the upper ground water system is separated from the bedrock system by a continuous lodgement till layer, that is assumed at this time to be impermeable. A relatively deep, stratified depression has been identified and is assumed to be completely contained within the site. However, uncertainties exist regarding the geology of this formation. This inadequately defined depression may have one or more subsurface outlets which could facilitate migration of contaminated ground water from the depression, beneath White Creek, and into adjacent drinking water sources.

The most obviously affected receptors of contamination from PAS are White and Wine Creeks and the adjacent wetlands. As stated previously, both streams appear to be within a normal stress range upstream of the site, but display evidence of severe stress adjacent to, and downstream from the site. Both streams are used by a wide variety of wildlife, including avian and fish species, the latter of which utilizes the streams for spawning. The lower reach of Wine Creek, near Lake Ontario, is used for seasonal recreational fishing. Wildlife, in addition to being adversely affected by contaminants, may act as vectors for off-site contaminant migration and may introduce contaminants into the food chain.

Contaminated surface water runs off the site onto the adjacent radio station property, facilitating direct human exposure to contaminants.

Enforcement

Potentially responsible parties have been identified from PAS invoices and financial records.

Two meetings have been held among EPA and all interested PRP's. The PRP's have formed a steering committee to represent those interested PRP's in negotiations, and a technical steering committee to review all technical documents. The steering committee met with EPA on March 28, 1984, in New York to discuss a possible settlement. As of this date, no settlement has been reached.

It is EPA's intention to negotiate with the potentially responsible parties if a settlement offer is forthcoming. If these negotiations are fruitless, or if it appears that the PRP's are not negotiating in good faith, then EPA is prepared to file a cost recovery action in Federal Court. In the case of a settlement agreement with the PRP's, an Administrative Order or Judicial Order would formalize or actualize the agreement.

ALTERNATIVES EVALUATION

The major objective of the feasibility study was to evaluate remedial alternatives using a cost-effective approach consistent with the goals and objectives of CERCLA. A cost-effective remedial alternative is defined in the National Contingency Plan (NCP) (40 CFR 300.68J) as "the lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment." The NCP outlines procedures and criteria to be used in selecting the most cost-effective alternative.

The first step is to evaluate public health and environmental effects and welfare concerns associated with the problem. Criteria to be considered are outlined in Section 300.68(e) of the NCP and include such factors as actual or potential direct contact with hazardous material, degree of contamination of drinking water, and extent of isolation and/or migration of the contaminant.

The next step is to develop a limited list of possible remedial actions which could be used. The no-action alternative must be included on the list.

The third step in the process is to provide an initial screening of remaining alternatives. The costs, possible adverse effects, relative effectiveness in minimizing threats, and reliability of the methods are reviewed here.

The no-action alternative was evaluated for PAS; however, based on the following assessment, it was eliminated from further consideration.

The results of the RI/FS indicate that there is significant contamination at PAS. Specifically, the ground water and soil beneath the site are contaminated, as is surface water on-site. Findings of a biological stream survey conducted in May 1983, indicate that the adjacent stream system has been adversely affected by the PAS site. Hydrogeological investigation of the sediments to approximately 45 feet in depth, exists near the center of the site. The exact geometry of this formation has not been conclusively defined, therefore, the possibility of subsurface ground water outlets can not be eliminated.

Two major concerns which have been identified at PAS are the potential for contaminated ground water to migrate from the site, and the adverse effect that PAS appears to be exerting on the adjacent stream system. The first concern, contaminated ground water migration, is primarily a public health concern. There is a potential for contaminated ground water to migrate from the site, via presently unrecognized ground water outlets from the stratified sediment depression and into private drinking water sources to the north of the site. The concentrations of several of the contaminants identified in the ground water beneath PAS exceed Primary Drinking Water Standards according to the Safe Drinking Water Act of 1977 (see Table #3). In addition, most of the organic compounds detected in the ground water exceed the New York State Department of Health 50 ppb guideline for single organic compounds found in water used for human consumption.

The second concern, the impact of PAS on the adjacent stream system, is both a public health and environmental issue. The stream system, although biologically stressed, is used by a wide variety of wildlife including avian species. The streams are spawning grounds for certain fish species, and are used for recreational fishing. Human consumption of fish taken from these streams can introduce contaminants into the food chain.

Based upon the results of the RI/FS, the impact of PAS on the adjacent surficial environment, and the potential for the contamination of drinking water sources, it was determined that measures should be taken to remove and/or isolate contaminants on site. Conceptually, this included the removal of any remaining sources of contamination, reduction of the quantity of ground water becoming contaminated, and the isolation of the site from the surrounding environment.

To address these objectives, on-site remedial options were categorized into three (3) broad scenarios that included, excavation and removal, on-site treatment, and site containment.

Complete site excavation was evaluated and associated costs were calculated. The cost for excavation, transport, and disposal of approximately 230,000 cubic yards of contaminated soil in a secure landfill, has been estimated to be $75 million. While the implementation of this alternative would provide the most effective and complete removal of contaminants from the PAS site, the associated expenditures were prohibitive. Since an alternative was available that would be effective in providing adequate protection to the public and the environment, the complete excavation option was eliminated.

Although, complete excavation was found to be not cost-effective, some removal of visible surface soil contamination, subsurface drums and tanks was considered, and deemed consistent with previous remediation on-site.

An array of options was then assembled that combined aspects of both source containment as well as on-site collection and treatment of contaminated waters.

Alternatives considered either technically unreliable or infeasible as well as too costly were excluded.

Six (6) remedial alternatives resulted and were individually analyzed to determine the degree to which each provided adequate protection of human health, welfare, and the environment. As indicated in Table 6, each of the six remedial alternatives includes limited excavation and removal as discussed previously. The development of the alternatives resulted from the combination of various remedial components that are summarized below:

- Limited excavation and removal of the visible contamination has been discussed and deemed feasible. An option to this recommendation (consistent with current RCRA requirements) would be to provide a secure disposal area on-site. This would require the installation of an impermeable bottom liner as well as an impermeable cap to enclose the excavated material. In addition, future monitoring of this facility would be mandatory. This alternate scheme was considered completely impractical. Associated costs would greatly exceed the $300,000 estimated for limited excavation and removal.

- Grading and capping of the site. The purpose of grading the site is to channel surface leachate into the proposed leachate collection system, and discourage off-site surface water run-off. Capping the site would reduce the amount of rain water infiltration into the site, which would reduce the amount of ground water becoming contaminated. Capping in conjunction with other measures, would lower the ground water table beneath the site. Lowering the ground water table is important because the data from the RI/FS indicates that soil contamination decreases with increasing depth. Therefore, lowering the ground water table would reduce the amount of ground water coming in contact with contaminated soil.

- Stream diversion of White Creek. In this remedial measure, White Creek would be intercepted south of the site, and diverted, through a conduit, into Wine Creek. This would eliminate substantial stream flow through the center of the site, thereby reducing the amount of surface water becoming contaminated. With proper construction (discussed in the RI/FS) the diversion trench would intercept shallow northward flowing ground water, before it reached the site. This, in conjunction with other measures, would lower the ground water beneath the site. Stream diversion, however, would not prevent ground water migration from the site.

- Construction of a perimeter slurry wall would divert ground water flow away from PAS, consequently lowering the ground water table beneath the site, and would isolate ground water contaminants onsite. The depth of the slurry wall will be deep enough to intercept any unrecognized ground water outlets from the stratified sediment depression, should any exist. The stratum (lodgement till or bedrock) into which the wall should be anchored would depend upon the outcome of test borings.

- Leachate collection from the existing central drainage ditch, and from the north and northeast boundaries of the site, would reduce the amount of leachate entering into the stream system, and onto adjacent properties.

- A pump and treat system to remove contaminated ground water from beneath the site. Of particular concern is the contaminated ground water in the stratified sediment depression.

  Based upon a conceptual model of this formation developed by the RI/FS consultant, the volume of ground water in it has been estimated to be one million gallons. It has been estimated that the removal of one volume (1 million gallons) of ground water will remove the majority of contamination from this area. One year is the estimated time required to remove this amount of ground water. This recovery process will continue until background levels are attained in the ground water beneath the site or until contaminant levels stabilize over the course of a complete volume. Under the latter scenario, an evaluation will be made by EPA and the State to determine the need for further treatment or closure in accordance with RCRA.

  Collection of the leachate and contaminated ground water require that provisions be made for ultimate disposal of these materials. Two general methods were considered in the RI/FS: off-site disposal and on-site treatment. The cost for off-site disposal is highly dependent upon the quality of leachate being handled. Based upon the analytical data from surface water in the two on-site drainage ditches and ground water in the monitoring wells, an average unit price for off-site disposal is estimated to be approximately $1.30/ gallon, including transportation to, and treatment at a permitted hazardous waste disposal facility. Evaluation of the same data indicates that on-site treatment of leachate is feasible at PAS. The cost for on-site treatment was estimated in the RI/FS to $0.26/gallon. This figure was based upon the following assumptions:

- The treatment mode is intermittent, utilizing the existing (retrofitted), 24,000-gallon wash water holding tank for flow equalization and retention.
- Treatment is provided whenever the 24,000-gallon wash water holding tank becomes full. During the first year, when leachate is being collected at a rate of 0.25 million gallons per year (MG/YR) and ground water is being recovered at a rate of 1.0 MG/YR, treatment will be required, on the average, once per 7 days. During the succeeding 4 years, when only leachate is being collected, treatment will be required only once per 35 days, or 5 weeks.

- Flow through the plant is set at 50 gallons per minute; the plant operating cycle is, therefore, 8 hours. An additional labor allowance of 4 hours per operating cycle is provided for start-up, shut-down and maintenance operations.

- The precipitation/sedimentation/filtration package plant has a rated capacity of 100 gpm at a filtration rate of 5 gpm/ft2. Assumed chemical dosage are 300 mg lime/gallon and 4 mg polymer/ gallon.

- The carbon adsorption treatment costs are based on an installed, two-stage, in-series, fixed bed, downflow contacting system. It has been assumed that exhausted carbon will be picked up and hauled away through a service agreement with a supplier who will also provide fresh carbon. The carbon system has been sized based on the following assumptions:

  - 30 minute contact time
  - Carbon usage rate - 74 lbs/hr.
  - System lined for corrosion resistance
  - Total weight carbon/bed = 3000 lbs.

- The neutralization system is assumed to be fully automated and will operate in a continuous mode.

- The building necessary to house the system occupies 1800 square feet and is fully winterized.

- One person will operate the treatment plans and will be on-site for a total of 12 hours each operating cycle. The assumed labor rate is $15.00/hr.

- An analytical allowance of $500 per operating cycle is provided.

Table 5 provides a list of unit processes for treatment of liquid hazardous waste. Based upon surface and ground water characteristics at PAS, an assumed intermittent treatment mode, and the capabilities of individual unit processes, the following processes train is considered to represent the most feasible and economical treatment scheme for PAS: flow equalization, precipitation/ flocculation/sedimentation, activated carbon adsorption, neutralization, and possible granular media filtration. The primary rationale for rejection of the other unit processes included: the generation of a highly contaminated residual waste stream requiring further treatment or disposal (e.g. ion exchange, liquid ion exchange, reverse osmosis, ultrafiltration), questionable ability to adequately treat the range of organics present (ozone oxidation), their relatively high capital costs (ion exchange, liquid ion exchange), and their sensitivity to various constituents present in the wastewater (e.g. sensitivity of ion exchange to aromatic organics).

As part of the design phase for on-site leachate treatment, bench-scale or pilot-scale testing would be required to determine the effectiveness of selected unit processes with actual leachate from PAS, and to establish final design parameters for these processes. Based upon this testing program, certain processes may have to be added, deleted or modified.

As stated previously, six alternatives were developed that were felt would provide varying degrees of public and environmental protection.

Alternative #1, as it appears in Table 6, was selected as the recommended remedial alternative because it provides adequate protection to public health and the environment. Limited excavation, off-site removal, grading, and capping of the site were included to remove existing sources of contamination and to reduce leachate generation. A perimeter slurry wall was recommended to isolate the site from the surrounding area. The wall would prevent ground water from flowing into the site, and would also prevent contaminated ground water from leaving the site. The proposed leachate collection system would contain leachate on-site. A ground water collection and treatment system has been recommended to collect and treat contaminated ground water from beneath the site.

Alternatives 2 through 6, while technically feasible, did not provide adequate protection. An assessment of these alternatives follow:

Alternative #2 is identical to #1 except that the slurry wall was replaced with stream diversion. This alternative was found to be inadequate because the stream diversion option would not contain contaminated ground water on-site.

In alternative #3 the ground water recovery option was eliminated. This alternative is unacceptable because it also does not include a means to prevent contaminated ground water from migrating off-site, and therefore does not provide adequate protection against ground water contamination.

Alternative #4 does not include leachate collection, ground water recovery, or on-site treatment. This alternative does not prevent contaminated ground water from migrating off-site, and therefore does not provide adequate protection against ground water contamination.

Alternative #5 is identical to #4 except that the slurry wall option replaces stream diversion. Although this alternative prevents ground water migration from the site, it does not provide for leachate and ground water collection and treatment, and therefore does not provide adequate protection against ground water contamination.

Alternative #6 involves only limited excavation, removal, grading, and capping. This alternative does not adequately prevent ground water contamination nor does it prevent contaminated ground water from migrating off-site. There is also no mechanism for the removal and treatment of contaminated ground water and leachate.

As previously stated, additional sampling will be performed to confirm the integrity of the lodgement till and thus determine if the slurry wall can be anchored into it. If it is found that the till cannot support the slurry wall, then it will be necessary to extend the wall to the bedrock, requiring an estimated additional $700,000. This additional expense would not affect the selection of alternative #1 since it would still be far less expensive than complete site excavation, the only other alternative that would provide adequate protection of health, welfare, and the environment.

A ground water monitoring program will be conducted in accordance with RCRA Part 264. As part of this monitoring effort, a limited number of bedrock wells will be installed to monitor for contamination of the bedrock aquifer.

Community Relations

The final draft of the RI/FS prepared by URS Company, was made available for public inspection and review on February 15, 1984, at the following locations: Oswego County Library, Oswego Clerks Office, Penfield Library, and the DEC, Region 7 Office. The public was notified of this by public notices which were mailed to 127 persons and by press releases which appeared in the Oswego Messengers, Oswego Palladium Times, Post Standard, and the Accent Edition of the Post Standard/Herald Journal. The public comment period began on February 17, 1984, and ended on April 4, 1984. A public meeting was held on February 29, 1984, in Oswego, New York. Numerous questions and comments were aired by local citizens. Responses to these comments are contained in the attached Responsiveness Summary prepared by NYSDEC.

Consistency With Other Environmental Laws

The final recommended remedial alternative for PAS will require that excavated materials be manifested for transport from the site to a secure landfill. The material to be removed will be visible, contaminated soil, buried drums and tanks. Site closure will be in accordance with RCRA Part 264.

The discharge of treated leachate and ground water into Wine Creek will require compliance with the requirements of the State Pollutant Dishcarge Elimination System (SPDES), pursuant to article 16, Title 8 of the New York State Environmental Conservation Law. Although compliance is required, an actual permit is not.

The 37-acre wetland area adjacent to and downstream from the PAS site has been tentatively designated as a regulated wetland (No. OE-1), pursuant to Article 24 of the New York State Environmental Conservation Law. Since it meets the criteria set forth for a Class I wetland, this area will receive the highest priority for protection. Remedial activities at the site, particularly slurry wall construction, will require compliance with the technical requirements of the above wetlands regulations, and also compliance with regulations which are appropriate for sediment control. This site activity will provide a beneficial impact on the wetland. The additional proposed investigation will help to assure the integrity of area wetlands in the future.

RECOMMENDED ALTERNATIVE

According to 40 CFR Part 300.68(j), cost-effectiveness is described as the lowest cost alternative that is technically feasible and reliable and which effectively mitigates and minimizes damages to and provides adequate protection of public health, welfare, and the environment. Evaluation of the six sugggested remedial alternatives, lead to the conclusion that, although alternative #1 is the most costly, it is the only alternative which meets the NCP criteria. The components of alternative #1 are all technically feasible and reliable, and when combined, provide an adequate level of protection for public health, welfare and the environment. The other five alternatives were all found to be deficient in minimizing actual or potential hazards at the site. An alternative to completely excavate contaminated soil from the site while being an effective alternative was rejected because it is very expensive, and the chosen alternative provides adequate protection at a much lower cost.

The following activities are recommended for approval:

On-site

- Limited Excavation and Off-site Removal to a RCRA Approved Landfill
- Grading and Capping in Accordance with RCRA part 264
- Perimeter Slurry Wall
- Leachate Collection
- Ground Water Recovery
- On-site Treatment
- Ground Water Monitoring in Accordance with RCRA Part 264

The following listed figures represent a cost estimate for the proposed actions. NYSDEC has the lead on this project. Cost sharing for the remedial design of this project is 100% Federal and for the project implementation is 90% Federal and 10% State.

COST SUMMARY FOR RECOMMENDED REMEDIAL ALTERNATIVE

INDIVIDUAL REMEDIAL MEASURE	COSTS		
	CAPITAL	O&M[2]	TOTAL
Limited Excavation and Removal	287,800	0	287,800
Grading & Capping	767,700	0	767,700
Slurry Wall to Lodgement Till[1]	337,500	0	337,500
Leachate Collection	71,000	1,400	72,400
Ground Water Recovery	59,600[4]	0	59,600
Onsite Leachate Treatment	480,200	112,700	592,900
	2,003,800	114,100[3]	2,117,900

(1) Data to date gives every indication that installation of the slurry wall to the lodgement till will be sufficient to contain contaminants onsite. If, however, the design phase reveals that the slurry wall should be anchored in the bedrock, then the costs for the slurry wall could exceed $1 million.

(2) NYSDEC understands that the Federal government will pay for 90% of O&M for the first year, after which time, O&M will be the responsiblity of the state. However, the proposed pump and treat system is considered a remedial action, and will be 90% Federally funded for its entire operation.

(3) This figure represents 5 years of O&M for leachate treatment, and 1 year of O&M for the ground water pump and treat system.

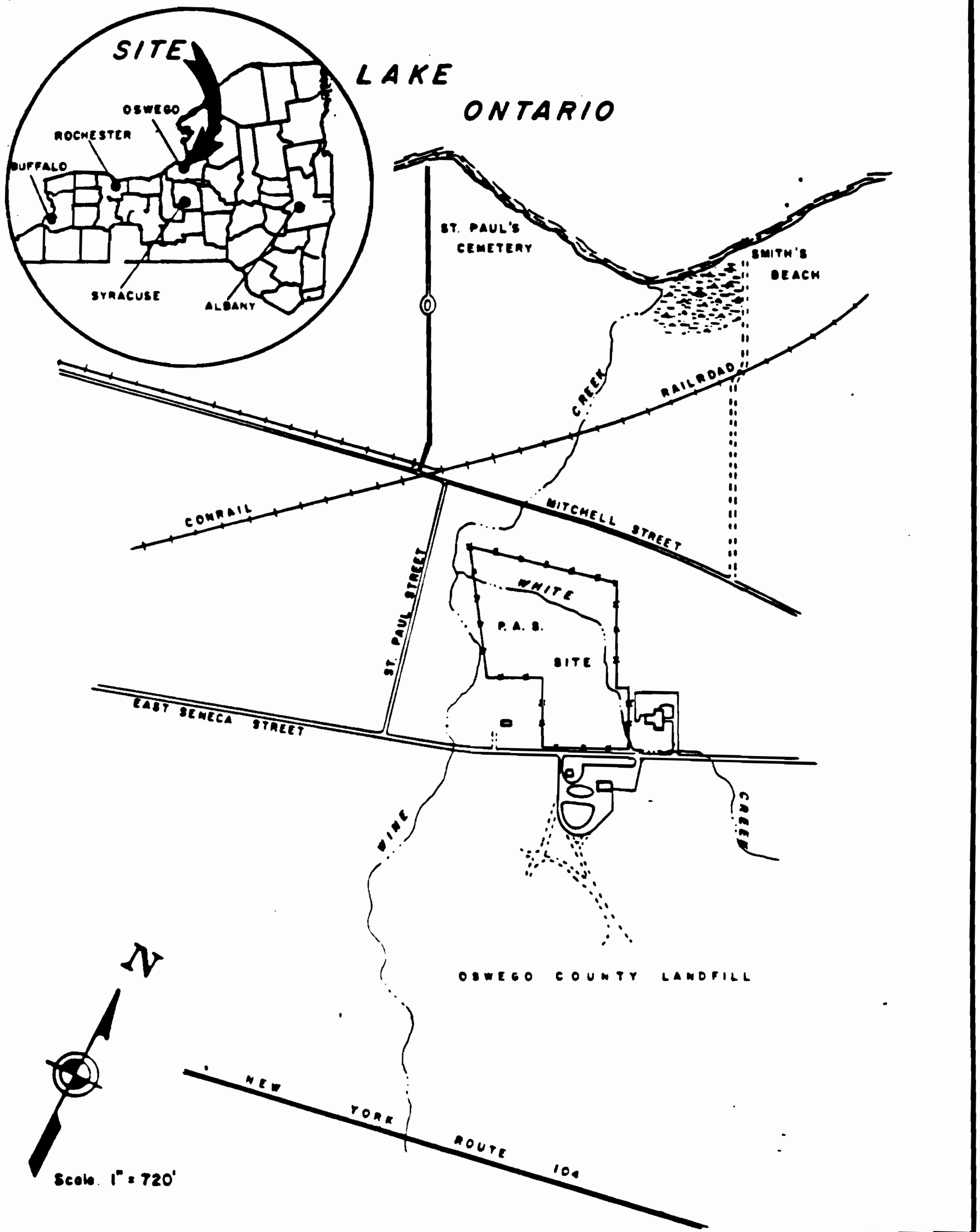
(4) This includes an one-year annual operating cost of $3100.

Schedule

It is anticipated that the final Record of Decision (ROD) will be approved by the end of May 1984. The Cooperative Agreement Amendment should be awarded by the middle of June 1984. Enforcement negotiations between EPA and the potentially respon-responsible parties are ongoing. If a settlement has not been reached by the award date of the Cooperative Agreement, negotiations will be suspended at that time. A Design and Study phase consultant should be selected by DEC during the summer of 1984, and the design phase should be completed by the end of 1984. Implementation is scheduled for the 1985 construction season, and should require approximately six months for completion. The recommended remedial alternative includes a ground water collection and treatment system which, it has been estimated, will require approximately 1 year to sucessfully draw out contaminated ground water from the site. This system is considered a remedial operable unit and will be funded as a remedial action and not as O&M. EPA will fund O & M for the leachate collection and treatment for one year, after which time O & M will become the responsibility of the State.

Future Actions

Leachate collection and ground water recovery measure will require periodic maintenance. On-site treatment will require both operation and maintenance, with the conceptual operation schedule involving a plant operator on-site once a week for the first year, and once every five weeks in the following four years of plant operation.



DWG. NO. A-1510

URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

LOCATION MAP

FIGURE NO. 1

TABLE 1

SUMMARY OF WASTE TYPES AND QUANTITIES
COLLECTED AND DISPOSED OF DURING
SURFICIAL CLEANUP OF THE PAS SITE

DESCRIPTION	TOTAL QUANTITY OF WASTE
Water Reactive Liquid	237.1 gal.
Organic Liquid, Low Halogen (<2%) <50 ppm PCB	20,749 gal.
Organic Liquid, High Halogen (≥2%) 50 ppm PCB	1,426 gal.
Aqueous Acids pH ≤2.0	769 gal.
Alkalines pH ≥12.5	1,819 gal.
Solids, ≥50 ppm PCB	60.75 drums
Solids, <50 ppm PCB	3,662.1 drums
PCB Contaminated Liquid, 50-500 ppm	55 gal.
PCB Contaminated Liquid, >500 ppm	144 gal.
Lab Packs	3 drums
Empty Drums	2,615 drums
Collection and Handling of Washwater[1]	63,918 gal.
Neutral Aqueous <50 ppm PCB, No Cyanide, No Sulfide	165,536 gal.
Collection and Handling of Sludges	123.5 drums
Disposal of Salvageable Steel to Smelter	62.42 tons
Disposal of Building Rubble to Landfill	123.42 tons

Reference: "Engineering Report for the Surficial Cleanup and Disposal of Chemical Wastes/Pollution Abatement Services Site/Oswego, New York," Camp, Dresser and McKee, June 1983.

Table 2

Summary of Soil Analytical Data

Compound	Maximum Detected Concentration (ppb)
Acid Compounds	
2,4-Dimethylphenol	660.0
Phenol	3,000.0
Base/Neutral	
Naphthalene	590.0
Nitrobenzene	185,000.0
Bis (2-ethylhexyl) Phthalate	14,000.0
Butyl Benzyl Phthalate	660.0
Di-N-Butyl Phthalate	410.0
Di-N-Octyl Phthalate	3,300.0
Anthracene	250.0
Phenanthrene	500.0
Pesticides/PCBs	
PCB-1248	22,000.0
Metals	**Maximum Detected Concentration (ppm)**
Arsenic	17.0
Beryllium	0.15
Chromium	26.0
Copper	87.0
Lead	9.1
Mercury	0.040
Nickel	27.0
Zinc	61.0

Table 3

Summary of Ground Water Analytical Data

*Indicates exceedance of Primary Drinking Water Standards according to the Safe Drinking Water Act of 1977.

Compound	Maximum Detected Concentration (ppb)
Volatile Compounds	
Benzene	5,500.0
Chlorobenzene	480.0
1,2-Dichloroethane	3,500.0
1,1,1-Trichloroethane	560.0
Chloroform	290.0
1,2-Trans-Dichloroethylene	5,300.0
Ethylbenzene	5,000.0
Methylene Chloride	120,000.0
Toluene	16,000.0
Trichloroethylene	15,000.0
Xylenes	36,000.0
Acid Compounds	
P-Chloro-M-Cresol	Trace
2,4-Dimethylphenol	1,200.0
2-Nitrophenol	550.0
Pentachlorophenol	Trace
Phenol	8,300.0
Base/Neutral Compounds	
Bis (2-chloroethyl)ether	Trace
1,2-Dichlorobenzene	160.0
1,3-Dichlorobenzene	Trace
1,4-Dichlorobenzene	22.0
2,6-Dinitrotoluene	Trace
Isophorone	14.0
Naphthalene	15.0
Bis(2-ethylhexyl) Phthalate	60.0
Di-N-Butyl Phthalate	Trace
Benzo (A) Pyrene	Trace
3,4-Benzoflouranthene	Trace
Benzo (K) Flouranthene	Trace
Metals/Inorganics	
Arsenic	100.0*
Cadmium	8.5.0
Chromium	330.0*
Copper	99.0
Lead	280.0*
Nickel	11,200.0
Selenium	61.0*
Zinc	240.0*
Cyanide	7,300.0

Table 4

Summary of Surface Water and Sediment Analytical Data

Compound	Maximum Concentration in Surface Water (ppb)	Maximum Concentration in Sediment (ppb)
Volatiles		
Benzene	270.0	23.0
Chlorobenzene	51.0	6.5
Chloroethane	<10.0	6.7
Chloroform	95.0	-
1,1-Dichloroethane	150	43.0
1,2-Dichloroethane	2,700	120.0
1,1-Dichloroethylene	6.9	<4
Trans-1,2-Dichloroethylene	540	.74
Ethylbenzene	380	77.0
Methylene Chloride	24,000	1200.0
Tetrachloroethylene	290	5.7
Toluene	4,300.0	130.0
1,1,1-Trichloroethane	45.0	-
1,1,2-Trichloroethane	7.1	-
Trichloroethylene	290	7.3
Vinyl Chloride	80	-
Acid Compounds		
2-Nitrophenol	120	-
Phenol	1,300	1.2
2,4-Dimethylphenol	320	29.0
2,4-Dichlorophenol	-	.41
Base/ Neutrals		
Anthracene	-	1.2
Benzo(A)Anthracene	-	0.50
Benzo(K)Flouranthene	-	0.70
Flouranthene	-	0.40
Pyrene	-	1.4
Fluorene	-	1.0
1,2-Dichlorobenzene	33	-
Bis (2-ethylhexyl) phthalate	40	0.90
Bis (2-chloroethyl) ether	110	-
N-Nitrosodiphenyl amine	23	2.4
Isophorone	22	0.53

Table 4 (Continued)

Compound	Maximum Concentration is Surface Water (ppm)	Maximum Concentration in Sediment (ppm)
Metals/Inorganics		
Beryllium	.002	5.67
Cadmium	.001	21.8
Chromium	.015	137.0
Copper	.013	37.7
Lead	.185	277.0
Mercury	-	0.116
Nickel	.326	49.3
Selenium	.243	
Silver	.088	-
Zinc	.61	258.0
Cyanide	.127	-
Conventional Parameters		
COD (mg/1)	607.0	N/A
Iron (mg/1)	28.7	N/A

TABLE 5

UNIT PROCESSES FOR TREATMENT OF LIQUID HAZARDOUS WASTE

- Flow Equalization
- Precipitation, Flocculation, Sedimentation
- Biological Treatment
  - Air-Activated Sludge
  - Pure Oxygen-Activated Sludge
  - Trickling Filters
  - Rotating Biological Discs
  - Biological Seeding
  - Stabilization Ponds/Aerated Lagoons
- Carbon Adsorption
- Ion Exchange
- Liquid Ion Exchange
- Stripping
  - Air
  - Steam
- Ozone Oxidation
- Neutralization (pH Adjustment)
- Wet Air Oxidation
- Reverse Osmosis
- Ultrafiltration

TABLE 6

Pollution Abatement Services (PAS)
Oswego, New York

ALTERNATIVE	COMPONENTS	COSTS ($1,000) CAPITAL	ANNUAL O&M	PUBLIC HEALTH CONSIDERATIONS	ENVIRONMENTAL CONSIDERATIONS	TECHNICAL CONSIDERATIONS	PUBLIC COMMENT	OTHER CONCERNS
Alternative #1	Limited Excavation and Removal Grading and Capping Perimeter Slurry Wall to Lodgement Till Leachate Collection Ground Water Recovery On-site Treatment	1363.7	117.2	• eliminates threat since contaminants are fully contained on-site	• grading and capping of the site will cause a minimal impact on adjacent floodplain and drainage to wetlands • leachate recovery and ground water collection will reduce the volume of ground water entering into White Creek	• final depth of slurry wall to be defined during design • chemical contaminants impact on wall is unknown	very acceptable	• continuing O&M required • temporary impacts during construction
Alternative #2	Limited Excavation and Removal Grading and Capping Stream Diversion Leachate Collection Ground Water Recovery On-site Treatment	1367.2	117.2	• minimizes threat since the predominant method of contaminant transport has been diverted	Same as #1 • stream diversion will greatly change stream system environment	• uncertainty regarding reliability of conduit trench for interception of ground water before reaching the site	marginally acceptable	Same as #1
Alternative #3	Limited Excavation and Removal Grading and Capping Stream Diversion Leachate Collection On-site Treatment	1335.4	114.1	• minimizes threat since the predominant method of contaminant transport has been diverted	Same as #2	Same as #2	marginally acceptable	Same as #1
Alternative #4	Limited Excavation and Removal Grading and Capping Stream Diversion	986.1	0	• minimizes threat since the predominant method of contaminant transport has been diverted	• grading and capping of the site will cause a minimal impact on adjacent floodplain and drainage to wetlands • stream diversion will greatly change stream system environment	• uncertainty regarding reliability of conduit trench for interception of ground water	marginally acceptable	• continued maintenance required • temporary impacts during construction
Alternative #5	Limited Excavation and Removal Grading and Capping Perimeter Slurry Wall to Lodgement Till	982.6	0	• minimizes threat since the predominant method of contaminant transport has been diverted	• grading and capping of the site will cause a minimal impact on adjacent floodplain and drainage to wetlands	• final depth of slurry wall to be defined during design • chemical contaminants impact on wall is unknown	marginally acceptable	Same as #4
Alternative #6	Limited Excavation and Removal Grading and Capping	763.6	0	• the threat is reduced but still exists; contaminants are still on-site and not contained	Same as #5	None	unacceptable	Same as #4
Alternative #7	No Action	0	0	• potential direct contact to nearby residents and recreational users of streams	• degradation of the stream and wetland systems • continued migration of contaminated ground water	None	unacceptable	None
Alternative #8	Total Excavation and Off-site Removal to a RCRA Landfill	75,000.0	0	• significant short-term exposure of workers and nearby residents	None	• uncertainty regarding endpoint for cleanup	acceptable	• community disruption due to truck traffic

MAY 24 1984

BRIEFING FOR THE ASSISTANT ADMINISTRATOR
RECORD OF DECISION
POLLUTION ABATEMENT SERVICES (PAS) SITE, OSWEGO, NEW YORK

PURPOSE

To select the appropriate remedial action at the PAS Oswego site that is consistent with the requirements of CERCLA and the NCP. The Assistant Administrator has been delegated the authority for that approval.

ISSUES

- The rejection of the no action alternative is predominantly based on environmental concerns. This site impacts a wetlands area and the remedial action will mitigate the contamination of the wetlands.

- Due to the selection of a "Best Reliable Technology" for source control at this site, the level of clean up is not an issue.

- The contaminated ground water collection and treatment is a remedial action operable unit, as opposed to the leachate collection and treatment which is an operation and maintenance expense.

- The recommended remedial action is consistent with the technical requirements of RCRA. The cap and ground water monitoring are consistent with Part 264 of RCRA and there is no apparent off-site migration of ground water.

- Enforcement is continuing to negotiate with the steering committee of the potentially responsible parties (PRPs), but the PRPs expressed the belief that the recommended remedy is excessive for this site.

MAIN POINTS

- PAS was a private venture high temperature incineration facility that operated from 1970 to 1977, when it was abandoned.

- EPA and NYSDEC performed emergency and remedial removal and control measures from 1977 to 1982. Over 14,000 drums and ten tanks, containing over 80,000 gallons of liquid chemical waste, were disposed off-site under a Cooperative Agreement for $3,000,000 awarded in March 1982.

- The 15-acre site is bounded on three sides by wetlands formed along the stream channels of Wine and White Creeks. Just north of the site the creeks converge and flow into Lake Ontario, approximately 1800 feet to the north.

- The recommended remedial action includes:
  - Limited excavation and off-site removal of visibly contaminated soils and materials.
  - Containment of the residual contamination by installing a slurry wall and impermeable cap.
  - The collection and treatment of contaminated ground water and leachate.
  - Ground water monitoring

NEXT STEPS

Action	Date
AA, OSWER approves ROD	May 25, 1984
AA, OSWER approves RD funding	June 15, 1984
Remedial Design (FY-84 funds)	August - December 1984
Implement RA (FY-85 funds)	April 1985

ALTERNATIVE	COMPONENTS	COSTS ($1,000) CAPITAL	ANNUAL O&M	PUBLIC HEALTH CONSIDERATIONS	ENVIRONMENTAL CONSIDERATIONS	TECHNICAL CONSIDERATIONS	PUBLIC COMMENT	OTHER CONCERNS
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