United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R01-85/013
September 1985

EPA

# Superfund Record of Decision:

# Nyanza Chemical, MA

## TECHNICAL REPORT DATA
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| 3. RECIPIENT'S ACCESSION NO. | |
| 4. TITLE AND SUBTITLE<br>SUPERFUND RECORD OF DECISION<br>Nyanza Chemical, MA | 5. REPORT DATE<br>September 4, 1985<br>6. PERFORMING ORGANIZATION CODE |
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16. ABSTRACT

The Nyanza Chemical Waste Dump site occupies 35 acres on the north and south sides of Megunco Road in the Village of Ashland in Middlesex County, MA, approximately 35 miles west of Boston. The Nyanza site was occupied from 1917 to 1978 by a succession of companies involved in the production of textile dyes and intermediates. Large volumes of industrial waste water generated by these companies, containing high levels of acids and numerous organic and inorganic chemicals, including mercury, were partially treated and discharged into the Sudbury River via a small unnamed stream (referred to as Chemical Brook). Large volumes of chemical sludges generated by the waste water treatment processes along with spent solvents, off specification products, and other chemical wastes were buried onsite. The area that contains the largest amount of buried waste and exposed sludge is referred to as the "Hill" section.

The selected remedial action for this site includes: excavation of all outlying sludge deposits and contaminated soils and sediments associated with these deposits to background levels; consolidation of this material with the Hill sludge deposits; capping of the Hill area in conformance with the technical requirements of RCRA; construction of a ground water and

17. KEY WORDS AND DOCUMENT ANALYSIS

| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
|---|---|---|
| Record of Decision<br>Nyanza Chemical, MA<br>Contaminated Media: gw, sediments, soil, sw, wetlands<br>Key contaminants: acids, arsenic, chromium, heavy metals, inorganics, organics, sludge | | |

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Abstract (continued)

surface water diversion system on the upgradient side of the Hill; backfilling the excavated areas to original grade and revegetating the wetland areas; and construction of a more extensive ground water monitoring network to enable future evaluation of the effectiveness of the cap. Total capital cost for the selected remedial alternative is estimated to range from $5.6 to $9.8 million, with annual O&M costs of $92,000 for year 1 and $70,000 for years 2-30. EPA will undertake an additional RI/FS to evaluate the extent of and risks posed by offsite ground water contaminant migration and sediment contamination in the Sudbury River and wetlands contiguous to the site. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared.

Record of Decision

Remedial Alternative Selection

SITE: Nyanza Chemical Waste Dump Site

Ashland, Ma.

DOCUMENTS REVIEWED:

I am basing my decision primarily on the following documents describing the analysis of cost-effectiveness of remedial alternatives for the Nyanza Chemical Waste Dump Site:

1.) Nyanza Chemical Waste Dump, Megunco Road, Ashland,MA. Preliminary Site Assessment Report, October, 1980 Prepared by Massachusetts DEQE

2.) Nyanza Chemical Site, Ashland, Massachusetts, Remedial Action Master Plan, July 1982, prepared by Camp, Dresser, and McKee, Inc., Boston, MA.

3.) Nyanza Chemical Site, Ashland, Massachusetts, Phase I Remedial Investigation/Feasibility Study, March, 1985, prepared by NUS Corp., Pittsburgh, PA.

4.) Nyanza Letter Report of Field Work Performed, July, 1985, prepared by Camp, Dresser, and McKee, Inc., Boston, MA.

5.) Summary of Remedial Alternative Selection (Attached)

6.) Community Relations Responsiveness Summary (Attached)

7.) The National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300.

8.) 40 C.F.R. Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart F - Groundwater Protection; Subpart G - Closure and Post Closure; Subpart N (§264.310 a and b) - Landfill Closure and Post Closure Care.

9.) Executive Order 11988 - Floodplain Management

10.) Executive Order 11990 - Protection of Wetlands

11.) 40 C.F.R. Appendix A Part 6 - Statement of Procedures on Floodplain Management and Wetlands Protection.

12.) RCRA/CERCLA Decisions Made on Remedy Selection, June 24,1985 OWPE Memorandum

DESCRIPTION OF SELECTED REMEDY

REMEDY

- Excavation of outlying sludge deposits/sediments and consolidation with Hill area sludge landfill.

- RCRA capping of the Hill area.

- Upgradient surface water/groundwater diversion system.

- Downgradient groundwater monitoring system.

DECLARATION

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40C.F.R. Part 300), I have determined that the remedy described herein is cost effective and provides adequate protection of public health, welfare and the environment. The Commonwealth of Massachusetts has been consulted and, as provided in the attached letter, agrees with the recommended remedy. This action will require future maintenance activities and post closure monitoring to ensure the continued effectiveness of the remedy.

Maintenance will include lawnmowing of the grass cover overlying the cap, removal of obstructions from the diversion trench, regrading as needed, and repair of any damage to the security fence. Monitoring will include sampling and analysis of upgradient and downgradient wells and surface water. EPA will fund 90% of the first year

maintenance costs.

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.

EPA will undertake an additional Remedial Investigation/ Feasibility Study to evaluate the extent of and risks posed by offsite groundwater contaminant migration and sediment contamination in the Sudbury River and wetlands contiguous to the site. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared for approval of the future remedial actions.

9/4/85
Date

Michael R. Deland
Regional Administrator

# SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

# FOR

# NYANZA CHEMICAL WASTE DUMP SITE

U.S. Environmental Protection Agency

Region I

Boston, MA.

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2.) MA DEQE Concurrence Letter

3.) Wetland Assessment

4.) Floodplain Assessment

5.) FEMA Floodway Maps

6.) MA Preliminary Assessment

## SITE LOCATION AND DESCRIPTION

The Nyanza Chemical Waste Dump Site (herein after "Nyanza Site" or "Site") occupies 35 acres on the north and south sides of Megunco Road in the village of Ashland in Middlesex County, MA., approximately 35 miles west of Boston, 2.5 southwest of Framingham, and .25 miles southwest of Ashland Center. (See Figure 1-1 from the NUS Remedial Investigation Report). For purposes of remedial investigation, the site study area was limited by the boundaries shown in Figure 7-1 from the NUS Report to include all areas of suspected sludge depositio Thus, the New York Central Railroad (CONRAIL) forms the northern boundary and the abandoned trolley bed the eastern boundary. The western and southern boundaries are defined by property lines to include areas owned by MCL corporation, the landowner of the majority of the site. The areas south and west of the site are undeveloped forest land. North and east of the site are residential and commercia areas.

Site drainage from the western half of the site flows into a 2 acre wetland just above the headwaters of Chemical Brook in the northwest corner of the site. Chemical Brook then flows parallel to the Railroad tracks along the northern site border. The eastern half of the site drains into a half acre wetland which is the origin of Trolley Brook. Trolley Brook flows parallel to the abandoned trolley bed until its juncture with Chemical Brook in the northeast corner of the site. The combined streams flow under the railroad and in an open ditch for approximately 100 feet parallel to the railroad befo entering a culvert which extends a quarter mile to the Sudbury River. It is noted that this 100 feet of stream bed is also considered a portion of the site study area due to the contaminated sediments and sideslopes.

The main features of the site are as follows:

- The "Hill" section, which contains the largest amount of buried and exposed sludge (Approx 70,000 $yd^3$).
- The northwest wetland which received sludge contaminants from direct deposition and from surface runoff from the Hill section.
- The eastern wetland which received direct discharge of wastewaters from Nyanza Chemical operations resulting in soil/sediment contamination.
- A light industrial complex in the low lying area between Megunco Road and the railroad where scattered waste deposits exist beneath the surface in the area of former Nyanza operations.

Groundwater flow in the area occurs in two unconfined aquifers. The shallow aquifer consists of glacial sediments 10 to 30 feet thick beneath the Hill section and 30 to 60 feet thick beneath the lower industrial area. Beneath these unconsolidated deposits is a

bedrock aquifer of fractured granite. Groundwater flow directior in both aquifers is north towards the Sudbury River, the presume regional discharge point. There in currently no usage of either aquifer in the area for drinking water supply due to the availability of municipal water supply. (These two aquifers can be considered one since no confining layer separates them.)

## SITE HISTORY

The Nyanza site was occupied from 1917 to 1978 by a succession of companies involved in the production of textile dyes and intermediates. Large volumes of industrial wastewater generated by these companies and containing high levels of acidity and numerous organic and inorganic chemicals, including mercury, were partially treated and discharged to the Sudbury River via a small unnamed stream (now referred to as Chemical Brook). Large volumes of chemical sludges generated by the wastewater treatment processes along with spent solvents, off specification procudts, and other chemical wastes were disposed of by onsite burial, primarily in the Hill Section. Scattered waste deposits and contaminated soils from spills during plant operations are also found in the Lower industrial areas. The last of these companies was Nyanza, Inc. which ceased operations at the site in 1978; the property was then involved in a series of ownership transfers and subdivisions. MCL Development Corp. now owns the majority of the site and leases the former Nyanza plant and operational facilities to Nyacol, Inc. and other businesses. Several small parcels in the lower industrial area were purchased from MCL by the business concerns currently operating there (despite knowledge of the contamination) and by other parties. The site was actually "discovered" in the early 1970's as a result of a study of mercury contamination of the water, sediments, and fish in the Sudbury River by JBF Scientific Corp., an EPA contractor. The study pinpointed Nyanza as the cause of this contamination. Earlier and later Federal and State involvement with Nyanza is outlined in the Preliminary Assessment Report prepared by Massachusetts DEQE in 1980.

The only response action taken thus far was the installation of a chainlink fence by MCL Development Corp. in 1981 to control access to the Hill section of the site.

## CURRENT SITE STATUS

A review of the information in the Remedial Investigation (RI) report prepared by NUS Corp. and a subsequent Nyanza Letter Report prepared by Camp, Dresser, and McKee, Inc. indicates the existence of thirteen (13) areas which have been contaminated either from direct waste deposition or from sediment transport via surface runoff from the deposition areas. Table 1 contains a description of each area and an estimate of the amount of contaminated material in each. Figure 1-2 shows the location of each area. All of these areas are contaminated to varying degrees with heavy metals

including mercury (Hg), lead (Pb), chromium (Cr), cadmium (Cd), and arsenic (As). Tables 7-2 and 7-4 from the RI report show, the ranges of concentrations present in the sludges, soils, and sediments.

Additional subsurface testing was conducted during the predesign phase in the Hill area and in the western wetland, the two areas where wastewater treatment sludges were directly deposited. The intent of this testing was to further delineate the depths of the sludge deposits and to assess the extent to which the soils beneath the sludge deposits had become contaminated from leaching. The results of this testing indicated that soil metal concentrations decreased markedly at depths of 1-2 feet below the sludge/soil interface and approached background levels at depths of 2-3 feet.

In addition to the heavy metal treatment sludges, the Hill area is also thought to have been the disposal area for off specification chemicals, distillation residues, and waste solvents. The groundwater beneath the Hill does show some contamination by organics such as trichloroethylene, nitrobenzene, and chlorinated benzenes. However, extensive test pitting in the area has failed to uncover any discrete concentrated sources, thus supporting the RI report conclusion that organic wastes were disposed primarily in the lower industrial area in unlined lagoons and only incidentally in the Hill area.

The identification of certain areas as sludge deposition areas by NUS Corp. in the RIFS, based on previous work by Connerstone,Inc. and Carr Research Laboratories, Inc., was not confirmed in the CDM pre-design field testing, which employed numerous test pits and borings. Area VI (using the RIFS designation) consists of a buried concrete vault behind the Nyacol production building in the southwest corner of the lower industrial area. Analysis of the contents of the vault indicated that the wastes contained therein, while containing some heavy metals, are primarily organic sludges. Test pits outside the vault exhibited high organics levels which suggests that the vault has been leaking for some time and is the probable source of the organic contamination in monitoring wells 8 and 5. The potential health and environmental problem associated with the organic material stems from migration through groundwater and not from dermal contact or other exposure pathways. The nature and extent of the cost-effective remedy for this waste deposit can be more accurately determined once the groundwater RI/FS is complete, as then the necessity for and degree of excavation can be assessed in light of whatever organic groundwater problem exists. Therefore, consideration of the remedy for the organics in the vault will be deferred to Phase II of the remedy.

Area II was identified as a sludge deposition area directly north of the Nyacol office building and parking lot. Test pitting in this area did not reveal any sludge deposits.

Areas III and IV are in the lower industrial area on the north side of Megunco Road and are the site of the former Nyanza plant buildings. These areas are now occupied by an excavation company

and a waste oil reclamation facility. Both had been identified as possibly containing buried sludge, contaminated fill, or contamir d soils from spillage during plant operations. Test pits and borir did not confirm these areas as grossly contaminated with sludge, although some surface contamination hot spots were found in Area III.

Certain other areas not identified in the RIFS as contaminated were also investigated based on comments received prior to and during the public comment period. The remnants of a former waste lagoon adjacent the two existing Nyacol waste treatment lagoons were unearthed during the pre-design test pitting. Heavy metal sludge was found and this area will be included in the Phase 1 remedy.

The large wetland east of the trolley bed was not investigated by NUS because it flows into the headwaters of Trolley Brook and was thought to be upgradient of any waste discharges. However, the upper reaches of this waterbody did receive some runoff from the southeastern corner of the Hill area and may also be a discharge point for groundwater. Preliminary results of pre-design field tests indicate that both the water column and the sediments are contaminated beyond normal background levels. However, the full extent of this contamination and the attendant risks are unknown. Since this contamination is a result of offsite migration from source areas, consideration of this area will be deferred to the Phase II study and addressed in conjunction with the Sudbury River sediments and the groundwater contamination problems which have also resulted from offsite migration.

Three other areas were added to the Phase I project based on the pre-design sampling. The sediments of Chemical Brook, selected hc spots in the wetland on the north side of the CONRAIL tracks, and the drainage path from the southeastern portion of the Hill all contain heavy metal contamination and will be excavated.

As previously noted, this Phase I action is a Source Control Action and does not address groundwater contamination. However, a brief discussion of this contamination is needed since it has some bearing on the justification for phasing the project. The existing data show contamination of both the bedrock and the unconsolidated deposits, which are hydraulically connected, with volatile and semivolatile organic compounds. This contamination centers around the lower industrial area and is presumed to have resulted from the prior discharge of waste solvents and other organic liquids to the groundwater using unlined lagoons and from the aforementioned leaking vault in the area near monitoring well 8. Some organic contamination is also present beneath the Hill in the vicinity of monitoring well 7 although efforts to locate a source in that area have proven fruitless. It is suspected that buried lagoons in the Hill area may have been used as leaching pits for organics at one time.

The existing data on heavy metal concentrations in groundwater is limited. Nevertheless, the existing data suggests that heavy

metals in the sludges are leaching to groundwater but to a very limited extent. This is probably due to the fact that portions of the Hill and wetland sludge deposits are below the seasonal high groundwater table. Monitoring wells 2, 7 and 10 in the Hill area show chromium, cadmium, mercury and arsenic levels below the Maximum Contaminant Levels (MCLs) set under the Safe Drinking Water Act, whereas the MCL for lead was exceeded in one well. At monitoring well 3 in the western wetland downgradient from the Hill, the metals were all below the MCLs. Monitoring wells 8, 9 and 11 are located in the lower industrial area on the south side of the CONRAIL tracks, an area of past discharge of untreated wastewaters to the groundwater. MCLs for lead and chromium were exceeded in these wells. Wells 4, 5 and 6 are located immediately north of the CONRAIL tracks and are the only wells downgradient from all former waste management areas. MCLs for chromium, arsenic and cadmium were exceeded at well 5 although this may be a local phenomenum in that the groundwater pH at this location was 3.9 and 4.2 during two sampling runs; this well is just north of a former waste acid sump. At wells 6 and 4, MCLs were not exceeded, although the valid data points are limited.

In summary, although the most prevalent and concentrated groundwater contamination is organic in nature, there is some inorganic (metals) contamination above MCL levels beyond the site boundaries downgradient from the former waste management areas. The available data suggest that the organic contamination resulted primarily from direct discharge of wastes to the groundwater with a lesser contribution from leaching of wastes intermixed with the metal sludges, whereas the heavy metal contamination resulted from the leaching of sludges placed below the groundwater table and/or from direct discharge of waste acids to groundwater.

## ENFORCEMENT

On March 4, 1982, EPA issued Notice Letters to 17 potentially responsible parties (PRP) including present and past owners and operators of the site. Based upon the responses to these notice letters, investigations by EPA Region I, and numerous discussions with the primary current owner, it was determined that there is no PRP willing and able to undertake the necessary response actions at the site. Therefore, it is recommended that CERCLA Trust Fund monies be expended on the site cleanup.

## ALTERNATIVES EVALUATION

The Feasibility Study has been limited to source control measures that address the contaminated sludge deposition areas and those area sediments and soils contaminated by past discharges of untreated wastewaters or runoff from the deposition areas. Contaminated groundwater will be addressed under 40 C.F.R. 300.68(e)(3) as an offsite remedial action in the Phase II RIFS. Contaminated sediments in the Sudbury River and in the wetland area east of the abandoned trolley bed will also be addressed in the Phase II project.

A. OBJECTIVES

The objectives of the Phase I Feasibility Study were to reduce the generation of contaminated leachate and thereby mitigate future groundwater contamination; to minimize offsite contaminant migration via surface runoff and air transport; and to minimize direct human and environmental exposure to contaminated sediments. To meet these broad objectives, the wastes must be isolated to minimize contac with groundwater, surface water, and air and to prevent human and animal exposure.

DEVELOPMENT OF ALTERNATIVES

Technologies were developed from a wide range of general response actions, based upon the technical applicability to the stated objectives of site remediation.

Table 2-1 lists the general response actions considered appropriate for evaluation in terms of the Nyanza site and the technologies considered for each response action. These technologies were then combined to form the thirteen (13) remedial action alternatives listed in Table 3-1.

Table 3-1 lists the alternatives in a hierarchy. At the bottom are the No-action alternatives, which do not satisfy the site objectives since no remediation is provided. Next are the capping alternatives (3-7) which involve selective excavation of the outlying sludge deposits and sediments, transfer to the hill area, and capping along with the hill deposits. The extent of excavation and ratio. .e therefore are discussed on pages 25-26. These alternatives differ in the type of cap, the degree of surface and groundwater diversion/ isolation, the use of fixation processes on the sludge, and whether or not leachate is collected and treated. Unlike the No-action alternatives, these alternatives do address the site objectives to varying degrees and would also result in short term impacts in the excavation areas. Each would present the potential for air emissions and contaminated runoff during excavation, traffic congestion due to importation of clean fill and transport of wastes from the lower industrial area to the Hill section, and possible disruption of business in the lower industrial area. Each would also involve excavation within the wetlands for brief periods of time. The next group of alternatives (8-12) involve total excavation of all sludge deposits including those in the Hill area, backfilling/revegetation, and surface water control. The alternatives differ in the method of containment, i.e. capping or secure landfill; the location, i.e. on site or offsite; the use or nonuse of fixation; the method of isolating wastes from groundwater, i.e. backfilling above the high water table or diverting upgradient groundwater to lower the water table; and the degree to which wastes are kept above the high water table, i.e. federal or state standards/guidelines. These alternatives also address the site objectives and would

accentuate the aforementioned short term impacts. The final alternative (13) involves capping the Hill deposits inplace and excavating the outlying areas for offsite disposal. This alternative also addresses the site objectives while adding the impacts associated with offsite transportation of the outlying wastes.

INITIAL SCREENING

The thirteen (13) alternatives were screened based on the criteria in 40 C.F.R. 300.68(h), i.e. cost, effects of the alternative, and acceptable engineering practices.

The following is a brief discussion of those alternatives that were eliminated from detailed evaluation and the reasons for the elimination.

2.) Monitoring This alternative was eliminated from further consideration because it does not achieve adquate control of source material and does not mitigate or minimize current or future threats to public health or the environment. Contaminants will continue to be released to groundwater, air, and surface waters. The existing degraded state of the wetlands will persist as will the potential for direct contact with contaminated sludges and sediments.

4.) Selective Excavation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation

This alternative was eliminated from further detailed evaluation on the basis of technical ineffectiveness and unreliability. The alternative is identical to alternative 3 (which will be fully evaluated) with the exception that the french drain/grout-curtain groundwater diversion system on the upgradient side of the Hill would be extended to encircle the Hill deposits in an attempt to fully isolate the capped wastes from groundwater. Consideration of the fractured nature of the bedrock led to the conclusion that groundwater passing underneath the grout curtain on the upgradient side could actually accumulate behind the downgradient curtain due to the Hill slopes with the net result that the capped Hill deposits would actually have more contact with groundwater (than that under alternative 3).

6.) Selective Excavation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation, Leachate Collection and Treatment

This alternative is identical to Alternative 5 with the exception that groundwater isolation is attempted rather than upgradient groundwater diversion. The alternative was eliminated on the basis of technical ineffectiveness and unreliability for the same reasons previously given for eliminating Alternative 4, i.e. impracticality of groundwater isolation using grout curtains.

7.) Selective Excavation, Waste Fixation, Onsite Disposal, Capping Surface Water Diversion, Groundwater Isolation, Leachate Collecti and Treatment

This alternative is similar to 6 with the exception that the outlying wastes would be fixated to immobilize the contaminants prior to placing them atop the Hill deposits. This alternative would reduce the quantity of contaminated leachate but would still result in contact of the "unfixed" Hill deposits with groundwater due to the impracticality of complete groundwater isolation by means of an encircling grout curtain. Thus, it was eliminated for the same reasons as Alternative 6.

8.) Total Excavation, Waste Fixation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation, Leachate Collection This alternative is again similar to 6 with the exception that all outlying wastes and the Hill wastes would be fixated prior to capping. This alternative was eliminated on the basis of technical infeasibility. The Hill sludge deposits are a very heterogeneous mix of sludge, boulders, construction debris, and rubbish which would severely limit the degree to which the fixation reagants could be mixed with the wastes. Therefore, this alternative was dropped from further detailed evaluation.

11.) Total Excavation, Waste Fixation, Onsite Disposal in Secure Landfill, Surface Water Control

This alternative is similar to alternative 12 (which will be ful evaluated) with the exception that all wastes would be fixated prior to placement in the landfill. This alternative was eliminated on the basis of technical infeasibility due to the heterogeneous nature of the Hill sludge deposits described above.

DETAILED EVALUATION OF ALTERNATIVES

The alternatives remaining for detailed evaluation are as follows:

1.) No Action

3.) Selective Excavation, Backfill/Revegetation, Soil Capping, Surface Water and Groundwater Diversion

5.) Selective Excavation, Backfill/Revegetation, RCRA Capping, Surface Water and Groundwater Diversion, Leachate Collection and Treatment

9.) Total Excavation, Backfill/Revegetation, Onsite RCRA Landfill ( DEQE standards ), Surface Water Diversion

10.) Total Excavation, Backfill/Revegetation, Offsite RCRA Landfill Disposal

12.) Total Excavation, Backfill/Revegetation, Onsite RCRA Landfill, ( federal standards ), Surface Water Diversion

13.) Selective Excavation, Backfill/Revegetation, Offsite RCRA Landfill of Outlying Deposits, RCRA Capping of Hill Deposits, Surface Water and Groundwater Diversion

The estimated costs for these alternatives are presented in Table 4-1. The detailed analysis was performed in accordance with 40 C.F.R. §300.68(i) of the National Contingency Plan considering technical feasibility, detailed cost estimation including distribution of costs over time, constructibility, effectiveness in addressing environmental, welfare, and public health concerns, and adverse impacts and mitigative measures.

The No-Action Alternative (#1) represents the baseline against which all other alternatives are to be compared. The objectives for site remediation, described earlier, are based on the conclusion that the current and future potential risks to public health, welfare, and the environment are unacceptable. Those risks were identified in the Feasibility Study and will be briefly summarized here. It is noted that the risks being considered are only those due to the heavy metal sludges, the focus of this Source Control action; this action is appropriate under the NCP since "there is a substantial concentration of hazardous substances remaining at or near the area where they were originally located and inadequate barriers exist to retard their migration into the environment." The second phase RIFS will assess actions that may be necessary to address wastes that have already migrated from their original location (i.e. groundwater contamination, Sudbury River sediment contamination).

The public health risks associated with the heavy metal sludges stem from the potential for direct contact with or ingestion of the sludges, soils, and sediments which are exposed. These wastes contain high concentration of mercury, lead, and chromium and minor amounts of cadmium and arsenic. For exposure via other pathways, the current risks appear insignificant based on comparison of ambient levels and relevent guidelines. Ambient air concentrations of mercury vapors in the Hill area are above background levels but well below existing guidelines at downwind receptor sites.

Thus current exposure via inhalation is negligible (See Table 7-1). It is noted that much of the Hill sludge deposits are covered with soil which reduces the volatilization of mercury vapors. Removal or erosion of this cover could substantially increase the emission rate. The metal concentrations in Chemical and Trolley Brooks and the Sudbury River are below the Interim Primary Drinking Water Standards (See Table 7-3) and do not present a risk from ingestion or dermal contact.

The site has and, if left unremediated, will continue to present environmental risks due to surface runoff from the Hill deposits into the wetland areas and the two brooks which drain the site. The Hill area exhibits considerable vegetative stress in the form of dead and dying trees and the wetland areas constitute poor habitat due to the presence of exposed sludge and contaminated sediments. Runoff from these areas during storm events will transport suspended metals for later deposition in the brooks and ultimately in the Sudbury River and downstream impoundments. The river and impoundment sediments are already contaminated with mercury, lead and chromium to the extent that fish have unacceptable mercury levels for human consumption (using F.D.A. standards). Inaction to mitigate migration of these contaminants will aggravate the existing situation. Thus the No-action alternative is eliminated from consideration because it will not achieve adequate source control and will not adequately prote human health and the environment.

Alternatives 3, 5, and 13 are similar in that all would leave the largest quantity of contaminated sludges, the Hill deposits, in place. Excavation would be limited to the outlying contaminated soils, sludges, and sediments in the wetlands and the contaminated sediments and sideslopes of Trolley Brook. The excavated areas would be backfilled to original grade and revegetated. All three alternatives would employ a surface water/groundwater diversion system upgradient of the Hill section to reduce contact with the sludges that would remain in place and to protect the cap from erosion

Under alternatives 3 and 5, the excavated wastes would be consol ed with the Hill deposits prior to capping. Alternative 3 would utilize a synthetic membrane and soil cover to reduce infiltration of precipitation into the wastes. This would eliminate the direct contact threat and restore the currently degraded wetland areas. It would reduce the emission rate of mercury vapors to the air and would eliminate the migration of contaminants via surface runoff. The imperfect nature of the groundwater diversion scheme coupled with that of the cap would allow some continued contact with the wastes with the result that leaching of soluble contaminants to groundwater would continue, albeit at a reduced rate. This cap does not fulfill the requirements of RCRA due to the lack of redundanc (or greater thickness) in the impermeable layer and is rejected on the basis of unreliability.

Under Alternative 5, the cap would be built to RCRA standards, which would virtually eliminate infiltration of precipitation into the wastes. A leachate collection system would also be installed beneath a portion of the Hill deposits to collect near surface groundwater which might circumvent the diversion system. (This system is not required to comply with RCRA closure standards). Leaching of soluble contaminants to groundwater would persist due to the present saturation of a portion of the wastes, the imperfec nature of the groundwater diversion system, and the lack of a bottom liner. However, the lowering of the water table from

capping and groundwater diversion will greatly reduce this leaching.

This alternative provides adequate protection of public health, welfare and the environment. Leaching of contaminants to groundwater following implementation of this alternative is expected to be minimal and, if it occurs, will be addressed in conjunction with the existing groundwater contamination to be addressed in a second phase RIFS.

Alternative 13 would slightly reduce the amount of wastes to be capped on the Hill while greatly increasing the costs due to the provision of offsite disposal of the outlying wastes at a commercial RCRA landfill. This alternative is rejected since it costs substantially more than Alternative 5 while providing the same degree of protection.

The remaining Alternatives 9, 10, and 12 involve excavation of both the Hill deposits and the outlying deposits followed by disposal in a secure landfill. The onsite alternatives 9 and 12 differ only in that 9 provides 4 feet of clearance between the high water table and the bottom liner as required by Mass. DEOE secure landfill standards whereas 12 provides 1 foot of clearance. (The federal RCRA regulations do not specify a minimum clearance but use a performance based standard which prohibits hydrostatic pressure from disrupting the bottom liner.) Both alternatives address all site remediation objectives by eliminating all direct contact potentia isolating the wastes from groundwater, surface water, and air, and restoring the degraded wetland areas. Both avoid the use of a grout curtain groundwater diversion system, an unproven technology in the New England environment, by filling the excavated Hill cavity above the high water table. This adds considerably to the cost, however, and also results in the landfill extending approximately 40 feet above grade. These alternatives were rejected on the basis of cost since Alternative 5 presents adequate protection at a much lower cost.

Alternative 10 provides for offsite disposal of all excavated wastes in a secure RCRA landfill. For costing purposes, the CECOS facility in Niagara Falls, New York was used. This alternative also satisfies all site remediation objectives by the total removal of all wastes. However, the cost is approximately twice that of the onsite secure landfill alternatives. The prime benefit of this alternative would be the peace of mind given to area residents who have expressed concern about the long term viability of an onsite containment structure, the commitment of state government to operate and maintain the facility, and the absence of guaranteed action by the federal or state government in the event of failure. This alternative would also have the greatest short term impacts in addition to those common to all excavation alternatives. The transport of approximately 100,000 cubic yards of waste material

would require 7000 eighteen wheel vehicles to enter and leave the site within a six month period. Considerable traffic congestion on Megunco Road in the lower industrial area could be expected due to the lack of suitable space for loading operations, vehicle inspec ıs parking, etc. This congestion would extend to the center of Ashl. through which the vehicles must pass en route to interstate transport routes. Selection of this alternative would not comply with the statutory restrictions on offsite disposal under CERCLA §101 (24) in that it is not the cost effective alternative, it is not necessary to protect public health, welfare or the environment, and it would not create new disposal capacity.

All of the alternatives involve excavation of the wastes, either selectively or totally. This excavation will result in increased contact of the wastes with the ambient air, resulting in an increase in the emission rate of organic and metallic vapors and particulates to the surrounding air. The heterogenous nature of the wastes together with their disparate locations precludes the effective use of air modeling techniques to accurately predict ambient air contaminant levels at downwind receptor sites. The meteorological study and air monitoring conducted during the Remedial Investigation and during the predesign sampling work have provided information on real time monitoring equipment capabilities and receptor locations for downwind monitoring sites; this information provides the basis for the design of an effective monitoring program for implementation by the construction contractor.

In summary, the stated objectives of site remediation are satisfi' by Alternative 5, the RCRA capping alternative, which will elimi direct contact, surface runoff of contaminants, and air emissions while virtually eliminating leachate production, once the presently saturated portion of the wastes are dewatered, by permanently lowering the groundwater table below the depth of the waste deposits.

## RECOMMENDED ALTERNATIVE

Section 300.68 (j) of the National Contingency Plan (NCP) states that the appropriate extent of remedy shall be determined by the lead Agency's selection of the alternative that is cost effective, i.e. 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, and the environment. Based on an evaluation of the RIFS and addendum and the Nyanza letter report, and the comments received from the public, local officials, and the Commonwealth of Massachusetts, EPA has determined and the MA DEQE has agreed that the following remedy meets the NCP criteria:

- Excavation of all outlying sludge deposits and contaminated soils and sediments associated with these deposits.

- Consolidation of this material with the Hill sludge deposits.

Table 3-1

Remedial Action Alternatives
Nyanza Chemical Site

| Alternate | Technologies |
|---|---|
| 1 | No Action |
| 2 | Monitoring |
| 3 | Selective Excavation, Onsite Disposal, Capping, Surface Water and Groundwater Diversion |
| 4 | Selective Excavation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation |
| 5 | Selective Excavation, Onsite Disposal, Capping, Surface Water and Groundwater Diversion, Leachate Collection and Treatment |
| 6 | Selective Excavation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation, Leachate Collection and Treatment |
| 7 | Selective Excavation, Waste Fixation, Onsite Disposal Capping, Surface Water Diversion, Groundwater Isolation, Leachate Collection and Treatment |
| 8 | Total Excavation, Backfill Excavation, Waste Fixation, Onsite Disposal, Capping, Surface Water Diversion, Leachate Collection and Treatment |
| 9 | Total Excavation, Backfill Excavation, Onsite Disposal in Secure Landfill, (State RCRA) Surface Water Diversion |
| 10 | Total Excavation, Offsite Disposal in Permitted Landfill, Backfill Excavation, Surface Water Control |
| 11 | Total Excavation, Waste Fixation, Backfill Excavation Onsite Disposal in Secure Landfill, Surface Water Control |
| 12 | Total Excavation, Backfill Excavation, Onsite Disposal in Secure Landfill (RCRA), Surface Water Diversion |
| 13 | Selective Excavation and Offsite Disposal of Outlying Sludge Deposits/Sediments, Capping Hill Deposits, Backfill, Revegetation |

- Capping of the Hill area in conformance with the technical requirements of RCRA.

- Construction of a groundwater and surface water diversion system on the upgradient side of the Hill.

- Backfilling the excavated areas to original grade and revegetating the wetland areas.

- Construction of a more extensive groundwater monitoring network to enable future evaluation of the effectiveness of the cap.

This alternative is similar to Alternative 5 in the Feasibility Study and Addendum except the leachate treatment system and well point dewatering system are omitted and a trench replaces the grout curtain. Capital cost estimates are approximately 80% of those listed in Table 4-1 for #5, with an estimated range of $ 5.6 to 9.8 million.

Extent of excavation

RCRA closure requirements address the extent of excavation in those areas to be excavated and then consolidated with the Hill sludge deposits. According to RCRA standards, removal of contaminated material to background levels is required for all areas which will not be capped unless alternative residual levels are developed which adequately protect public health, welfare, and the environment. Data were gathered during pre-design testing to assess the depths to which sludge contaminants had penetrated the underlying soils and sediments and to determine metal levels in undisturbed areas (background) for comparison. The metals used for comparison were chromium, lead, and mercury. (The levels of cadmium and arsenic in the contaminated areas are too close to background to serve as excavation criteria.)

Table I lists the depth of primary excavation for each contaminated area. This depth represents both sludge deposits and underlying contaminated soils in sludge deposition areas (B,C,D,G,$I_1$), surface soil contamination in runoff areas ($I_2$,J,K,M), and sediment contamination in the brooks (J,N). After completion of primary excavation to these depths, testing will be performed on the underlying soils for comparison with background levels. It is anticipated that further excavation beyond the depths listed in Table 1 may be required in areas C and G to reach background levels.

As indicated in the wetland assessment, capping of the wetland areas would effectively destroy the wetlands. Thus capping would contravene the Agency policy of avoiding adverse impacts to wetlands. Were excavation to be terminated prior to reaching background levels, and capping not implemented so as to avoid destruction of the wetlands, the remaining soil contaminants would be subject to

infiltration of precipitation, erosion and man-made disturbances resulting in potential direct contact and resuspension and surface runoff of the contaminants. In addition, the residual lead and mercury may be remobilized due to biomethylation by benthic microbes. For these reasons, the extent of excavation will be to background soil metal levels to the extent possible, given the difficulties of both excavation and in situ testing below the water table.

The additional "satellite" areas listed in Table I contain less than 10% of the total volume of contaminated material. Were excavation in these areas to be terminated without reaching background levels, they would have to be closed with a RCRA cap to prevent direct contact and surface runoff and would require individual monitoring systems for the 30 year post closure period. The cost to close these areas in place and provide this post closure monitoring is prohibitive relative to the cost of excavating these areas to background and consolidating the wastes with the Hill deposits. Using an estimated $ 9.50 / $ft^2$ capping cost, capping the 65000 $ft^2$ area of the outlying areas costs $613,200 whereas excavating 5900 $yd^3$ at $65 / $yd^3$ costs $383,500. Adding in the O & M costs for capped areas, consolidation is clearly cheaper. Therefore, these areas will be excavated to background levels also. Table I also lists the estimated volumes of contaminated material in each area. Selective excavation will include all areas except the Hill area; the estimated volume is thus 33,600 cubic yards (105,600 minus 72,000 = 33,600). Certain of these areas will involve excavation below the water table, depending on weather conditions and the time of year. All wet material will be stabilized to reduce the free liquid content to a minimum prior to consolidation with the Hill deposits. Bench scale testing will be performed during the Design phase to determine the optimal method of achieving this goal. The paint filter test described in 40 C.F.R. §264.314 will be used to demonstrate the absence of free liquids.

Groundwater/Surface Water Diversion

Due to the questionable efficacy of grout curtains, the diversion system concept has been revised to provide an open cut trench which will extend into bedrock to a depth beneath that of the deepest sludge deposits. The trench will extend from ridge to ridge immediately upgradient of the Hill deposits and will intercept both surface water and groundwater. Discharge from the trench will occur at both ends as overland flow. Appropriate erosion control measures will be incorporated into the design. Construction of the trench will lower the water table sufficiently to obviate the need for both the leachate collection system and the wellpoint dewatering system proposed for excavation in the outlying areas. It will, however, require that the Commonwealth obtain permanent easments or take the necessary land by eminent domain.

Operation and maintenance (O & M)

O & M activities associated with the source control remedy includ maintenance of the cap (mowing, liner inspection and repair), the security fencing, and the diversion trench (removal of obstructions, regrading for erosion control). Groundwater monitoring will be performed at upgradient and downgradient monitoring wells and in the brooks draining the site to determine the effectiveness of the cap and diversion system. The costs are estimated to be the same for synthetic or clay cap options. (The final choice will be made during the Design phase.) Projected O & M costs are as follows:

Year 1 : $92,000

Years 2 - 30 : $70,000

These costs differ from those presented in Table 4-1 for Alternative 5 in that Alternative 5 provides for leachate collection and treatment at a cost of $99,000 per year whereas the recommended alternative omits leachate collection and treatment.

The Commonwealth of Massachusetts has indicated its commitment to provide the required operation and maintenance. A formal contract (State/EPA Superfund Contract) is presently being negotiated between EPA and MA DEQE, the agency responsible for O & M. This contract will be signed prior to execution of the Interagency Agreement (IAG) by EPA and the Army Corps of Engineers. Table 2 provides a breakdown of estimated O & M costs.

COMMUNITY RELATIONS

Appended to the ROD is the Responsiveness Summary (Attachment 1). This document summarizes the concerns expressed by the community, the Commonwealth, and the local industries during the public comment period and provides the Agency's responses to these concerns. Detailed comments were provided by the Ashland Associates for a Clean Environment (A.A.C.E.), the attorney for the Ashland Board of Health, State Representative David Magnani, and Nyacol, Inc., one of the industries occupying the former Nyanza site in the lower industrial area.

The general thrust of the comments pertains to the perceived inadequac of the RIFS and Addendum in defining all areas of contamination and the attendant risks to human health and the environment and in describing the alternatives and the effects and impacts of each. A second concern expressed is the need for EPA to expedite the approval process to ensure that funds are obligated this fiscal year and that construction is undertaken next calendar year.

The preferred alternative reflected in the public comments was limited to the secure landfill options, either onsite or offsite, with a clear preference for offsite disposal. The basis for

this preference is a perception that the site is unsuitable for a landfill due to the presence of a high groundwater table and fractured bedrock underlying the site. Concern was also expressed that maintenance of the facility by the Commonwealth would not be as rigorous as that provided at a commercial disposal facility, and that the commitment of the state and federal governments to rectify any failure of an onsite facility was suspect. The community also recommended that, if an onsite facility is selected, it be designed to provide an extra factor of safety by utilizing waste fixation, reinforced concrete bottom liners, thicker synthetic liners,etc.

Nyacol, Inc. expressed concern that the remedial action not interfere with its business operations or threaten the health of its employees. No comments were received from the other industries in the lower industrial area, from the Ashland Board of Selectmen, or from the property owners.

The Massachusetts D.E.Q.E. also questioned the adequacy of the existing studies and expressed a preference for the secure landfill options, either onsite or offsite. They requested that consideration be given to permanent lowering of the groundwater table by means of an upgradient diversion trench with the onsite landfill option to eliminate the need to import massive quantities of fill to build the landfill above the high water table.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

Environmental laws applicable or relevant to the proposed source control action are as follows:

- Resource Conservation and Recovery Act (RCRA), Part 264

- Executive Orders 11990 (Wetlands) and 11988 (Floodplains) and Guidance outlined under 40 C.F.R. Part 6, Appendix A

The proposed alternatives were reveiwed for consistency with the applicable RCRA technical standards, specifically 40 C.F.R. §264 Subpart G entitled Closure and Post Closure and 40 C.F.R. §264 Subpart N, Landfills, Section 264.310 entitled Closure and Post Closure Care (for landfills).

Alternatives 5,6,7,8 and 13 all comply with the RCRA standards for closure whereas alternatives 9,10,11 and 12 exceed the closure standards by excavation of all wastes followed by secure landfill disposal either onsite or offsite.

The RCRA cap for the recommended alternative (#5 modified) will be designed in accordance with Section 264.310(a) to:

1.) Provide long term minimization of liquids through the closed landfill;

2.) Function with minimum maintenance;

3.) Promote drainage and minimize erosion or abrasion of the cov

4.) Accomodate settling and subsidence so that the cover's integrity is maintained;

5.) Have a permeability less than or equal to the impermeability of any bottom liner or subsurface soils.

The cap installation will be performed as specified in §264.303. The landfill will be surveyed and a notice placed in the deed and to the local land authority as specified in §264.119 and §264.120. The applicable closure requirements in §264 Subpart G will be addressed. (Decontamination/Disposal of Equipment, Certification by a Professional Engineer, and Site Security will be provided as specified in § 264.114 - §264.117). Post closure care and groundwate monitoring in accordance with 40 C.F.R. Subparts F and G and Subpart N, §264.310(b) will be provided.

Wetlands/Floodplains Impacts

As noted previously, an assessment of wetland and floodplain impacts was performed and is appended to the ROD. Alternatives for Source Control were evaluated for possible wetland impacts in accordanc with Section 2 of Executive Order 11990.

A determination was also made that all contaminated areas to be addressed in the Source Control action are outside the boundaries of the 100 year floodplain of the Sudbury River and that the project will not impact this floodplain.

FUTURE ACTIONS

A second phase Remedial Investigation/Feasibility Study will begin in the first quarter of Fiscal Year 1986, pending availability of funds. This phase will further define the extent of groundwater contamination, locate or further define source areas, including the aforementioned vault, define migration pathways and ultimate fate, and define the risks to public health, welfare, and the environment. It is currently known that contaminants have migrated north beyond the CONRAIL tracks in the direction of the Sudbury River, the presumed groundwater discharge point. The RI will attempt to confirm this understanding and will detail the current and future impacts to the River and to receptors in the path of the plume. The RI will also address the extent of sediment contamination in the Sudbury River and its impoundments and in the wetland area due east of the abandoned trolley bed abutting the Nyanza site. An assessment of the environmental and public health risks posed by the contaminated sediments will then be made. Following completion of the RI, a Feasibility Study will be conducted to address the problems ider tified in the RI.

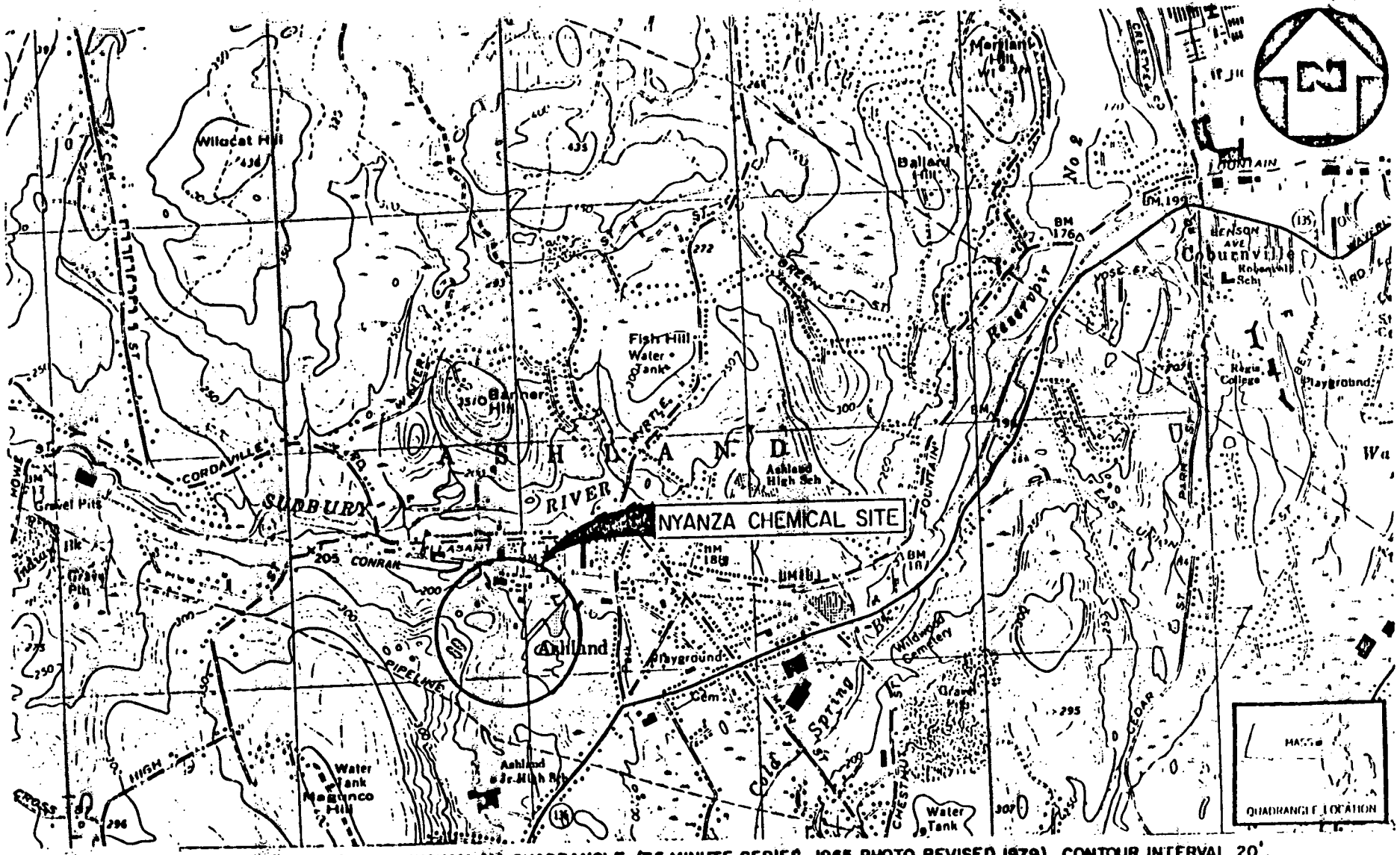
The Phase I source control action will require maintenance and monitoring activities as described earlier in the O & M section of the Recommended Alternative description.

SCHEDULE

The following are the key milestones and dates for the implementation of the selected remedy:

| | |
|---|---|
| Approve Remedial Action Recommendation (ROD) | September 3,1985 |
| * Issue Work Order for Design Services | October 1,1985 |
| * Start Design | October 1,1985 |
| * 95% Design Completion | December 15,1985 |
| * Execute SSC with MA DEQE | December 15,1985 |
| * Execute Construction IAG with Army COE | December 15,1985 |
| * Complete Design and Advertise for Bids | February 1, 1985 |
| * Select Construction Contractor | May 1, 1986 |
| * Start Construction | July 1, 1985 |
| * Complete Construction | July 1,1987 |

* pending availability of funds




BASE MAP IS A PORTION OF THE U.S.G.S. FRAMINGHAM, MA QUADRANGLE (7.5 MINUTE SERIES, 1965 PHOTO REVISED 1979). CONTOUR INTERVAL 20'.

FIGURE 1-1

# LOCATION MAP
# NYANZA CHEMICAL SITE, ASHLAND, MA

SCALE: 1"=2000'

NUS CORPORATION

A Halliburton Company

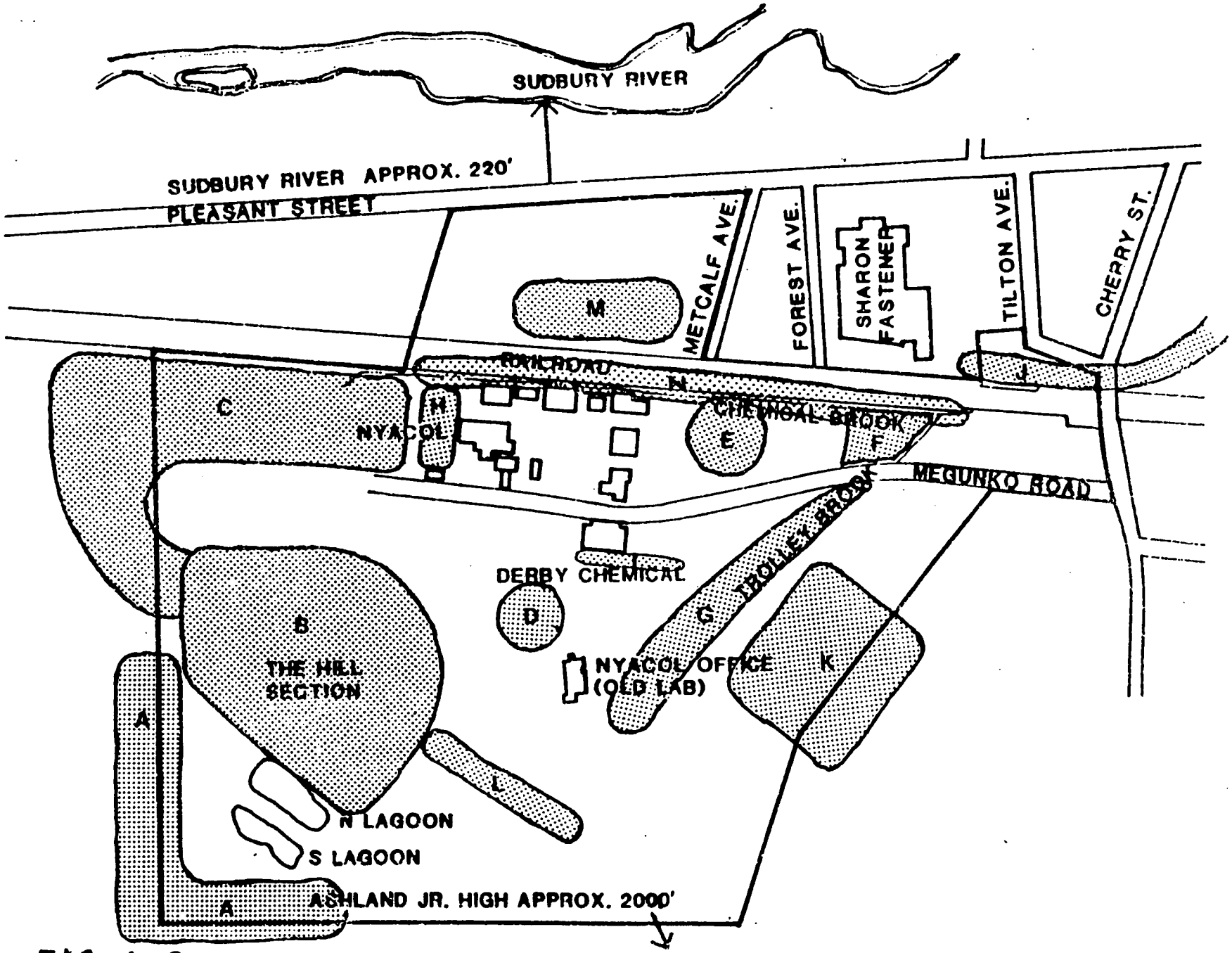
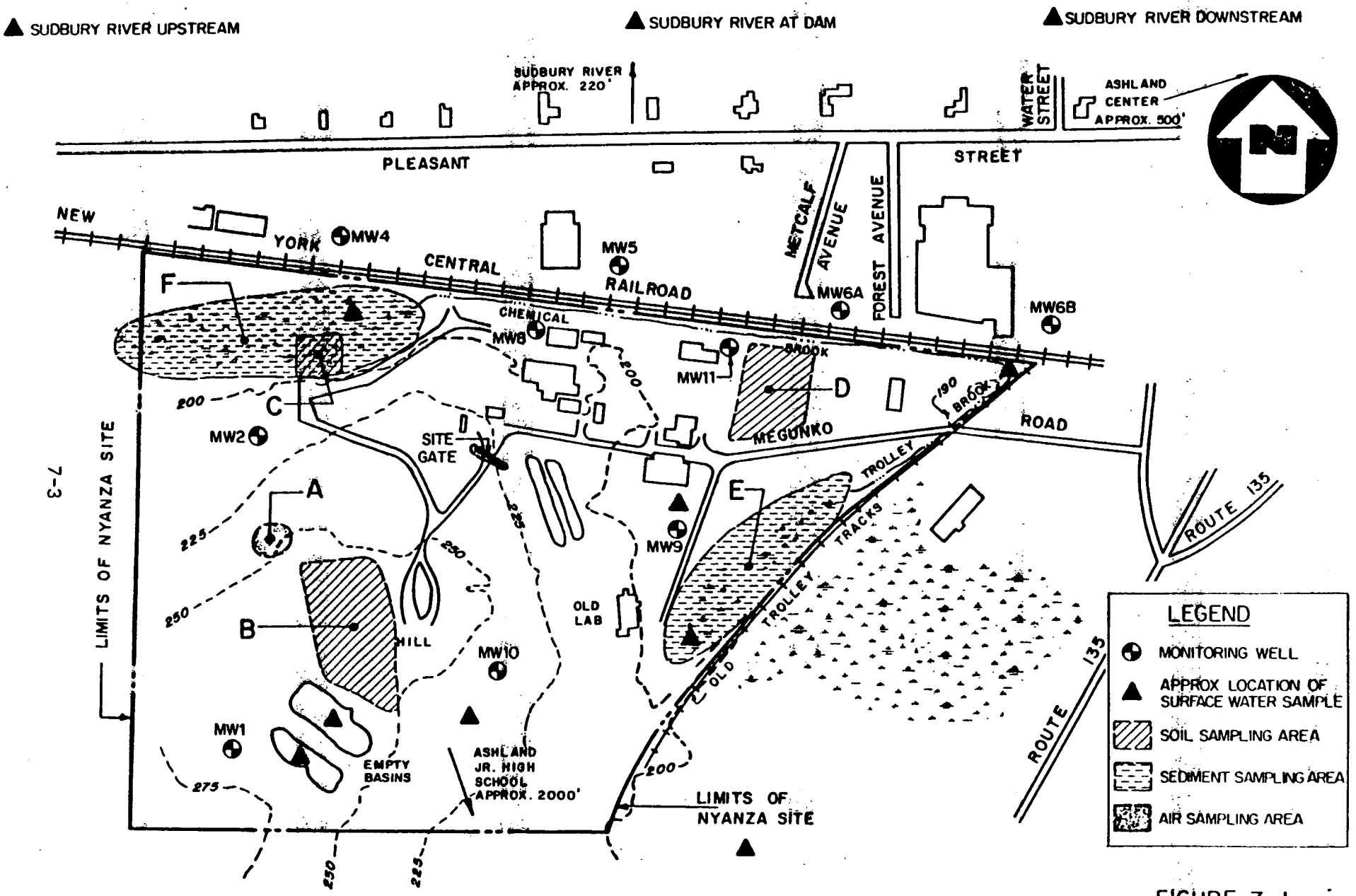



FIG. 1-2
PLAN OF SAMPLING AREAS
NYANZA CHEMICAL SITE, ASHLAND, MA




7-3

FIGURE 7-1

## NYANZA SITE MAP SHOWING AREAS OF SURFACE WATER, SEDIMENT, & SOILS SAMPLING

NOT TO SCALE

NUS CORPORATION

A Halliburton Company

| AREA | DESCRIPTION | VOLUME(estima |
|---|---|---|
| B | The Hill area, repository for the largest volume of metal sludge intermixed with rubble, boulders, rusted drum remnants. Soil cover over 75 % of the area; sludge depth to 13 feet, partially below water table. | 72,600 |
| C | Seasonal wetland contaminated from direct sludge deposition and runoff Hill. Sludge depth approximately 2 feet. | 19,790 |
| D | Remnants of a former lagoon adjacent to the two existing Nyacol waste treatment impoundments. Lagoon is buried, approximately 10 feet deep. | 2,180 |
| E | Surface contamination hot spots from spillage and past wastewater discharge to Chemical Brook. approximately 3 feet deep. | 110 |
| F | Suspected area of sludge burial; none found. | ----- |
| G | Wetland area west of abandoned Trolley bed with sludge deposits and sediments contaminated from past raw wastewater discharges. Area drains to Trolley Brook; sludge depth approximately 4 feet. | 6,480 |
| H | Buried concrete vault with organics and heavy metals. Not included in Phase I. | -- |
| I (1 & 2) | Former lagoon behind Derby Chemical and drainage path to Trolley Brook. Lagoon contamination to 8 feet, surface contamination of drainage path soils to 2 feet. | 1,310<br>330 |
| J | Sediments of Trolley Brook and surface soils behind Tilton Ave. contaminated from past brook overflows 1 foot depth. | 1,120 |
| K | Wetland/pond east of abandoned Trolley bed; sediments contaminated in scattered areas; not addressed in Phase I. | ---- |
| L | Drainage path from southeast area of Hill to abandoned Trolley bed; surface soil contamination to 1.5 feet. | 1,030 |
| M | Extension of Area C wetland on north side of CONRAIL tracks; hot spots from runoff to 1 foot depth | 480 |
| N | Chemical brook sediments contaminated from past wastewater discharges 1 foot depth. | 170 |
| | | 105,600 |

Table II

ANNUAL OPERATING COSTS

CAPPING

| Cost Component | Estimate ($) | Basis of Estimate | Frequency | Year Period |
|---|---|---|---|---|
| O & M Costs<br>1. Operating Labor<br>a. _____<br>b. _____<br>c. _____ | | | | |
| 2. Maintenance Materials and Labor<br>a. Labor<br>b. _____<br>c. Mat'ls | $5760<br><br>$500 | 2 men $30/hr.<br>24 hrs/ea. 4 x 1 yr.<br>2 (30)(24)(4)<br><br>Reveg. | ANN | 1-30 |
| 3. Auxiliary Materials and Labor<br>a. Mat'l<br>b. _____<br>c. _____ | $1260 | Assume replacement of 3% topsoil<br>1260 | ANN | 1-30 |
| 4. Purchased Services<br>a. Equip.<br>b. _____<br>c. _____ | $1000 | | ANN | 1-30 |
| 5. Disposal<br>a. _____<br>b. _____ | | | | |
| 6. Administration | $1000 | | ANN | 1-30 |
| 7. Insurances, Taxes, Licenses<br>a. _____<br>b. _____<br>c. _____ | | | | |
| 8. Maintenance Reserve and Contigency Costs | $1000 | | ANN | 1-30 |
| 9. Other | | | | |
| ANNUALIZED CAPITAL COST | $10520 | | ANN | 1-30 |

Table II (cont.)

ANNUAL OPERATING COSTS

SURFACE & GROUNDWATER DIVERSION

| Cost Component | Estimate ($) | Basis of Estimate | Frequency | Year Period |
|---|---|---|---|---|
| O & M Costs<br>1. Operating Labor<br>a. _____<br>b. _____<br>c. _____ | | | | |
| 2. Maintenance Materials and Labor<br>a. Labor<br>b. _____<br>c. Mat'l | $9600<br>$ 500 | 2 men $30/hr. 40 hrs/ea. 4 x 1yr. 2 (30)(40)4<br>Reveg. | ANN | 1-30 |
| 3. Auxiliary Materials and Labor<br>a. Mat'l<br>b. _____<br>c. _____ | $1000 | Replacement | ANN | 1-30 |
| 4. Purchased Services<br>a. Equip.<br>b. _____<br>c. _____ | $1000 | | ANN | 1-30 |
| 5. Disposal<br>a. _____<br>b. _____ | | | | |
| 6. Administration | $1000 | | ANN | 1-30 |
| 7. Insurances, Taxes, Licenses<br>a. _____<br>b. _____<br>c. _____ | | | | |
| 8. Maintenance Reserve and Contigency Costs | $1000 | | ANN | 1-30 |
| 9. Other | | | | |
| ANNUALIZED CAPITAL COST | $14100 | | ANN | 1-30 |

Table II (cont.)

ANNUAL OPERATING COSTS

MONITORING & ANALYSIS

| Cost Component | Estimate ($) | Basis of Estimate | Frequency | Year Period |
|---|---|---|---|---|
| O & M Costs<br>1. Operating Labor<br>a. Labor<br>b. _____<br>c. _____ | $10,200 | 1 man $25/hr.<br>2 men $30/hr.<br>30 hrs. - 4 times per year<br>(85)(30)(4) | ANN | 1-30 |
| 2. Maintenance Materials and Labor<br>a. _____<br>b. _____<br>c. _____ | | | | |
| 3. Auxiliary Materials and Labor<br>a. Equip.<br>b. _____<br>c. _____ | $500 | Experience | ANN | 1-30 |
| 4. Purchased Services<br>a. Lab Analysis<br>b. _____<br>c. _____ | 1st. $56260<br>2nd. $34960 | 1st yr. 25 samples $525 ea. 4 times a year<br>Sed/Soil 3 $80 x 4<br>Air 2 $350 x 4<br>2nd-30 25 samples $312/ea 4 times a year<br>Sed/Soil 3 $80 x 4<br>Air 2 $350 x 4 | ANN | 1-30 |
| 5. Disposal<br>a. _____<br>b. _____ | | | | |
| 6. Administration | | | | |
| 7. Insurances, Taxes, Licenses<br>a. _____<br>b. _____<br>c. _____ | | | | |
| 8. Maintenance Reserve and Contigency Costs | | | | |
| 9. Other | | | | |
| ANNUALIZED CAPITAL COST | 1st $66,960<br>2nd-30 $45,660 | | | |

TABLE 2-1

POTENTIAL REMEDIAL TECHNOLOGIES
NYANZA SITE

| General Response Action | Applicable Technology Types |
|---|---|
| No Action | Continued monitoring of contaminant migration and water quality analyses. |
| Groundwater Containment | Barrier walls, capping of site surface. |
| Groundwater Collection | Barrier walls, pipe drains, wells. |
| Groundwater Treatment | Onsite, and offsite treatments. |
| Surface Water Control | Diversion measures, collection systems, capping, grading, revegetation. |
| Sediment Control | Capping, dredging, filters, barriers. |
| Sediment Treatment | Onsite, and offsite treatments. |
| Airborne Particulate Control | Capping, dust control measures, grading, revegetation, excavation. |
| Excavation of Wastes | Selective removal (sludge, debris, highly contaminated zones), complete removal. |
| Fixation of Contaminants | In situ, onsite and offsite treatment. |
| Treatment of Waters | In situ, onsite, and offsite treatments. |
| Disposal of Wastes | Onsite RCRA landfill, offsite RCRA landfill, onsite non-RCRA landfill. |
| Site Access Restrictions | Fences, signs. |

Page retyped for NTIS -- December 31, 1985

Table 3-1

Remedial Action Alternatives
Nyanza Chemical Site

| Alternate | Technologies |
|---|---|
| 1 | No Action |
| 2 | Monitoring |
| 3 | Selective Excavation, Onsite Disposal, Capping, Surface Water and Groundwater Diversion |
| 4 | Selective Excavation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation |
| 5 | Selective Excavation, Onsite Disposal, Capping, Surface Water and Groundwater Diversion, Leachate Collection and Treatment |
| 6 | Selective Excavation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation, Leachate Collection and Treatment |
| 7 | Selective Excavation, Waste Fixation, Onsite Disposal, Capping, Surface Water Diversion, Groundwater Isolation, Leachate Collection and Treatment |
| 8 | Total Excavation, Backfill Excavation, Waste Fixation, Onsite Disposal, Capping, Surface Water Diversion, Leachate Collection and Treatment |
| 9 | Total Excavation, Backfill Excavation, Onsite Disposal in Secure Landfill, (State RCRA) Surface Water Diversion |

Table 3-1
Remedial Action Alternatives
Nyanza Chemical Site
Page Two

| Alternate | Technologies |
|---|---|
| 10 | Total Excavation, Offsite Disposal in Permitted Landfill, Backfill Excavation, Surface Water Control |
| 11 | Total Excavation, Waste Fixation, Backfill Excavation, Onsite Disposal in Secure Landfill, Surface Water Control |
| 12 | Total Excavation, Backfill Excavation, Onsite Disposal in Secure Landfill (RCRA), Surface Water Diversion |
| 13 | Selective Excavation and Offsite Disposal of Outlying Sludge Deposits/Sediments, Capping Hill Deposits, Backfill, Revegetation |

TABLE 4-1

PROJECT COST SUMMARY ($1,000's)

| Remedial Action Alternative | Capital Cost Estimates | | Operation and Maintenance Costs | | Present Worth Analyses (30 Yrs) | |
|---|---|---|---|---|---|---|
| | Low | High | Year 1 | Year 2-30 | Low | High |
| 2 - No action | $ | $ | $ | $ | $ | $ |
| 3 - Selective Excavation, Onsite Disposal, Surface and Groundwater Diversion, Construction Water Treatment | 8,184 | 10,444 | 191 | 70 | 8,937 | 11,216 |
| 5 - Selective Excavation, Onsite Disposal, Surface and Groundwater Diversion, Leachate Collection, Construction Water and Leachate Treatment | 8,803 | 11,545 | 191 | 170 | 8,626 | 13,167 |
| 9 - Total Excavation, Onsite Disposal in Secure Landfill, Construction Water Treatment | 10,988 | 18,804 | 183 | 64 | 11,699 | 19,515 |
| 10 - Total Excavation, Offsite Disposal in Permitted Landfill, Restore Area, Construction Water Treatment | 21,013 | 44,597 | 157 | 45 | 21,416 | 44,980 |
| 12 - Total Excavation, Onsite Disposal in a Secure Landfill, Backfill, Construction Water Treatment | 9,321 | 15,706 | 183 | 64 | 10,032 | 16,417 |
| 13 - Cap Hill Deposits, Offsite Disposal of Outlying Deposits, Surface and Groundwater Diversion, Leachate and Construction Water Treatment | 13,441 | 28,020 | 191 | 170 | 15,063 | 30,242 |

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TABLE 7-1

AMBIENT AIR SAMPLING DATA[A]
NYANZA CHEMICAL SITE

| | Concentration | Detection Limit |
|---|---|---|
| January 1983 | | |
| Mercury vapor (~4 inches above Area A surface) | 74 ng/m$^3$ | Unknown |
| Mercury vapor (50-75 yds. downwind of Area A) | 7.2 ng/m$^3$ | Unknown |
| June 22, 1983 | | |
| Mercury vapor (above Area A surface) | 220 ng/m$^3$ | Unknown |
| Mercury vapor (~ 6 inches below Area A surface) | 450 ng/m$^3$ | Unknown |
| Mercury vapor (50-75 ft. downwind of Area A) | 48 ng/m$^3$ | Unknown |
| Organics In Air | | 0.5 ppb |
| November 1983[3] | | |
| Trichloroethylene | ND | 0.5 µg |
| 1,2 Dichlorobenzene | ND | 0.5 µg |
| 1,3 Dichlorobenzene | ND | 0.5 µg |
| 1,4 Dichlorobenzene | ND | 0.5 µg |
| Nitrobenzene | ND | 0.5 µg |

Typical New England Ambient Air Mercury Vapor Concentration: 7-10 ng/m$^3$.
ND - Not Detected

TABLE 7-1
AMBIENT AIR SAMPLING DATA
NYANZA CHEMICAL SITE
PAGE TWO

A. See Figure 7-1 for sampling locations.

1. January 1983 Climatic Data
   Temp: 15-20°F
   Wind: Velocity Unknown, From W-SW

2. June 1983 Climatic Data
   Temp: 85-90°F
   Wind: 2-4 Knots, from W-SW

3. November 1983 Climatic Data
   Unknown

Note: January and June Sampling Reference: EPA Interoffice Communication, July 19, 1983. F. Willey to D. Gagne, Air Toxics at Nyanza Chemical Site.

TABLE 7-2

NYANZA CHEMICAL SITE
SOIL SAMPLES
TOTAL OF 66 SAMPLING LOCATIONS IN THREE AREAS
ALL VALUES mg/kg

Soils - Area B of Figure 7-1

| Contaminant | High | Average | Std. Dev. | Positive Observations |
|---|---|---|---|---|
| Cr | 975 | 215.4 | 260 | 39 |
| Hg | 420 | 35.3 | 67 | 40 |
| Cd | 2.3 | 0.25 | 0.39 | 38 |
| Pb | 558 | 79.6 | 102.4 | 40 |
| Total Halogen | | None Detected | | |
| Total Organic Carbon | 103,300 | 33,473 | 24,756 | 40 |

Soils - Area C of Figure 7-1

| Contaminant | High | Average | Std. Dev. | Positive Observations |
|---|---|---|---|---|
| Cr | 182 | 126.1 | 55.6 | 5 |
| Hg | 420 | 281.5 | 162.9 | 5 |
| Cd | 0.2 | 0.14 | 0.03 | 5 |
| Pb | 109 | 68.3 | 33.9 | 5 |
| Total Halogen | | None Detected | | |
| Total Organic Carbon | 120,100 | 43,760 | 43,132 | 5 |

Soils - Area D of Figure 7-1

| Contaminant | High | Average | Std. Dev. | Positive Observations |
|---|---|---|---|---|
| Cr | 87.5 | 25.8 | 23.6 | 19 |
| Hg | 58 | 16.6 | 20.3 | 19 |
| Cd | 1.3 | 0.29 | 0.35 | 18 |
| Pb | 154 | 51.9 | 39.9 | 19 |
| Total Halogen | 700 | 272 | 193.9 | 7 |
| Total Organic Carbon | 98,600 | 33,705 | 27,152 | 19 |

TABLE 7-3

NYANZA CHEMICAL SITE
SURFACE WATER CONTAMINANTS
(µg/l)

| Contaminants | Trolley Brook Background Sample | Maximum Observed Concentration | Maximum Allowable Concentration* | Number of Observations |
|---|---|---|---|---|
| Trichloroethylene | - | 25 | ** | 6 |
| Chromium | <10 | 20 | 50 | 9 |
| Lead | 7.0 | 10 | 50 | 7 |
| Mercury | <.4 | 1.8 | 2.0 | 12 |

* Interim Primary Drinking Water Standards, 40 CFR 141

** No Drinking Water Standard exists. Ambient Water Quality criteria corresponding to an increased cancer risk of one additional case per one million people is 2.7 µg/l.

Note: See Appendix D for complete Analytic Data

## TABLE 7-4

## SEDIMENTS - 7 SAMPLES
## NYANZA CHEMICAL SITE

| Critical Health Contaminant | Maximum (mg/kg) Concentration | Average Sediment Concentration (mg/kg) | Background (mg/kg) Concentration | Number of Observations |
|---|---|---|---|---|
| Chromium | 6,600 | 142* | 28 | 7 |
| Cadmium | 1.8 | 0.53 | 1.2 | 7 |
| Lead | 1,200 | 190* | 120 | 7 |
| Mercury | 420 | 254 | Unknown | 7 |
| Volatile Organics Compounds | None Detected | None Detected | None Detected | ** |

* In averaging, a single order of magnitude outlier value was discarded
** Two samples were analyzed
Note: See Appendix D for complete analytic data.

TABLE 7-5

NYANZA CHEMICAL SITE
GROUNDWATER CONTAMINANTS
44 SAMPLES

| Critical Health Contaminant | Average Concentration (µg/l) | Maximum Concentration (µg/l) | Maximum Allowable* Concentration (µg/l) | Number of Observations |
|---|---|---|---|---|
| Aniline | 1,189 | 4,132 | ** | 16 |
| Benzene | 8.9 | 27.8 | ** | 7 |
| Chloroform | 5.8 | 6.9 | 100 µg/l | 5 |
| 1,2 Dichlorobenzene | 840 | 5,345 | ** | 18 |
| 1,3 Dichlorobenzene | 70 | 254 | ** | 9 |
| 1,4 Dichlorobenzene | 490 | 1,900 | ** | 21 |
| 1,1,1 Trichloroethane | 137 | 180 | ** | 5 |
| Trichloroethane | 1,550 | 7,000 | ** | 25 |
| Vinyl Chloride | 76 | 121 | ** | 8 |

** No Drinking Water Standard Presently in force.

Note: See Appendix D for complete analysis of groundwater in each monitoring well.

# COMMUNITY RELATIONS RESPONSIVENESS SUMMARY
# NYANZA CHEMICAL SITE
# ASHLAND, MASSACHUSETTS

## INTRODUCTION

This Responsiveness Summary for the Nyanza Chemical Site documents, for the public record, the concerns and issues raised during remedial planning, the comments presented during the comment period on the Feasibility Study, and the responses of the Environmental Protection Agency (EPA) to these concerns.

## ACTIVITIES CONDUCTED PRIOR TO THE FEASIBILITY STUDY COMMENT PERIOD

Public interest in this site has been moderate and the primary concerns have been with the extent of the offsite migration of contaminants and with the adequacy of site test data. Community relations activities conducted by the State and by the EPA at the Nyanza Chemical Site include the following:

- EPA prepared a Community Relations Plan (CRP).
- A public meeting was conducted by the EPA and attended by the Massachusetts Department of Environmental Quality Engineering (DEQE), the Ashland Board of Health, local news media, and 10 citizens to discuss the DEQE site assessment. (1981)
- EPA participated in a series of public forums on hazardous waste sponsored by the Massachusetts Foundation for the Humanities and Public Policy. One of the forums was conducted in Ashland, Massachusetts. (March 1983)
- A public meeting was held by the EPA in Ashland to discuss the Remedial Investigation/Feasibility Study (RI/FS) work plan. The DEQE, town selectmen, the Ashland Board of Health, the local news media, Senator Edward Kennedy's representative, the EPA contractor, and 25 residents attended. (June 1983)
- The EPA's project officer established an informal policy of presenting verbal reports to major community participants every 2 weeks. (1983)
- Fact sheets describing the progress of the Remedial Investigation were mailed to local citizens and officials by the EPA. (November 1983)
- EPA held a public meeting to discuss RI progress. In attendance were representatives from the DEQE, the Town of Ashland, the Ashland Board of Health, State Senator Ed Burke's office, State Representative Andrew Roger's office, Senator Edward Kennedy's office, the South Middlesex Chamber of Commerce, Ashland Advocates for a Clean Environment (AACE) and local business. (December 1983)

- Copies of the Remedial Action Master Plan (RAMP) and the Work Plan, which were produced by the EPA contractor, were sent to the information repositories at the Ashland Public Library and the Ashland Board of Health by the EPA. (1983)

- The EPA held a public meeting to discuss RI findings. The RI and data gaps that it identified were discussed. The EPA contractor and the Ashland Board of Health were represented. (November 1984)

## CONCERNS RAISED PRIOR TO THE FEASIBILITY STUDY COMMENT PERIOD

The primary concern expressed by the Ashland community at the first public meeting was for the water quality of the Sudbury River. This river has been designated as a backup water supply for the City of Boston, Massachusetts; it is also used for recreation.

Later, concern was expressed about the groundwater supply and the integrity of public water lines that might intersect contaminant plumes originating at the Nyanza Chemical Site. There was fear that contaminants may be pulled into water lines through structural faults during periods of low pressure or heavy demand. Residents near the Trolley Brook were also concerned that contaminated groundwater might be seeping into their basements.

The nature of pollution at the site and the extent and pathways of offsite migration were of concern to area residents. The risk to workers' health at the onsite industrial complex was also a consideration. Concern was voiced that data gaps in the RI made it impossible to assess site-related risks.

Remedial funding and future site use were also concerns to the community.

## AGENCY RESPONSE TO CONCERNS RAISED PRIOR TO THE FEASIBILITY STUDY COMMENT PERIOD

As a result of concerns raised by the community regarding groundwater seeping into their basements, EPA arranged for samples of the seepage to be taken and analyzed. Sampling, especially off site along the Trolley Brook, was also expanded, in part, as a response to community concerns.

## ACTIVITIES CONDUCTED DURING THE FEASIBILITY STUDY COMMENT PERIOD

The Phase I Feasibility Study comment period for the Nyanza Chemical Site was announced in a mailing to the media and interested parties on March 27, 1985. A public meeting was held in Ashland, Massachusetts, on April 10, 1985. Originally, the comment period was to begin on April 1 and close on April 22, 1985. However, due to the release of an "Addendum to the Phase I RI/FS" on April 29, 1985, this period was extended until May 10 to allow interested parties to consider the new information. The extension was announced in a press release and a fact sheet distributed by the EPA. It was also announced at a public hearing held at the Ashland Senior High School on April 18, 1985.

Approximately 30 citizens attended the April 10 meeting held at the local high school auditorium. They included community officials, representatives of the Ashland Board of Health, and members of AACE.

Present at the April 18 hearing were members of the AACE, the Ashland Board of Health, the community of Ashland, and State Representative David Magnani. Comments from 18 hearing attendees were officially recorded and a transcript was produced. The hearing transcript was made available at EPA offices in the John F. Kennedy Federal Building in Boston and at the Ashland Public Library.

## SUMMARY OF COMMENTS AND RESPONSES

Numerous questions of a general nature were asked at the public hearing. These were addressed as they were presented. Questions raised included EPA decision-making policy, enforcement strategy, funding and distribution of funds, financial and legal liabilities, statutory limitations for excavating and transporting hazardous wastes, State responsibility for remedial action funding and maintenance, the physical limits of the RI study area, an emergency evacuation plan, remedial technologies, range of costs, community input and control, monitoring, and the hazard ranking system. Copies of the complete transcript are available at the locations mentioned on the preceding page.

Comments that were not addressed at the hearing have been summarized and categorized in the following sections. Within each category, comments were separated into three groups according to source: community comments, State comments, and Potentially Responsible Party (PRP) comments.

Community comments include opinions from individual residents, local officials, the Ashland Board of Health, and the AACE. Comments from State Representative David Magnani were also included in this section because he seemed to be speaking on behalf of his constituents rather than as an official representative of the Commonwealth of Massachusetts.

State comments are from the Commonwealth of Massachusetts, Executive Office of Environmental Affairs, Department of Environmental Quality Engineering, Division of Solid and Hazardous Waste.

The only industry that was officially identified as a commentor was Nyacol, Inc.

## ADDITIONAL ALTERNATIVES SUGGESTED BY THE COMMUNITY, STATE, OR PRPs/OTHER INDUSTRIES

In addition to the remedial alternatives evaluated in the Feasibility Study, DEQE requested an evaluation of an optional configuration for a secure landfill constructed atop the hill area. This option was to include the excavation of all waste materials followed by the construction of a secure waste repository founded at the base of the excavation. It was also to provide for permanent groundwater and surface water lowering and diversion.

Subsequent evaluation showed that the alternative proposed would require less backfill for the excavated cavity than Alternatives 9 and 12. Groundwater

lowering would be achieved in a manner similar to Alternatives 3 and 5. These alternatives have been previously described in the Phase I Feasibility Study or in the Addendum to the Phase I RI/FS.

The reduction of backfill quantity would be approximately 38,600 cubic yards. The cost savings for this reduction of backfill would range between $444,000 and $1,022,000 based upon the -20 percent and +30 percent volume of sludge that might be encountered. The additional cost for the surface and groundwater diversion requested would range between $571,000 and $1,180,000 for the variations of factors evaluated in the cost-sensitivity analyses. These costs are added and subtracted to the remedial action Alternative 12, which is similar to the other construction work required for this option. The net effect on the capital cost estimate would be higher than the costs for Alternative 12. The capital costs would range between $9,455,000 (low estimate) and $15,863,000 (high estimate).

The reduction in risks to public health and the environment would be less than that afforded by Alternatives 9 and 12 which provide for a secure repository. The technology of permanently lowering the groundwater level to the surface of the bedrock would not be as reliable as backfilling the cavity above groundwater levels. Therefore, this alternative is less effective and less reliable than Alternatives 9 and 12.

**REMAINING CONCERNS**

The community remains concerned about the quantity of contaminated materials present at the Nyanza Chemical Site. They have asked to be kept well informed of site-related progress and activities. Several individuals and officials suggested a biweekly fact sheet distribution be arranged.

Concern also remains regarding loss of committed funds if a remedial alternative is not chosen and designed before the end of the fiscal year. Therefore, project scheduling is important to the community.

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SUPERFUND PROCEDURES:
COMMUNITY COMMENTS

**Comment:** **What impact does EPA's May 6, 1985 memorandum on "Procedures for Planning and Implementing Offsite Response Actions" have on remedial alternatives at this site, and has that impact already been considered in the choice of site alternatives?**

**Response:** The procedures outlined in the May 6, 1985, memorandum would only be implemented if the Record of Decision selected an offsite disposal option. At the RI/FS stage, EPA's contractors select a commercial disposal facility to cost out an alternative. Contact is made with the facility to get information on price, wastes accepted, and general availability.

**Comment:** **Objections were raised to the alternatives presented in the Addendum on grounds that EPA policy requires a 3-week comment period and only 9 days were provided for evaluating these last alternatives.**

**Response:** The Addendum addressed comments made during the RI/FS review process and public comment period. The two "new" alternatives presented were modifications to or hybrids of existing alternatives.

**Comment:** **Are remedial alternatives subject to local zoning, building, and fire codes, and is written approval from local authorities and the Board of Health needed. Does the community have any recourse if the selected remedial alternative is unsatisfactory?**

**Response:** **Under current EPA draft policy, Superfund remedial actions will not** have to comply with the procedural and administrative aspects of other environmental laws and regulations (Federal, State, or local). The construction contractor will need to secure other permits as necessary.

**Comment:** **Remedial cleanup technologies are often impermanent. What assurance is there that monitoring will be adequate. Can new technologies developed in the future be applied to this site? How will the future use of this site be restricted to protect the integrity of any remedial measures taken here? Will it be necessary for the Commonwealth of Massachusetts to take possession of the property to perform long-term operation and maintenance?**

**Response:** Cleanup and monitoring activities are current, state-of-the-art procedures for identifying and remediating inadequately disposed wastes.

Whether or not new technologies developed in the future may be applied to this site will depend on the need; i.e., does the onsite containment remedy adequately protect public health and the environment? As long as waste remains on site, the site can be listed on the NPL if it meets the National Contingency Plan (NCP) criteria. Thus, new technologies can be applied to the site in the future if the current remedy fails.

Future use of the property will be restricted by the imposition of use restrictions or other legal procedures. The Commonwealth will not have to possess the property but will need to have a right-of-access to perform operation and maintenance.

**Comments:** **The public needs to be informed of progress and developments during the construction and design phase. It is suggested that biweekly fact sheets be reinstated.**

**Response:** The existing community relations plan will be updated to provide information during design and construction. Periodic progress reports will be sent to citizens and the press on the mailing list. Informal conversations between the Site Manager and local citizens and officials will continue also.

## TECHNICAL PROCEDURES AND DATA GAPS: COMMUNITY COMMENTS

**Comment:** **The RI/FS Report is inadequate and does not present enough information to make a remedial action alternative decision. The report is based on the same data that was considered inadequate in September 1984. Both the report and the EPA contractor, hired for the design of the remedial action alternative, stress that additional sampling is needed.**

**Response:** The Nyanza Chemical Site has been studied by 3 different consultants in the last 5 years with EPA and DEQE review. As with every other uncontrolled site, the data do not always provide a perfect understanding of the situation; anomalies do exist. However, EPA is confident that adequate data exists to support source control in the Record of Decision. Further refinements will be made during the Pre-Design and Design Phases, and contingencies will be built into the construction contract to handle unforeseen circumstances.

**Comment:** Arsenic was found in 31 groundwater samples, yet no link has been established between the arsenic contamination and the sludges. Since Phase I is supposed to deal with all of the heavy metals on site, it seems premature to proceed with remedial actions until the source of the arsenic is found.

**Response:** The results of tests for arsenic in the environment, reported by previous investigators, indicated the concentrations were within naturally occurring limits in soils and below safe drinking water standards in water samples. Therefore, testing for arsenic in sludges was not deemed necessary in the RI/FS, since it was not previously identified at high concentrations.

**Comment:** How can the treatment of sludge deposits and groundwater be separated? What impact will sludge removal have on groundwater quality and groundwater remediation?

**Response:** Phasing is fully in accordance with 40CFR 300.68 of the National Contingency Plan, which differentiates between source control actions and offsite remedial actions.

The existing data indicate minimal groundwater migration of heavy metals from the leaching of sludge deposits. These sludges do migrate via surface runoff and also present a potential direct contact hazard where exposed. Both surface migration and direct contact potential can be abated by in situ capping.

Even after these sources are removed, the groundwater will remain contaminated until the aquifer is purged. The Phase II FS will examine the threats posed by No-Action, i.e., allowing the aquifer to cleanse itself. If unacceptable risks are presented, various groundwater remediation strategies will be studied. These remedies would be different since source control remedies involve excavation and/or isolation. Groundwater remediation might require pumping out the contaminated water and treating it.

**Comment:** The validity of background samples is highly questionable. In most cases, only one sample, per medium, was taken. Often, those samples showed elevated contaminant levels; additional testing should be performed to rule out the possibility of laboratory error. If laboratory error did not occur, how can the EPA claim to have taken these samples from a clean area, and how can assumptions based on these samples be valid? In some cases, no background values were presented at all.

**Response:** The "background" samples were obtained from areas that were believed to be upgradient and outside the limits of sludge dumping

activities. Concentrations of heavy metals and other contaminants can be expected to be present in soil and water samples reflecting the ambient conditions (background) of the locale. Other possibilities for the contamination found in background samples might be attributed to a random incident of dumping, contamination during test pit excavation, contamination during sampling, and/or contamination in the laboratory. The pre-design sampling is expected to clarify the questions associated with the limits of contamination and background conditions.

**Comment:** **Test results should be presented individually for critical contaminants, and concentration units for each specific medium should be standardized.**

**Response:** Test results for individual constituents are reported in Volume 1A of the Phase I RI/FS. Summations of concentrations of key constituents were presented in the report to summarize site contamination and simplify the presentation. The presentation supports the conclusions of contaminants present at the site and the need for remediation. Different media such as soil and groundwater cannot have standardized concentration units. Concentrations in soils are traditionally expressed on a weight-by-weight basis, whereas concentrations in water are expressed on a weight-by-unit basis.

**Comment:** **Boring samples should be taken prior to sludge removal to determine the depths to clean soil; soil color should not be considered adequate to determine the presence of contamination. The possibility of an inorganic sludge deposit beneath the lower industrialized area should be explored. Monitoring well samples should be collected during rain conditions to help determine whether the hill sludge deposition area is a major contaminant source.**

**Response:** The quantities of sludges were determined by 16 NUS test pits, 80 Connerstone and Carr test pits, use of previous reports, and interpretation of historical photographs. Analytical tests were preformed on 66 samples of sludges, and the results are reported in Volume 1A. The identification of sludges included visual observations, including all colors, and laboratory testing. These data were used to estimate the likely quantity of sludge to be encountered.

The sludge solids tend to be less mobile than liquid fractions in the environment and are not likely to be transported through the ground. The more mobile constituents associated with the dumping (i.e., solvents, soluble materials) that have migrated into the groundwater will be addressed in the Phase II RI/FS for groundwater remediation.

Additional test pitting and sampling are proposed prior to the final engineering design. The testing will establish the precise extent of waste deposits and the amount of contaminated materials that must be removed during site cleanup.

**Comment:** **The extent of contamination in the bedrock aquifer should be determined. Fracturing of the bedrock should be characterized to determine the feasibility of using a grout curtain/slurry wall at the site.**

**Response:** The full study of groundwater contamination and remedial measures are proposed under Phase II. The contaminants in the groundwater and the bedrock have migrated to these locations from the location where they were dumped. Dealing with the source of the contamination, i.e., the sludges, will control the generation of additional groundwater contaminants and may isolate them from the potential for direct contact by human and environmental receptors. The grout curtain technology has been dropped and replaced by an open cut trench.

**Comment:** **Conflicting and/or incomplete information was presented in the drawings in the RI/FS Report, especially Drawing 0714-06-03, in the October 1984 and March 1985 reports. No additional data were supplied for the second report.**

**Response:** In December 1984 additional field testing and test pit excavation were conducted in the hill area to visually determine sludge deposits. Drawing No. 0714-06-03 in the March 1985 report illustrates all known sludge deposits based on previous reports, historical data, and onsite investigations. Based on this data, the volume of sludges and contaminated fill were recalculated.

The volume of sludge, fill, and contaminated materials present on the Nyanza Chemical Site, and immediately downstream along Trolley Brook, is estimated as 103,700 cubic yards. This figure was the best estimate of the volume of sludge, fill, and contaminated material based on data available in April 1985. The locations and volumes of individual deposits are summarized on Drawing No. 0714-06-03, Sheet 3 of 6, in the Remedial Investigation Report. The limitations posed by the available data and the need for additional testing were presented in the report. In order to estimate the impact on project costs due to a greater or lesser volume of contaminated material that might be encountered during actual construction, reasonable variations in the volumes of minus 20 percent and plus 30 percent were incorporated into the cost estimates.

STATE COMMENTS:

Comment: **The scope of the Phase I investigation was too narrow. It is unclear, in reading the RI/FS Report, whether NUS utilized past investigations conducted at the Nyanza Chemical Site by DEQE, private consultants, and the EPA. Wetlands east of the trolley embankment were not investigated, even though an earlier evaluation indicated the area was contaminated with oil and mercury. Wetlands and stream sediments immediately adjacent to the former Nyanza property and sediment transport to the Sudbury River were not investigated. These should be addressed prior to a final decision.**

Response: The presence of contaminated sediments along Trolley Brook has been identified as Area VIII and the volume is estimated at 800 cubic yards. The limits of these deposits were determined in the field during the December 1984 sampling. Contamination was found within 16 feet of the brook. The removal and reclamation of this area has been included in all remedial action alternatives except the "no-action" Alternatives 1 and 2. Any significant decrease or increase in the quantity of contaminated sediments in Area VIII will be within the range of contaminated materials estimated for this project.

The eastern wetland was investigated during the remedial investigation by a walkover, looking for evidence of waste deposition. The portion of this wetland that is east of the trolley road grade drains to Trolley Brook through a drainage way in the road grade embankment. Therefore, the flow is from the area beyond the trolley road grade into the established study area for the Nyanza Chemical Site. The limits of sludge contamination was based on available data including personal observations, previous reports, and a series of historical aerial photographs.

Comment: **Analytical procedures, sampling dates, and compound analyses should be included in an appendix, and actual laboratory report sheets should be included to substantiate data.**

Response: The samples were obtained in accordance with EPA-approved procedures and tested in qualified laboratories. Standard methods have been employed to obtain the test results. A comprehensive data review procedure was then employed to validate the laboratory test results. These test results have been summarized in Volume 1A of the Phase I Remedial Investigation. The sampling dates for the various media are presented in Volume I, Phase I, Remedial Investigation. Presenting the raw, laboratory test sheets would entail a large number of additional pages (thousands) that would not be meaningful to most readers.

Comment: No calculations were provided for storm water or groundwater dewatering volumes. Based on soil descriptions from the test pits, infiltration rates should be recalculated for surface water.

Response: Estimates of the waters to be handled during construction were presented in the "Addendum to the Phase I RI/FS." Standard engineering procedures were used to estimate these values. These estimates included:

- Drainage from excavated sludges - 60,000 GPD.
- Contaminated groundwater from dewatering wells - 324,000 GPD.
- Storm runoff from construction areas - 90,000 GPD (as required).

In addition, infiltration estimates were based on the existing conditions, the Narragansett soil with moderate permeability, and the proposed capping options with impermeable membrane liners. These estimates were presented in the Phase I Remedial Investigation and also in the "Addendum." The actual waste deposits may be more pervious than Narragansett soil.

Comment: **Additional piezometric data is needed to determine if the Sudbury River is a regional divide and also to determine that contamination is not flowing under the Sudbury River.**

Response: Additional piezometric data is needed for the groundwater remediation phase, Phase II, RI/FS Management of Migration. This need has been identified and was cited in the Phase I Feasibility Study, Volume II, Section 5.6.

Comment: **Regarding Drawing 0714-06-03 from the RI/FS October and March reports, the differences in sludge and fill volumes need to be addressed and the basis for Area VI needs to be clarified.**

Response: Refer to the last response, page 10, for a discussion of differences between the October and March reports.

Area VI is an area that was previously used as a sump for recirculating liquids from former chemical processes. The soil gas readings of January 1985 indicated elevated levels of volatile organics in this area.

COSTS AND FUNDING:
COMMUNITY COMMENTS

Comment: The range in capital cost estimates and the overlap of the higher cost of a less construction-intensive alternative with the lower cost for a more construction-intensive alternative needs explanation.

Response: As explained at the public hearing of April 18, 1985, the factors that affect the capital costs would affect all alternatives in a similar manner. These factors included quantities of work, material costs, and installation costs. The ranges of costs presented for each alternative are within the prescribed accuracy for Superfund projects, i.e., plus 50 percent, minus 30 percent. The amount of sludge has a major impact on costs for both onsite and offsite disposal. High end estimates will result in costs toward the high end of the range for both alternatives.

Comment: Methodology for quantifying the sludge and fill volume is unacceptable. Therefore, the cost estimates could be inaccurate and misleading in deciding on a remedial action.

Response: The methodology for quantifying the sludge volume, i.e., test pitting analysis and cross-sectional volume computations, is acceptable. The impact that variable quantities of sludge might have on the cost estimates was accounted for in the sensitivity analyses. The same range of sludges, which might reasonably be encountered, was incorporated into the cost estimates of all the alternatives. The amount of sludge that is actually encountered will affect all the alternatives in a similar manner.

Comment: Transporting excavated wastes by rail carrier for offsite disposal may cost less than truck transport.

Response: Use of Conrail to ship wastes for offsite treatment presents two major problems. First, the actual disposal site would not be finalized until all bids were received and evaluated and a contractor selected. The particular disposal site will be the prerogative of this contractor as long as the site has all the necessary permits and a good compliance record. The feasibility of using Conrail cannot be verified until the disposal site has been selected.

Second, use of the railroad will entail two additional loadings/unloadings, one at the Ashland end and one at the terminus nearest the disposal site. This would have a major impact on the transportation cost and would create additional risks due to the rehandling operations.

The Cecos facility does not have a rail spur or car unloading/decontamination facility to receive wastes transported in railroad cars. In addition, the presence of Conrail trackage adjacent to the site is not sufficient for loading rail cars with waste. A siding, loading, and decontamination facility would be required at the site to load the wastes. The costs for the rail car loading, unloading, two decontamination facilities, and the necessary trackage would be borne by the project, which proposes this means of transportation. Considering these additional expenses, it is judged that the cost for truck transport of wastes would be competitive with railroad transport.

**Comment:** **Consideration should be given to the effect of site remedial alternatives on land values and tax revenues. If the State needs to condemn the Nyanza Chemical Site property in order to carry out long-term operation and maintenance, the cost of this action should be considered. Another consideration is whether Federal and State cost recovery opportunities vary with different alternatives.**

**Response:** Potential loss of tax revenue from a contaminated site is not considered in the current RI/FS policy. Condemnation of the site to enable the Commonwealth to provide long-term maintenance is not currently contemplated, and the cost was therefore not considered.

EPA's cost recovery case will depend on a demonstration that the selected remedy is cost effective relative to the other alternatives.

**Comment:** **EPA should draw any necessary additional remedial funds, over the $7 million available for the Nyanza Chemical Site, from projects with remaining 1985 funds. These funds should, then, be committed to the Nyanza Chemical Site fourth-quarter budget for cleanup during this fiscal year.**

**Response:** EPA had realigned its budget to set aside adequate funds during the fourth quarter of FY85 for the Nyanza source control project. However, these funds were deobligated by the Administrator on August 16, 1985 pending CERCLA reauthorization and additional funding.

**Comment:** **Will an annual reappropriation of funds be necessary for all Phase I Design and Construction?**

**Response:** The Design monies have already been appropriated and allocated and will be obligated as soon as the ROD is signed. Construction monies have also been appropriated and will be obligated as soon as the design is sufficiently complete to estimate costs within 10-15 percent. EPA will then transfer construction funds to the U. S. Army Corps of Engineers by means of an Interagency Agreement (IAG).

PRP/OTHER INDUSTRY COMMENTS

Comment: EPA policy for the recovery of funds should be defined. EPA should make provisions to protect businesses on site from financial loss during the remedial construction period. If local industries are forced to shut down, losses could range from missed shipments to permanent loss of business.

Response: EPA's general policy on cost recovery was outlined at the public meetings; the specific cost-recovery strategy for this site (or any site) is not suitable for public disclosure. Remedial actions will be designed to minimize any impact to the ongoing businesses on site. No forced shutdowns are foreseen.

REMEDIAL ACTION ALTERNATIVES:
COMMUNITY COMMENTS

Comment: Only a secure landfill with a bottom liner, leachate collection system, and cap is acceptable for the disposal of the onsite wastes. Therefore, alternatives that do not provide all these features are unsatisfactory.

Response: The prescribed scenarios to be included in a Feasibility Study require remedial action alternatives for five categories of site cleanup. These five categories include:

- No-action alternatives
- Alternatives to minimize generation and/or to mitigate against migration of contaminants (CERCLA)
- Alternatives that comply with Federal requirements (RCRA)
- Alternatives that exceed Federal requirements
- Alternatives that provide for the removal and/or destruction of the wastes

The alternatives proposed are intended to fulfill the requirements of one of the cleanup categories. All alternatives are not intended to provide equal site cleanup and reduction of health and environmental risks. The evaluation of feasible solutions for each category of site cleanup presents data on reduction of health risks, improved environment, and implementation costs to aid the decision makers.

Many of the alternatives do comply with the technical standards of other laws, principally the Resource Conservation and Recovery Act (RCRA). Under RCRA, a site may be closed if it is capped with a cap meeting the requirements of 40 CFR Part 264.

**Comment:** **The existing data are so inadequate in defining the extent of contamination that a remedy should not be chosen at this time pending further data gathering and analysis.**

**There is insufficient information provided to make a decision about onsite or offsite landfilling. There is no discussion of siting considerations for the onsite landfill. A flat, low-lying area that is not marshy would be preferable to the hill area. Groundwater in the hill area is at a very shallow depth and the hill is defined as a groundwater recharge area. If a landfill on the hill leaks, contamination will spread quickly to the low-lying areas. What quantity of waste can be safely placed in a hilltop landfill at the Nyanza Site?**

**Response:** The Nyanza Chemical Site has been studied by three (3) different consultants in the last 5 years with EPA and DEQE review. As with every other uncontrolled site, the data does not always provide a perfect understanding of the situation; anomalies do exist. Further refinements will be made during the Pre-Design and Design Phases, and contingencies will be built into the construction contract to handle unforeseen circumstances. However, in EPA's opinion, there is adequate data to determine the extent of contamination and the appropriate remedy.

The hill was chosen for use for an onsite landfill since it is the only area of the "site" of adequate size to accommodate a landfill. The lower industrial area is occupied by a number of ongoing businesses (unrelated to Nyanza) and is therefore unavailable, as are the wetland areas.

The landfill itself would be built to satisfy the technology requirements of the RCRA reauthorization legislation. A double liner with both a leachate collection zone and a leak detection zone would be included, as would an impermeable cap to minimize infiltration into the wastes. These safeguards coupled with groundwater monitoring will prevent undetected leakage from the facility in time to take corrective action.

Based upon the type of insitu soils encountered during the onsite drilling work and the topography of the Nyanza Chemical Site, a safe landfill can be constructed atop the hill area to accommodate the volume of wastes that is likely to be encountered on the Nyanza Chemical Site.

Comment: Can "land disposal" of wastes be relied upon? Landfills will eventually leak.

Response: The remedial action alternatives calling for the placement of sludges and wastes into a lined and capped repository are current, state-of-the-art technology for storage of waste materials. Placement of a cap over existing waste piles is an applicable technology for closure of an inactive waste deposit. Waste disposal facilities with these features are in conformance with State and Federal hazardous waste disposal regulations.

Comment: **The required 20 mil thickness of the synthetic impermeable membrane is inadequate, and compatibility testing for selection of this membrane should be conducted.**

Response: The synthetic, impermeable membrane should be specified during the final design phase of the project. The 20 and 30 mil thicknesses for the impermeable membrane proposed for the cap and liner and cited in the Phase I Feasibility Study are in conformance with Federal regulations and were used for costing purposes. In the final design phase, thickness, strength, durability, and compatibility determinations will be made to specify the type, material, and thickness of the synthetic, impermeable membrane.

The first use of an impermeable membrane was in 1960, when polyvinyl chloride sheet was used in the construction of Mission Dam in British Columbia, Canada. (Construction and Geotechnical Engineering Using Synthetic Fabrics, R. M. Koerner, J. P. Welsh; John Wiley & Sons, New York, 1980 pg. 72.) Since that time, much more knowledge of synthetic membranes and improved materials is available for use in engineering construction. The selection of a membrane liner system is based on proper installation, physical properties of the fabric, chemical compatibility data, and durability data to provide a facility with a suitable service life.

Comment: **Alternative 10 is most likely to meet with the necessary approvals to maintain the scheduling required to prevent the loss of funds currently available for remediation of the Nyanza Chemical Site. However, it is unclear whether offsite landfill capacity is available to accommodate the contaminated materials from the site if the offsite alternative is chosen. By what mechanism must the Commonwealth of Massachusetts assure the EPA that offsite landfill capacity will be available?**

Response: It is impractical for the Commonwealth (or others) to reserve landfill capacity. Should EPA choose an offsite disposal remedy, the actual facility will be selected during the competitive bid process. Prior to

construction contract award, EPA and DEQE would jointly implement the procedures in the May 6, 1985, Offsite Disposal Policy memorandum. The State Superfund Contract would be the mechanism by which EPA would require DEQE to participate in the facility selection process.

**Comment:** **The EPA granted Final Authorization (of remedial actions) to the Massachusetts Hazardous Waste Management Program (Federal Register, 2/7/85, pg. 3344). Selection of a remedy, such as Alternative 12, violates State landfill standards and contravenes State and Federal law. Also, EPA policy requires that the public be informed of the extent to which any remedial action alternative fails to attain or exceed public health and environmental standards; the report fails to mention that Alternative 12 doesn't comply with State landfill standards.**

**Response:** Where a State adopts more stringent regulations than the Federal regulations, the State may be required to pay 100 percent of the additional costs beyond that needed to comply with the Federal standards, regardless of whether or not the EPA has adopted the State standards in authorizing the State program to operate in lieu of the Federal program.

EPA has not adopted Massachusetts hazardous waste landfill standards but has ruled that the State has an acceptable program for dealing with and controlling the disposal of hazardous wastes.

Alternative 12 complies with the requirements described on page 19.

**Comment:** **Why were two new alternatives presented in the "Addendum to the Phase 1 - RI/FS," and why is the surface area of Alternative 9 greater than the surface area of Alternative 12?**

**Response:** EPA (Region I) requested that two new alternatives be developed, described, evaluated, and presented to the public in the "Addendum to the RI/FS." The EPA described these two remedial action alternatives in their review comments to the RI/FS reports.

Alternative 12 constructs the secure repository above the seasonal high groundwater level. It requires less backfill than Alternative 9 and the resulting surface area of the repository is only 3.1 acres. This alternative complies with Federal (RCRA) requirements concerning placement above the seasonal high groundwater level.

Alternative 9 constructs the secure repository above the probable maximum high groundwater level in accordance with Massachusetts waste disposal requirements. This alternative requires more offsite

material than Alternative 12 to backfill the excavated cavity to 4 feet above the probable maximum high groundwater level. Consequently, more total material (greater amount of offsite borrow material) is placed on the hill and a larger surface area of the secure repository results.

**Comment:** **Alternative 11 offers more risk reduction, through waste fixation, than other alternatives that employ onsite disposal but this alternative was deleted from the final evaluation. Waste fixation should be researched further.**

**Response:** As stated in the Phase I Feasibility Study, the presence of debris and other waste material mixed in with the sludges and fill will hamper the fixation process. The presence of these wastes will cause the "fixed" product to be unreliable. The goal of producing a highly impermeable mass will not be achieved and the fixation process will not be effective. The reduction in health risks by this alternative will be the isolation of the sludges and waste from the environment in a secure, lined, capped repository. This isolation will reduce health risks and improve the environment by:

- Having no potential for direct contact of contaminated materials
- Being secured against surface water erosion and transport of contaminated materials
- Being secured from contact with the atmosphere and transport as airborne particulates or emissions
- Being secured against contact by groundwater and the potential for leaching and transport by this medium

Other alternatives providing for onsite disposal in a secure repository provide the same isolation and attendant reduction in health risk and adverse environmental impacts. However, these other alternatives require less work and would be more cost effective in reducing the risks.

In summary, waste fixation was eliminated during the initial technology screening process due to the simple fact that the largest sludge volume is on the hill and is intermixed with building rubble and debris. It is not amenable to mixing with any fixation reagents.

Comment: How was the determination of the seasonal high groundwater level made and does Alternative 9 comply with the requirements specified in the Massachusetts Code for hazardous waste disposal?

Response: The available data was used to estimate the probable maximum high groundwater level, as specified in 310 CMR 30.620. Alternative 9 would locate the bottom of the liner 4 feet above the estimated, probable maximum high groundwater level consistent with this requirement.

Comment: What is the purpose of the water treatment plant during the Phase I remediation of the sludges, contaminated soils, and sediments?

Response: During the Phase I construction, contaminated waters encountered will require treatment. The sources of these waters were discussed in the "Addendum to the Phase I - RI/FS" and are identified again as follows:

- Contaminated groundwater from dewatering wells employed to lower the groundwater level in areas where excavation is planned.
- Contaminated drainage from saturated solids drying on the rehandling area after excavation from below the groundwater levels.
- Runoff after a rainfall from construction areas containing contaminated materials.

STATE COMMENTS:

Comment: Should a gas venting/control system for onsite landfill options consider methyl mercury generation?

Response: The onsite air sampling and testing did not indicate hazardous levels of mercury at the site boundary from the undisturbed sludges, obviating the need for a gas venting/control system. Once the sludges are properly disposed in a secure landfill, high concentrations of landfill gases and mercury vapors are not expected. Caution will be required during sludge excavation which should be accomplished in conformance with approved excavation and monitoring plans. These specific plans are to be designed during the final design phase.

Comment: Consideration should be given to the possibility that cleanup at the Nyanza Chemical Site could be slowed or halted by a lack of out-of-state disposal space.

Response: Availability of disposal capacity at any future date cannot be foreseen with any degree of certainty. Should offsite disposal be selected in the Record of Decision, the bidders would have to consider the existing capacity situation and fallback options in developing their bid proposal.

Comment: **Aeration/air stripping of VOC-contaminated water prior to or instead of treatment by activated carbon may be a cost-effective alternative for water treatment in Phase I. Iron and manganese removal by aeration may be more desirable than by chlorination. Perhaps aeration of the equalization lagoon followed by sedimentation would accomplish this goal. Adverse impacts of adding chlorine to water with an appreciable organic burden should be examined.**

**Bench-scale testing should be considered to optimize design and construction of the water treatment facility, especially metal precipitation unit(s).**

**A temporary, unitized, factory-assembled treatment plant system that can be disassembled or scaled-down following construction activities should be considered.**

Response: The design phase of the wastewater treatment plant can consider these options. A plant should be designed using compatible unit processes and optimal systems to provide a satisfactory effluent.

An optimal plant should be provided to fulfill short-term (construction) and longer-term goals, such as groundwater renovation, if required. The above comments should be considered during final design.

## HEALTH RISK ASSESSMENT AND ENVIRONMENTAL IMPACTS: COMMUNITY COMMENTS

Comment: **Health risks associated with onsite disposal of wastes have not been adequately assessed. There is concern that children might come into contact with contaminated sediments in the surface waters and future residents might install wells for potable water supplies.**

Response: The reduction in risks to public health and the lessening of adverse impacts to the environment for sludge-related contamination have been stated in the Phase I RI/FS and the "Addendum to Phase I RI/FS." Reiterating the findings of these reports, the main health and

environmental hazard associated with sludge deposits is the potential for direct contact with the sludges and contaminated sediments in and along the surface water streams. Potential for exposure will exist until these sludges are placed in a secure configuration to prevent direct contact and/or offsite transport and deposition because of continued erosion by surface runoff. Placing the sludges into a secure configuration, i.e., capping with ground and surface water diversion (Alternatives 3, 5, and 13), a secure onsite landfill with underliner, leachate collection and cap (Alternatives 9 and 12), or offsite disposal (Alternative 10), achieves the same immediate reduction of risk for direct contact of the sludges and/or contaminated sediments. The reduction of risk and improved environment, over the long term, will be maintained by the ongoing monitoring and maintenance of the completed, secure facility. The construction, monitoring, and maintenance are current, state-of-the-art technologies for securing and/or disposing of waste materials.

The contaminated sediments in the drainageway downstream from the site could be removed and placed in a secure repository. This action would remove the contaminants from the environment and eliminate the potential for direct contact by children and residents. These actions are proposed in all action alternatives proposed in the Phase I RI/FS (Source Control).

Contamination is known to be present in the groundwater in the vicinity of the site. The full extent of groundwater contamination is not known at this time. The Phase II RI/FS is proposed to obtain more data to identify this contamination. Until the extent of the groundwater contamination is determined, it is recommended that no wells be constructed downgradient of the site for the purpose of extracting groundwater for potable water or irrigation purposes.

**Comment:** **What procedures will be implemented to assure the protection of the public health during the implementation phase of the site cleanup? These procedures and any emergency response planning should be made available to the public as soon as possible prior to construction.**

**Response:** Costs for onsite monitoring of the environment during construction have been included in the cost estimates. Safety monitoring will include testing of air, sediments, soils, surface and groundwater to assure that the work is progressing in a safe manner and the threat of resident and worker exposure, and offsite migration of contaminants are at acceptable minimums. A detailed safety monitoring plan will be formulated and included in the final design documents.

Construction procedures will be formulated to safely perform the onsite activities. These procedures will include safeguards to prevent hazardous concentrations of contaminants in the environment. Contingency plans will be formulated and implemented if hazardous conditions would occur.

Design of the remedial option will include the design of an air monitoring system to continually monitor air emissions for comparison with ambient air standards or guidelines for toxic air pollutants. A contingency plan will be developed by the designer in concert with EPA, the Center for Disease Control (CDC) and the DEQE. This plan will outline hazard levels which, if reached, will trigger response actions such as work stoppage, evacuation, or additional monitoring. This plan development must await selection of an alternative to be specific. Other issues of safety, site security, etc., will be addressed in the bid documents and will have to be satisfied by the construction contractor before the U.S. Army Corps of Engineers will issue the Notice to Proceed.

**STATE COMMENTS:**

**Comment:** **Not all of the contaminated areas are fenced. Also, potential for direct contact of contaminated sludges along the stream, in both the culverted and open areas, is not clearly defined.**

**Response:** The contaminated sediments, soils, and sludges in unsecured areas do pose a risk to the public. The potential for direct contact of these contaminants exists in the wetlands along Trolley Brook. Massachusetts DEQE is currently planning to fence these areas to restrict access.

**Comment:** **The potential for contact with contaminants in the air is not known because previous studies have addressed point sources rather than a 20-acre source.**

**Response:** Design of the remedial option will include the design of an air monitoring system to continually monitor air emissions for comparison with ambient air standards or guidelines for toxic air pollutants. A contingency plan will be developed by the designer in concert with EPA, the Center for Disease Control (CDC) and the DEQE. This plan will outline hazard levels that, if reached, will trigger response actions, such as work stoppage, evacuation, or additional monitoring. This plan development cannot be specific until the selection of an alternative. Other issues of safety, site security, etc. will be

addressed in the bid documents and will have to be satisfied by the construction contractor before the Corps will issue the Notice to Proceed.

Comment: The unprecedented magnitude of offsite transport creates a demand for the development of vehicle decontamination measures.

Response: Decontamination of construction equipment leaving the site will be required. This can be performed on the rehandling area provided for all onsite disposal alternatives. Removal of waste to an offsite facility will require decontamination of the transporter prior to exiting the site.

PRP/OTHER INDUSTRY COMMENTS:

Comment: Exposure to contaminants during construction activities could affect both short- and long-term health of workers in the onsite industrial complex.

Response: Design of the remedial option will include the design of an air monitoring system to continually monitor air emissions for comparison with ambient air standards or guidelines for toxic air pollutants. A contingency plan will be developed to outline hazard levels that will trigger response actions, such as work stoppage, evacuation, or additional monitoring if exposure action levels are reached.

SITE INVESTIGATION PARAMETERS:
COMMUNITY COMMENTS

Comment: The areas north of the railroad tracks and east of the trolley embankment should have been included in the scope of the RI/FS. Surface water drainageways should be included in the Phase I cleanup. The Board of Health requests that the Trolley Brook drainageway be made the focus of an immediate removal action. The area upgradient of the site should have been more widely sampled.

Response: The wetland areas north of the Conrail tracks and east of the trolley bed were sampled by CDM during the pre-design phase; the results are provided in the pre-design report.

The sediments in Trolley Brook will be included in the Phase I cleanup. Actions to fence the open portion of Trolley Brook until excavation next year are under consideration by EPA and DEQE.

Additional upgradient sampling was conducted by CDM to better define background contaminant levels.

STATE COMMENTS:

**Comment:** **The State reiterates that the above named areas north and east of the site should have been included in the RI/FS.**

**Response:** Refer to response to "Site Investigation Parameters: Community Comments."

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
One Winter Street, Boston 02108

S. RUSSELL SYLVA
Commissioner

September 3, 1985

Mr. Michael Deland
Regional Administrator
U.S. Environmental Protection AGency
JFK Federal Building
Boston, Massachusetts 02203

Re: Nyanza, Ashland
Phase I Remedial Action

Dear Mr. Deland:

The Department of Environmental Quality Engineering has reviewed the following documents prepared by EPA and its consultants on the Nyanza federal Superfund site in Ashland, Massachusetts.

1) Draft - Phase I - Remedial Investigation/Feasibility Study Report Volumes 1 and 2, March, 1985;

2) Draft - Phase I - Remedial Investigation/Feasibility Study Report Volume 1A, Phase I, RI Appendices, March, 1985;

3) Appendum to Phase I - Remedial Investigation/Feasibility Study April, 1985;

4) Report of Field Work Completed, Technical Assistance for the Nyanza Chemical Site, Ashland, Massachusetts, July 1985

5) Draft Record of Decision, Remedial Alternative Selection, Nyanza Chemical Site, August, 1985.

The Department has also received and reviewed comments from the Ashland Board of Health, the Ashland Advocates for a Clean Environment (AACE), the Citizens Advisory Committee, and State Representative David Magnani. Additionally, Department staff have met with members of the Board of Selectmen, Board of Health, AACE, and interested citizens and abuttors to discuss further issues regarding the Nyanza site.

The concerns of the community, as expressed in writing and at the public hearing and meetings, have been: (1) the technical inadequacy of the Remedial Investigation/Feasibility Study (RF/FS), and (2) the community's preference for excavation and disposal of contaminated materials in a 'secure landfill' as the remedial action.

The Department has two major areas of concern regarding this project. The first concern regards the lack of community involvement in the decision-making process. The design and implementation of both Phase I and Phase II must provide ample opportunity for community and DEQE involvement.

An Advisory Committee already has been established by the community for this purpose. The Department strongly supports the Committee and believes that short and long term solutions acceptable to the community can only be achieved through a close working relationship among the community, DEQE, and EPA.

The Department's second area of concern is technical in nature. First, the Department is concerned about the adequacy of the data in the draft FI/FS to support the proposed Phase I Remedial Action. Secondly, we are concerned about the potential impacts associated with implementing the proposal. These concerns have also been expressed by the community.

In response to the technical inadequacies of the draft RI/FS, EPA tasked Camp, Dresser, and McKee to perform additional field and laboratory work to better define the nature and extent of contamination. EPA then chose the following remedial action alternative:

- Excavation of outlying sludge deposits/sediments and consolidation with Hill area sludges
- RCRA capping of the Hill area
- Upgradient surface water/groundwater diversion system
- Downgradient monitoring system

The Department feels that the remedial action strategy chosen by EPA will, by removing the highly-contaminated lowlands areas, remove the greatest source of heavy metal contamination to surface and ground waters. Capping, instead of the Hill area excavation necessary for a secure landfill, will minimize air emissions and associated potential health impacts. This alternative, if the groundwater data on which it is based is confirmed during design, presents an acceptable balance between ground water protection and the potential negative impacts associated with the construction of a lined landfill. The Department does not anticipate the use of this site for any other hazardous waste.

Therefore, after review and evaluation of all the data and the potential benefits and impacts of the alternative remedial actions presented, the Department concurs, subject to the conditions outlined below, with the Phase I remedial action strategy proposed by EPA. This conditional concurrence is based on the premise that information to be developed during design will confirm EPA's analysis which justifies the conceptual basis for its choice of remedy, and that, if it does not, the remedy will be reconsidered.

The following is necessary to confirm the conceptual basis for EPA's decision:

- The construction and evaluation of the surface water/groundwater diversion system prior to Hill capping.

- Additional assessment of the impact of Hill sludges on groundwater.

- An evaluation of the feasibility of the fixation of the excavated materials from the lowlands. If feasible, the fixation of these highly contaminated materials would minimize any leachate that might be generated.

The following areas should be evaluated for inclusion in the Phase I remedial action:

- Old Nyanza lagoons

- Spring-bed on eastern side of hill

- Suspected antimony pit

In addition to confirming the conceptual basis, the following is needed to address major technical concerns regarding the implementation of the proposed remedial action:

- A small pilot project on the northwestern wetlands near the Conrail tracks to validate theoretical estimates of modelling in order to determine the impact of vapor and particulate mercury emissions on workers, abuttors, and ambient air quality. Phasing of the construction such that minimal construction during the summer months may be warranted.

- An evaluation of the methods of trench excavation to ensure adequate performance of the surface water groundwater diversion system.

Additional issues will arise during implementation. These should be discussed thoroughly with the Advisory Committee.

The Department believes that both the conceptual and implementation issues can be resolved and is looking forward to working closely with both the Advisory Committee and EPA toward that end. We anticipate that as design progresses, the information which becomes available will allow us to either reconfirm or reconsider the Phase I remedial action proposal.

Finally, as has been discussed between our staffs, the Department feels it is necessary to fast-track an evaluation, and take removal actions if appropriate, of the organic chemical contamination associated with the 'vault area', presently scheduled to be studied by EPA in Phase II. This area is a major source of groundwater contamination, and while not addressed in Phase I, should not be delayed until the results of the Phase II study are available. Therefore, the Department believes it is appropriate to use its own contractors for this purpose and will apply to receive 'advance match credit'. We look forward to working cooperatively with EPA to begin this study in the near future.

Very truly yours,

by: Thomas F. Powers

S. Russell Sylva
Commissioner

SRS/MS/jp

cc: Ashland Board of Selectmen
Ashland Board of Health
A.A.C.E.
State Representative David Magnani
State Senator Edward Burke
Sanford M. Matathia, Esq.
Senator John Kerry
Senator Edward Kennedy
U.S. Congressman Joseph Early
Richard Chalpin, DEQE

ATTACHMENT III

## Wetlands Assessment for the Nyanza Chemical Site, Ashland, MA.

On March 20, 1985, Richard Cavagnero, EPA project officer, and Douglas Sparrow, U.S.Army Corps of Engineers staff biologist, visited the Nyanza site to perform an assessment of the wetland areas both on and contiguous to the site which may be impacted by remedial actions taken at the site. Assessments of this nature are based solely on visual observations and typically include:

- a general characterization of wetland vegetation cover types;
- a general characterization of hydrologic features;
- an evaluation of the level of disturbance to the wetland areas from human factors (i.e. degradation).

That assessment follows :

### Observations:

The site walkover began on the Hill area from which we proceeded north down the slope to a wetland area of approximately 2 acres which is bounded on the north by the CONRAIL tracks. The eastern terminus of the wetland is just above the headwaters of Chemical Brook, an intermittent stream which was virtually dry at the time of our tour. Standing water was present over one third of the wetland area to a depth of less than 6 inches. The source of this water is runoff from the Hill area and from the wooded area

inants to the water column for eventual transport into Chemical and Trolley brooks and ultimately to the Sudbury River. Thus it was deemed that in order to effectuate the CERCLA goals of minimizing public health and environmental risks, no practicalbe alternative exists but to excavate the sediments in the wetlands.

In situ capping would effectively destroy the wetlands which would eliminate their value in providing storage of stormwater runoff and discharging groundwaters. The result would be to increase flows in the two brooks, although the impacts to each would be negligible since neither is suitable for recreational usage.

Excavation of the contaminated sediments followed by backfilling to original grade and revegetation would maintain the existing water storage capacity while providing the opportunity for establishment of a more diverse plant community and improved habitat value.

The alternatives for handling the sludges would have minimal impact on the wetland areas. All of the onsite options involve capping, which would eliminate the runoff of contaminants from the Hill area into the wetlands. Certain of the capping options include provisions for upgradient diversion of groundwater and surface waters around the Hill area; these waters would nevertheless still flow to the wetland areas although their path would be slightly altered.

Page retyped for NTIS--December 31, 1985

to the west along with discharging groundwater. The only plant species observed was reed grass (Phragmites australis). No aquatic life was observed although some bird species were observed in the area. Sludge of various colors including black and purple was observed on or directly beneath the surface of approximately 75% of the area, which appeared to be thoroughly degraded.

The second wetland area was visited next. This occupies approximately one half acre between Megunco Road and the abandoned Trolley bed. It is fed by surface runoff from the west and by the overflow from the larger water body on the eastern side of the Trolley embankment. Standing water was present over 50 % of the area to a depth of 1-2 feet. Reed grass was again the only observed plant species whereas a few green frogs were noticed. The sediments in this area are heavily contaminated with heavy metals from past discharges of untreated industrial wastewaters; no sludge dumping occurred in this area.

Discussion:

Although 13 alternatives were discussed in the RIFS and Addendum, there were three options for handling the contaminated sediments; No action, Excavation and consolidation with the sludges, and in situ capping. Under No action, both areas would remain heavily contaminated and would continue to present a direct contact threat as well as the potential for resuspension of the sediment contam-

Conclusions and Recommendations:

Excavation of the contaminated sediments followed by backfilling to original grade and revegetation is the preferred option. Mitigati measures will be required during the excavation to isolate the wetlands from the two brooks to prevent suspension of contaminants from runoff into the brooks. Typical sedimentation and erosion controls will be employed to prevent overland runoff of contaminants during excavation. Final details will be developed during the design phase.

The large water body east of the Trolley bed will be addressed in the Phase II RIFS; a thorough assessment will be performed to characterize the vegetation, hydrology, and animal life in that area.

Comments from the Water Quality Branch and a wetland map are attached

March 15, 1985

Review of the RI/FS on the Nyanza Chemical Site for Wetland Impacts and Applicability of Section 404

Matt Schweisberg MS
Planning and Standards Section

Don Porteous, Chief
Water Quality Branch

THRU: Bill Butler, Chief
Planning and Standards Section

Generally, due to the size and degraded state of the wetlands in question (see attached map), selection of an alternative which involves excavation of the contaminated wetland soils and plants would be preferred, although recognizably expensive. If an alternative requiring excavation is selected, specific care must be taken to isolate the wetland areas during excavation so as to prevent any contaminated materials from being transported into either Chemical Brook, Trolley Brook, or the larger wetland adjacent to the half-acre wetland on the southeast corner of the Nyanza property. Once excavation is complete, regrading to original slope and planting with wetland plant species would be recommended. Once regrading is complete, the hydrologic connections to both wetland areas should be restored.

Regarding applicability of Section 404, the excavation and subseqent regrading of the half-acre wetland would probably be covered under a Corps of Engineers nationwide permit (e.g., this area is above the headwaters and less than one acre in size). Similar activities in the two-acre wetland on the northwest corner would probably require a predischarge notification to the Corps (e.g., this area is above the headwaters but is between one and ten acres in size). In both cases, an individual permit would not be required.

Attachment

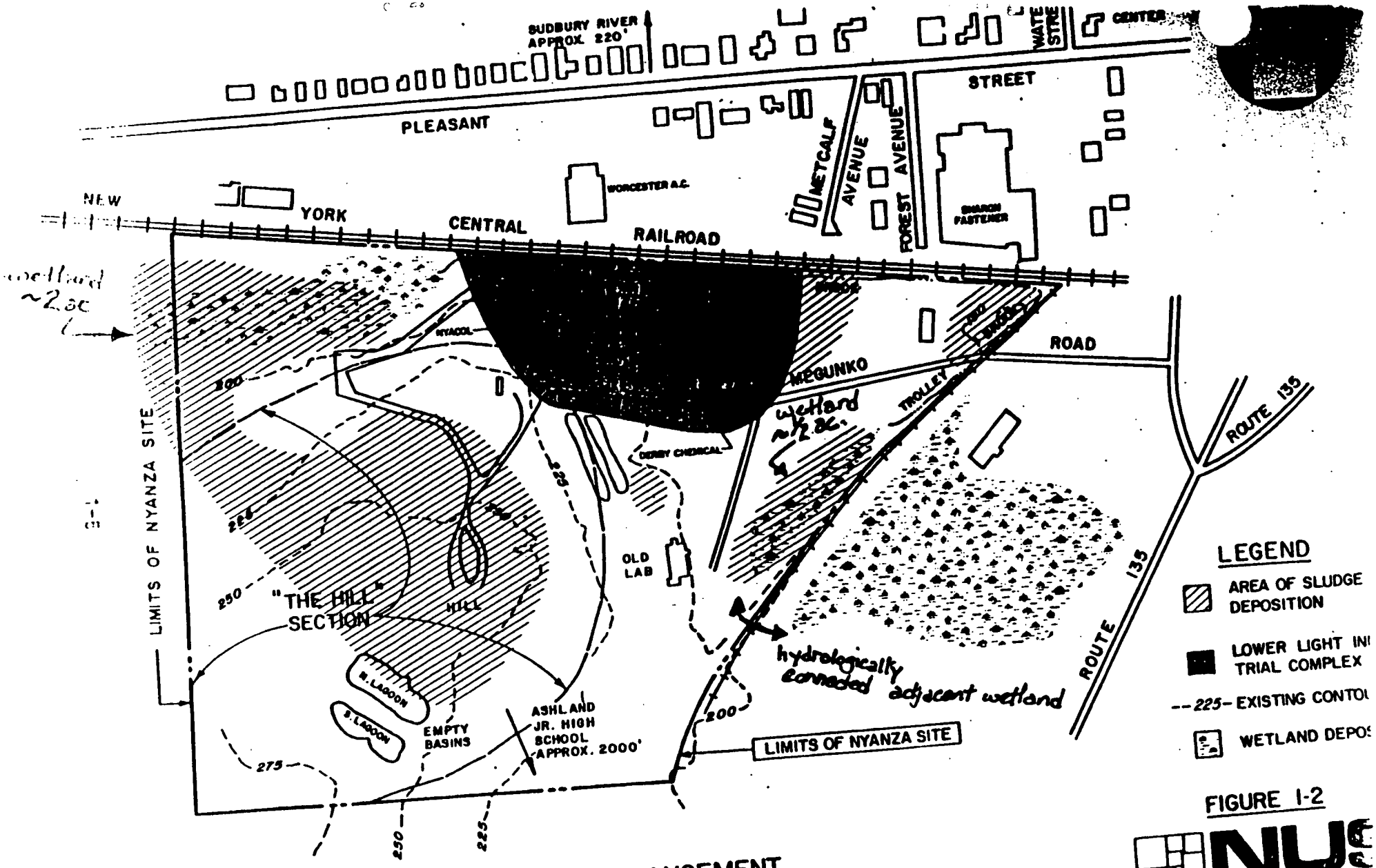


FIGURE 1-2

GENERAL ARRANGEMENT
NYANZA CHEMICAL SITE, ASHLAND, MA
SCALE 1" = 400'

NUS CORPORATI
A Halliburton Comp

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

July 15, 1985

Potential Wetland Impacts from Remedial Activities at the Nyanza Chemical Site

Matt Schweisberg
Planning and Standards Section WQP-2103

To

Rich Cavagnero
Site Response Section HWM-1903

In response to your inquiry regarding the effects of the proposed diversion of groundwater upon the wetland area at the northwest corner of the site, it seems that little or no effect will occur. This wetland area appears to have been "created" by the impounding effects of the railroad tracks and bed directly to north of the wetland. As such, the wetland probably is dependent upon surface runoff for its source of water rather than groundwater; however, only monitoring of surface and groundwater flows can confirm this hypothesis. In addition, the diversion of groundwater may benefit the larger wetland to the east of the site by increasing amounts of water flowing to it.

If you have any other questions, please call me at 223-3949.

cc: Carol Wood

Page retyped for NTIS--December 31, 1985

ATTACHMENT IV

Floodplain Assessment for the Nyanza Chemical Site, Ashland, MA.

Attached are the floodway maps for the Town of Ashland which were prepared by the Federal Emergency Management Agency. These maps clearly demonstrate that the Nyanza site is outside of the 100 year floodway of the Sudbury River. No excavation will take place within the floodplain and no structures are to be built in the floodplain or which will alter the existing limits of the floodplain.

Page retyped for NTIS--December 31, 1985