Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
ALCOA - WEST FILL AREA
Town of Massena, St. Lawrence County
Site Number 6-45-025

March 2000

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

ALCOA - West Fill Area Inactive Hazardous Waste Site
Town of Massena, St. Lawrence County, New York
Site No. 6-45-025

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the West Fill Area Class 2 inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the West Fill Area inactive hazardous waste site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study (RI/FS) for the West Fill Area and the criteria identified for evaluation of alternatives, the NYSDEC has selected a combination of excavation and covering of waste and contaminated soil. The components of the remedy are as follows:

- Soils, sediment, and waste will be excavated from identified "hot spots" until the cleanup objectives specified in Technical and Administrative Guidance Memorandum (TAGM) No. HWR-94-4046 are achieved. The contaminants of concern include polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and polynuclear aromatic hydrocarbons (PAHs). The excavated material will be disposed in ALCOA's on-site Secure Landfill.

- The areas of excavation will be backfilled to original grade with clean soil All other areas where surficial soil contamination or exposed waste is present will be covered with a minimum of one foot of clean soil, which will be graded to promote surface water drainage away from the site. The site will be seeded to help establish a vegetative cover and protect the soil cover from erosion.

- A long-term groundwater, surface water, and air monitoring program will be implemented to evaluate the effectiveness of the remedy. In the event Department-specified thresholds are exceeded, then previously identified contingencies will be instituted.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

3/21/00
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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RECORD OF DECISION

ALCOA-WEST FILL AREA
Massena (T), St. Lawrence County, New York
Site No. 6-45-025
March 2000

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) has selected this remedy to address the significant threat to human health and/or the environment created by the presence of hazardous waste at the West Fill Area, a Class 2 inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of this document, a variety of on-site operations has resulted in the disposal of a number of hazardous wastes, including polychlorinated biphenyls (PCBs), spent solvents, and spent potliners. These disposal activities have resulted in the following significant threats to public health and/or the environment:

- A significant threat to human health and biota associated with direct contact with contaminated surface soil and exposed waste, as well as the inhalation of air-born contaminants.

- A significant threat to human health associated with direct contact with contaminated subsurface soil, waste, and contaminated groundwater during utility line maintenance.

- A significant environmental threat associated with the impacts of contaminants to the local groundwater, and the potential for the contamination to be discharged to on-site surface water and the near-by Grasse River.

In order to eliminate or mitigate the significant threats to public health and/or the environment that the hazardous wastes disposed at the West Fill Area have caused, the following remedy was selected:

- Soils, sediment, and waste will be excavated from identified "hot spots" until the cleanup objectives specified in Technical and Administrative Guidance Memorandum (TAGM) No. HWR-94-4046 are achieved. The contaminants of concern include PCBs, volatile organic compounds (VOCs), and polynuclear aromatic hydrocarbons (PAHs). The excavated material will be disposed in ALCOA's on-site Secure Landfill.

- The areas of excavation will be backfilled to original grade with clean soil. All other areas where surficial soil contamination or exposed waste is present will be covered with a minimum of one foot of clean soil, which will be graded to promote surface water drainage away from the site. The site will be seeded to help establish a vegetative cover and protect the soil cover from erosion.

- A long-term air, surface water, and groundwater monitoring program will be implemented to evaluate the effectiveness of the remedy. In the event Department-specified thresholds are exceeded, then previously identified contingencies will be instituted.

The selected remedy, discussed in detail in Section 8 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Record of Decision (ROD), in conformity with applicable standards, criteria, and guidance (SCGs, Table 1).

SECTION 2: SITE LOCATION AND DESCRIPTION

ALCOA's Massena Operations are situated on 2,700 acres in the Town of Massena, St. Lawrence County, less than half a mile north of NYS Route 37. The plant is bordered on the north by the St. Lawrence River, on the southwest by the Massena Power Canal, and on the southeast by the Grasse River. The village of Massena (population 15,000) is located to the west and the south (Figure 1).

To date, the NYSDEC and the NYSDOH have identified 18 hazardous waste disposal areas at the plant (Figure 2), including the 25-acre West Fill Area (Site No. 6-45-025).

SECTION 3: SITE HISTORY

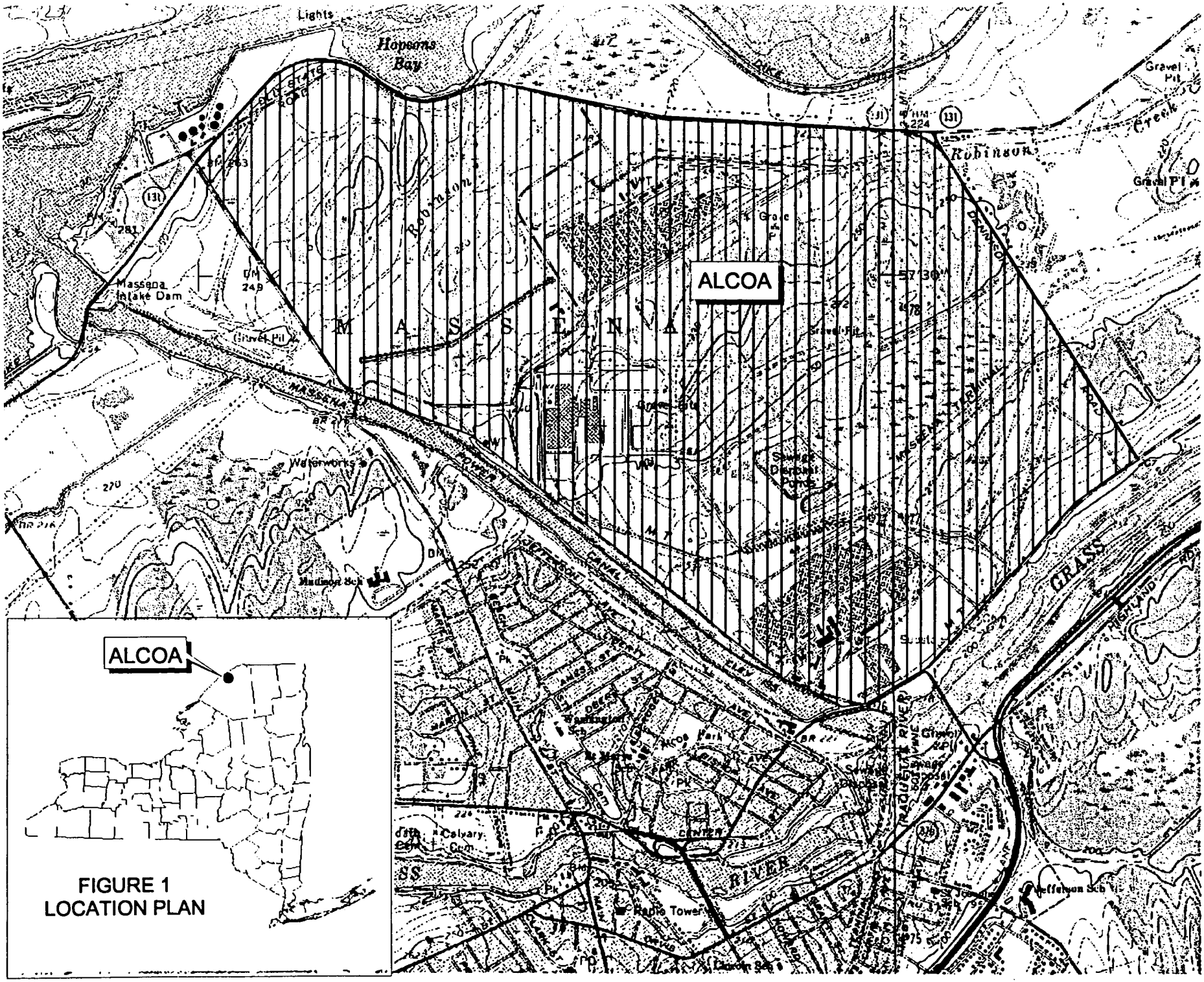
3.1: Operational/Disposal History

The presence of hazardous waste in the West Fill Area is attributable to a number of operations, as discussed below.

- From approximately 1942 until 1954, portions of the site were utilized for the disposal of both natural fill generated during major plant expansions, as well as miscellaneous man-made wastes, some of which were likely hazardous.

- At this time, another portion of the site served as a reclamation area (Figure 3). Equipment and drummed materials were temporarily staged here pending reuse, recycling, or disposal.

- The southern portion of the site contained a shallow, bermed area that functioned as a fire training pit for an unknown period of time through the mid 1970s (Figure 3). Flammable liquids were placed in the pit and ignited, and the plant fire department would practice extinguishing the fires.


Lights
Hopsons Bay
Massena Intake Dam
ALCOA
MASSENA
Waterworks
Power Canal
Madison Sch
Robinson
Gravel Pit
Creek
Grass River
Raquette River
Calvary Cem
Radio Tower
Jefferson Sch
Highland Rd
Sewage Disposal Ponds
ALCOA
FIGURE 1
LOCATION PLAN

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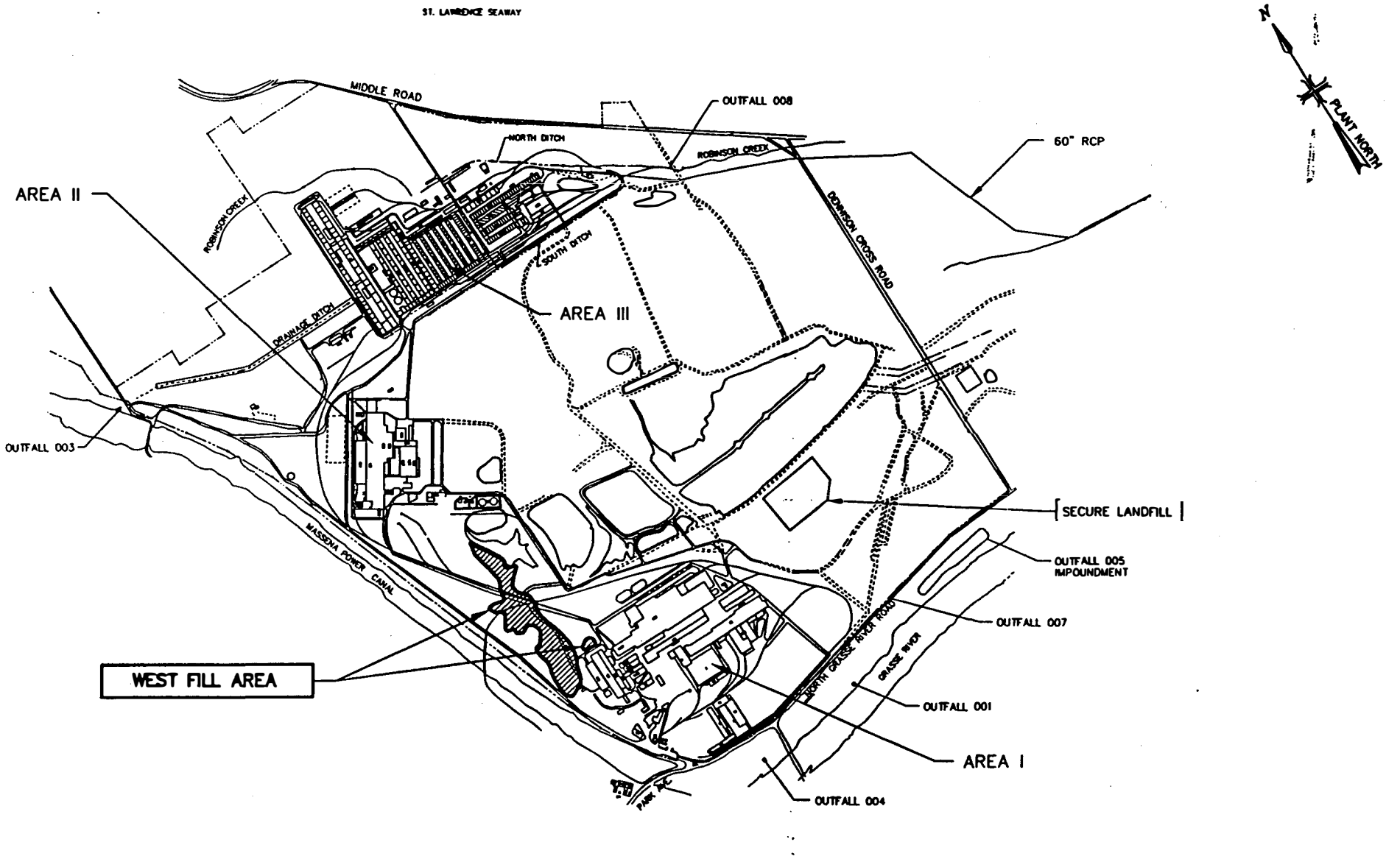


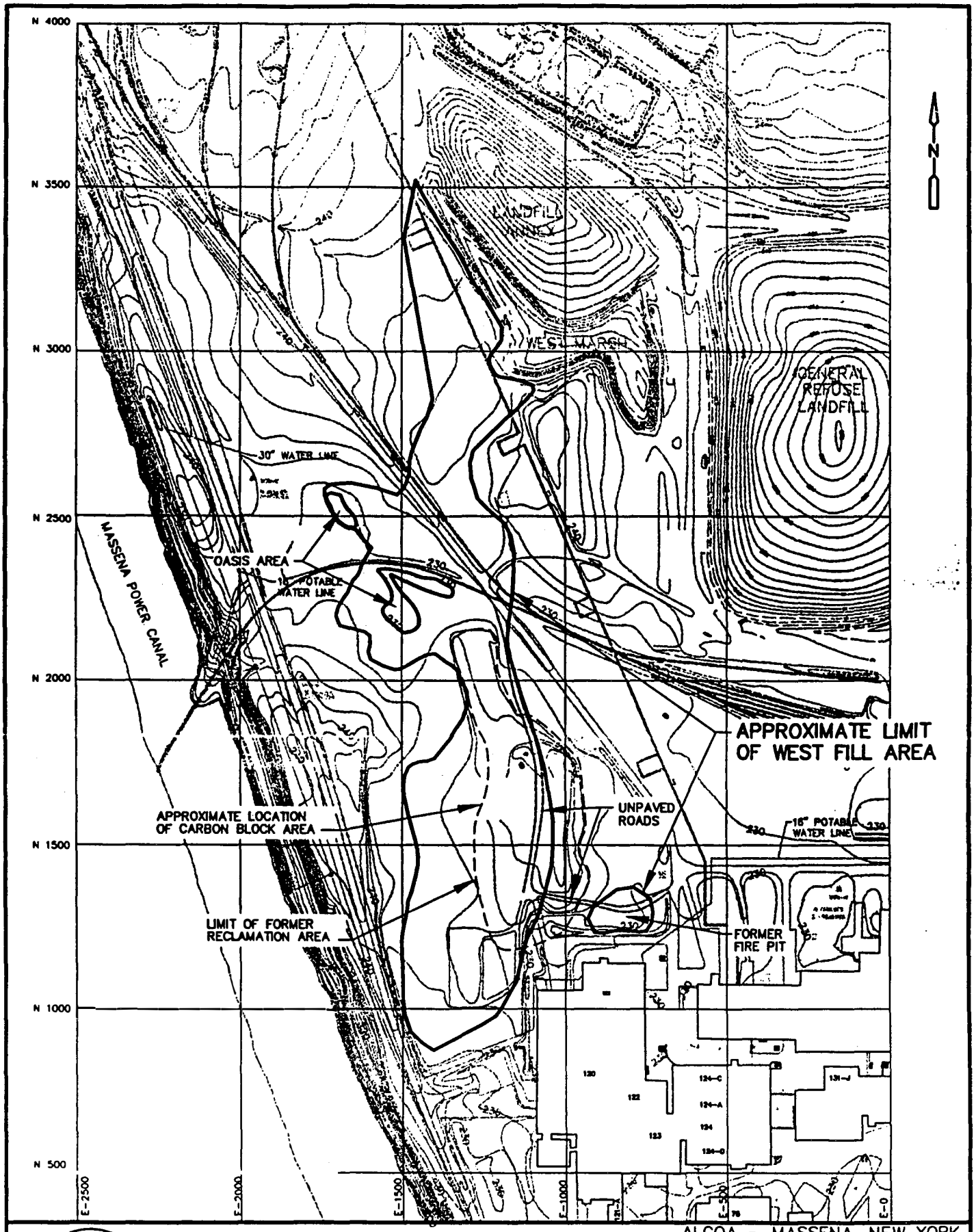
SCALE IN FEET

2000 0 2000 4000

ALCOA – MASSENA, NEW YORK

WEST FILL AREA SITE LOCATION PLAN

FIGURE 2



ALCOA – MASSENA, NEW YORK

SCALE IN FEET
200 0 200 400

WEST FILL AREA

FIGURE 3

E:\ALCOA\WESTFILL\ CSTWFA12A.DWG 12/14/99 Scott G. Costagnier ALCOA/RPO

- There are an estimated 3.7 miles of unpaved roadways throughout the plant which were routinely sprayed with waste oils as a means of dust suppression. Some of these roadways extend across the southern portion of the West Fill Area. This practice was discontinued in the mid 1970s.

3.2: Remedial History

The Department first expressed a concern for the West Fill Area in early 1998 as a result of subsurface conditions encountered during installation of a new stormwater line through the site.

Later in 1998, at the Department's request, ALCOA conducted a Phase I Site Assessment, which focused on the evaluation of existing data and the identification of data inadequacies. Central to this effort was a series of interviews with current and former plant employees who may have had knowledge of historical operations in the West Fill Area.

In order to address the data gaps identified in the Phase I study, ALCOA undertook a Phase II Site Investigation in 1994. Subject to Department approval, this work consisted of the evaluation of actual surface and subsurface conditions within the West Fill Area, including the sampling and analysis of various site media.

In June 1995, as a result of the Phase II investigation, the Department placed the West Fill Area on the Registry of Inactive Hazardous Waste Disposal Sites, assigning it a "Class 2" designation (i.e., the site poses a significant threat to public health and/or the environment, and action is needed).

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste, ALCOA has recently conducted an RI/FS.

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was conducted in the fall of 1998. A June 11, 1999 report entitled, *Remedial Investigation/Feasibility Study for the West Fill Area* has been prepared which describes the field activities and findings of the RI in detail.

The RI included the following activities:

- Excavation of 26 test pits to confirm the presence or absence of drums, to assess the depth of fill, and to collect samples for chemical analysis.

- Drilling 28 soil borings to provide a visual classification of subsurface stratigraphy, and to collect samples for physical and chemical analysis.

- Installation of 6 piezometers and 14 monitoring wells to measure groundwater elevations, determine groundwater flow direction, and evaluate subsurface utilities as preferential pathways.

- Sampling the wells to determine the nature and extent of groundwater contamination.

- Collecting and analyzing 8 shallow soil samples within a small wetland area known as the "Oasis" (Figure 3) to evaluate the distribution of PCBs detected during the Phase II investigation. The Oasis is a remnant of a wetland that once extended across the ALCOA facility. Over the years, the majority of this wetland has been filled in.

- Collecting and analyzing 4 shallow soil samples to evaluate the cleanup of an area where high pH waste was discovered on the ground surface.

- Collecting and analyzing 3 seep samples along the bank of the Massena Power Canal to determine if contaminated groundwater from the site was being discharged the canal.

- Collecting and analyzing 3 surface water samples from within the West Fill Area, including 2 from the Oasis, to determine if contaminated groundwater is being discharged to on-site surface water and, in the case of the Oasis, is subsequently being discharged to the plant's stormwater conveyance system.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to SCGs. Groundwater, drinking water and surface water SCGs identified for the West Fill Area are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For soils, TAGM 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions, and health-based exposure scenarios. In addition, for soils, site-specific background concentrations can be considered for certain classes of contaminants. Guidance values for evaluating contamination in sediments are provided by the NYSDEC "Technical Guidance for Screening Contaminated Sediments".

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI/FS Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, where applicable, SCGs are provided for each medium.

4.1.1: Site Geology and Hydrogeology

The uppermost geologic unit within the West Fill Area has been designated as Stratum I. Sand, gravel, silt, and clay are all present within this unit, either as native deposits, or as fill resulting from construction of the Power Canal or various plant expansions. Plant wastes and demolition debris are also present, such as brick, ash, cinders, wire, wood, metal fragments, stained soil, carbon block, wood block flooring, and drum remnants. Throughout much of the West Fill Area, the base of Stratum I includes a layer of soft, grey clay with occasional silt, organics, and gravel.

Underlying Stratum I across the majority of the site is a series of clay and silt deposits, collectively referred to as Stratum IIA. The remaining sequence of unconsolidated deposits includes a layer of dense silt and fine sand (Stratum IIB) overlying extremely dense silt and clay (Stratum III). Stratum III is underlain by dolomitized limestone bedrock.

Because of their lower hydraulic conductivities, the grey clay and the Stratum IIA clays represent barriers to vertical groundwater movement beneath the more permeable Stratum I deposits. Accordingly, the shallow groundwater system is characterized by lateral flow within the natural materials and wastes above the clays. As discussed in detail in Section 4.1.3, this flow is heavily influenced by the Oasis within the central portion of the site, as well as a number of subsurface utility lines to the south.

4.1.2: Nature of Contamination

As described in the RI/FS Report, many soil, groundwater, surface water, waste material, and seep samples were collected at the site to characterize the nature and extent of contamination. The main contaminants which exceed their SCGs are PCBs, VOCs, PAHs, and cyanide.

4.1.3: Extent of Contamination

Table 2 summarizes the extent of contamination for the contaminants of concern in each of the media identified above, and compares the data with the SCGs for the site. The following is a summary of the findings of the investigation, by media type.

Soil

With regard to shallow soils, several samples were collected from an area where a high pH waste was discovered on the ground surface. The material exhibited a pH value of 10.4, and was suspected to be spent sodium hydroxide used in ALCOA's aluminum etching operations. The material was excavated based upon visual observation, for disposal in the on-site Secure Landfill. The pH analysis of the underlying soil yielded values ranging from 7.65 to 7.98. These values are typical of what would be expected for surficial soils, and therefore are considered evidence that the waste was satisfactorily removed.

Within the Oasis, a shallow soil sample collected during the Phase II investigation exhibited a PCB concentration of 142 ppm, which exceeds the facility-wide cleanup goal of 10 ppm established in a March 15, 1991 Record of Decision (ROD). TAGM 4046 also specifies a PCB cleanup objective of 10 ppm. PCBs were not detected in any of the RI samples, an indication that the contamination is not widespread across the Oasis. However, the lateral extent of the contamination encountered during the Phase II investigation must still be determined, and will be verified in design.

The segments of unpaved roadways extending through the southern portion of the West Fill Area were not included in the RI, since they had been previously addressed as part of a facility-wide roadway sampling and analysis program. The results of that study revealed PCB levels as high as 1,802 ppm on the road surfaces, while levels as high as 105 ppm were detected in the soils of the adjacent drainage ditches.

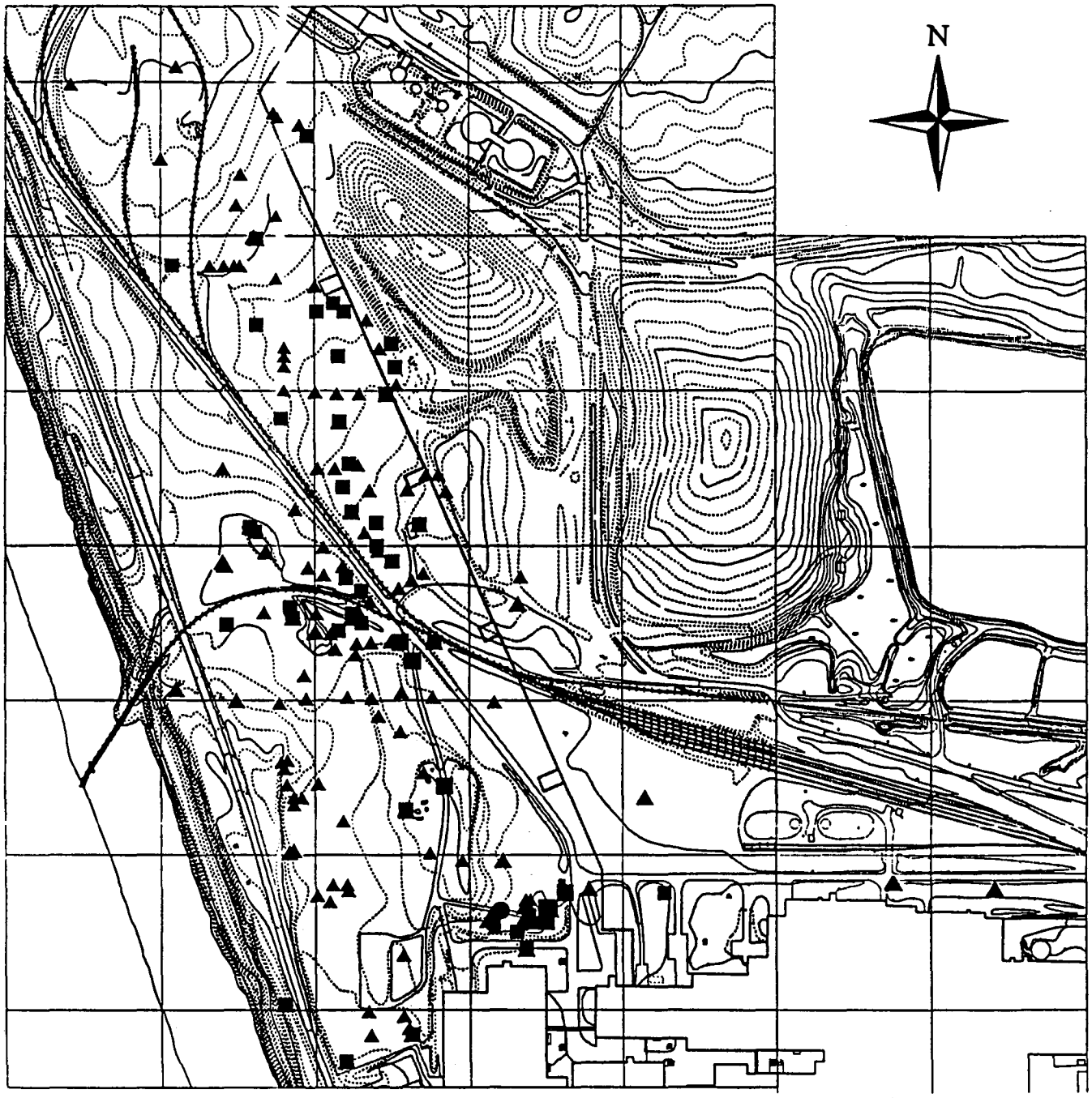
Concerning the deeper soils, PCBs were detected at concentrations up to 9,720 ppm at a depth of 5 feet beneath the former fire training pit. The greatest depth beneath the pit at which PCBs were detected above applicable cleanup goals was 8 to 10 feet. A number of individual VOCs and PAHs were also detected above TAGM 4046 cleanup goals at similar depths below the pit.

Elevated levels of cyanide were found below the pit, as well - as high as 130 ppm at a depth of 5 feet. The March 15, 1991 ROD provided a method for calculating an appropriate cleanup goal for cyanide, which was determined to be 8 ppm. Additionally, isolated exceedances of this cleanup goal were noted, including a level of 89 ppm at a depth of 12 to 12.5 feet below an area suspected of containing a mixture of spent carbon block and potliner waste. (Cyanide is considered a primary indicator of the presence of potliner waste.)

Figure 4 illustrates the lateral extent of soil contamination above SCGs across the West Fill Area.

Groundwater/Surface Water/Seeps

Shallow groundwater flow within the West Fill Area occurs in Stratum I, which is characterized by relatively permeable natural fill and wastes.



▲ Soil Boring, Surface Sample or Test Pit Location

■ Location with VOCs, PAHs, PCBs , Cyanide, and/or Fluoride detected greater than TAGM 4046 Recommended Soil Cleanup Objectives

500 0 500 Feet

Summary of Soil Sampling
Figure 4

In the northern portion of the site, groundwater generally flows toward the Oasis, where it is discharged. From there, it is conveyed through a drain line to be combined with other stormwater flows from throughout the plant for treatment prior to being discharged to the Grasse River. A surface water sample collected near the outlet of the Oasis did not reveal any contaminant levels above ALCOA's permitted discharge limits.

A second, smaller component of groundwater flow in the northern portion of the site ponds behind a seepage barrier constructed as part of the West Marsh remedial program. This water is occasionally pumped to a roadside ditch where it is eventually combined with the Oasis discharge and other stormwater flows for treatment. A sample of the ponded water did not exhibit detectable levels of any of the contaminants of concern.

It is possible that a third component of flow in the northern portion of the site exists along the backfill of the Oasis drain line. However, a well screened in this area did not exhibit detectable levels of any of the contaminants of concern.

Within the southern portion of the West Fill Area, shallow groundwater flow appears to be influenced by a number of subsurface utility lines.

A sand and gravel-filled trench utilized as bedding for a pressurized, potable water line is likely effecting flow in the southwestern portion of the site, where potliner waste may be present with spent carbon block. The water line extends across the extreme southern end of the West Fill Area, and then runs north parallel to the Massena Power Canal. During installation of the line, drain pipes were placed at low points in the bedding. These daylight along the bank of the canal.

Below the carbon block/potliner waste, cyanide was detected in a Stratum I well at a concentration of 4.74 ppm, which exceeds the ambient water quality standard of 0.2 ppm.

Cyanide was also detected in two wells installed adjacent to the potable water line to the south, and in seep samples collected from the outlets of the drain pipes along the canal. However, all of the concentrations were below the ambient water quality standard.

In the southeastern portion of the site where the former fire training pit is located, groundwater flow is influenced by a 15-inch stormwater drain line to the south. This pipe is constructed of vitrified clay, and during video taping of utility lines in this area, groundwater was observed to be seeping into the pipe at its joints. PCBs, VOCs, PAHs, and cyanide were all detected in a well screened directly below the pit at concentrations exceeding applicable ambient water quality standards (or guidance values, in the case of PAHs). With regard to PCBs, a concentration of 4.37 ppb was detected, in comparison to the ambient water quality standard of 0.1 ppb. An elevated PCB concentration (0.148 ppb) was also found in a well installed between the pit and the stormwater line, an indication that contaminated groundwater may be migrating off-site via the stormwater line.

Vertical groundwater flow throughout the West Fill Area is restricted by the presence of clay fill at the base of Stratum I, as well as Stratum IIA clay, which underlies Stratum I. There is a small area in the northeastern portion of the site, however, where neither the clay fill nor Stratum IIA was observed in soil borings. Minor exceedances of ambient water quality standards for a few VOCs have been noted in both a Stratum I well and a well screened in the underlying till (Stratum IIB). The contaminant levels have remained steady, however, and in some instances, have actually decreased. Thus, while there is some downward movement of groundwater contamination in this location, it does not appear to be significant.

Figure 5 identifies monitoring well locations where exceedances of ambient water quality standards and/or guidance values have been observed. It is important to note that none of these exceedances were observed outside the footprint of the West Fill Area.

Waste Materials

During the test pit exploration program, a number of drum remnants were observed, including a few crushed drums that still held contents. Waste material samples were obtained from three drums for analysis. The only result of note was a total PAH concentration of 94,422 ppm from a tar-like substance. According to ALCOA's laboratory, the material was similar to roofing pitch. Pitch is utilized by ALCOA in the manufacture of carbon anodes.

In addition to the drum remnants, occasional wood blocks were uncovered during the test pit work. The blocks were used historically for flooring throughout the plant, and were subject to a variety of spills. Based on investigations performed in other areas of the plant, these blocks can exhibit elevated levels of PCBs. However, several samples of the blocks were analyzed as part of the RI, and PCBs were not detected in any of them.

4.2: Summary of Human Exposure Pathways

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 7 of the RI/FS Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

● Groundwater Monitoring Location:
VOCs, PAHs, PCBs and Cyanide less than Water Quality Standards

■ Groundwater Monitoring Location:
VOCs, PAHs, PCBs and Cyanide greater than Water Quality Standards

500 0 500 Feet

Summary of Groundwater Sampling
Figure 5

Pathways which are known to or may exist at the site include:

- Direct contact with exposed waste or surficial soil contamination.
- Direct contact with waste, contaminated soil, or contaminated groundwater during maintenance activities associated with underground utility lines.
- Inhalation of fugitive dust from areas of exposed waste or surficial soil contamination.

Possible future pathways include:

- Direct contact with waste, contaminated soil, or contaminated groundwater during excavation activities.
- Inhalation of fugitive dust or volatilized contamination during excavation activities.

The entire facility is fenced and the gates are manned by security personnel 24 hours per day. Therefore, exposure to the general public is unlikely. With regard to plant employees, the West Fill Area is a low-use portion of the plant. Railroad tracks and plant roadways cross the site, but the presence of employees on foot is limited. Accordingly, direct contact with exposed waste or surficial soil contamination, or inhalation of fugitive dust is also limited.

The potential for worker exposure during utility line maintenance or remediation activities would be minimized through identification and implementation of appropriate health and safety practices.

4.3: Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures and ecological pathways which may be presented by the site. Section 7 of the RI/FS Report presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. The following pathway for environmental exposure and/or ecological risk has been identified:

- Direct contact with exposed waste or surficial soil contamination. Wildlife such as deer, fox, and birds have been observed on the site.

While groundwater is likely migrating to the Massena Power via utility line bedding, samples of groundwater exiting the bedding along the bank of the canal have not shown elevated levels of contamination.

Contaminated groundwater appears to have migrated to the Grasse River as well via seepage into a stormwater drain line, although this flow is now subject to treatment prior to its discharge to the river.

Samples of on-site surface water bodies, which act as discharge points for local groundwater, have not exhibited elevated levels of contamination.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and ALCOA entered into a Consent Order on January 16, 1985. The Order obligated ALCOA, as the PRP, to undertake a facility-wide investigation of hazardous waste disposal areas. An October 15, 1990 amendment to the Order further required ALCOA to develop and implement a remedial program at each of the identified areas of concern.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all SCGs and be protective of human health and the environment. At a minimum, the remedy selected should eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- To eliminate, to the extent practicable, the potential for human or animal contact with exposed waste and contaminated soil.
- To eliminate, to the extent practicable, the release of contaminants from the waste and contaminated soil to groundwater.
- To eliminate, to the extent practicable, the potential for contaminated surface water run-off from the site.
- To eliminate, to the extent practicable, the off-site migration of groundwater which does not meet ambient water quality standards.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the West Fill Area were identified, screened and evaluated in the RI/FS Report.

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, or procure contracts for design and construction.

7.1: Description of Remedial Alternatives

The potential remedies are intended to address the waste and contaminated soil and groundwater at the site.

Alternative 1 - No Action

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. Since this alternative would not meet minimum protection criteria, it is not evaluated further in Section 7.2.

Present Worth:	$765,476
Capital Cost:	-
Annual O&M:	$ 68,000
Time to Implement:	1 week

Alternative 2 - Soil Cover and Monitoring

Alternative 2 would involve placing a 12-inch layer of clean fill over all areas where either waste is exposed, or surficial soil contamination is present. The fill would be placed and graded to achieve favorable surface drainage, and would then be loamed and seeded.

Long-term activities would include cover maintenance, and groundwater, surface water, and air monitoring.

Groundwater monitoring would be established to verify that contamination is not migrating off the site through preferential pathways such as utility lines or their backfill. If contaminated groundwater migration that would cause a violation of SCGs outside of the West Fill Area is detected and verified, contingencies such as barrier wall installation, groundwater collection, or a combination of the two would be evaluated and implemented as necessary to achieve and maintain remedial action objectives.

Periodic surface water and air monitoring would be established to verify that the cover system is functioning properly to control the potential for direct exposure or contaminant migration via surface water run-off or fugitive dust. If contaminant migration via surface water or air is detected and verified, contingencies such as expanding the soil cover or upgrading the cover would be evaluated and implemented as necessary to achieve and maintain remedial action objectives.

Present Worth:	$1,653,591
Capital Cost:	$ 468,490
Annual O&M:	$ 72,000
Time to Implement:	1 month

Alternative 3 - Targeted Excavation and Monitoring

Alternative 3 would involve excavating contaminant hot spots (i.e., areas of elevated contamination, such as the Oasis, the former fire training pit, the unpaved roadways, and associated drainage ditches) for disposal in ALCOA's on-site Secure Landfill. Cleanup verification testing would be performed at the limits of the excavations to confirm that material exhibiting contaminant levels above TAGM 4046 soil cleanup objectives had been removed. The excavated areas would then be backfilled to match existing grades, and would be loamed and seeded.
Long-term activities would include cover maintenance, and groundwater and surface water monitoring. Groundwater monitoring would be established to verify that contamination is not migrating off the site through preferential pathways such as utility lines or their backfill.

Present Worth:	$3,026,955
Capital Cost:	$1,499,424
Annual O&M:	$ 66,000
Time to Implement:	1 month

Alternative 4 - Targeted Excavation, Soil Cover, and Monitoring

Alternative 4 would involve a combination of Alternatives 2 and 3. Contaminant hot spots would be excavated for disposal in ALCOA's on-site Secure Landfill. Cleanup verification testing would be performed at the limits of the excavations to confirm that material exhibiting contaminant levels above TAGM 4046 soil cleanup objectives had been removed. The excavated areas would then be backfilled to match existing grades, and would be loamed and seeded.

A layer of clean fill would be placed over any remaining areas where either waste is exposed, or surficial soil contamination is present. The fill would be placed and graded to achieve favorable surface drainage, and then would be loamed and seeded.

Long-term activities would include cover maintenance, and groundwater, surface water, and air monitoring. Groundwater monitoring would be established to verify that contamination is not migrating off the site through preferential pathways such as utility lines or their backfill. If contaminated groundwater migration is detected and verified, contingencies such as barrier wall installation, groundwater collection, or a combination of the two would be evaluated and implemented as necessary to achieve and maintain remedial action objectives.

Periodic surface water and air monitoring would be established to verify that the cover system is functioning properly to control the potential for direct exposure or contaminant migration via surface water run-off or fugitive dust. If contaminant migration via surface water or air is detected and verified, contingencies such as expanding the soil cover or upgrading the cover would be evaluated and implemented as necessary to achieve and maintain remedial action objectives.

Present Worth:	$3,394,565
Capital Cost:	$1,762,001
Annual O&M:	$ 66,000
Time to Implement:	1 month

7.2: Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the RI/FS Report.

The first two criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State SCGs Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance (Table 1).

With regard to waste and contaminated soil, Alternative 2 would not comply with chemical-specific or action-specific SCGs since none of the material would be removed, and the cap would not meet landfill cover requirements for hazardous waste. Alternatives 3 and 4 would comply with chemical-specific SCGs for the most part, given the fact that contaminant hot spots would be excavated until TAGM 4046 soil cleanup objectives were achieved. While waste and soil with sporadic exceedances of the cleanup objectives would still exist, the heterogeneous nature of the fill would necessitate that the entire 25-acre site be excavated in order to achieve compliance. This is not considered practicable, in view of the fact that the threats posed by the residual contamination can be effectively controlled by preventing direct contact via use of a soil cover.

With respect to groundwater, the soil beneath the fire training pit appears to represent the only significant source of contamination. Alternative 2 would not comply with chemical-specific SCGs since the soil would be left in place and would continue to leach contaminants to the groundwater in contravention of ambient water quality standards. Alternatives 3 and 4 would comply with chemical-specific SCGs since the source of the groundwater contamination would be removed, and groundwater conditions would be expected to improve to the point where a contravention of standards no longer existed.

2. Protection of Human Health and the Environment This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Alternative 2 would be effective in eliminating human and animal exposure to the contamination through soil covering. This would also eliminate the potential for contaminated surface water run-off. However, groundwater would not be protected due to the continued leaching of contaminants. Alternative 3 is considered more effective in terms of groundwater protection, since the removal of contaminant hot spots would eliminate the sources of groundwater contamination. Alternative 3 would be less effective with regard to the potential for direct contact or contaminated surface water run-off. Alternative 4 is considered the most effective, since it combines the excavation aspect of Alternative 3 with the soil cover aspect of Alternative 2.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Each of the alternatives is considered effective in the short term. Construction activities would be conducted within the ALCOA facility, well away from any residential area. Risks to workers from direct contact or dust inhalation would be controlled with conventional health and safety measures.

4. Long-term Effectiveness and Permanence This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 2 would provide long-term protection against the risks associated with direct contact, fugitive dust migration, and contaminated surface water run-off via installation of a soil cover. However, Alternative 2 would not be effective in protecting groundwater. Alternative 3 would provide long-term protection against the risks associated with contaminated groundwater migration via the removal of contaminant hot spots. Alternative 3 would also provide long-term protection against the risks associated with direct contact, fugitive dust migration, and contaminated surface water run-off, but this would be limited to the hot spot areas. Alternative 4 would provide long-term protection against all of the identified risks since it incorporates the elements of both Alternatives 2 and 3.

5. Reduction of Toxicity, Mobility or Volume Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

None of the alternatives would permanently reduce the toxicity or volume of the contamination, since no treatment is being considered.

Each of the alternatives would reduce the mobility of the contaminants, but to varying degrees. Alternative 2 (soil cover) would be effective in reducing contaminant mobility via fugitive dust migration or surface water run-off, while Alternative 3 (hot spot removal) would be effective in reducing contaminant mobility via groundwater migration. Alternative 3 would also reduce contaminant mobility via fugitive dust migration or surface water run-off, but this would be limited to the hot spot areas. Alternative 4 (soil cover and hot spot removal) would be the most effective in reducing the mobility of the contaminants, since it would completely address all of the identified avenues of contaminant transport.

6. Implementability The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

Each of the alternatives is considered technically and administratively feasible. Construction would involve standard excavation and/or material handling techniques. Alternatives 3 and 4 would be slightly more complicated than Alternative 2 due to the need for sheeting and bracing to control the potential for rapid groundwater infiltration into the excavations. These activities have been performed at other ALCOA remediation sites and can be accomplished with conventional and readily available equipment and technologies.

7. Cost Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 3.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is evaluated after public comments on the PRAP have been received.

8. Community Acceptance Concerns of the community regarding the RI/FS Report and the PRAP have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised. In general, the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED ALTERNATIVE

Based upon the results of the RI/FS and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 4 as the remedy for this site.

Alternative 2 would not meet SCGs for containment of hazardous waste, since only a soil cover is proposed. Alternative 3 would remove much of the known hazardous waste from the site, but residual levels of hazardous waste would remain on the surface exceeding levels considered safe for human and animal exposure. Alternative 4 is the only alternative that meets all of the remedial action objectives and is protective of human health and environmental resources. Alternative 4 is only 10% more costly than Alternative 3 ($3,464,507 compared to $3,096,897), on a present worth basis.

The cost to construct the remedy is estimated to be $1,762,001 and the estimated average annual operation and maintenance cost for 30 years is $66,000.

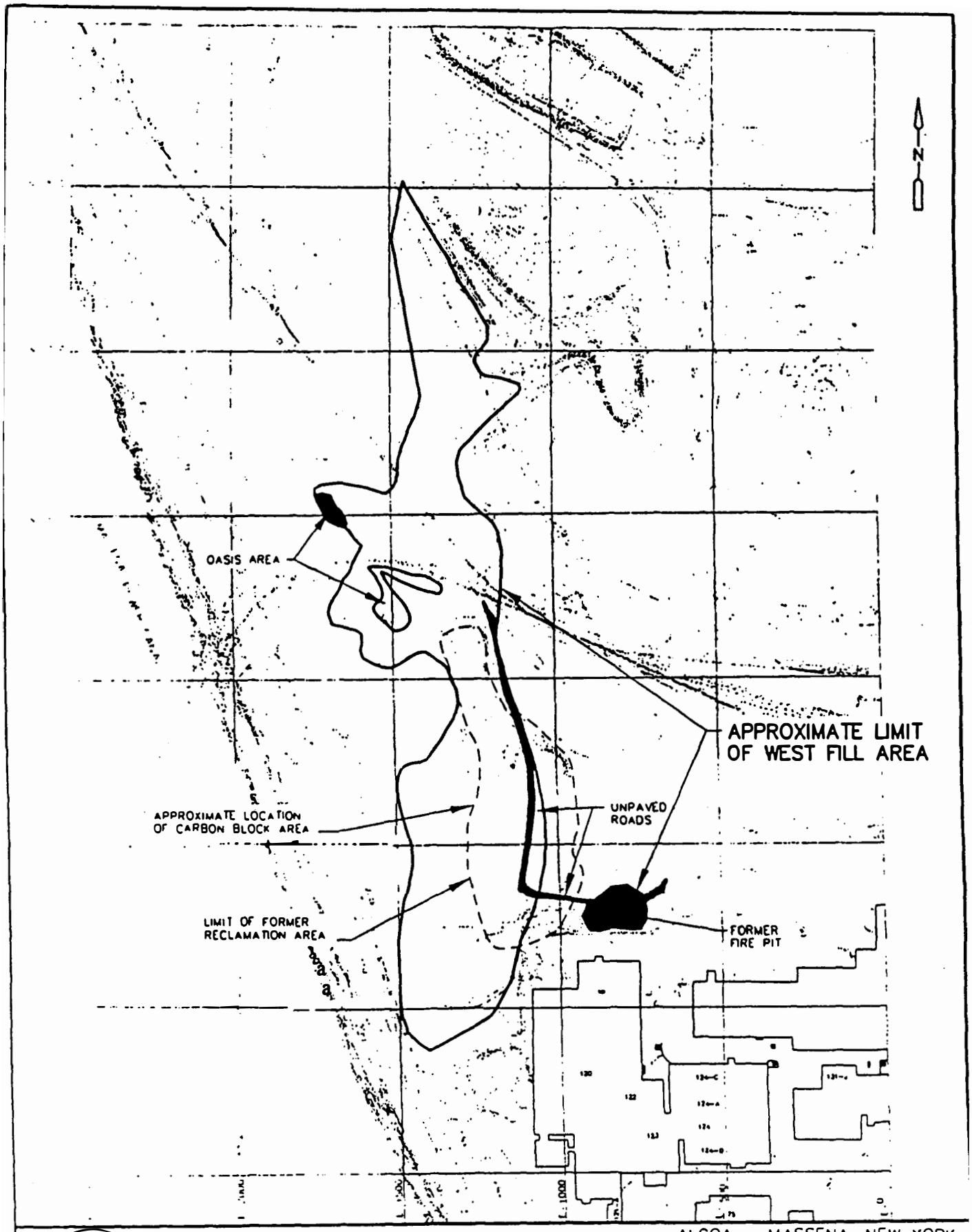
The elements of the selected remedy are as follows:

1. A remedial design program will be implemented to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved, such as the extent of PCB contamination in the Oasis soils.

2. An estimated 10,000 cubic yards of waste and contaminated soil will be excavated from the following hot spots for disposal in ALCOA's on-site Secure Landfill: the Oasis, the fire training pit, the unpaved roadways, and the roadside drainage ditches (Figure 6).

3. Cleanup verification testing will be performed at each of the above locations. Excavation will continue as necessary until the TAGM 4046 soil cleanup objectives for all of the contaminants of concern have been satisfied. The excavated areas will then be backfilled with clean material to match existing grades, and will be seeded.

4. A clean soil cover will be placed over all other portions of the site where either waste is exposed, or surficial soil contamination is present. The cover will be graded to achieve favorable surface drainage, and will then be seeded.



ALCOA – MASSENA, NEW YORK

WEST FILL AREA

AREAS OF EXCAVATION

Figure 6

Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program will be instituted. Groundwater monitoring will be established to verify that contamination is not migrating off the site through preferential pathways such as utility lines or their backfill. If contaminated groundwater migration is detected and verified, contingencies such as barrier wall installation, groundwater collection, or a combination of the two will be evaluated and implemented as necessary to achieve and maintain remedial action objectives.

Periodic surface water and air monitoring will be established to verify that the cover system is functioning properly to control the potential for direct exposure or contaminant migration via surface water run-off or fugitive dust. If contaminant migration via surface water or air is detected and verified, contingencies such as expanding the soil cover or upgrading the cover will be evaluated and implemented as necessary to achieve and maintain remedial action objectives.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners, local political officials, local media, and other interested parties.
- A public meeting was held to discuss the characteristics of the site and the proposed remedy, and to answer any questions raised.
- A "Responsiveness Summary" was prepared and made available to the public as part of this ROD to address the comments received during the public comment period for the PRAP.

ALCOA REMEDIATION PROJECTS ORGANIZATION
WEST FILL AREA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT

TABLE 1

Chemical and Action-Specific Standards, Criteria and Guidelines

REGULATION\GUIDANCE	JURISDICTION (AGENCY)	MEDIA	APPLICABILITY	REFERENCE / COMMENTS
1. Hazardous Waste Site Cleanup Goals	New York State (NYSDEC)	Soil	Guidance for Recommended Soil Cleanup Objectives	TAGM HWR-94-4046.
2. ROD for other Alcoa sites	New York State (NYSDEC)	Soil	Recommended Soil Cleanup Goals for ROD Sites	RODs dated 3/91 and 1/92
3. Water Quality Standards	New York State (NYSDEC)	Surface water Groundwater	Ambient Water Quality Criteria and Guidance	6 NYCRR 701 and 702 (surface) 6 NYCRR 703 (ground) TOGS 1.1.1 (June, 1998)
4. Surface Water Discharge (SPDES)	New York State (NYSDEC)	Surface runoff	Limitations on Surface Discharge through Outfall 005	Maximum Daily Discharge Limitations. SPDES Permit #0001732.
5. Hazardous Waste Regulations	New York State (NYSDEC)	Soil Liquids	Defines State Listed and Characteristic Hazardous Waste	6 NYCRR 371.4(e) Based on RCRA and TSCA Land Disposal Restrictions apply; use Paint Filter Test to determine liquid content.
6. TSCA	U.S. Government (EPA)	All	PCBs≥50 ppm	Material containing PCBs above 50 ppm is subject to TSCA (40 CFR 761).
		Soil and Bulk Remediation Waste	PCBs≥50 ppm	Soil > 50 ppm constitutes disposal. If excavated, must be disposed of in a chemical waste landfill, treated via incineration, or equivalent.(40 CFR 761.60)
		Liquids	PCBs > 500 ppm	Prohibited from land disposal. Treatment options include incineration or "equivalent alternate," i.e., residuals < 2 ppm PCB.
		PCB Remediation Waste	PCBs >50 ppm	Environmental media >50 ppm (40 CFR 761.61)

REGULATION\GUIDANCE	JURISDICTION (AGENCY)	MEDIA	APPLICABILITY	REFERENCE / COMMENTS
8. RCRA	U.S. Government (EPA)	Non-liquids Liquids	Defines Federal listed and characteristic hazardous wastes	Land Disposal Restrictions prohibit disposal on land (without prior treatment) above threshold concentrations.
9. Clean Water Acte	U.S. Government (EPA)	Surface water discharges	Establishes Ambient Water Quality Criteria (AWQC) and NPDES Provides basis for State WQS in NYCRR 702 and SPDES	Water Quality Criteria developed based on risk. AWQC are used as guides in developing state standards.
10. Safe Drinking Water Act	U.S. Government (EPA)	Drinking water	Establishes Maximum Contaminant Levels and Goals Provides basis for State WQS in 6 NYCRR 703	Maximum Contaminant Level Goal (MCLG) is zero for carcinogens. Maximum Contaminant Level (MCL) is set based on excess cancer risk of 1E-04 to 1E-06. MCLs must be attained by public water supplies and may be relevant to groundwater that is or could be drinking water.

SPDES = State Pollutant Discharge Elimination System
TSCA = Toxic Substances Control Act (40 CFR 761)
RCRA = Resource Conservation and Recovery Act
NYCRR = New York Codes of Rules and Regulations
CFR = Code of Federal Regulations

* Unlisted and Non-characteristic wastes only.

Table 2
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	SCG (ppb)	FREQUENCY of EXCEEDANCES of SCGs
Soils (Surface/ Shallow)	Semi-volatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND (300) to 5,060	224	3 of 8
		Benzo(a)pyrene	ND (300) to 5,780	61	3 of 8
		Benzo(b)fluoranthene	ND (300) to 11,940	1,100	2 of 8
		Benzo(k)fluoranthene	ND (300) to 4,190	1,100	2 of 8
		Chrysene	ND (300) to 8,080	400	3 of 8
		Indeno(1,2,3-cd)pyrene	ND (300) to 3,920	3,200	1 of 8
		PCBs	ND (300) to 1,802,300	10,000	6 of 41
Soils (Deep)	Volatile Organic Compounds (VOCs)	Trichloroethene	ND (10) to 3,031	700	1 of 57
		O-Xylene	ND (10) to 1,700	1,200	1 of 57
		Vinyl Chloride	ND (10) to 881	200	1 of 57
		Cis-1,2-Dichloroethene	ND (10) to 1,240	250	1 of 57
		Benzene	ND (10) to 176	60	2 of 57
	Semi-volatile Organic Compounds (SVOCs)	Anthracene	ND (300) to 265,860	50,000	2 of 58
		Benzo(a)anthracene	ND (300) to 510,450	224	22 of 58
		Benzo(a)pyrene	ND (300) to 259,810	61	30 of 58
		Benzo(b)fluoranthene	ND (300) to 389,710	1,100	23 of 58
		Benzo(g,h,i)perylene	ND (300) to 95,190	50,000	1 of 58
		Benzo(k)fluoranthene	ND (300) to 244,180	1,100	18 of 58
		Chrysene	ND (300) to 574,070	400	28 of 58
		Dibenzo(a,h)anthracene	ND (300) to 44,450	14	6 of 58
		Fluoranthene	ND (300) to 1,170,790	50,000	8 of 58
		Fluorene	ND (300) to 86,420	50,000	1 of 58
		Indeno(1,2,3-cd)pyrene	ND (300) to 111,100	3,200	15 of 58
		Naphthalene	ND (300) to 34,170	13,000	2 of 58
		Phenanthrene	ND (300) to 883,460	50,000	5 of 58

		Pyrene	ND (300) to 788,250	50,000	7 of 58
		PCBs	ND (300) to 9,719,710	10,000	4 of 58
	Conventionals	Cyanide	ND (5000) to 130,000	8,000	8 of 58
Groundwater (Stratum I)	Volatile Organic Compounds (VOCs)	Trichloroethene	ND (1) to 9.03	5	3 of 27
		Vinyl Chloride	ND (1) to 314.1	2	1 of 27
		Cis-1,2-Dichloroethene	ND (1) to 36.28	5	1 of 27
		Toluene	ND (1) to 26.49	5	1 of 27
		1,1-Dichloroethane	ND (1) to 92.51	5	1 of 27
		Benzene	ND (0.7) to 251.91	1	1 of 27
		Ethylbenzene	ND (1) to 83.98	5	1 of 27
		O-Xylene	ND (1) to 81.92	5	1 of 27
		1,2,4-Trimethylbenzene	ND (1) to 186.2	5	1 of 27
		1,3,5-Trimethylbenzene	ND (1) to 68.98	5	1 of 27
	Semi-volatile Organic Compounds (SVOCs)	Naphthalene	ND (1) to 33.16	10	3 of 27
		PCBs	ND (.065) to 4.37	0.09	3 of 27
	Conventionals	Cyanide	ND (10) to 4,740	200	4 of 28
Groundwater (Stratum IIB)	Volatile Organic Compounds (VOCs)	Vinyl Chloride	ND (1) to 4.62	2	1 of 11
		Cis-1,2-Dichloroethene	ND (1) to 8.5	5	1 of 11

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Present Worth
1 - No Action	-	$68,000	$765,47
2 - Soil Cover and Monitoring	$468,000	$72,000	$1,653,591
3 - Targeted Excavation and Monitoring	$1,499,424	$66,000	$3,026,955
4 - Targeted Excavation, Soil Cover and Monitoring	$1,762,001	$66,000	$3,394,565

APPENDIX A
RESPONSIVENESS SUMMARY

COMMENT: If groundwater contamination is detected and verified after the remedial effort has been completed, then another removal effort of the site should be considered. The barrier wall and/or groundwater collection system is a short-term remedy and will not sufficiently keep the contamination from reaching the Grasse River.

RESPONSE: Exceedances of groundwater quality standards have been limited to the footprint of the West Fill Area, primarily in the vicinity of the former fire training pit. Waste and contaminated soil will be excavated from this area utilizing cleanup goals which are considered protective of groundwater. Once the source of groundwater contamination has been removed, the Department fully expects groundwater conditions to improve. If conditions do not improve, however, and the contamination appears to be migrating off site, then installation of a barrier wall and/or a groundwater collection system would be considered the most appropriate next step.

COMMENT: ALCOA must be certain of the removal of contaminated soil due to high levels of PCB and PAH contamination.

RESPONSE: A Department-approved Soil Cleanup Verification Plan will be utilized during all excavation activities. This document will address not only PCBs and PAHs, but VOCs and cyanide as well.

COMMENT: The drainage pipe parallel to the Power Canal should be connected to the treatment system, if it has not been already.

RESPONSE: The analyses of seep samples from the drain pipes along the Power Canal have revealed only trace levels of cyanide, none above water quality standards. As such, no action beyond continued monitoring is warranted at this time.

COMMENT: Will the waste be solidified before being placed in the Secure Landfill?

RESPONSE: Any material which has been identified for disposal in the Secure Landfill must be free of water, as determined by the paint filter test, and must exhibit a minimum specified placement strength and long-term bearing strength. Material excavated from the West Fill Area will be tested and solidified, as necessary, to insure that the landfill acceptance criteria is satisfied.

APPENDIX B
ADMINISTRATIVE RECORD

1. *Phase I Preliminary Site Assessment for the West Fill Area*
Camp Dresser & McKee, June 1993 (Revised February 14, 1994)

2. *Work Plan for the Phase II Site Investigation for the West Fill Area*
Camp Dresser & McKee, July 28, 1993

3. *Interim Report, Phase II Site Investigation for the West Fill Area*
Camp Dresser & McKee, April 7, 1994

4. *Phase II Site Investigation, West Fill Area*
Camp Dresser & McKee, December 15, 1994 (Revised April 1995)

5. *Remedial Investigation/Feasibility Study Work Plan for the West Fill Area*
Camp Dresser & McKee, September 11, 1998 (Revised November 2, 1998)

6. *Remedial Investigation/Feasibility Study for the West Fill Area*
Camp Dresser & McKee, June 11, 1999 (Revised November 12, 1999)

7. *Proposed Remedial Action Plan*
NYSDEC, January 2000

8. *Record of Decision*
NYSDEC, March 2000