

Ramapo Town Landfill
ROCKLAND, NEW YORK

Site Management Plan

NYSDEC Site Number: 344004

Prepared for:
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237 Route 59
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SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at the Ramapo Town landfill (hereinafter referred to as the “Site”) under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with State Assistance Contract (SAC) # C093003, and Order on Consent Index # W3-0083-8707, which was executed on April 1, 1988.

1.1.1 General

The Town of Ramapo entered into an Order on Consent and a SAC, with the NYSDEC to remediate an 80 acre property located in the Town of Ramapo, Rockland County, New York. This SAC and Order on Consent, required the Remedial Party, the Town of Ramapo, to investigate and remediate contaminated media at the site. A figure showing the site location and boundaries of this 80 -acre site is provided in Figure [#]. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement.

After completion of the remedial work described in the Remedial Action Work Plan, some contamination was left in the subsurface at this site, which is hereafter referred to as ‘remaining contamination.’ This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports

associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by [Environmental Consultant name], on behalf of the Town of Ramapo, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May, 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the site.

1.1.2 Purpose

The site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Rockland County Clerk, will require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and

recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems).

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement;
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the State Assistance Contract # C093003, Order on Consent, Index #W3-0083-8707; Site #344004) for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The site is located in the town of Ramapo, County of Rockland, New York and is identified as Block xxxx and Lot xxx on the [Municipality or County Name] Tax Map. The site is an approximately [x]-acre area bounded by [road, feature] to the north, [road, feature] to the south, [road, feature] to the east, and [road, feature] to the west (see Figure [x]). The boundaries of the site are more fully described in Appendix [x] – Metes and Bounds.

1.2.2 Site History

1.2.3 Geologic Conditions

A geologic section is shown in Figure [x].

A groundwater flow figure is shown in Figure [x].

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following reports:

Generally, the RI determined that

Below is a summary of site conditions when the RI was performed in (year(s)):

Soil

Site-Related Groundwater

Site-Related Soil Vapor Intrusion

Underground Storage Tanks

1.4 SUMMARY OF REMEDIAL ACTIONS

The site was remediated in accordance with the NYSDEC-approved [Remedial Design, Remedial Action Work Plan, Interim Remedial Measure Work Plan, etc.] dated [month, year] and [add any supplemental RA Work Plans, etc. here].

The following is a summary of the Remedial Actions performed at the site:

1. Excavation of soil/fill exceeding [unrestricted, restricted residential, commercial, industrial] SCO's listed in Table [x], [add: to a depth of x feet or bedrock, as applicable];
2. Construction and maintenance of a soil cover system consisting of [summary of cover types] to prevent human exposure to remaining contaminated soil/fill remaining at the site;

3. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site.
4. [Other major remedial elements including all Institutional Controls listed here: see later section for list of common Institutional Controls.];
5. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed at the site in [month, year].

1.4.1 Removal of Contaminated Materials from the Site

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern (COCs) and applicable land use for this site is provided in Table [x].

A figure showing areas where excavation was performed is shown in Figure [x].

1.4.2 Site-Related Treatment Systems

No long-term treatment systems were installed as part of the site remedy.

1.4.3 Remaining Contamination

Table [x] and Figure [x] summarize the results of all soil samples remaining at the site after completion of Remedial Action that exceed the Track 1 (unrestricted) SCOs.

Figure [x] summarizes the results of all soil samples remaining at the site after completion of Remedial Action that meet the SCOs for unrestricted use of the site.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil and groundwater exists beneath the site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

2.2.1.1 Soil Cover [or Cap]

Exposure to remaining contamination in soil/fill at the site is prevented by a soil cover system placed over the site. This cover system is comprised of a minimum of [12 inches or 24 inches] of clean soil, asphalt pavement, concrete-covered sidewalks, and concrete building slabs [add other components as appropriate]. The Excavation Work Plan that appears in Appendix A outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.1.x [Other ECs: e.g. Sub-slab Depressurization Systems; Air Sparging/Soil Vapor Extraction Systems; etc...]

Procedures for operating and maintaining the [remedial system name] system are documented in the Operation and Maintenance Plan (Section 4 of this SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the site, occurs.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

[2.2.2.x Monitored Natural Attenuation]

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the [ROD, to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to commercial and industrial [usage type] uses only. Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan.

These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP;

Institutional Controls identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for commercial and industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted or restricted residential, use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area noted on Figure [x], and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The site has been remediated for restricted commercial and industrial use. Any future intrusive work that will penetrate the soil cover or cap, or encounter or disturb the

remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix A to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site. A sample HASP is attached as Appendix [x] to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified (see Figure [x]), an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH “Guidance for Evaluating Vapor Intrusion in the State of New York”. Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the State Assistance Contract (SAC), Order on Consent, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the [State Assistance Contract (SAC), Order on Consent, and all approved work plans and reports, including this SMP
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to [qualified environmental professional]. These emergency contact lists must be maintained in an easily accessible location at the site.

Table [x]: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table [x]: Contact Numbers

[qualified environmental professional:]	[phone]

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location: [insert information]

Nearest Hospital Name: [insert information]

Hospital Location: [insert information]

Hospital Telephone: [insert information]

Directions to the Hospital:

1. [insert information]

2.

3.

Total Distance: [insert information]

Total Estimated Time: [insert information]

Map Showing Route from the site to the Hospital:

[insert map]

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table [x]). The list will also be posted prominently at the site and made readily available to all personnel at all times.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the soil cover system, and all affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);

- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

[Quarterly or Annual] monitoring of the performance of the remedy and overall reduction in contamination on-site [and off-site] will be conducted for the first [length] years. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in air, soil, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table [x] and outlined in detail in Sections 3.2 and 3.3 below.

Table [x]: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 SOIL COVER SYSTEM MONITORING

3.3 MEDIA MONITORING PROGRAM

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy.

The network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the site. The network of on-site [and off-site] wells has been designed based on the following criteria:

Monitoring well construction logs are included in Appendix [x].

The sampling frequency may be modified with the approval NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

Deliverables for the groundwater monitoring program are specified below.

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix [x]. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

3.3.1.2 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and

replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

[3.3.x, etc. Soil, Surface Water, Sediment, Biota, etc. Monitoring]

3.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix [x]). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (Appendix [x]). Main Components of the QAPP include:

Add or modify text to the following sections as necessary.

- QA/QC Objectives for Data Measurement;
- Sampling Program:
 - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
 - Sample holding times will be in accordance with the NYSDEC ASP requirements.
 - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
 - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
 - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

3.6 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file on-site. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. A letter report will also be prepared [if required by NYSDEC], subsequent to each sampling event. The report (or letter) will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in Table [x] below.

Table [x]: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the [type] systems;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the [type] systems are operated and maintained.

Information on non-mechanical Engineering Controls (i.e. soil cover system) is provided in Section 3 - Engineering and Institutional Control Plan. A copy of this Operation and Maintenance Plan, along with the complete SMP, will be kept at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

The Operation, Maintenance and Monitoring Plan, for the Ramapo Town Landfill site, dated 1999, (URSGWC, 1999) provides the basis for the required OM & M for the Ramapo Town Landfill Site. This OM &M plan is attached as Appendix B of this SMP.. This SMP is to be modified in the future to incorporate the OM &M plan within the body of the SMP, at which time the 1999 OM &M plan will be removed as an Appendix.

4.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

4.2.x.1 Scope

4.2.x.2 System Start-Up and Testing

The system testing described above will be conducted if, in the course of the [type of system] system lifetime, significant changes are made to the system, and the system must be restarted.

4.2.x.3 System Operation: Routine Operation Procedures

4.2.x.4 System Operation: Routine Equipment Maintenance

4.2.x.4 System Operation: Non-Routine Equipment Maintenance

4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

4.3.1 Monitoring Schedule

Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the [type] system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the [type] system are specified later in this Plan.

4.3.2 General Equipment Monitoring

A visual inspection of the complete system will be conducted during the monitoring event. [Type] system components to be monitored include, but are not limited to, the following:

A complete list of components to be checked is provided in the Inspection Checklist, presented in Appendix [x]. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan are required immediately, and the [EC type] system restarted.

4.3.3 System Monitoring Devices and Alarms

The [EC type] system has a warning device to indicate that the system is not operating properly. In the event that the warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the [EC type] system restarted. Operational problems will be noted in the subsequent Periodic Review Report.

4.3.4 Sampling Event Protocol

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the site will be kept on-file on-site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

4.4.1 Routine Maintenance Reports

Checklists or forms (see Appendices [x, x]) will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;
- Other repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

5. INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system which are contained in Appendices [x] [EC system], and [x] [EC system]). Additionally, a general site-wide inspection form will be completed during the site-wide inspection (see Appendix [x]). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,

- The site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and FER.

5.2 CERTIFICATION OF [ENGINEERING AND] INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare the following certification:

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.

- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner’s Designated Site Representative] I have been authorized and designated by all site owners to sign this certification] for the site.

The signed certification will be included in the Periodic Review Report described below.

5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every third year. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix B (Metes and Bounds). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
 - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;
 - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
 - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
 - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
 - The overall performance and effectiveness of the remedy.
- A performance summary for all treatment systems at the site during the calendar year, including information such as:
 - The number of days the system was run for the reporting period;
 - The average, high, and low flows per day;
 - The contaminant mass removed;
 - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
 - A description of the resolution of performance problems;
 - A summary of the performance, effluent and/or effectiveness monitoring; and
 - Comments, conclusions, and recommendations based on data evaluation.

Revise as appropriate: The Periodic Review Report will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

[Name of Regional Hazardous Waste Remediation Engineer]

Regional Hazardous Waste Remediation Engineer

[Address of Regional Office where the site is located]

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix [x] of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

A-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

A-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows: [describe route and provide map]. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to

major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

A-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material have been approved by NYSDEC and are listed in Table [x]. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

A-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the [RAWP, decision document, or Record of Decision]. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of

the cover element of the remedy and the upper surface of the 'Remaining Contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

A-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table [x]. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

A-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

A-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-13 COMMUNITY AIR MONITORING PLAN

A figure showing the location of air sampling stations based on generally prevailing wind conditions is shown in Figure [x]. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at

least two downwind monitoring stations. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

A-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include [define elements]. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils; [add other elements as appropriate]. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods [add others as necessary].

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

A-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX B – Operation, Maintenance and Monitoring Plan

The appended OM &M plan, dated 1999, for the Ramapo Town Landfill Site is incorporated for use until such time as the SMP is modified to update Section 4 of the SMP.



**Operation and Maintenance Manual
Ramapo Landfill Remediation**

NYSDEC SITE NO. 3-44-004

prepared for:

**THE TOWN OF RAMAPO
Ramapo, New York**

prepared by:

**URS GREINER, INC.
282 Delaware Avenue
Buffalo, New York 14202**

March 1999

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1.0 INTRODUCTION

Development of an Operation and Maintenance Manual and Emergency Contingency Plan (O&M Manual) is a required element of the remedial action at the Ramapo Landfill. The O&M Manual must contain a description of all components of the site remedy.

The O&M Manual is a "living" document; that is revised to reflect repairs and modifications made to the completed work.

The components of the site remedial design are described in Section 3-1. Those components which will require a regular long-term maintenance program are the final cover, leachate collection/transfer system gas vents, surface water control features, and the perimeter fence. Regular site inspections and routine (scheduled) maintenance plans for these features are described in the Section 6.0. The Emergency Contingency Plan is discussed in Section 9.0.

1.1 Ramapo Landfill Project

The Ramapo Landfill is New York State Department of Environmental Conservation (NYSDEC) Site No. 3-44-004, as outlined the Record of Decision (ROD) dated March 31, 1992. The purpose of the remedial design was to implement a response action to address the principal threats to human health and the environment by effectively controlling the sources of contamination and by extracting and treating contaminated groundwater. The USEPA on September 29, 1997 in a Preliminary Close-Out Report has determined that the remedy has been constructed in accordance with *Close-out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09), in accordance with the remedial design, and conforms to the ROD. URS Greiner (URSG) (formerly URS Consultants, Inc.) of Buffalo, New York is under contract with the Town of Ramapo to provide engineering services for the remedial design, construction monitoring, groundwater monitoring, and preparation of this O&M Manual.

The design of the project was completed in June 1994. Remedial construction services were awarded on October 4, 1994 Geo-Con, Inc. of Voorhees, New Jersey. Remedial construction

commenced in December, 1994 with mobilization operations. Substantial completion date was May 30, 1997. It was determined during the September 1997 final inspection that only miscellaneous punch list items have yet to be completed. Subsequent to the final inspection, all punch list items were acceptably completed. Groundwater monitoring services have been provided on a regular (quarterly) basis since the Remedial Investigation/Feasibility Study (RI/FS) stage in 1991.

A physical description of the site is provided in Section 2 of this manual. Descriptions of the remedial action components such as the multi-layer landfill cap and leachate collection system and long term controls are summarized in Section 3. Section 3 also summarizes the long term controls such as groundwater monitoring. Monitoring and data collection, specifically for groundwater, surface water, and air, are covered in Section 4. Section 5 provides a contingency plan ~~for an alternate water supply should implementation necessary.~~ Site maintenance of all major site features are covered in Section 6. Section 7 addresses records and reports and their frequency and distribution. The personal, organizational structure, and manpower requirements necessary to carry out the O&M tasks are covered in Section 8. Section 9 addresses an emergency contingency plan for occurrences outside of routine maintenance inspection. Report forms are provided in the exhibits at the end of this manual.

1.2 Purpose of Operation and Maintenance (O&M) Manual

This O&M Manual is prepared as required by the ROD. The specific ROD requirements in this regard are stated in Section 3.2. The O&M Manual meets the requirements set forth in the NYSDEC Official Compilation of Codes, Rules, and Regulations (6 NYCRR Part 360) and the ~~X~~ NYSDEC TAGM dated April 20, 1992 for Operation, Maintenance and Monitoring Manuals for Hazardous Waste Sites. This manual provides a suitably clear and comprehensive discussion of the necessary monitoring, routine maintenance, emergency contingencies, personnel, record keeping, and reporting associated with the 30-year post-closure period.

1.3 Key Aspects of the Operation and Maintenance Manual

The Operation and Maintenance (O&M) Manual is prepared as required by the ROD and meets the requirements of 6NYCRR Part 360. The manual provides a comprehensive discussion of the necessary monitoring, routine maintenance, emergency contingencies, personnel, record keeping, and reporting associated with the 30-year post-closure period. This section summarizes key aspects of the O&M Manual.

Inspections and Routine Maintenance:

The Town of Ramapo Department of Public Works or a contracted landscaping firm will perform the required routine maintenance as presented in Section 6.1.

Significant Concerns

Significant problems other than those discussed in Section 6.1, require an event-specific solution. A qualified civil/environmental engineer must perform the following:

Emergency Contingencies

- Determine the nature and extent of the problem
- Identify the cause of the problem and the steps required to prevent it from recurring
- Determine how to repair the failed area to original operating condition

This process should begin immediately upon discovery of the problem. The NYSDEC will be notified of the nature and extent of the problem within 30 days of its discovery.

Remedial Materials

Materials removed from remediation areas may be reused in the remedy provided they are uncontaminated or not altered from their required originally-constructed state. Products such as

stone and drainage net contaminated by sediments may be taken offsite and washed free of sediments. Geotextile material used in landfill cap construction must be new since degradation and clogging may not be visible to the human eye. Geotextile is typically bonded to drainage net so it appears likely that geonet will be replaced along with any replaced geotextile. Geomembrane can be re-used provided it appears in new condition and excessive strain (maximum 10 percent) has not occurred.

Earthen materials may be re-used in the remediation provided they are not commingled with adjacent materials. All materials to be disposed will be taken off of the landfill site and disposed at the Town's own expense. Materials contaminated with leachate will be disposed of at a facility permitted to landfill such waste.

Water and Air Sampling

Groundwater and surface water samples will be collected on a regular basis, three times during 1998, for site-related parameters from nearby residential wells and from selected existing monitoring wells. If increases are noted through this monitoring program at or immediately upgradient of the residences, the State and USEPA will make a determination of the need for appropriate action (e.g., extension of a public water line) to remedy the situation.

The Post-Construction Air Monitoring Program will consist of regular monitoring, of the air and landfill gases near the landfill. The initial sampling event included analysis for volatile organic compounds (VOCs). The VOC analytical results were used in conjunction with an air dispersion model to estimate contaminant concentrations at potential offsite receptors.

2.0 SITE DESCRIPTION

2.1 Site History

The site encompasses approximately 60 acres of waste fill within the 96-acre tract owned by the Town of Ramapo. The site is situated at the western base of the Ramapo Mountains off Torne Valley Road. The landfill is mounded in two major lobes commonly known as the north and south lobes which lay against the side of the mountain. After construction, landfill slopes range from three (3) to thirty-three (33) percent.

Prior to landfill operations in the 1950s and 1960s, portions of the site were excavated as a source of gravel. In 1971, the Rockland County Department of Health granted a permit to the Town of Ramapo for the operation of a sanitary landfill. Municipal waste was accepted in the landfill until 1984; construction and demolition debris until 1989. In 1998, the Town of Ramapo subdivided the parts of the site which were used as a transfer facility and scalehouse. The facilities were sold to the Rockland County Solid Waste Management Authority. The site was placed on the federal Superfund National Priorities List in September 1983. A leachate collection and treatment system was constructed along the downgradient (west) edge of the landfill in 1984 and 1985. Surface water and groundwater were conducted to an onsite leachate storage pond south of the landfill. The pond's discharge was directed initially to the Ramapo River after aeration and settling in the pond. Beginning in November 1990, discharge has been via a sewer line to the Village of Suffern Wastewater Treatment Plant. The contract with the Village of Suffern provides for an anticipated average daily flow of 80,000 gallons for a maximum yearly flow of 29,200,000 gallons. Town records confirm these anticipated flow volumes are approximately those actually experienced. Since 1996, the leachate has been discharged to Rockland County Sewer District No. 1 POTW for final treatment.

The landfill was covered by a relatively thin soil cover, and has been regraded and capped with a multi-layer cover system. The leachate storage pond located south of the landfill within a fenced area has been replaced with a 250,000-gallon storage tank. Contact with waste material has been essentially eliminated. Intermittent leachate seeps, especially on the western side of the

northern lobe, have been redirected into the leachate collection system and capped. The landfill has been emitting gases and organic compounds and will continue to do so, but at a lesser rate due to the landfill cap's minimizing rainwater infiltration into the waste. It was determined that the site presented a potential human health risk (over a 70-year exposure period) through ingestion and dermal contact with onsite soils/waste; inhalation of onsite air; and ingestion of onsite groundwater, necessitating the remedial action.

2.2 Site Characterization

Chemical Hazards

Samples collected during the remedial investigation revealed a wide variety of contaminants present in onsite soils, surface water, sediments, and groundwater downgradient of the landfill. Also, organic compounds were detected in the air over the site; one compound exceeded New York State Ambient Air Quality Standards. Analytical results from these media were used in the health risk assessment developed for the site which showed a potential human health risk. Personal exposure to contaminants at this landfill were considered to possibly have some attached risk, depending on the length of exposure and degree of personal protection. A summary of the analytical data compared to Applicable, Relevant and Appropriate Requirements (ARARs), and a list of chemicals of potential concern for groundwater, soil, waste, and air as presented in the ROD.

Landfill Gas

As positive LEL readings were observed during the site investigations, there is a possibility that landfill gas could cause fire or explosion. This hazard was considered potentially of particular concern during the drilling and installation of gas vents, and during activities related to existing manholes.

Physical Hazards

Timber rattlesnakes and deer ticks are known to be present in the area.

3.0 SITE REMEDIATION

As stated in the ROD, page 26:

"The purpose of this response action is to reduce the present risk to human health and the environment due to contaminants leaching from the landfill mound. The capping of the landfill will minimize the infiltration of rainfall and snowmelt into the landfill, thereby reducing the potential for contaminants leaching from the landfill and negatively impacting the wetland habitats and groundwater quality. Capping will prevent direct contact exposure to contaminated soils, and as such will result in risks which are less than USEPA's target levels of 10^{-6} and 1 for carcinogenic risks and the noncarcinogenic hazard index, respectively.

Pumping and treating the groundwater will contain the groundwater contamination within the site boundary and will ensure that groundwater beyond the site boundary meets applicable or relevant and appropriate state and federal standards for groundwater. The extracted leachate and groundwater will be discharged to a POTW for off-site treatment.

The response action also reduces the movement and toxicity of the contaminated landfill leachate into groundwater, and subsequent downgradient migration of contaminants."

The major items of the selected remedy as stated in the ROD are discussed below.

3.1 Description of Remedial Action

The remedial action items as required by the ROD and as constructed are as follows:

- A cap was installed on the top of the landfill using a multi-media system including layers of fill material, a gas-venting system, and a synthetic geomembrane barrier.

Confirmatory studies indicated that the barrier should also be included on all of the side slopes of the landfill and was thus constructed.

- The landfill mound was regraded and compacted to provide a stable foundation for the placement of the cap prior to its construction.
- Contaminated off-site soil resulting from leachate seeps was required to be excavated and consolidated within the capped area but such areas essentially were close enough to the landfill to be capped instead.
- Groundwater extraction wells were installed to supplement the existing leachate collection system.
- Portions of the leachate collection system were modified (deepened) to improve the efficiency of the system.
- Leachate seeps were diverted to the leachate collection system for off-site treatment.
- Drainage channels and swales were installed on the cap and at the landfill perimeter to collect and divert surface water runoff.
- If groundwater pretreatment had been needed (pursuant to the requirements of the POTW), a pretreatment facility would have been constructed to tie into the existing leachate collection and discharge system. Instead, it was deemed applicable to modify the existing pump house by addition of new pumps, as well as constructing an emergency temporary leachate storage tank.
- Air monitoring was performed prior to and during construction at the site to ensure that air emissions resulting from the cap construction meet applicable or relevant and appropriate requirements. Perimeter air monitoring was performed in the groundwater monitoring wells, piezometers, and additional gas monitoring wells

installed between the landfill and the Baler Building. The gas monitoring wells have been monitored quarterly for explosive gas concentrations.

- Air dispersion modeling has been performed to estimate ambient air concentrations of contaminants. Landfill gas emissions will be controlled, if necessary.
- Property deed restrictions were imposed by the appropriate state or local authorities. The deed restrictions included measures to prevent the installation of drinking water wells at the site and to restrict activities which could affect the integrity of the cap.

3.2 Description of Long Term Controls

The following controls are also requirements of the ROD:

- A maintenance and sampling program is being performed following completion of closure activities. The monitoring program fulfills the requirements of 6 NYCRR Part 360 for post-closure landfill monitoring and includes the parameters of concern found at the site. Installation of additional monitoring wells will be considered if needed to detect any movement of site-related contaminants toward nearby private wells, including production wells belonging to United Water New York, NYACK, New York.
- A contingency plan will be developed for rapid implementation of measures to protect nearby residents and users of groundwater if those measures are determined to be necessary.
- Samples will be collected on a regular basis, for site-related parameters from nearby residential wells and from new and selected existing monitoring wells. If increasing concentrations of contaminants are noted through this monitoring program at or immediately upgradient of the residences, the State and USEPA will

make a determination of the need for appropriate action , (e.g., extension of a public water line) to remedy the situation.

United Water New York production well Nos. 93, 94, 95, and 96 have been monitored quarterly since 1993 for the site-specific parameter list. The monitoring program did not show trends suggesting an impact from site-related contaminants so the monitoring schedule for these wells was adjusted to conform with the minimum monitoring requirements specified under Chapter 20, Subpart 5-1 of the New York State Sanitary Code.

4.0 MONITORING AND DATA COLLECTION

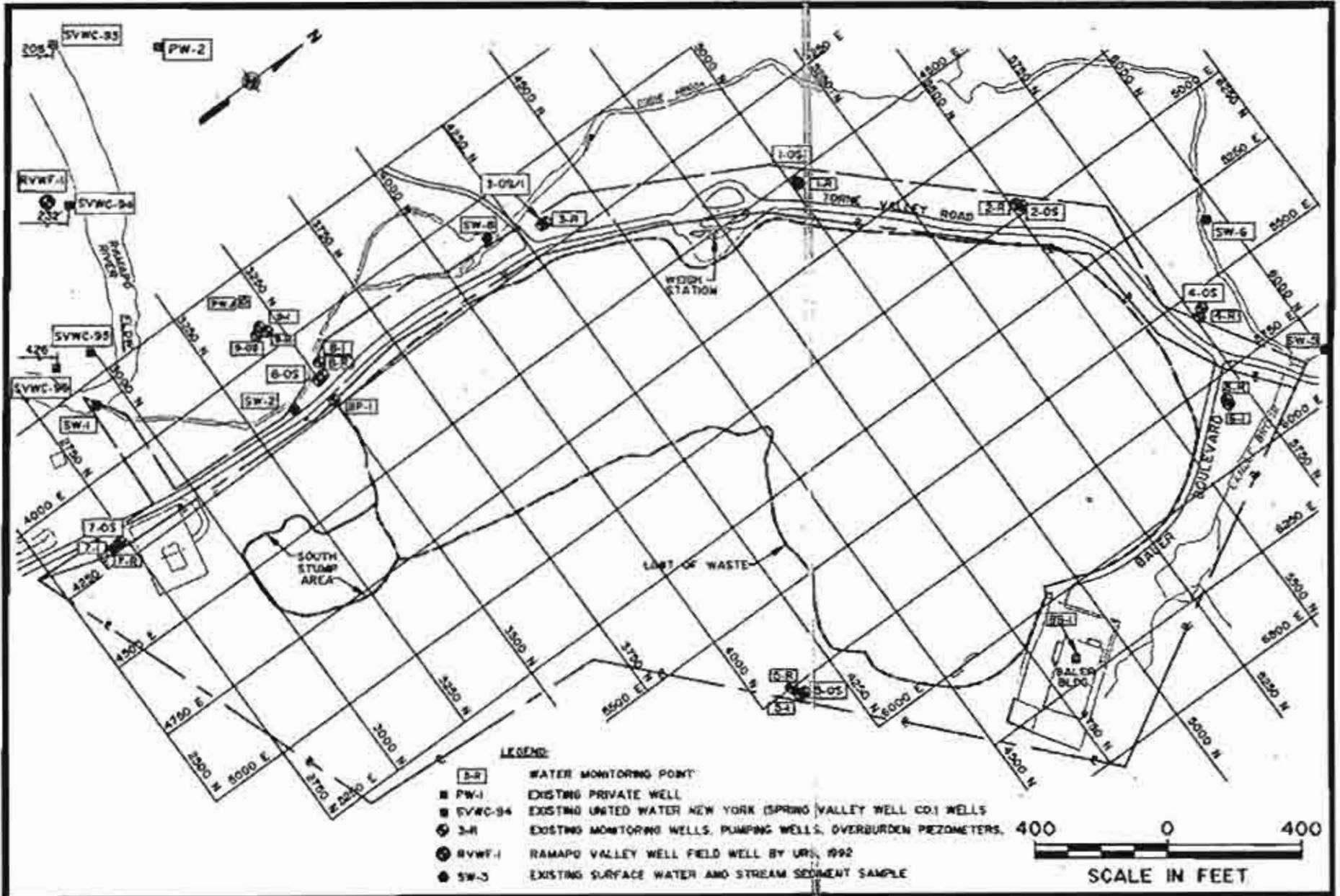
4.1 Monitoring Plan

As discussed in Section 3.2 of this manual, long-term controls consist of the monitoring covered by this section. This monitoring plan includes environmental sampling and analysis of groundwater, surface water, air emissions and leachate. The analytical schedules and frequency are presented. Monitoring of water levels within the monitoring wells is also discussed. The presentation of data and reports is discussed in this section and also in Section 7.

4.2 Groundwater and Surface Water Monitoring

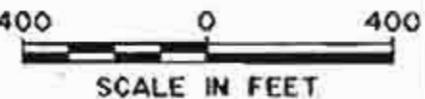
Groundwater and surface water monitoring commenced prior to the RI/PS and is an ongoing task. It has been performed on a regular basis since 1993, first quarterly, and now three times per calendar year. At the onset of monitoring in 1993, the analytical schedules for monitoring included a comprehensive list of compounds and indicator based parameters for the majority of wells and surface water sampling points at the landfill. Figure 4-1 shows the location of monitoring points for the Ramapo Landfill. Table 4-1 shows the listing of routine groundwater and surface water sampling points for 1993. Table 4-2 shows the analytical schedules and method references for compounds and indicator parameters for 1993.

As a result of regular review of data and discussions with NYSDEC, NYSDOH, and USEPA over the years, the number of sampling points and compounds/parameters to be analyzed has been reduced. Compounds and/or parameters which have historically not been detected, or which have been determined to not be indicative of Ramapo Landfill leachate have been eliminated from the analytical schedules. Sampling locations, including all surface water sampling points, have been eliminated as well. Table 4-3 shows a listing of 1998 sampling points. Table 4-4 shows the analytical schedules and method references for compounds and indicator parameters analyzed in 1998.



LEGEND:

- S-R WATER MONITORING POINT
- PW-1 EXISTING PRIVATE WELL
- SVWC-94 EXISTING UNITED WATER NEW YORK (SPRING VALLEY WELL CO.) WELLS
- 3-R EXISTING MONITORING WELLS, PUMPING WELLS, OVERBURDEN PEZOMETERS
- RVWF-1 RAMAPO VALLEY WELL FIELD WELL BY URS, 1992
- SW-3 EXISTING SURFACE WATER AND STREAM SEDIMENT SAMPLE



At present, URSG routinely samples 15 wells located in eight different clusters on the landfill property. Additionally, Rockland County Health Department (RCHD) personnel sampled nine wells. Six of these nine wells are potable water wells and are identified as: Supply Well Nos. SVWC-93, SVWC-94, SVWC-95, and SVWC-96 (located on Ramapo Land Company property and leased by United Water New York); Torne Brook Farm well PW-1; and Flanagan well PW-2. The other three wells monitored by RCHD are monitoring wells located on Torne Brook Farm and are identified as: 9-OS, 9-I, and 9-R. URSG provides the sampling equipment and any technical assistance that RCHD requires.

Analytical results for all locations sampled during an event, including RCHD results, along with historical results for benzene, chromium, iron, and manganese are compiled into each monitoring report. A brief discussion of analytical results and a comparison with ARARs is also included. Reports are distributed to the Town of Ramapo, adjacent property owners and lessors, the Rockland County Department of Health, the NYSDEC, and the USEPA.

In addition to monitoring reports, post-remediation trend analyses are performed on some of the compounds/parameters, especially those which are proposed for elimination from the analytical schedules. A complete comparison of concentrations and locations of detected compounds and parameters is to be included in the five-year review. Such a review will aid in the determination of the effectiveness of the remediation.

4.3 Air Monitoring

URSG has developed a Post-Construction Air Monitoring Program for the Ramapo Landfill to meet the provisions of the ROD and to determine compliance with federal, state, and local air emissions regulations. According to the ROD, air emissions must meet ARARs listed in the following:

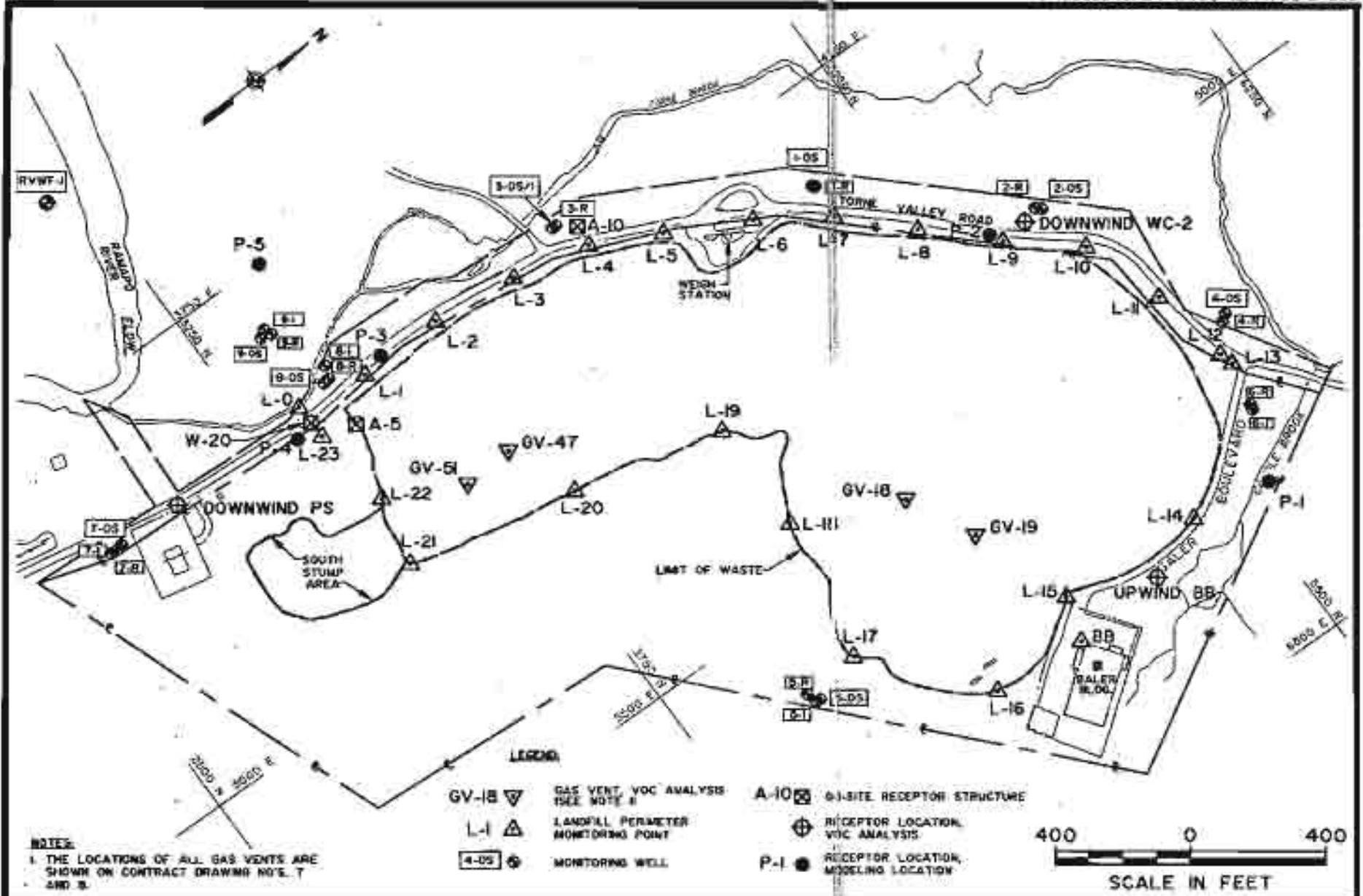
- National Emissions Standards for Hazardous Air Pollutants (NESHAPs)
- 6NYCRR Part 257 Air Quality Standards
- 40 CFR 50 Air Quality Standards

• New York State Air Cleanup Criteria, January 1990

The Post-Construction Air Monitoring Program consists of periodic monitoring of the air and landfill gases near the landfill, VOC analysis of air and landfill gases, and modeling of air concentrations at potential receptor locations. The Air Monitoring Plan is provided on Table 4-5.

Air and landfill gas monitoring consists of measuring the percentage of the lower explosive limit (LEL) and hydrogen sulfide concentrations present in the air/gas at one location within the Baler Building and at 16 monitoring wells, 58 gas vents, 2 lift stations (A-10 and W-20), and the combined leachate manhole (A-5) located within the landfill property boundaries. In addition, air monitoring is conducted at three offsite monitoring well locations (9-OS, 9-R, and 9-I) and along the perimeter of the landfill property at locations spaced approximately 500 feet apart. Air monitoring locations are shown on Figure 4-2. The locations of the gas vents are shown in Contract Drawing Nos. 7 and 8. Additionally, photoionization detection (PID) readings are recorded for all monitoring wells. Air and gas monitoring is being conducted at a planned frequency of twice per year through the year 1999.

Quantitative VOC analyses will be conducted twice within the first five years of the December 26, 1994 Commencement Date of the Remedial Action. The first sampling event was conducted in December 1997 when landfill gas emissions were expected to be the greatest. The second is scheduled to be conducted in the summer of 1999, prior to the planned five-year remediation review. VOC samples are collected at four source and three receptor locations to determine contaminant concentrations in the atmosphere above the landfill and in the surrounding area. VOC samples are collected from the air using summa canisters and analyzed in accordance with EPA method TO-14. Four passive gas vents (two sampling locations from each landfill lobe) are sampled as contaminant sources. Their selection is based on a worst case scenario, i.e., the gas vents with the highest LEL and hydrogen sulfide readings during the prescreening are selected. One upwind and two downwind locations are also sampled as potential receptor locations. Receptor locations are based on guidance criteria and meteorological conditions. Locations that were selected for the 1997 VOC sampling event are shown on Figure 4-2.



An air dispersion model, Air Guide-1, which was developed by the NYSDEC is used to estimate VOC concentrations in landfill emissions. Air Guide-1 was previously used during the RI/FS (URSG, 1992) and following construction completion to model worst-case scenario air concentrations at potential receptors. The highest VOC concentrations of contaminants detected in the source samples are utilized to model contaminant concentrations at the property boundary and potential offsite receptors. These results are compared with actual VOC concentrations from upwind and downwind receptor locations and with ARARs. The ARARs for the landfill are the Annual Guideline Concentrations (AGCs) from Air Guide-1 and Threshold Limit Value (TLV)/300. AGCs are derived from various government agency standards and are compiled in Air Guide-1. TLV/300 are based on occupational exposure risks.

~~If the estimated or analytical concentrations exceed ARARs, an appropriate plan of action~~ will be developed and implemented as detailed in the Design Analysis Report (URSG, 1994). Air results are reported to the Town, the NYSDEC, and the USEPA. The air monitoring reports contain a comparison between results and ARARs and a discussion of results. The December 1997 findings were below action levels.

4.4 Leachate Discharge Monitoring

Discharge of leachate is monitored by the Rockland County Sewer District No. 1 POTW.

4.5 Groundwater Level Monitoring

Groundwater levels within the monitoring wells at the landfill have been monitored since the RI/FS to determine the effect of the landfill cap on groundwater elevations. Water levels were measured quarterly from September 1990 to December 1997 for the wells shown on Table 4-6. Presently, levels are measured a minimum of twice per year.

A complete set of water levels in the monitoring wells, as well as some of the surface water points, was obtained in September 1990. These are used as pre-remediation water levels for comparative purposes with post-remediation water levels. A significant change, especially higher

water levels in the monitoring wells, may indicate higher levels of precipitation or that the collection system and/or extraction wells are not performing as expected. These possible types of causes should be investigated.

Depth to water level results are reported to the Town, the NYSDEC, and the USEPA. Water level monitoring reports contain a discussion of changes in groundwater elevation and the effect of collection and extraction wells on groundwater elevation. A full analysis will be performed for the five-year review including a re-survey of the top of risers for the monitoring wells as water levels are calculated from the top of riser, which since 1990 may have heaved or been altered by construction activities.

TABLE 4-1

LISTING OF 1993 GROUNDWATER AND SURFACE WATER MONITORING POINTS

	First Quarter	Second, Third and Fourth Quarter	TCL (with First Quarter)
SVWC No. 93	A	B, C	-
SVWC No. 94	A	B, C	-
SVWC No. 95	A	B, C	-
SVWC No. 96	A	B, C	-
PW-1	A	B, C	-
PW-2	A	B, C	-
1-OS	D	B, C	D
1-R	D	B, C	D
2-OS	-	B, C	-
2-R	-	B, C	-
3-OS	A	B, C	-
3-R	A	B, C	-
4-OS	A	B, C	-
4-R	A	B, C	-
5-OS	D	B, C	D
5-R	D	B, C	D
6-I	A	B, C	-
6-R	A	B, C	-
7-OS	A	B, C	-
7-R	A	B, C	-
8-OS	A	B, C	-
8-R	A	B, C	-

TABLE 4-1 (Continued)

	First Quarter	Second, Third and Fourth Quarter	TCL (with First Quarter)
9-OS	A	B, C	--
9-R	A	B, C	-
SW-1	A	B, C	-
SW-5*	A	B, C	-
SW-6	A	B, C	--
SW-8	A	B, C	--
Baler Building	A	B, C	--
RVPW-1	A	B, C	-

*Location of SW-5 is proposed to be moved further upstream than indicated in the RI.

OS - Overburden/Shallow Well

R - Bedrock Wells

See Attachment A, Table B 1-2, for definition of parameters

- Not Sampled

A - Schedule A - Baseline, Site Related, and Limited TCL Parameters

B - Schedule B - Routine Parameters

C - Schedule C - Site Related Parameters

D - Schedule D - TCL Parameters

TABLE 4-2

1993 ANALYTICAL SCHEDULES AND METHOD REFERENCES

Parameters	Schedule A Document/Method No.	Reference
TKN	351.3	1
Ammonia	350.2	1
Nitrate	352.1	1
COD	410.1	1
BOD ₅	405.1	1
TOC	415.1	1
TDS	160.1	1
Sulfate	375.3	1
Alkalinity	310.1	1
Phenols	420.1	1
Chloride	325.3	1
Hardness as CaCO ₃	130.1	1
Turbidity	180.1	1
Color	110.1	1
Boron	212.3	1
Hexavalent Chromium	218.4	1
Cyanide	335.2	1
Volatile Purgeable Halocarbons	601	1
Volatile Purgeable Aromatics	602	1
TCL Semivolatiles (No TICs)	NYSDEC ASP	1
TCL Pesticides/PCBs	NYSDEC ASP	1
TAL Metals	NYSDEC ASP	1

TABLE 4-2 (Con't)

Parameter	Schedule B Document/Method No.	Reference
Ammonia	350.2	1
Nitrate	352.1	1
COD	410.1	1
TOC	415.1	1
TDS	160.1	1
Sulfate	375.3	1
Alkalinity	310.1	1
Phenols	420.1	1
Chloride	325.3	1
Hardness as CaCO ₃	130.1	1
Turbidity	180.1	1
Potassium	200.7	1
Sodium	200.7	1
Iron	200.7	1
Manganese	200.7	1
Magnesium	200.7	1
Lead	200.7	1
Cadmium	200.7	1
Calcium	200.7	1

TABLE 4-2 (Con't)

Parameter	Schedule C Document/Method No.	Reference
Benzene	602	1
Chlorobenzene	602	1
1,1-Dichloroethane	601	1
Di-n-octylphthalate	8270	1
Vinyl Chloride	601	1
Hexachlorobenzene	8270	1
bis(2-ethylhexyl)phthalate	8270	1
Dibenzofuran	8270	1
gamma-BHC	8080	1
delta-BHC	8080	1
alpha-BHC	8080	1
Antimony	204.2	1
Arsenic	206.2	1
Chromium	200.7	1
Copper	220.1	1
Mercury	245.1	1
Nickel	249.1	1
Zinc	289.1	1
Parameter	Schedule D Document/Method No.	Reference
TCL Volatiles (No TICs)	NYSDEC ASP	1
TCL Semivolatiles (No TICS)	NYSDEC ASP	1
TCL Pesticides/PCBs	NYSDEC ASP	1
TAL Metals (23)	NYSDEC ASP	1
TCL Cyanide	NYSDEC ASP	1

TABLE 4-2 (Con't)

Parameter	Field Parameters Document/Method No.	Reference
Specific Conductance	120.1	1
Temperature	170.0	1
Static Water Level	—	—
Floaters or Sinkers*	—	—
pH	150.1	1
Eb	D1498	2
Dissolved oxygen**	360.1	1
Field Observations***	—	—

* Any floaters or sinkers found must be analyzed separately for baseline parameters

** Surface water only

*** Any unusual conditions (colors, odors, surface sheens, etc.) noticed during well development, purging, or sampling must be reported.

References:

1. New York State Department of Environmental Conservation Analytical Services Protocol, September 1989, 12/91 Revisions
2. American Society for Testing and Materials, ASTM, 1989.

TABLE 4-3

RAMAPO LANDFILL
LISTING OF 1998 GROUNDWATER MONITORING POINTS

	First Event +	Second Event +	Third Event +
SVWC No. 93	A	B, C	B, C
SVWC No. 94	A	B, C	B, C
SVWC No. 95	A	B, C	B, C
SVWC No. 96	A	B, C	B, C
PW-1	A	B, C	B, C
PW-2	A	B, C	B, C
1-OS	A	-	B, C
1-R	A	-	B, C
2-OS	A	-	B, C
2-R	A	-	B, C
3-OS/1	A	--	B, C
3-R	A	-	B, C
4-OS	A	--	B, C
4-R	A	--	B, C
5-OS or 5-I ±	A	-	B, C
5-R	A	--	B, C
7-OS	A	--	B, C
7-R	A	-	B, C
8-OS	A	B, C	B, C
8-I	A	B, C	B, C
8-R	A	B, C	B, C
9-OS	A	B, C	B, C
9-I	A	B, C	B, C
9-R	A	B, C	B, C

+ Includes List of Field Parameters shown in Table 4-4

± 5-I will be sampled if 5-OS does not contain a sufficient quantity of water

OS - Overburden/Shallow Well B - Schedule B - Routine Parameters

I - Intermediate Well (See Table 4-4)

R - Bedrock Well C - Schedule C - Site Related Parameters (See

A - Schedule A - Baseline Parameters (see Table 4-4)

TABLE 4-4

**1998 ANALYTICAL SCHEDULES AND METHOD REFERENCES
FOR GROUNDWATER MONITORING**

Parameters	Schedule A - Baseline Parameters	Reference
	Document/Method No.	
TKN	351.3	1
COD	410.1	1
TOC	415.1	1
TDS	160.1	1
Alkalinity	310.1	1
Hardness as CaCO ₃	130.1	1
Volatile Purgeable Halocarbons	601	1
Volatile Purgeable Aromatics	602	1
TCL Semivolatiles (No TICs)	NYSDEC ASP (Site-related SVOCs)*	1
TAL Metals	NYSDEC ASP	1

* Site-related SVOCs include:
hexachlorobenzene, dibenzofuran, di-n-butylphthalate, and bis(2-ethylhexyl)phthalate

TABLE 4-4 (Continued)

Parameter	Schedule B - Routine Parameters	References
	Document/Method No.	
COD	410.1	1
TOC	415.1	1
TDS	160.1	1
Alkalinity	310.1	1
TKN	351.3	1
Hardness as CaCO ₃	130.1	1
Iron	200.7	1
Manganese	200.7	1
Lead	220.2	1
Cadmium	200.7	1
Sodium	200.7	1
Magnesium	200.7	1

Parameter	Schedule C - Site Related Parameters	Reference
	Document/Method No.	
Benzene	602	1
Chlorobenzene	602	1
1,1-Dichloroethane	601	1
Vinyl Chloride	601	1
Antimony	204.2	1
Arsenic	206.2	1
Chromium	200.7	1
Copper	220.1	1
Mercury	245.1	1
Nickel	249.1	1
Zinc	289.1	1

TABLE 4-4 (Continued)

Parameter	Field Parameters	Reference
	Document/Method No.	
Specific Conductance	120.1	1
Temperature	170.0	1
Static Water Level	—	--
Floater or Sinkers*	—	--
pH	150.1	1
Eb	D1498	2
Field Observations***	--	--

* Any floaters or sinkers found must be analyzed separately for baseline parameters.

*** Any unusual conditions (colors, odors, surface sheens, etc.) noticed during well development, purging, or sampling must be reported.

References:

1. New York State Department of Environmental Conservation Analytical Services Protocol, September 1989, 12/91 Revisions.
2. American Society for Testing & Materials, ASTM, 1989.

TABLE 4-5
AIR MONITORING PLAN

Well	LEL	Bi-Annual Monitoring			Sampling Location	Notes
		Hydrogen Sulfide	PID	VOC Monitoring		
1-R	◇	◇	◇	—	In vent riser	—
1-OS	◇	◇	◇	—	In vent riser	—
2-R	◇	◇	◇	—	In vent riser	—
2-OS	◇	◇	◇	—	In vent riser	—
3-R	◇	◇	◇	—	In vent riser	—
3-OS/I	◇	◇	◇	—	In vent riser	—
4-R	◇	◇	◇	—	In vent riser	—
4-OS	◇	◇	◇	—	In vent riser	—
5-R	◇	◇	◇	—	In vent riser	—
5-I	◇	◇	◇	—	In vent riser	—
6-R	◇	◇	◇	—	In vent riser	—
6-I	◇	◇	◇	—	In vent riser	—
7-R	◇	◇	◇	—	In vent riser	—
7-OS	◇	◇	◇	—	In vent riser	—
8-I	◇	◇	◇	—	In vent riser	—
8-OS	◇	◇	◇	—	In vent riser	—
9-I	◇	◇	◇	—	In vent riser	—
9-OS	◇	◇	◇	—	In vent riser	—
9-R	◇	◇	◇	—	In vent riser	—
RVWF-1	◇	◇	◇	—	In vent riser	—
Baler Bldg.	◇	◇	◇	—	Waist high	—
Manhole A-5	◇	◇	◇	—	Inside manhole	—
Lift station A-10	◇	◇	◇	—	Inside lift station	—
Lift station W-20	◇	◇	◇	—	Inside lift station	—
Landfill Gas Vents	◇	◇	◇	—	At Gooseneck	1 and 2
Receptors	—	—	—	—	See Note 3	2 and 3
Landfill Perimeter	◇	◇	◇	—	Waist high	4

SYMBOLS:

◇ - Monitored or Sampled

NOTES:

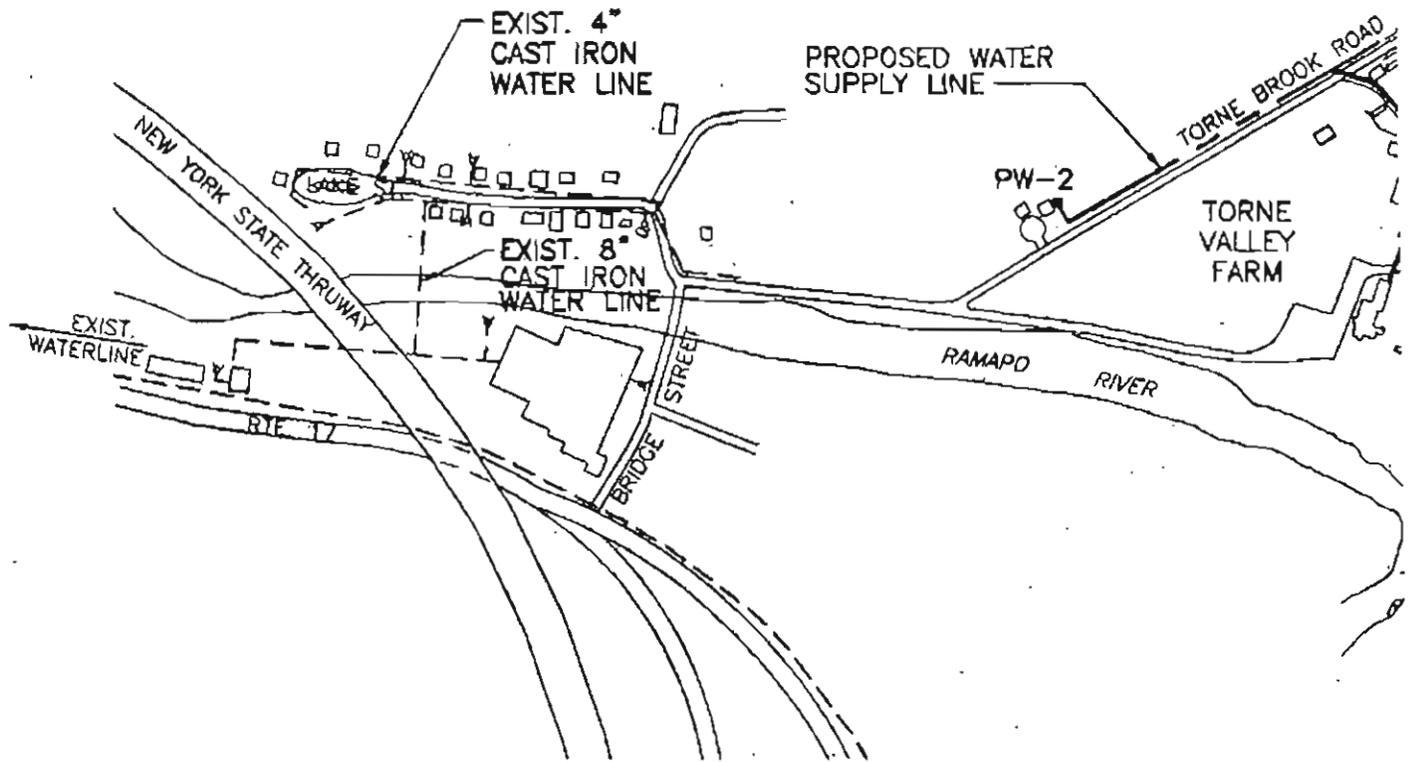
- Not Monitored or Sampled
- 1. VOC sampling and analysis will be conducted at four landfill gas vents only
- 2. VOC sampling and analysis will be conducted in the first and fifth year only
- 3. One upwind and two downwind receptors will be selected for VOC sampling and analysis based on field conditions on the day of sampling.
- 4. Sampling points will be spaced approximately 500 feet apart as shown on Figure 4-2.

TABLE 4-6

RAMAPO LANDFILL
GROUNDWATER LEVEL MONITORING

WELL	COMMENT
1-OS	--
1-R	--
2-OS	--
2-R	--
3-OS/I	--
3-R	--
4-OS	--
4-R	--
5-OS	--
5-I	--
5-R	--
6-I	--
6-R	--
7-OS	--
7-R	--
8-OS	--
8-I	--
8-R	--
9-OS	A Tome Brook Farm representative must be present to access well.
9-I	A Tome Brook Farm representative must be present to access well.
9-R	A Tome Brook Farm representative must be present to access well.
RVWF-I	A Loggette, Brashears, and Graham representative must be present to remove data logger before well can be accessed.

CONNECTION POINT
TO PROPOSED WATER
SUPPLY LINE



5.0 CONTINGENCY PLAN FOR AN ALTERNATE WATER SUPPLY

To date, results from sampling of nearby residential wells indicate that they are not being adversely impacted by the landfill. However, should groundwater monitoring data indicate that drinking water standards are being contravened, then an alternate water supply may be deemed necessary. Monitoring as prescribed in 6 NYCRR Part 360 is currently being performed at selected onsite wells, at residential wells PW-1 and PW-2, and at early warning monitoring wells. If drinking water standards are significantly exceeded for site-related parameters in residential wells or in other same-aquifer wells indicating that residential wells will be affected, and detected concentrations are confirmed by subsequent sampling, then residents would immediately be provided with bottled water and/or an acceptable point-of-use treatment system as an interim measure until an alternate water supply could be constructed. This procedure is a contingency plan, developed for implementation of an alternate water supply. The plan includes the preliminary design requirements as suggested by the NYSDEC in their Responsiveness Summary (ROD, Appendix V, 1992).

Two options were initially identified for extending existing water lines to the site, as discussed below:

- An 8-inch municipal water line from the Village of Hillburn terminates approximately 500 feet from Route 59 along Torne Valley Road. Water would be supplied to PW-1 and PW-2 by extending the municipal water line by about two miles.
- The Pothat Water Co., currently owned by United Water New York provides water to individuals on Lake Street. The Pothat waterline could be extended to PW-1 and PW-2. The distance from the easternmost extent of the Pothat water line to PW-1 and PW-2 is approximately 1,500 feet.

During the remediation of the landfill, a 16-inch diameter ductile iron waterline was installed along the east side of Torne Valley Road, from Rte. 59 to the new Rockland County Recycling/Composting Facility located at the north end of Torne Valley Road and to the Baler Building, located at the south end of Baler Blvd., just northeast of the new landfill cap. The waterline

was constructed by T&T Commonwealth, under separate contract by the County, during January/February 1996.

A 16-inch x 16-inch x 6-inch ductile iron tee was installed in the waterline across from (east of) Torne Valley Road at Torne Brook Road. A 6-inch branch was installed beneath Torne Valley Road terminating at a 6-inch gate valve installed on the west side of Torne Brook Road, north of Torne Valley Road at the approximate location shown on Figure 5-1. The 6-inch gate valve was installed in a precast concrete box.

In order to supply water to Torne Brook Farm, to PW-2, a 6-inch water line could be constructed as shown on Figure 5-1. The location of the water line is selected so as to minimize construction in currently undisturbed areas, meaning that crossing through archaeologically sensitive areas will be minimized. From the connection point (6" gate valve) the water line could run along the north side of Torne Brook to Torne Valley Farm, located on the south side of the road, and continue along the north side of Torne Brook Road to the residence served by PW-2. The north side of Torne Brook Road to Torne Valley Farm, located on the south side of the road, and continue along the north side of Torne Brook Road to the residence served by PW-2.

The minimum depth of installation would be the frost depth of 42 inches to top of pipe which is used by the Town of Ramapo for water lines. Regulations pertaining to minimum separations between potable water lines and sewer lines would be incorporated, as well. Strict avoidance of all archaeologically sensitive areas may not be possible so a Stage 1B Cultural Resource Survey may be necessary. Final location and design of the alternate water line would be dependent upon the results of that survey. Since construction of a water line is a contingent item, dependent on future monitoring results, and since the implementability of connecting to the Pothat Water Co. water lines is not yet fully explored, it is proposed that the Stage 1B Survey be performed at the time it is evident that such a water line is necessary. Bottled water and/or an acceptable point-of-use treatment system, which are readily implementable technologies, is suggested as an interim measure until a water line could be investigated, designed, and constructed.

6.0 SITE MAINTENANCE

6.1 General Maintenance and Inspections

Site maintenance covers the routine inspection and upkeep of all of the major site components and their respective functions over the 30-year post closure care period. The minimum initial frequency of inspections will be four times per year, then less frequent based on the general condition of site features and maintenance history, unless otherwise indicated or approved by the NYSDEC. All records on frequency of inspection and general maintenance will be submitted to the NYSDEC as discussed in Section 7.

~~The following scheduled maintenance activities should be adequate to maintain the remedial system in proper operating condition.~~

The Town of Ramapo Department of Public Works or a contracted landscaping firm will perform the required routine maintenance which will include:

- Cutting of the vegetation on the final cover and grass-lined ditches and swales three times a year (late spring, mid-summer, and late autumn). To prevent the invasion of weeds and brush, the seed mix specified for the final cover is designed for the infrequent mowings.
- Fertilization and liming will be conducted on re-seeded areas resulting from erosion, washouts, etc. The level of fertilization and liming will be selected for the grass species, soil type, and setting. The seeding requirements are provided in the Record Construction Specifications.
- Cleaning the swales, ditches, and downchutes of accumulated leaves, twigs, and other debris concurrently with mowing. Failure to remove debris from the drainage features could result in scouring or breaching of the channel.

Inspections of the remedial components will be performed immediately after scheduled maintenance tasks by a qualified civil or environmental engineer experienced in the construction and function of a multi-layered cover system. In addition, an inspection will be performed after an abnormal rain event. The purpose of these inspections will be to identify any potential problems with the remedial system that are not being addressed adequately by routine maintenance, and to document the current condition of the system. The Engineer will complete the site inspection checklist after each inspection and submit it to the NYSDEC as soon after the inspection as possible. The Engineer will prepare an annual report for submission to the NYSDEC which will document the current condition of the system.

For each inspection, the Engineer will evaluate the following items and will estimate the nature and extent of corrective action required.

- Surface Water Control Features - Channel cross-sections must be inspected to ensure that sideslopes are stable. Inspection will be made for scour, sediment deposition, breaches, rodent holes, and other damage. The riprap-lined downchute also will be checked for undermining and damage to geotextile.
- Leachate Seeps - Any areas of leachate seeps will be noted and monitored. The need for adding remedial controls in any such areas will be assessed.
- Landscaping - The vigor and density of the vegetative cover on the cap, ditches, and swales will be assessed. The location and extent of bare, sparse, and undernourished areas will be noted. Areas of significant weeds, woody brush, or deep-rooted vegetation will be noted. The need for vegetation removal in any such area will be assessed.
- Vermin Control - The cap will be inspected for damage due to vectors and/or burrowing animals. Any damaged areas will be flagged and noted.
- Erosion - The presence and extent of any rills or other signs of erosion of the final cover, ditches, swales, or downchutes will be noted.

- Gas Vents - The condition of all gas vents will be inspected and noted. Visual inspection will be made for clogging of the vent opening by birds or insects.
- Settlements - Visual evidence of differential settlement of the final cover will be noted and its impact on the integrity of the final cover, swales, or required drainage patterns will be assessed.
- Fence - The fence including gates and locks will be inspected for signs of vandalism and other damage. No scheduled maintenance is required.
- Access Roads - Vehicular traffic across the landfill cap will be limited to the engineered access roads. ~~These vehicles will be necessary to inspect and maintain the site, and to~~ perform necessary services. Rutting, cracking, or other damage to the access roads across the landfill will be noted.
- Leachate Collection System - Discussed below.

The leachate collection system components include the manholes and leachate collection pipes, located on both sides of Torne Valley Road. Manholes serve as cleanouts to all reaches of the network of collection piping. Inspection of each manhole will include, at a minimum, removing the covers and using artificial light if necessary, inspecting all characteristics and components in the manholes. Gravity mains will also be inspected for proper function. The condition of the manholes themselves will be noted, including any cracks, leaks, or misalignment. Pipe entrances and exits to manholes will be inspected for sediment build-up and tight seals. If necessary, the inspector will enter the manholes for best viewpoint. Pipes will be inspected by qualified personnel with video camera equipment if deemed necessary.

Maintenance and repairs will be performed when required so that proper function is not interrupted. Maintenance may include manual labor to remove sediment or possibly sewer snaking mechanical methods. Chronic problems such as large sediment accumulations may be indicative of a pipe breach, so video camera equipment may be deployed in such instance to verify. Necessary

repairs including pipe replacement will be considered as applicable. Temporary portable pumps may also be considered. Gravity mains will be cleaned out when necessary and repaired/replaced if warranted.

The leachate collection/transfer/storage electro-mechanical and alarm system components will be inspected and maintained in accordance with the respective manufacturer's operation and maintenance manuals. These manuals are presented as appendices in the O&M Manual for the Ramapo Landfill Remediation project. Operational procedures for the leachate system are discussed in the O&M Manual.

6.2 Fence

The 6-foot high chain-link perimeter security fence and access gates will be kept in good repair to prevent unauthorized access onto the landfill site. Periodic inspections will be performed by walking the entire perimeter of the site and documenting any signs of damage due to causes such as vandals, weather and ground movement, and local traffic by Town vehicles. Repairs to these features will be performed as necessary by qualified personnel in accordance with standard practice.

6.3 Mowing

The landfill cap will be mowed at a frequency to minimize the likelihood of the accumulation of clippings which could smother the vegetative cover. Any undesirable species will be removed if their presence is suspected of having the potential to harm the geomembrane within the cap. The seed mix utilized for the landfill cap is designed for infrequent mowings, necessary to prevent the invasion of weeds and brush. A fertilizer consisting of a minimum percentage of 12 percent nitrogen of which 50 percent shall be organic, 12 percent available phosphoric acid and 12 percent potash.

6.4 Landfill Cap System

The landfill cap is a multi-layer system consisting of soils and synthetic materials so judgement will be necessary to determine the condition of underlying/hidden layers.

Any signs of erosion, settling, cracking or other site maintenance problems detected during routine site inspections will be corrected as soon as possible. All eroded areas will be brought back to original grade according to the procedures described for constructing the final cover. Settling which results in ponding of water will be regraded and revegetated as necessary to eliminate the ponding. All bare spots in the final cover will be reseeded and fertilized as necessary, but not less than once every year. Seed and fertilizer will be of the same type and quality as specified in Section 6.3.

The need for cover repairs due to subsidence and/or settling will be determined based on an evaluation of whether the functions of the landfill cap components in the affected area has been impaired. Those areas where the function has been impaired, or will be impaired, will be repaired ~~to ensure that the integrity of the final cover is maintained. These repair actions may include, but~~ will not be limited to the following:

- strip and stockpile topsoil from the affected area
- strip and stockpile barrier protection soil (general fill layer) from the affected area to expose geosynthetics
- repair, remove, or replace the geomembrane and/or overlying drainage composite in accordance with the manufacturer's directions
- repair the gas vent composite then replace the overlying geomembrane and drainage composite
- regrade the affected area to blend in with the existing slopes and the general configuration of the grading plan, using barrier protection soil.
- replace topsoil and revegetate affected area in accordance with required practice.

In the event that damage to the final cover is observed during the inspection, corrective action to repair the damaged area will be performed promptly in accordance with the following sections. The NYSDEC will be notified of the damage and the date of the corrective action.

6.4.1 Significant Bare or Sparse Areas

Any significant areas on the final cover that are bare or sparsely vegetated will be prepared, reseeded, mulched, and maintained.

6.4.2 Rill Erosion of the Final Cover

Rill erosion can be caused by an insufficient vegetative cover. If left unchecked, the rills will deepen and could compromise the integrity of the final cover. The eroded topsoil must be scarified, regraded, and/or replaced as necessary. The topsoil then must be seeded and mulched. The seeding and mulching requirements will be provided in the Construction Specifications.

6.4.3 Differential Settlement of the Final Cover

Areas of differential settlement of the cap will be repaired where the settlement would cause ponding of precipitation, or concentrated flows that could erode the cover. Repair will consist of placing earth fill (topsoil) to return the area to existing (adjacent) grades, restoring the original drainage patterns. The area then will be covered with topsoil, seeded, and mulched to restore the vegetative cover.

6.4.4 Drainage Composite Repair

The drainage composite has been shown during remedial construction to be susceptible to clogging by fines as well as to deterioration when the overlying soil has eroded and sediment-laden runoff washes over the surface of the exposed composite. Any exposed geotextile of the composite will be required to be cut open in a minimum of three places along flow direction (perpendicular to grade contours) to accommodate inspection of the drainage net; if possible the cut geotextile will then be repaired by sewing a patch of geotextile of same type as the original/cut geotextile. The geotextile is typically bonded to geonet so replacement of geonet along with geotextile may be necessary. If the inspection requires replacement of drainage composite then the extent of sediment-clogged

composite will be uncovered, removed, and replaced using methods required by the project specifications.

6.4.5 Geomembrane Liner Repair

Repair of the defective area(s) of the geomembrane liner will first involve exposure, brooming, and washing. A patch will be cut from remnant geomembrane liner material used during the final cover construction or from newly purchased material manufactured using the same or similar resins.

All seams used in the repairing procedures will be created in accordance with the manufacturer's directions and will be subjected to the same non-destructive test procedures specified in the technical specifications for the original geomembrane liner construction.

The detailed following tasks must be performed for proper repair of the geomembrane liner:

- Strip topsoil and barrier protective soil surrounding the damaged area
- Remove geosynthetic drainage system (if necessary)
- Remove damaged geomembrane liner and inspect underlying gas venting layer (remove damaged gas venting layer, if necessary)
- Backfill, grade, and compact subgrade, as necessary, to form a uniform surface for placement of new geosynthetics
- Place and seam geosynthetics underlying geomembrane, liner as necessary
- Place and weld geomembrane liner
- Place and seam geosynthetic drainage system (if necessary)
- Perform all required quality assurance/quality control (QA/QC) testing, as outlined in the Contract Documents, to provide certification that the final cover has been repaired adequately
- Replace barrier protection soil, topsoil, and restore vegetative cover

6.5 Vermin Control

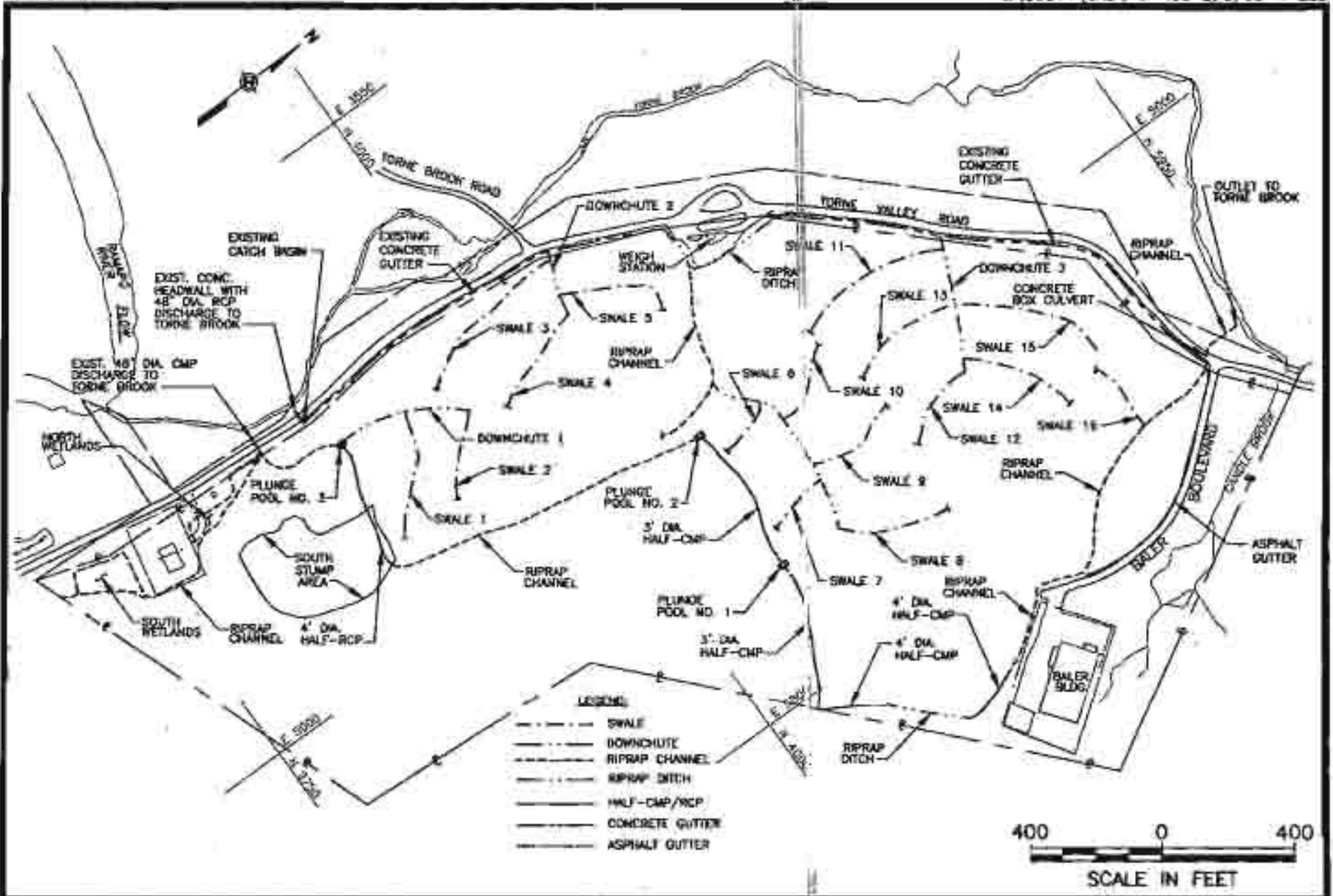
Control of any rodents will be in accordance with the requirements of the NYSDOH and NYSDEC. Based on recent history, however, no vermin problem is expected and therefore, no special precautions will be implemented. Animal burrows are normally surrounded by a natural earthen dam to direct surface runoff in the hole. Damage caused by burrowing animals can be readily repaired by filling the hole with soil, regrading the surface, and revegetating. Special attention will be paid to inspecting for any damage to geosynthetics and ascertaining the entire length of burrow.

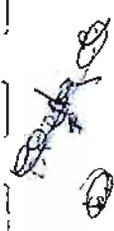
6.6 Erosion Control Structures

All erosion control structures such as landfill swales and downchutes, perimeter channels, plunge pools and outlets to both Torne Brook and to wetlands are included in the maintenance work. Every lined foot of each structure will be walked to visually inspect for irregularities such as displaced stones, eroded material, sediment build-up, and settlement which prevents effective drainage. Periodic removal of debris and sediment may be required. Sediment build-up may require complete replacement of affected materials if a simple sediment removal process too costly or impractical. The cause of any problems, particularly repeat events, will be investigated to determine if pre-emptive measures such as placement of larger stone or energy dissipation structures should be considered. The location of the erosion control structures are presented in Figure 6-1.

6.7 Stone Drainage Aprons

The landfill cap perimeter and each drainage swale are constructed with a stone-filled apron outlet which releases any infiltration above the geomembrane to surface drainage structures. Proper maintenance of this outlet is critical to preventing infiltration from backing up into the cap and creating seepage instability. This outlet will be kept free of debris and sediment. Evidence of improper drainage would be soft, saturated cap areas, potentially with shallow surficial sloughing of soil above the synthetics. Any such areas will be closely monitored and documented for widespread developments of similar conditions. A soft area may be indicative of clogging of





drainage composites further down the slope, clogging of the apron stone, or just poor initial construction/compaction. A problem area may require replacement of the underlying drainage composite, the stone apron itself, or the geotextile material lining the upslope edge of the apron.

6.8 Gas Venting System

The purpose of the landfill gas venting system is to discharge landfill gases passively in an environmentally-safe manner, using cost-effective design, and without damaging the effectiveness of the landfill cover system. The passive gas venting system, consisting of a gas venting layer and gas venting risers, was designed to comply with all applicable NYSDEC regulations. The gas venting risers require routine inspection and maintenance.

GAS VENTING LAYER - The gas venting layer is located above the grading fill over the subgrade surface and just below the geomembrane. A geosynthetic venting net (geonet) that provides the equivalent function, as defined by 6 NYCRR Part 360-2.13 (p), as a soil layer, is used. A geotextile filter fabric, bonded to the geonet is used above and beneath the geonet.

GAS VENTING RISERS - Gas venting risers are installed for the purpose of venting landfill gases to the atmosphere, and are spaced on an approximate 200-foot grid over the landfill cover (i.e., just over one gas vent per acre of landfill cover). The vents extend through the landfill cover at least 4 feet into the existing waste and project 3 feet above the top surface of the landfill cover. The risers are constructed of 6-inch Schedule 80 diameter PVC pipe. The lower 4-foot portion of the risers (beneath the gas venting geonet) are slotted to allow migration of the gas into the gas risers. The geomembrane is attached to the gas venting riser using pre-fabricated boot seals to prevent channeling of surface water through the cap and gas emissions around the outside of the pipe.

Gas vents will be inspected for clogging of the opening by birds or insects. Also, verticality will be observed to determine if settlement has compromised the seal between the vent boot and the geomembrane, and if there is a seepage conduit formed around the vent for erosive sediment-carrying runoff. Gas vents and adjacent areas which require maintenance will be restored to the original design configuration, re-using the existing materials to the extent possible.

6.9 Leachate Collection System

The existing leachate collection system was modified to include extensions and upgrades (mechanical and electrical). Modifications included the installation of seven (7) extraction wells, two (2) lift stations, a stone filled trench at the northwest section of the North lobe, new gravity mains, an alarm system with an auto-dialer, and appurtances and connections. Modifications to the leachate collection system are discussed in Chapter 10.0, LEACHATE COLLECTION SYSTEM IMPROVEMENTS, of the project Construction Monitoring Report.

6.9.1 Leachate System Operation

~~All leachate and groundwater which is collected in the North leachate collector and the West~~ leachate collector flows through an existing 12-inch perforated PVC gravity main to Lift Station A-10. These two collection systems are located north and west, respectively, of the North lobe of the landfill. Lift Station A-10 also receives gravity leachate flows from the existing 12-inch perforated PVC gravity collection system located in the west slope of the North and South lobes. Lift Station A-10 is located on the West side of Torne Valley Road, approximately 125 feet north of Torne Brook Road, opposite the South lobe of the landfill. After the leachate is pumped from Lift Station A-10, the leachate flows through a 6-inch PVC gravity main located on the west side of Torne Valley Road into existing Manhole A-5. Leachate is pumped from Extraction Wells W-2, W-3, W-4, and W-7 into the same 6-inch gravity main. Leachate is also pumped from Extraction Wells W-5 and W-6, located on the west slope of the South lobe, opposite Torne Brook Road, across Torne Valley Road into the 6-inch gravity main. Leachate from the new South leachate collector, located south of the South Lobe, flows by gravity into existing Manhole A-5. Leachate which is pumped from Extraction Well W-1, located on the west slope of the South Lobe, flows by gravity into existing manhole A-5. Leachate which is pumped from Lift Station W-20 flows through a 4-inch PVC gravity main into existing Manhole A-5. All the leachate from existing Manhole A-5 flows to the existing pump pit (wet well) through an existing 12-inch PVC gravity main. The existing pump pit is located north of the existing leachate control building on the east side of Torne Valley Road, adjacent to the newly constructed North wetlands. From the existing pump pit, the leachate is pumped, through a forcemain

to the Rockland County Sewer District in No. 1 POTW for treatment. The location of the extraction wells and lift stations are presented in Figure 6-2.

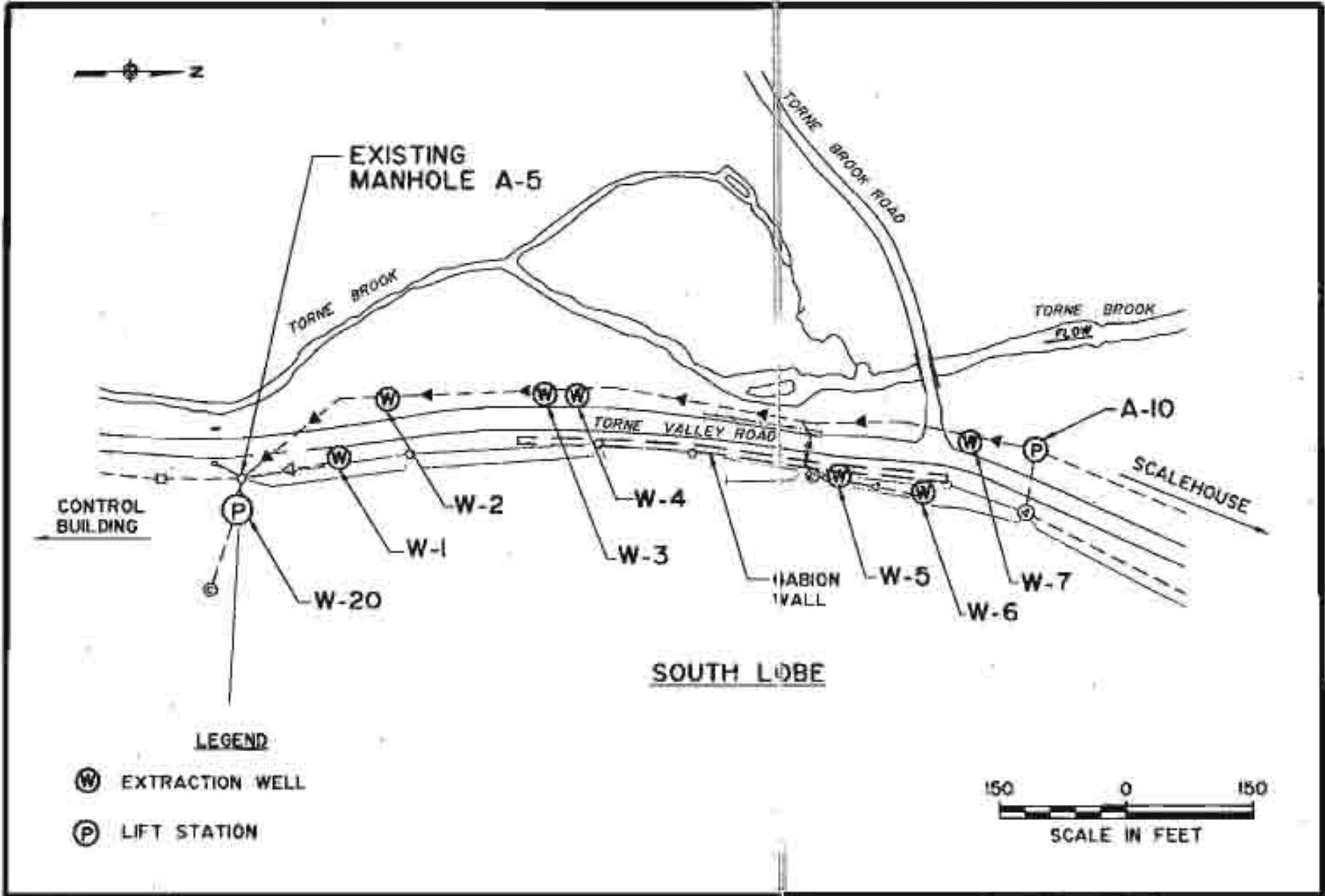
The leachate collection/transfer system was designed and constructed to fully operate in an automatic mode. Individual pump controls are as follows:

1. Extraction Wells - Probes sensing water levels by hydraulic conductivity.
2. Lift Station Pumps - Floats with mercury switches sensing actual water levels.
3. Pump Pit Pumps - Floats with mercury switches sensing actual water levels.

The individual pumps can also be operated in a manual mode by changing the respective pump control switches from the "AUTO" to "MAN" position. ~~These switches are located on the~~ respective pump control panels at each of the extraction well and lift station pump locations. The pump control switches for the pump pit pumps are located on the pump control panel located in the existing control building.

In the event of abnormally high leachate flows into the pump pit which enable the high-high-level alarm, all pumps in the extraction wells and lift stations will shut down automatically. To restart the system, the three pumps in the pump pit should be manually started. The operator should observe the leachate drawdown and after the leachate in the pump pit reaches an acceptable level (below the high-high-level alarm float), the remaining system pumps will start automatically. Once the extraction well pumps and lift station pumps start, the three (3) pump pit pump control switches should be returned to the "AUTO" portion. It should be noted, that at this point in the start-up operation, all the remaining pumps will be in high-level alarm and should be acknowledged at the annunciator panel located in the existing control building and at the receiver located in the Town of Ramapo police station. As the leachate reaches normal operating levels in the wells and lift stations, the alarms will automatically clear.

All the manually operated system valves, including the actuated valves discussed in paragraph 6.9.2 should be manually operated semi-annually. At the same time, the removal of the lift station



pumps (4 each) should be simulated in order to insure proper operation of the guide-rail system. Any necessary repairs and/or replacements shall be made at that time.

There may be periodic false alarms (anomalies) reported at the onsite annunciator and at the receiver located at the Town of Ramapo police station. These alarms shall be considered a "nuisance-type alarm" until verification is made that a system component is actually in an alarm condition. Any alarm condition which does not clear itself within 24 hours must be investigated; any alarms involving high levels in the Pump Pit must be promptly investigated and Corrective Action Taken.

6.9.2 Leachate Storage Tank

~~A 250,000-gallon leachate storage tank was constructed in lined secondary containment area~~
lined with a 60 mil. HDPE located approximately 200 feet south of the existing leachate control building. The purpose of the storage tank is to receive leachate from the pump pit in the event that Rockland County Sewer District No. 1 POTW (POTW) cannot receive leachate from the landfill. When the POTW can again accept leachate, the leachate in the storage tank will be discharged back into the pump pit through a 4-inch PVC gravity main. The leachate is then pumped to the POTW. Leachate flows are controlled through a series of actuated and manually operated valves.

Proper valve positioning is as follows:

Leachate pumped to POTW

1. Actuated valve V-4 is open.
2. Actuated valve V-3 is closed.
3. Actuated valve V-1 is open or closed.
4. Manually operated valve V-2 is open or closed.
5. Manually operated valve V-10 is closed.

Leachate pumped to Storage Tank

1. Actuated valve V-4 is closed.
2. Actuated valve V-3 is open.

3. Actuated valve V-1 is closed.
4. Manually operated valve V-2 is closed.
5. Manually operated valve V-10 is closed.

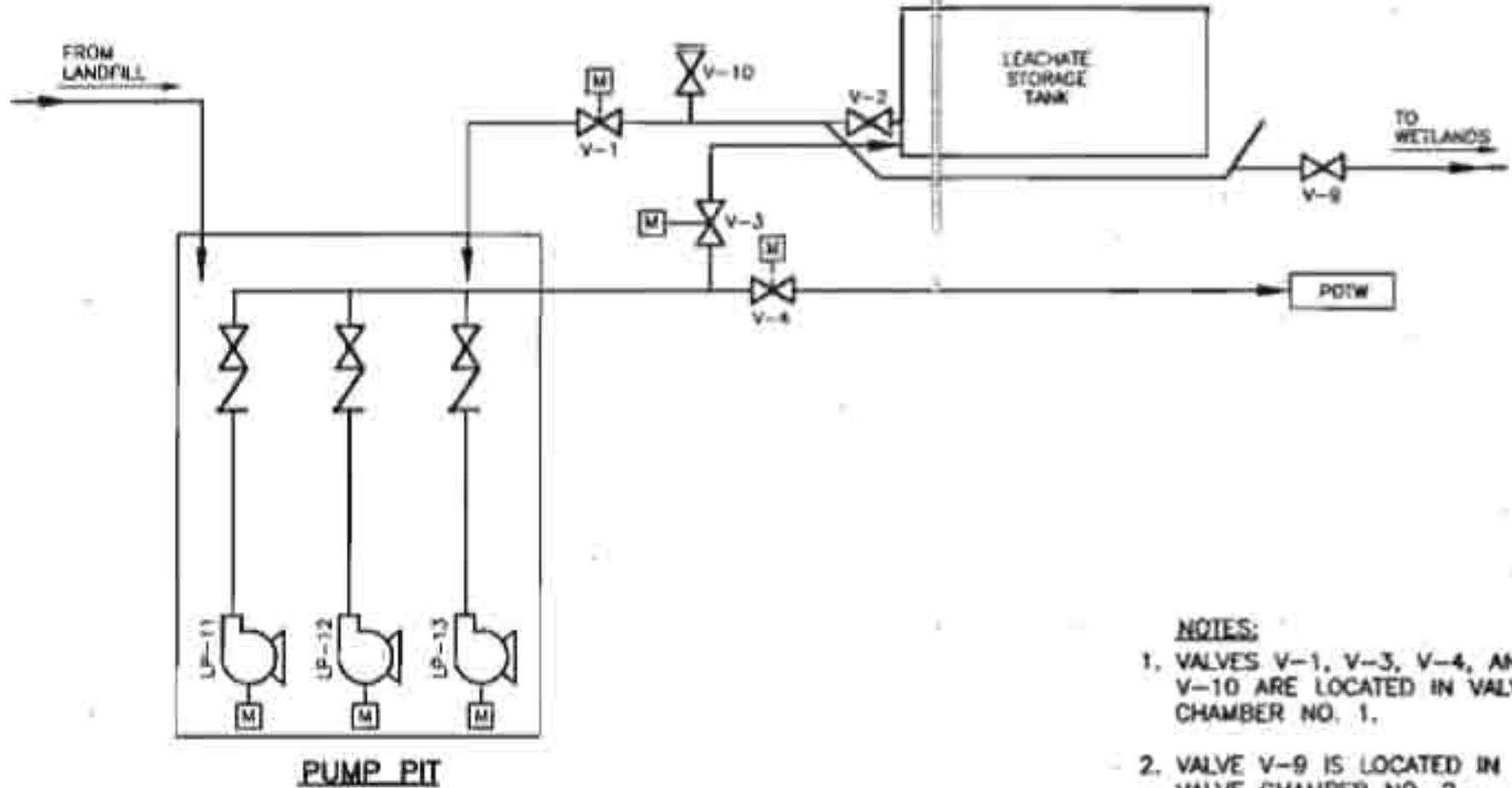
Leachate draining from Storage Tank to Pump Pit (pump pit discharging to POTW)

1. Actuated valve V-4 is open.
2. Actuated valve V-3 is closed.
3. Actuated valve V-2 is open.
4. Manually operated valve V-2 is open.
5. Manually operated valve V-10 is closed.

~~There is a manually operated valve in the precast concrete chamber located in the southeast~~
corner of the secondary containment area. The valve is designated V-9 and provides isolation of the contents of the secondary containment cell from the South wetlands. This valve is always in the closed position. The quantity of accumulated storm water in the secondary containment cell shall be monitored by Town of Ramapo DPW operations personnel on a regular basis, especially in the springtime and after any major storm events. When accumulated storm water reaches an unacceptable level, manually operated valve V-9 should be opened, allowing the accumulated storm water to drain into the South wetlands. This drawing operation must be supervised and valve V-9 should be closed as soon as practical. The location of the leachate flow control valves is presented in Figure 6-3.

6.9.3 Pump Maintenance

All routine pump maintenance shall be performed in accordance with the requirements of the manufacturer's Operation and Maintenance (O&M) Manuals presented in Appendix C. The manufacturer's Preventive Maintenance recommendations should be followed for ALL routine equipment maintenance, as presented in the respective O&M manuals.



- NOTES:**
1. VALVES V-1, V-3, V-4, AND V-10 ARE LOCATED IN VALVE CHAMBER NO. 1.
 2. VALVE V-9 IS LOCATED IN VALVE CHAMBER NO. 2.

NOT TO SCALE

6.9.4 Leachate Collector Cleaning

The leachate collector components covered by this section include the manholes and leachate collection pipes, located on both sides of Torne Valley Road. Manholes serve as cleanouts to all reaches of the network of collection piping. Inspection of each manhole will include, at a minimum, removing the covers and using artificial light if necessary, inspecting all characteristics and components in the manholes. Gravity mains will also be inspected for proper function. The condition of the manholes themselves will be noted, including any cracks, leaks, or misalignment. Pipe entrances and exists to manholes will be inspected for sediment build-up and tight seals. If necessary, the inspector will enter the manholes for best viewpoint. Pipes will be inspected with video camera equipment if deemed necessary.

Maintenance and repairs will be performed when required so that proper function is not interrupted. Maintenance may include manual labor to remove sediment or possibly sewer snaking mechanical methods. Chronic problems such as large sediment accumulations may be indicative of a pipe breach, so video camera equipment may be deployed in such instance to verify. Necessary repairs including pipe replacement will be considered as applicable. Temporary portable pumps may also be considered. Gravity mains will be cleaned out when necessary and repaired/replaced if warranted.

6.9.5 Leachate Seeps

The RI revealed that groundwater is below the level of the landfill waste material and leachate seeps from the landfill mass have not been observed. The installation of an impermeable cap to prevent infiltration of rainwater into the fill material further mitigates the potential for leachate seeps at the ground surface. Although the possibility of a seep is unlikely, a visual survey for seeps will be performed quarterly. If seeps are observed, then an interim collection sump will be installed and the seep water will be pumped to drums or tanks for classification. Once the seep water has been classified, an appropriate disposal method will be determined. This interim collection of seep water would continue until either the seep has stopped or more permanent engineering controls are designed and installed.

6.10 Wetlands

The two new wetland areas, the North wetlands and the South wetlands were constructed using Claymax 500 SP geosynthetic clay liner and 6-inches of topsoil. After the wetlands were constructed, a timed-release fertilizer was placed in 2 to 4-inch deep holes in a 2-foot grid pattern in the topsoil. Typha species were planted on the wetland floor and Scipus and Carex species were randomly mixed and planted on the side slopes up to the wetland boundaries.

The primary method for wetlands inspection and maintenance will be visual observation and subsequent plantings replacement when required.

~~The rip-rap ditch connecting the two wetlands, north and east of the leachate storage tank, and~~
the rip-rap outlet ditch at the southeast area of the South wetlands should be inspected, as required, and kept free of all debris and sediment.

6.11 Other Problems

Significant problems other than these discussed in this section, require an event-specific solution. A qualified civil/environmental engineer must:

- Determine the nature and extent of the problem
- Identify the cause of the problem and the steps required to
- Determine how to repair the condition

This process should begin immediately upon discovery of the problem. The NYSDEC will be notified of the nature and extent of the problem within 30 days of its discovery.

6.12 Inspection and Maintenance Check Lists

The results of all regularly scheduled inspections, other formal inspections, and cursory inspections resulting in the discovery of situations requiring immediate maintenance will be

presented on check list forms as shown in the attached exhibits. This information will be presented to the NYSDEC as discussed in Section 7.1.

6.13 Disposal of Used Material and Waste

Materials removed from remediation areas may be reused back onsite provided they are uncontaminated or significantly altered from their required originally-constructed state. Products such as stone and drainage net contaminated with sediments may be taken offsite and washed free of sediments. Geotextile material used in landfill cap construction must be new since degradation and clogging may not be visible to the human eye. Geotextile is typically bonded to drainage net so that generally the geonet will be replaced along with any replaced geotextile. Geomembrane can be ~~re-used, provided it appears to be in like new condition and excessive strain (maximum 10 percent) has not occurred.~~
has not occurred.

Earthen materials may be re-used in the repair provided they are not commingled with adjacent materials. All materials to be disposed will be taken off of the landfill site and disposed at the Town's own expense.

7.0 RECORDS AND REPORTS

7.1 General

The Town will keep records of all data collected throughout the post-closure period. These records will be used to support compliance with Part 360 requirements.

The Town will retain records of all maintenance and monitoring information, including calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all records required by its permit.

~~The records will be kept for at least 30 years from the date of the remedial construction~~
contract close-out. Records for groundwater monitoring information will include the following:

- Date, place and time of sampling
- Names of individual(s) who performed sampling
- Date analyses performed
- Person(s) performing analyses
- Analytical method used and results
- Additional information relating to analyses including records of internal laboratory QA/QC

The records will be available to the NYSDEC upon its request.

Records on frequency of inspection, general maintenance, and detection monitoring, will be submitted to the NYSDEC Region 3 Office, New Paltz, NY, Attention: Regional Solid and Hazardous Waste Engineer.

Annual reports discussed in Section 7.3 will also be submitted to the NYSDEC main office, Division of Environmental Remediation, Bureau of Hazardous Site Control, Operation and Maintenance Section, 50 Wolf Road, Albany, NY 12233-7010

7.2 Quarterly Reports

The Town will prepare reports of inspections, maintenance, and monitoring, and submit them to the NYSDEC periodically throughout the calendar year.

Routine Monitoring

The routine monitoring reports will include reports of any inspections and maintenance, leachate quantity records, as well as enactment of contingency items discussed in this manual (i.e., alternate water supply and emergency contingency items). These reports are planned to be submitted in April, July, October, and January for each calendar year of monitoring.

Groundwater and Surface Water Monitoring

The groundwater and surface water monitoring reports are submitted in two parts. The first submission indicates what is planned for the next monitoring event. The second submission presents monitoring results. Both submissions are provided for each monitoring event throughout the calendar year. Monitoring results of a previous event are reported prior to carrying out the subsequent monitoring event.

The first submission planning the monitoring will include the following:

- The date of scheduled monitoring
- The name of the laboratory the analysis
- The listing of wells to be sampled
- The analytical schedules and method references to be performed

The second submission containing results will include the following:

- A figure showing the locations of sampling points
- A table showing contaminants detected
- A comparison of parameters detected to ARARs
- A historic comparison of benzene, chromium, iron, and manganese concentrations at all sample points over the duration of the project versus their ARARs
- A brief discussion of monitoring results and ARARs

Air Monitoring

Air monitoring is not performed on a scheduled basis. As air monitoring is conducted, air monitoring reports will be provided. Prior to any air monitoring event, a report identifying the proposed air monitoring activities will be provided. Air monitoring results will be provided either as a separate report or included with other monitoring reports as appropriate.

7.3 Annual Reports

The Town will submit an annual report to the NYSDEC and USEPA within 60 days of March 1 of each year. The annual report will include the following:

- Results of all routine groundwater monitoring performed throughout the year.
- The amount of leachate collected and the amount of leachate transported off site. The treatment facility will be identified.
- Any changes from the approved design analysis report, plans, and specifications or permit conditions will be listed with justification for each change.

7.4 Five-Year Review

Post-closure activities will be reviewed by USEPA within five years of the December 26, 1994 (i.e., 12-26-99) commencement date of the remedial action. In accordance with the Comprehensive Environmental Response, § 9601 *et seq.* Section 121(c) and 40 CFR 300.430(f)(4)(ii). This review action will be conducted because the remedy resulted in hazardous substances remaining on site. The review will evaluate the monitoring performed up to that time. Additional action may be recommended should this review show that the remedy is not adequately protecting public health and the environment.

Site completion is contingent upon an evaluation of groundwater data obtained following ~~construction completion to assess whether drinking water standards are being constructed in~~ private and public water supply wells and if an alternate water supply is needed. In addition, further monitoring of sediments may be conducted to determine whether contaminant concentrations in the sediments have improved.

8.0 PERSONNEL

8.1 Organization

Town of Ramapo

Supervisor and Town Board

Department of Public Works

Division of Engineering

Division of Solid Waste

Division of Sewers

Police Department

8.2 Manpower Requirements

Inspection & Reports

Edward P. Dzurinki, Director

Michael J. Sadowski, P.E., Deputy Director

Paul Gdanski, P.E., Engineer II

Edward G. Moran - Engineer I

Landfill Cover - Mowing, Maintenance & Inspection

Jeffrey Mann, Motor Equipment Operator II

Brett Insler, Laborer

Leachate System - Maintenance & Inspection

Gary Wren, Sewage System Supervisor

Robert Gamble, Sewer Inspector II
Glenn Zahlmann, Maintenance Mechanic I
Robert Kemmer, Maintenance Mechanic I
Steven Stevens, Sewage System Mechanic
Kenneth Boddy, Motor Equipment Operator II
Nicholas Stecz, Motor Equipment Operator II
Richard Cohen, Motor Equipment Operator II
Ronald Stecz, Assistant Maintenance Mechanic
Richard Prosser, Assistant Maintenance Mechanic
Sean Kelly, Assistant Maintenance Mechanic
Steven Sheridan, Motor Equipment Operator I

8.3 Health and Safety Training

All town employees are given in-house training regarding emergency procedures, on-the-job safety, and hazard communication (right-to-know). Training for confined space entry is given to employees whose responsibilities may require entry into confined spaces.

9.0 EMERGENCY CONTINGENCY PLAN

The objective of the emergency contingency plan is to address any event of an emergency nature that may occur outside the scope of the routine maintenance program. The plan will be implemented following the discovery of a condition of the site which is not covered by routine maintenance. It covers occurrences that reasonably could be expected to occur and not extreme conditions such as an earthquake or war. The plan presents an organized and coordinated course of action which is both technically and financially feasible. All corrective actions, where appropriate, would be executed in a timely fashion after notification of the appropriate entities involved. This plan should be followed whenever emergency situations develop which may endanger health, safety, and/or the environment. The plan discusses procedures for reporting and handling emergencies, as well as personnel and responsibilities.

The Emergency Contingency Plan provides guidance in the event that a problem occurs with the remedial program which cannot be addressed under the steps outlined in the O&M Manual. The scope of this Contingency Plan is limited by the following considerations:

- This is not an operating landfill, so operational contingencies such as hot loads, fires, etc. need not be considered.
- There are no active gas collection transfer or treatment systems to foul or breakdown.

To identify potential concerns, quarterly inspections of the closed landfill will be performed by a qualified civil/environmental engineer, as outlined in this O&M Manual. Concerns which would trigger this Contingency Plan to be implemented include any event which could cause an element of the remedial program to fail to function in accordance with the remedial design for the 30-year period following successful completion of construction. As stated above, steps to address routine problems are included in the O&M Manual.

It is possible, however, that problems beyond the scope of those addressed in the O&M Manual may occur, such as:

- Incidents requiring emergency response
- Damage to geomembrane barrier layer
- Significant or repeated erosion of the drainage channels or final cover
- Slope failure of the landfill final cover

Steps required to address the emergency responses and damage to the geomembrane barrier layer are identified in the following sections. In general, problems that are likely to occur will be unique and event-specific, and are difficult to provide predetermined solutions in this format. Therefore, a qualified civil/environmental engineer must be included in the emergency remediation design process.

~~Emergency events refer to any unforeseen or unusual event which may occur during the~~ closure or post-closure period and may include fires, collapse, or sudden release of contaminants. If any of these or other events which could threaten public safety or integrity of the environment occur, the proper agencies and authorities will be notified. A list of some of the potential agencies are identified in Section 9.1.

9.1 Emergency Response

Emergency response procedures have been developed to provide guidance to the affected entities in the event of emergency. The procedures include description and recognition of emergencies, plan implementation, communication, equipment, and evacuation.

9.1.1 Notification

The following entities will be contacted as dictated by the circumstances:

Town of Ramapo

<u>Names</u>	<u>Phone Number</u>
Thomas J. Howard, Superintendent of Highways	357-0903
Brian Brophy, Director of Building, Planning & Zoning	357-5100
Thomas Buckley, Fire Inspector	357-5100
Police Department	911 or 914-357-2400
Fire Department	911

New York State

Police	914-942-0300
Department of Environmental Conservation Region 3	914-256-3000
Department of Health	518-458-6305

County

Rockland County	914-638-5000
Rockland County Department of Health Hazardous Materials Response Team	914-364-2000
URS Greiner, Inc. Buffalo Office	716-856-5636

The Town has in place, both internal and external communication systems. Internal systems will include telephones, pagers, and two-way radios. Two-way radios and paging systems will be functional as hand held units and as vehicle-based inside of Town vehicles.

9.1.2 Procedures

In the event of an imminent or actual emergency occurrence, the first person on the scene should notify the Town's Emergency Coordinator (or his designee) who, in turn, will initiate a proper response to the situation in question. Notification of the Town may be performed second only to attending to any immediate safety needs of personnel by the first person on the scene. A list of the emergency contacts will be posted in a conspicuous location in the Onsite Pump Control Building.

Identification

Whenever there is a fire and/or explosion, spill, release, or other incident presenting a potential threat to health, safety, or the environment, the Town will immediately attempt to identify the source of the emergency.

Assessment

In an emergency situation, an assessment of the possible hazard will be made. If the Town determines that the facility has had a fire and/or explosion, spill or release, or other incident that presents a possible hazard to health, safety, and/or the environment, and an evacuation of the surrounding area is necessary, then the Town's Emergency Coordinator (or his designee) will initiate the Contingency Plan and contact local agencies informing them of the situation. The NYSDEC will also be advised of all pertinent facts regarding the incident.

When making a report to the NYSDEC, the following information will be provided:

- Name and telephone number of Town representative making the report.
- Name, address, and telephone number of the facility.
- Type and time of incident occurrence.

- Name and quantity of material(s) involved, to the extent known.
- Extent of any injuries.
- Possible hazards to health, safety, and/or the environment surrounding the facility.

Control Procedures

The occurrence of an emergency at a closed sanitary or inactive hazardous waste landfill is unlikely, but possible. Emergencies can arise unexpectedly and may require immediate response measures.

In the event of any emergency, the Town of Ramapo will take all reasonable measures to prevent the occurrence, recurrence, or spread of a fire or explosion or unplanned releases to other portions of facility. These measures include, when applicable and necessary, collecting and containing any applicable materials.

The Town of Ramapo, will create a broad-based emergency response network to respond to any incidents at the facility. If an emergency occurs, fully trained response personnel will be contacted immediately.

Requests for assistance from the emergency response network are to include:

- Name, address, and telephone number of the facility
- Type and time of incident occurrence
- Extent of any injuries
- Possible hazard to public health and safety, and/or the environment surrounding the facility
- Type and quantities of materials involved, if known

Immediate action by on-site personnel will concentrate on preventing any fire/explosion, or spill/leak situation that occurs from spreading to other areas of the facility or off site, and immediate emergency medical attention will be given to any injured personnel. Any possible sources of ignition will be removed from the incident area, if this can be done without risk. Vehicular traffic will be suspended and work ceased until the fire or incident can be safely contained or controlled.

Whenever there is any type of incident at the landfill, the Town of Ramapo will immediately notify any personnel at the site, identify and assess the source and extent of the emergency, and take action to control the situation.

Requests for assistance should always include the same information required in making reports to the NYSDEC above.

Storage and Treatment of Released Materials

Immediately after an emergency situation, the Town will arrange for the offsite disposal of any recovered wastes, or any contaminated materials resulting from the incident.

9.1.3 Equipment

Emergency equipment will be available for ready implementation. The town will determine the most efficient locations for storage of each piece of equipment.

Fire Turnout Gear

Fire turnout gear provides personal protection during fires and chemical spills. Only those employees who are properly trained in the use of this equipment will be allowed to use this equipment. Records will be kept of employees who have completed an OSHA or Fire Department course in the proper use of this equipment. These employees will meet and review the proper use of this equipment at least annually.

Self-Contained Breathing Apparatus

Self-contained breathing apparatus is used only with fire turnout gear. All self-contained breathing apparatus is inspected regularly per a written maintenance procedure.

Only those employees who are properly trained in the use of this equipment will be allowed to use this equipment. Records will be kept of employees who have completed an OSHA or Fire Department course in the proper use of this equipment. These employees will meet and review the proper use of this equipment at least annually.

Respirators

In the event a chemical release should occur, self-contained breathing apparatus will allow Town personnel adequate time to evacuate the area. Each operator of this equipment will be trained in the use of the escape pack.

First Aid Kit

First aid kits are used in the event of illness or injury.

Fire Extinguishers

The fire extinguishers are inspected on a regular schedule and are used for extinguishing small fires. They will be maintained in conformance with local fire codes and regulations.

Sewer Jet

This truck carries its own water supply, and is equipped with a high pressure pump. The sewer jet can also be used for the initial control of fires.

Spill Control Material

Spill control materials includes booms, pads, absorption blankets, light soda ash, lime and other neutralizing chemicals. Equipment and materials for emergency berming are also readily available.

Off-Site Emergency Resources

In addition to on-site personnel and equipment, additional off-site resources are available if needed to give expert advice during emergency situations.

Equipment Maintenance

Following an emergency incident, all emergency response equipment used will be cleaned and made fit for re-use, or replaced as necessary, so that the affected equipment will be available in the event of an additional situation. An inspection of all equipment will take place before emergency operations recommence to ensure that each item is in proper working condition. Activities, such as the recharging of fire extinguishers, replacement of personal protective gear, and restocking of disposable items will be completed as soon as possible after use.

9.1.4 Evacuation Plan

In an emergency situation, the Town will be responsible for determining if and when evacuation of the premises is required. Potential areas to be evacuated include the Baler building, weigh station, leachate storage tank area, pump house, and the landfill itself. Imminent or actual dangers that constitute a situation requiring evacuation include the following:

- A generalized fire or threat of generalized fire at or near the landfill.
- An explosion or the threat of explosion.

- A major spill or leak that cannot be contained and constitutes an immediate threat to on-site personnel.

When evacuation is required, the following procedures should be followed:

- Alert all personnel by using the facility communications systems.
- Shut down all landfill equipment.
- All on-site personnel and visitors should proceed towards Torne Valley Road to either the north, or south ends of the landfill or near the weigh station area, but should not leave the premises. ~~Once assembled, a determination and identification of any missing persons will be made.~~
- Once assembled and accounted for, visitors and non-essential Town personnel will be directed to leave in the upwind direction. Essential Town personnel will stand by to afford assistance to the emergency response agency.
- Alternate Evacuation Route - If the preferred evacuation route is impassable or time does not permit, Town personnel and visitors accompanied by Town personnel should evacuate the site on foot in any direction onto the adjacent properties owned by the Town and then await direction from the Emergency Response Agency and/or the Town.

9.1.5 Fire/Explosion

General

The outbreak of fire or the occurrence of an explosion is always a possibility, although unlikely. The Contingency Plan should be implemented in the following situations:

- A fire has started.

- An explosion has occurred.
- An imminent danger exists that an explosion could occur, causing a safety hazard and/or spreading to other materials or facilities:
- The fire spreads and could possibly ignite materials at other locations on-site or could cause heat-induced explosions.
- The fire could possibly spread to off-site areas.

Prevention and Control

Immediate action by Town personnel should concentrate on preventing any fire/explosive situation that occurs from spreading to other areas of the facility, and immediate emergency medical attention should be given to injured onsite personnel. Any possible sources of ignition should be removed from the incident area, if this can be done without risk; and vehicular traffic should be suspended and work ceased until the fire or incident can be safely contained or controlled.

Small Fires

A small fire is defined as one which can be suppressed by a single person using a single fire extinguisher. All Town personnel on site will be trained in the use of fire extinguishers and will be aware of their storage locations. In the event of a small fire, the person discovering the fire will put the fire out with any available fire extinguisher. The person discovering the fire will notify the Town Supervisor immediately. For small fires, the Town Supervisor will use judgement to decide whether the fire department is needed. The Town Supervisor will direct any cease work and cease operations orders, and direct available manpower to needed tasks such as traffic direction, telephoning appropriate agencies, and on-site communications.

Large Fires

Appropriate response measures, including personnel safety, will be the responsibility of the fire department. Underground fires will be controlled as necessary. Above-ground fires will be quenched according to approved fire department protocols. Damage to the surface drainage system or final cover system will be repaired where these systems have been compromised.

Fires that have the slightest chance of not being controllable with manpower and simple equipment on the site will be reported to the fire department immediately. At the first sign of such a problem, the site will be evacuated and all operations will cease.

~~Upon excavation, Town personnel will be posted at the entrance gates. These personnel will~~ have hand held two-way radios and maintain constant communication with the Town Supervisor. The personnel will keep traffic and individuals away from the access roadways to ensure fire equipment has free access to the site. All gates will be opened to allow fire equipment entry. No unauthorized personnel will be allowed entrance to the site. Operations may resume only after authorization from the fire department.

9.1.6 Personal Injury

General

In cases of medical emergency, trained medical response personnel should be contacted immediately. First aid administered by qualified on-site personnel should continue until professional assistance arrives.

First aid is the immediate care of a person who has been injured or has suddenly taken ill until professional medical aid can be obtained. The objectives of first-aid are as follows:

- Control conditions that might endanger life.

- Treat for shock.
- Make the patient as comfortable as possible.

The initial responsibility for first-aid rests with the first qualified person at the scene who should react quickly, but in a calm and reassuring manner. If needed, medical assistance should be summoned, being as explicit as possible in reporting suspected types of injury or illness and location of the victim. The injured person should not be moved, except when necessary.

Pulmonary Resuscitation (General Guidelines)

~~If the victim is unresponsive and no breathing movements are apparent, begin mouth-to-mouth~~
resuscitation immediately. Delay increases the risk of serious disability or death. Observe the following:

- Carefully place the patient flat on his back on the floor and kneel at the patient's side. In cases where the patient is a violent accident victim, use caution and best judgement to decide if the patient should be moved. If the victim is in an awkward position, roll victim as a unit onto his back, keeping the body from twisting and keeping the spine in alignment.
- Establish an airway. Check the victim's mouth with your finger to be sure that no obstruction is present, and then tip the patient's head back until the chin points straight up. This will help prevent the tongue from blocking the airway.
- Pinch the patient's nostrils and begin mouth-to-mouth resuscitation by taking a deep breath and placing your mouth over the patient's mouth so as to make a leak-proof seal. Blow your breath into the patient's mouth until you see the chest rise.
- Remove your mouth and allow the patient to exhale.

- Repeat the procedure at a rate of approximately once every five seconds.

Heart (Cardiac) Resuscitation (General Guidelines)

In the unresponsive patient, check for a cardiac pulse. Locate the larynx or Adam's apple with the tips of the fingers, and slide fingers into the groove between it and the muscle at the side of the neck. If no pulse is felt, circulation must be re-established within four (4) minutes to prevent brain damage; as follows:

- With the patient flat on his back, kneel at the waist, facing the patient's head.
- ~~Place the heel of your right hand over the heel of your left hand on top of the patient's~~ breastbone about one (1) inch above its lower tip, holding your fingers off the patient's chest.
- Shift your weight to the patient's chest and compress it at least 1-1/2 to 2 inches, then remove the pressure.
- Continue at a rate of 80 compressions per minute.
- Alternate one breath and five compressions until medical personnel arrive.

Heavy Bleeding

Heavy bleeding is caused by injury to one or more large blood vessels. Lie the patient down. Control bleeding by elevating the injury location above the level of the head if possible then apply firm pressure directly over the wound with a clean handkerchief, cloth, or your hand. A tourniquet should be applied only in cases of amputation or other injury to a limb in which there is no other way to stop the bleeding. If a tourniquet is applied, do not loosen or remove it. Attach a note on the victim indicating the location of the tourniquet and the time it was applied. This information is very important and will be needed by the medical facility to where the victim is taken.

Shock

Shock, or traumatic shock, usually accompanies severe injury and may be caused by injuries of all types. The signs of shock include pallor, a cold and clammy skin, and beads of perspiration on the forehead and palms or hands, weakness, nausea or vomiting, shallow breathing, and a rapid pulse that may be too faint to be felt at the wrist. The following procedures for the treatment of shock should be followed:

- Correct the cause if possible (e.g., control bleeding). If neck or spine injuries are suspected, avoid moving victim.
- ~~The patient's position should be based on his injuries; if in doubt, keep the patient lying~~ down with feet elevated above heart level until emergency medical aid arrives.
- Keep the patient's airway open. If the patient appears to be about to vomit, turn the patient's head to the side.
- Keep the patient warm enough to prevent chilling and loss of body heat.

Ingestion of Chemicals (For a conscious victim)

- If you do not know what was ingested, call 911.
- Read the label on container for directions in case of ingestion.
- Save the label or container of the suspected chemical for identification. If the victim vomits, save sample of the vomited material for analysis. Send the suspected container and/or other informative material with the victim to the medical facility.
- Seek medical assistance by calling the poison control center or a physician.

- If the victim becomes unconscious, keep his airway open. Give artificial respiration or cardiopulmonary resuscitation (CPR), if necessary. Only administer CPR if you are trained to do so. Call an emergency squad as soon as possible.

Chemicals Spilled on the Body (General)

- Read the label on container for directions.
- Wash away the chemical with large amounts of water using a safety shower or hose as quickly as possible and for at least 15 minutes. Remove the victim's clothing from the areas involved; no time should be wasted because of modesty. The rescuer should take precautions so as to avoid contaminating himself.
- If first aid directions for burns caused by specific chemicals are available, follow these directions after the initial flushing with water.
- Apply a dressing bandage and get medical aid. Call 911.
- If a delayed reaction is noted, obtain medical attention promptly and explain carefully what chemicals were involved (e.g. the physiological effects of some chemicals such as methyl and ethyl bromides may be delayed as much as 48 hours).

Chemicals Spilled on the Body over a Large Area

- Quickly remove all contaminated clothing while using a safety shower or water hose; seconds count and no time should be wasted because of modesty.
- Immediately flood the affected body area with cold water for at least 15 minutes; resume if pain returns. Do not use neutralizing chemicals, ointments, or salves.
- Call for emergency medical personnel promptly.

Extrication

In some types of accident situations, it may be impossible for the victim to free himself. In cases where the victim is confined in a vehicle or pinned by machinery, he may be injured, but there may also be danger to him and the first-aider. **IMPORTANT:** Evaluate each situation to determine if extrication prior to the emergency rescue squad arriving could possibly cause further injury to the victim or injury to the rescuers. Provide basic life support until emergency rescue personnel arrive.

Accidents Involving Machinery

- Victims pinned in or under machinery, may suffer severe injuries and there may be ~~severe traumatic shock. After evaluating the situation to determine if it is safe to~~ proceed, administer first aid promptly, and contact emergency rescue personnel immediately.
- The machinery should be stopped and the power cut off. If the equipment does not have automatic release capabilities, or they are not functioning, the equipment may have to be dismantled. In such cases, the person(s) administering first aid should attempt to control bleeding, treat shock, keep the victim's airway open (in unconscious victims), keep the victim as comfortable as possible, and be reassuring while waiting for trained emergency rescue personnel.

Additional Illness and Injuries (General First Aid Guidelines)

Apparently non-emergency health conditions can develop into emergencies and are therefore addressed herein. After requesting emergency medical assistance, the following points should be addressed in specific emergencies:

Abdominal Pain - Keep the patient quiet. Give nothing by mouth. Treat for shock.

Back and neck injuries - Keep the patient quiet. Do not move the patient or lift the head unless absolutely necessary.

Chest pain - Keep the patient calm and quiet. Place the patient in the position in which the patient feels most comfortable.

Convulsion or epileptic seizure - Place the patient on the floor or a couch. Do not restrain the patient's movements except to prevent injury. Do not place a blunt object between the teeth, put any liquid in the mouth, slap the patient, or douse the patient with water. Remove any items that the patient might hit during convulsions.

Electric shock - Throw the switch to turn off the current. Do not touch the victim until he or she is separated from the current source. Begin mouth-to-mouth resuscitation if respiration has ceased. Begin heart (cardiac) resuscitation if the heart stops.

Fainting - Simple fainting can usually be ended quickly by lying the victim down. Insure that an open airway is present.

Unconsciousness - Be sure the victim has an open airway and check for bleeding. Look for and carefully consider any emergency medical identification around the victim's neck or wrist, or in his personal effects. Keep the victim warm, lying down, and quiet until he or she regains consciousness. Do not move the victim's head if there is bleeding from the nose, mouth, ear, or eyes. Do not give the victim anything by mouth. Keep the victim's airway open to aid breathing. Do not cramp the neck with a pillow.

9.1.7 Toxic Releases

Chemicals/Liquids - In the event suspected hazardous chemicals are discovered, the area will be immediately evacuated and all operations will cease.

The County's Hazardous Materials Response Team will be notified. In addition, the NYSDEC Region 3 Solid and Hazardous Waste Department will be advised of the situation.

The chemical waste will not be approached until it has been identified and its hazards are known. For transported materials, attempt to identify the waste involved by reviewing the shipping papers. Any person responsible for spill migration must wear the appropriate level of protective gear.

In the event of a fire involving hazardous chemicals, the procedure in Section 9.1.5 of this plan will be followed.

~~In the event of a spill, the procedures outlined above for reporting and responding to~~
hazardous material release will be followed. All ignition sources within the hazard area will be eliminated. There will be no smoking, no flares, and no open flames permitted. There will be attempts to contain the spill or leakage by diking if this can be accomplished without risk to personnel.

If runoff cannot be contained, downstream health, and sanitation districts and the NYSDEC will be notified immediately.

In all cases, personnel will stay upwind from the spill. Personnel will beware of vapors from flammable liquids. These vapors are likely to be heavier than air and will flow along ground paths. Should the vapors reach an ignition source, a flash back could occur.

Air Contamination

Methane gas venting to the atmosphere should not present a risk to human health due to the nature of the waste and the lack of a human population adjacent to the landfill. However, it is conceivable, although unlikely, that a build up of landfill gas might occur. Should it be suspected that methane gas generation is presenting an explosion or other hazard, the Town will notify the NYSDEC. If it is determined that such a hazard is present, a work plan will be developed to

determine the appropriate response actions. Possible response actions include installing an active gas withdrawal system. Any proposed remedial actions would be approved through NYSDEC prior to implementation.

APPENDIX A

POST-CLOSURE SITE INSPECTION CHECKLIST

RAMAPO LANDFILL
 NYSDEC SITE NO: 3-44-004
 POST-CLOSURE SITE INSPECTION CHECKLIST

DATE: _____
 INSPECTED BY: _____

	CONDITION: (Check)				Remarks
	Acceptable	Not Acceptable	Present	Not Present	
1) Vegetative Cover	_____	_____	_____	_____	
2) Drainage Structures (Swales, Downchutes, Channels, Plunge Pools, Outfalls to Torne Brook)					
a) Sediment Build-Up	_____	_____	_____	_____	
b) Pooling or Ponding	_____	_____	_____	_____	
c) Slope Integrity	_____	_____	_____	_____	
d) Overall Adequacy	_____	_____	_____	_____	
e) Concrete Lining	_____	_____	_____	_____	
f) Gabion Lining	_____	_____	_____	_____	
g) CMP Lining	_____	_____	_____	_____	
3) Access Road	_____	_____	_____	_____	
4) Extraction Wells and Lift Pump Stations					
a) Manholes	_____	_____	_____	_____	
b) Pumps and Appurtenances	_____	_____	_____	_____	
c) Control Panels	_____	_____	_____	_____	
d) Piping	_____	_____	_____	_____	
5) Landfill Cover System					
a) Erosion Damage	_____	_____	_____	_____	
b) Leachate Seeps	_____	_____	_____	_____	
c) Settlement	_____	_____	_____	_____	
d) Stone Aprons	_____	_____	_____	_____	
6) Gabion Retaining Walls					
a) Structural	_____	_____	_____	_____	
b) Drainage Media Behind Wall	_____	_____	_____	_____	
7) Fence and Gates	_____	_____	_____	_____	
8) Slope Stability					
a) Landfill	_____	_____	_____	_____	
b) Mountain Side	_____	_____	_____	_____	
9) Gas Vents	_____	_____	_____	_____	

MISCELLANEOUS COMMENTS:

APPENDIX B

MAINTENANCE CHECKLIST

RAMAPO LANDFILL
 NYSDEC SITE NO. 3-44-004
 MAINTENANCE CHECKLIST

DATE: _____

Maintenance Performed (Check)	Item	Remarks
_____	1) Vegetative Cover:	
_____	a) Seeding	
_____	b) Fertilizing	
_____	c) Topsoil Replaced	
_____	d) Removal of Undesirable Vegetation	
_____	2) Drainage Structures	
_____	a) Excavation	
_____	b) Fill	
_____	c) Regrading	
_____	d) Landfill Cap Replacement	
_____	e) Vegetative Cover Placement	
_____	f) Lining Replacement	
_____	3) Access Road	
_____	a) Excavation	
_____	b) Fill	
_____	c) Grading	
_____	d) Stone Paving	
_____	4) Extraction Wells and Lift Pump Stations	
_____	a) Pumps	
_____	b) Manholes	
_____	c) Appurtenances	
_____	d) Control Panel	
_____	5) Landfill Cap	
_____	a) Excavation	
_____	b) Cover Materials	
_____	- topsoil	
_____	- barrier protection layer	
_____	- drainage composite	
_____	- geomembrane	
_____	- gas vent composite	
_____	c) Testing	
_____	d) Grading Fill	
_____	e) Vegetative Cover	
_____	6) Gabion Retaining Walls	
_____	a) Replace Stone	
_____	b) Replace Baskets	
_____	c) Drainage Media Behind Wall	
_____	- clean	
_____	- replace	
_____	7) Fence and Gates	
_____	8) Gas Vents	
_____	- Pipes	
_____	- Bedding and Adjacent Media	
_____	9) Other	

APPENDIX C

MANUFACTURER'S MAINTENANCE and REPAIR SPECIFICATIONS

~~The Manufacturer's Maintenance and Repair Specifications were previously transmitted to~~
the Town of Ramapo on January 19, 1998.

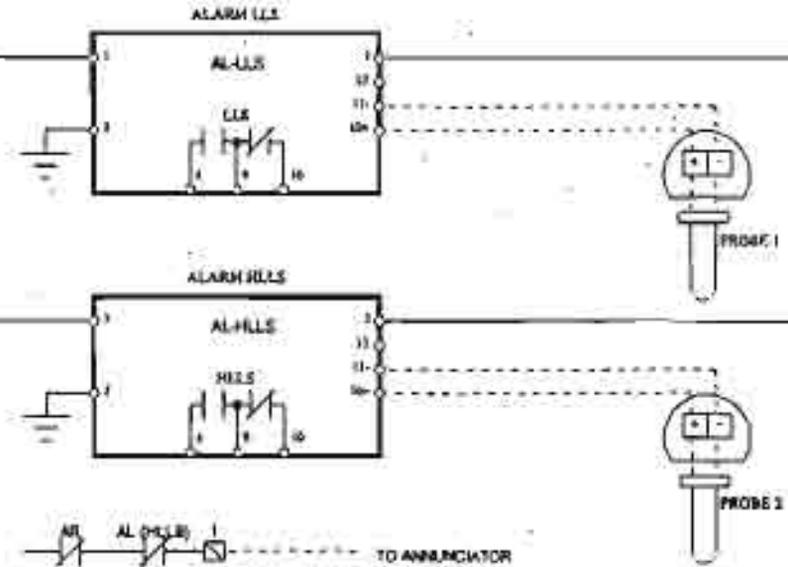
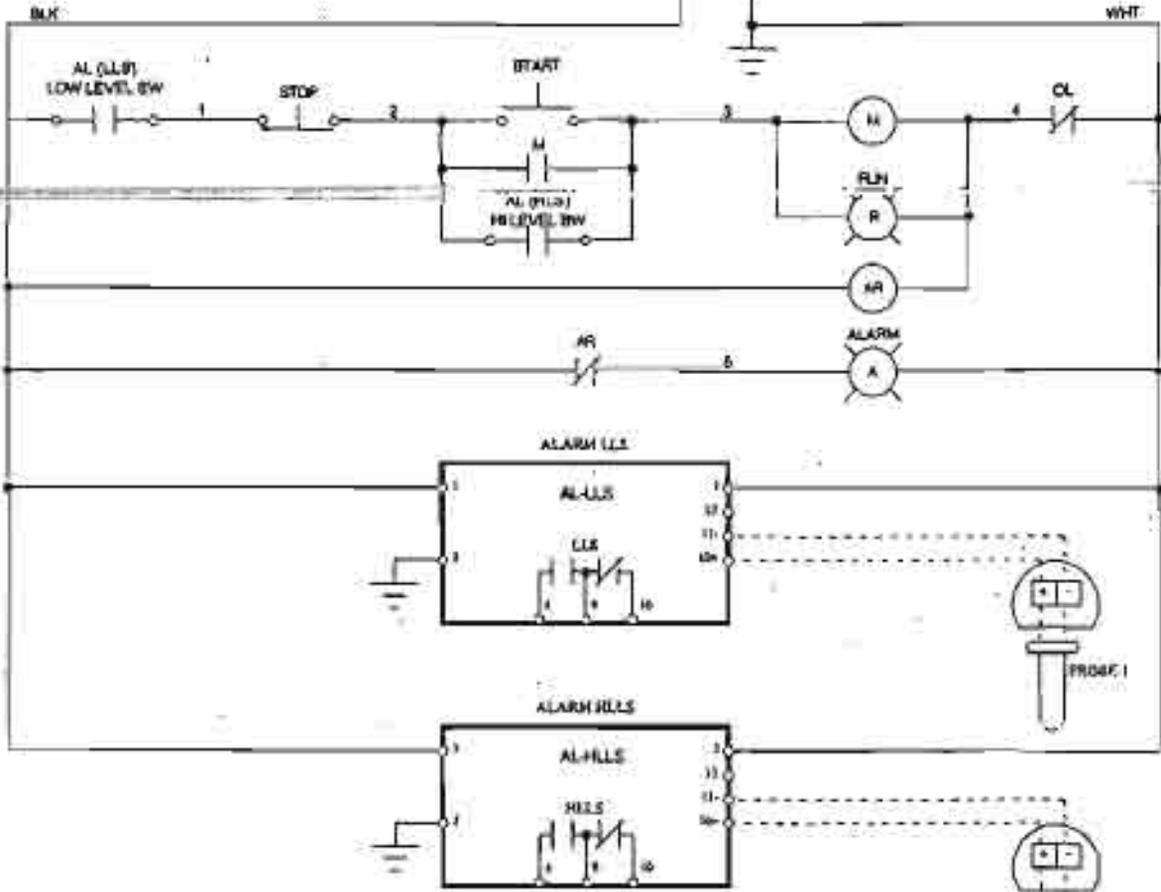
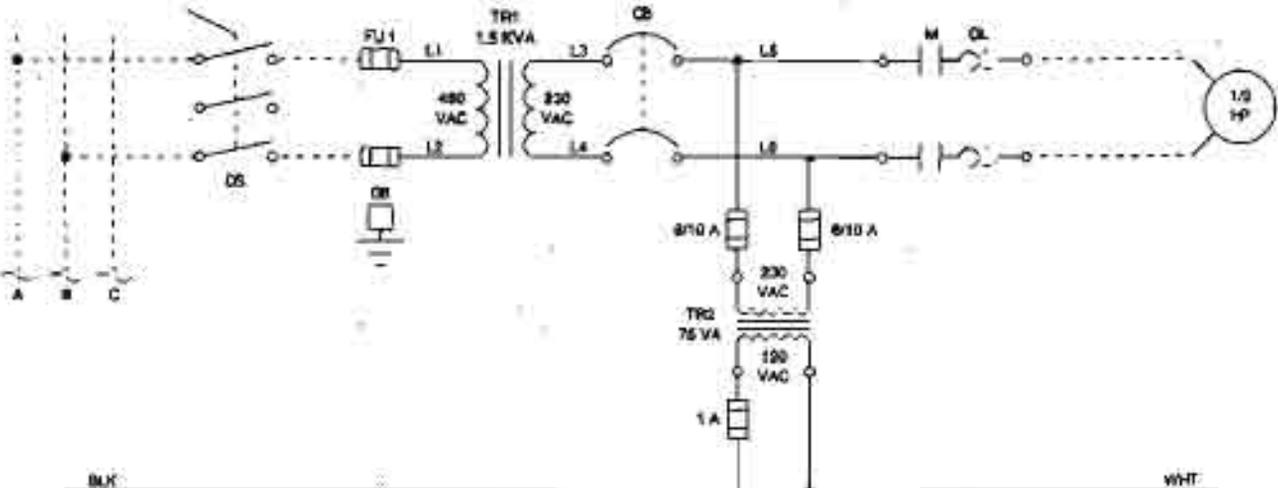
URSGWC will maintain a set of Manufacturer's Maintenance and Repair Specifications in
the Buffalo, NY office.

No copies of the Manufacturer's Maintenance and Repair Specifications are included with
the Final O & M submittal dated March 19, 1999 to the New York State Department of
Environmental Conservation or the United States Environmental Protection Agency.

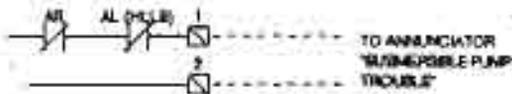
APPENDIX D

RECORD ELECTRICAL WIRING SCHEMATIC DRAWINGS

480 VAC
FROM
JUNCTION BOX



NOTE: ALTERNATE PHASE
CONNECTION ON EACH
STATION (AB, BC, CA.....)



BENFIELD
CONTROL SYSTEMS, Inc.
WHITE PLAINS NY 814-948-3231

RAMAPO LANDFILL EXTRACTION WELL PUMP
WIRING DIAGRAM (TYP 10F 7)
GEO-CON VOORHEES NJ

DATE 12/30/97
REV.
DRAWING NO. PS3385.B2

Baron H. Janssen

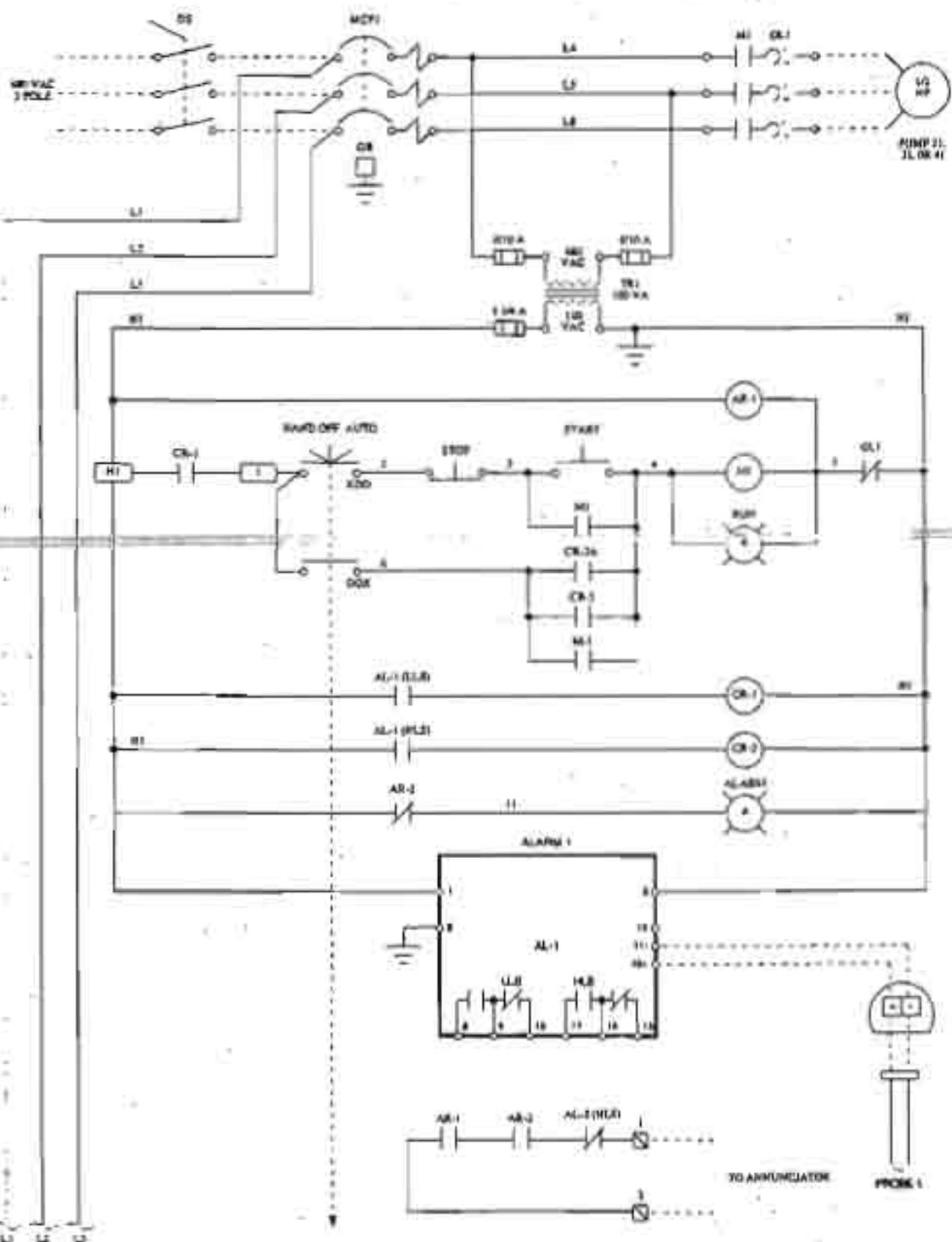
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TAG	DESCRIPTION	MANUFACTURER	QTY	PART NO.
BNC	ENCLOSURE NEMA 3R WINNER PANEL	HOFFMAN HOFFMAN	1 1	A-24R248HCR A-24P24
PL1	PILOT LIGHT	ALLEN BRADLEY	1	800H-QR11R
PL2	PILOT LIGHT	ALLEN BRADLEY	1	800H-QR11A
SS1	3 POSITION SELECTOR SWITCH	ALLEN BRADLEY	1	800H-JR2A
AL-LLS,HLLS	ALARM BOARD	B&W	2	5200HF2-OC
TR1	TRANSFORMER	ACME	1	T-2-53011-S
FU1	FUSE BLOCK 2P 30 A W/PRIMARY FUSE	----- BUSSMAN	1 2	----- FNQ-R-3
CB	CIRCUIT BRAKER W/N.C. AUXILIARY CONTACT	ALLEN BRADLEY ALLEN BRADLEY	1 1	1492-CB2G100 1492-ACBH2
TB2	TRANSFORMER W/PRIMARY FUSE W/SECONDARY FUSE	MICRON BUSSMAN BUSSMAN	1 2 1	B075MBT713RK FNQ-R-8/10 FNM-1
AR	CONTROL RELAY	ALLEN BRADLEY	1	700-HF32A1
M	FULL VOLTAGE MOTOR STARTER W/HEATER ELEMENT	ALLEN BRADLEY ALLEN BRADLEY	1 2	509-TOXD W43 W45
TB	TERMINAL BLOCK	ALLEN BRADLEY	5	1492-W4
GB	GROUND BAR	SIEMENS	1	GB5
DS	DISCONNECT SWITCH (PROVIDED SEPARATE)	SEVERO	1	-----

BENFELD
CONTROL SYSTEMS Inc.
WHITE PLAINS NY 914-948-3231

RAMAPO LANDFILL: EXTRACTION WELL FROM
BILL OF MATERIALS (TYP. OF 2)
GEO-CON
VOORHEES NJ

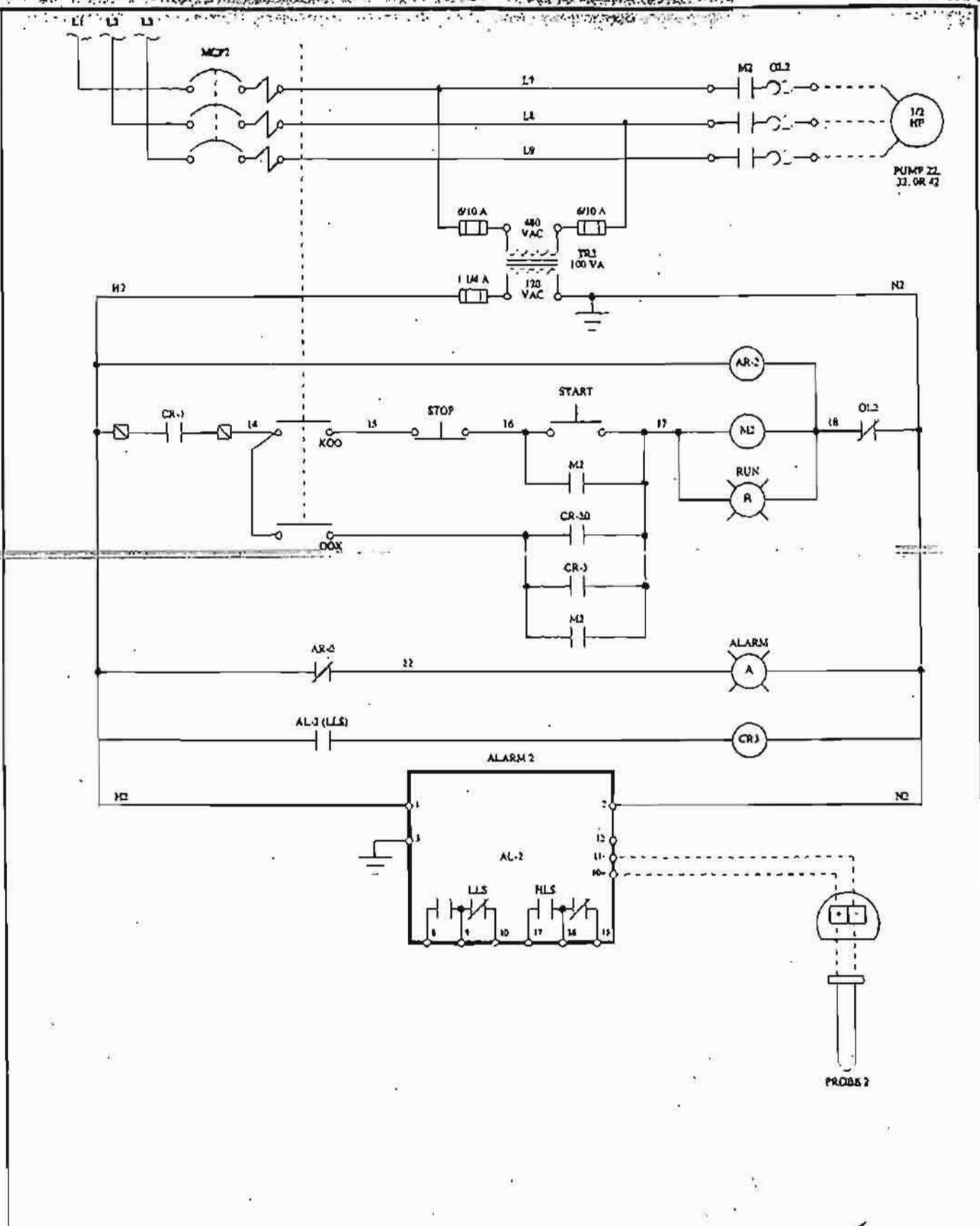
DATE 12/30/87
REV.
DRAWING NO. PS3385.B3



BENF ELD
 CONTROL SYSTEMS INC.
 WHITE PLAINS NY 914-948-3231

RAMAPO LANDFILL: LIFT STATION PUMP
 WIRING DIAGRAM (TYP. OF #1)
 GEO-CON VOORHEES NJ

DATE 12/30/97
 REV.
 DRAWING NO. PS3385.A2



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BENF ELD
CONTROL SYSTEMS INC.
WHITE PLAINS NY 914-948-3231

RAMAPO LANDFILL LIFT STATION PUMP
WIRING DIAGRAM (TYP. OF 3)
GEO-CON
VOORHEES NJ

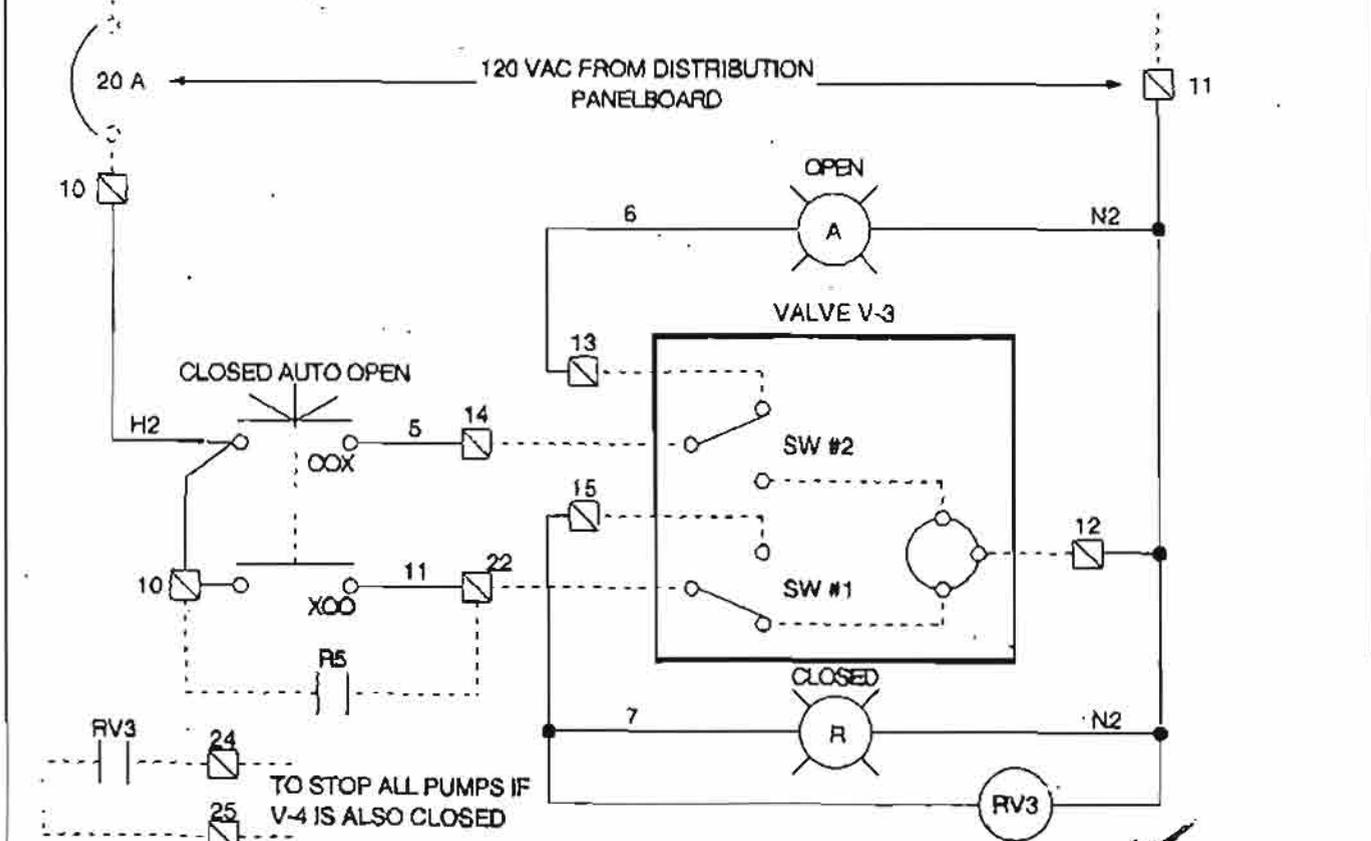
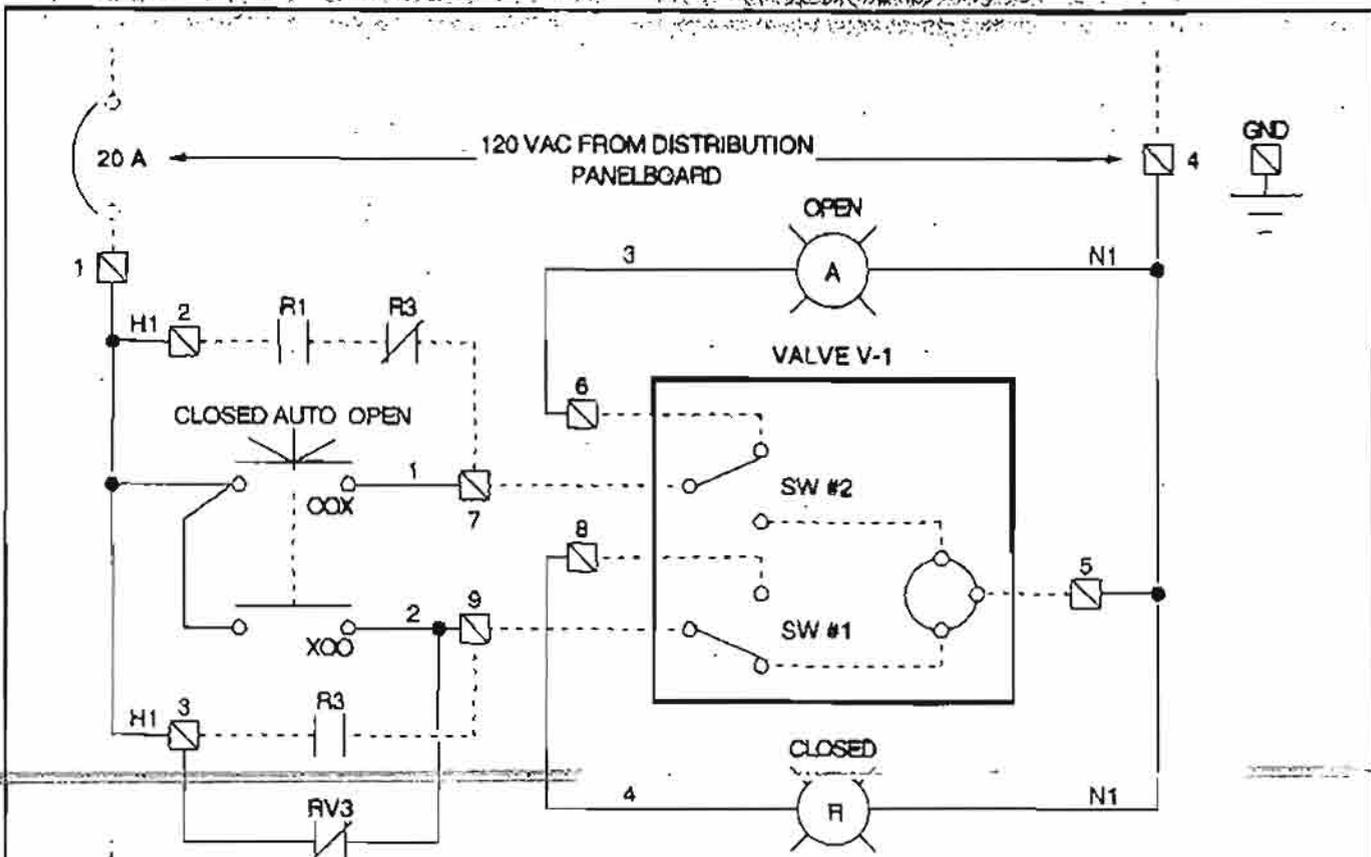
DATE 12/30/97
REV.
DRAWING NO. PS3385.A3

TAG	DESCRIPTION	MANUFACTURER	QTY	PART NO.
ENC	ENCLOSURE NEMA 3R WINNER PANEL	HOFFMAN HOFFMAN	1 1	A-30R3012HCR A-30P30
PL1	PILOT LIGHT	ALLEN BRADLEY	2	800H-QR11R
PL2	PILOT LIGHT	ALLEN BRADLEY	2	800H-QR11A
PB1	PUSH BUTTON	ALLEN BRADLEY	2	800H-AR1D1
PB2	PUSH BUTTON	ALLEN BRADLEY	2	800H-BR6D2
SS	3 POS/1N SELECTOR SWITCH	ALLEN BRADLEY	1	800H-JR2A
AL-1	FLOATS	B/W	2	7010-A-4-A-20
TR1,TR2	TRANSFORMER	MICRON	2	B100MBT713RK
	W/PRIMARY FUSE	BUSSMAN	4	FNO-R-6/10
	W/SECONDARY FUSE	BUSSMAN	2	FNM-1 1/4
CR1,2,3,AR1,AR2	CONTROL RELAY	ALLEN BRADLEY	5	700P-400A1
MCP1,MCP2	MOTOR CIRCUIT PROTECTOR	SIEMENS	2	ED63A010
	W/AUXILIARY CONTACT	SIEMENS	2	AO1ED62
M1	FULL VOLTAGE MOTOR STARTER	ALLEN BRADLEY	1	509-T00
	W/HEATER ELEMENT	ALLEN BRADLEY	1	W27
	W/2 N.O. AUXILIARY CONTACT	ALLEN BRADLEY	1	195-FA20
M2	FULL VOLTAGE MOTOR STARTER	ALLEN BRADLEY	1	509-T00
	W/HEATER ELEMENT	ALLEN BRADLEY	1	W27
	W/ N.O. N.C. AUXILIARY CONTACT	ALLEN BRADLEY	2	195-FA22
TB	TERMINAL BLOCK	ALLEN BRADLEY	4	1492-W4
GB	GROUND BLOCK	SIEMENS	1	GB5
DS	DISCONNECT SWITCH (PROVIDED SEPARATE)	SIEMENS	1	NFR351

BENF ELD
CONTROL SYSTEMS Inc.
WHITE PLAINS NY 914-948-3231

RAMAPO LANDFILL: LIFT STATION PUMP
BILL OF MATERIALS (TYP. OF 3)
GEO-CON
VOORHEES NJ

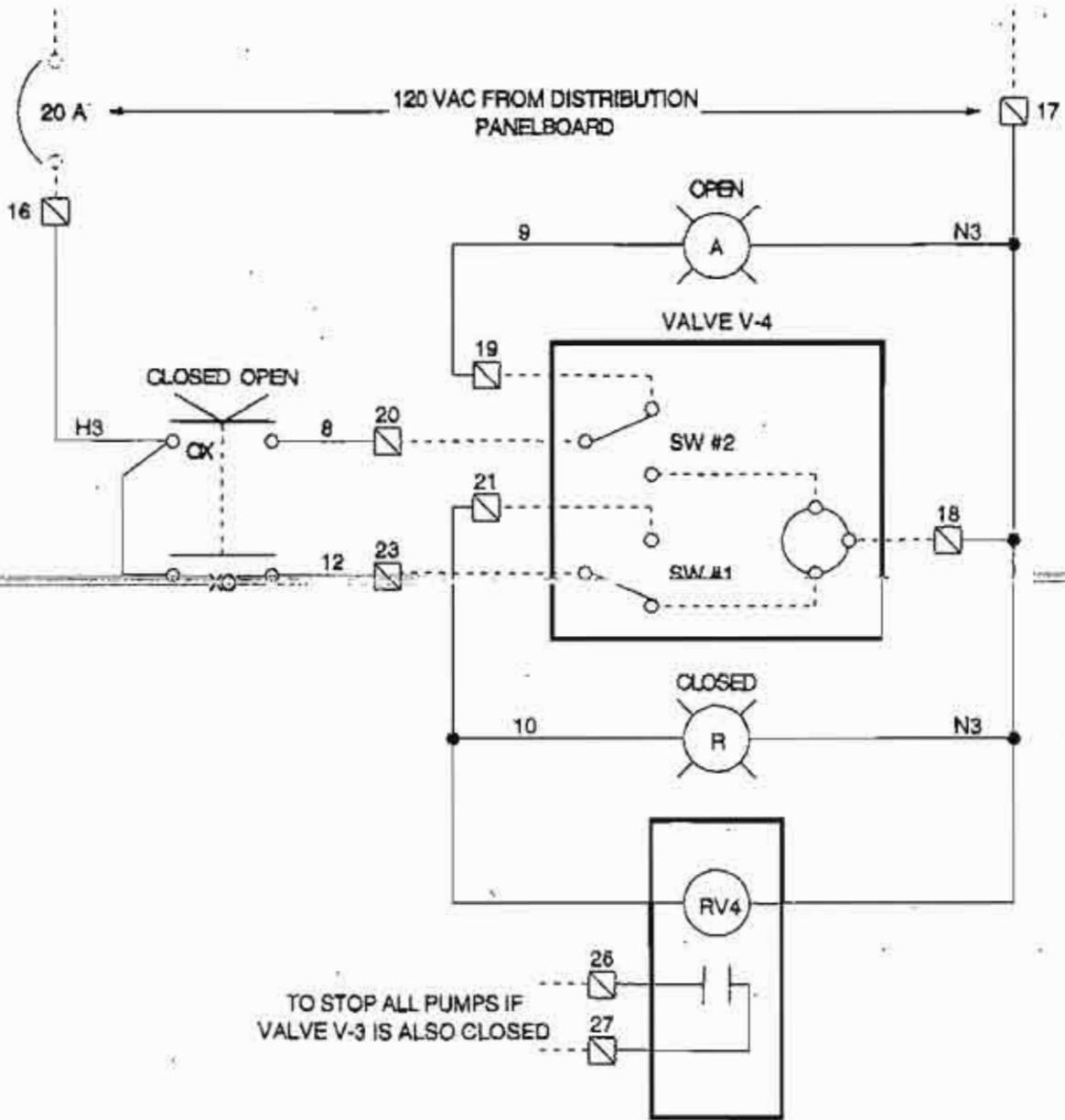
DATE 12/30/97
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DRAWING NO. P53385.A4



BENF ELD
 CONTROL SYSTEMS INC.
 WHITE PLAINS NY 914-948-3231

RAMAPO LANDFILL: VALVE CONTROL PANELS
 WIRING DIAGRAM
 GEOCON VOORHEES NJ

DATE 12/30/97
 REV.
 DRAWING NO. PS3385.C2/C4



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BENF ELD
CONTROL SYSTEMS Inc.
WHITE PLAINS NY 914-948-3231

RAMAPO LANDFILL: VALVE CONTROL PANEL
WIRING DIAGRAM

GEO-CON
VOORHEES

DATE 12/30/97

REV.

DRAWING NO.
PS3385.C3

TAG	DESCRIPTION	MANUFACTURER	QTY	PART NO.
ENC	ENCLOSURE NEMA 12	HOFFMAN	1	C-SD12128
	WINNER PANEL	HOFFMAN	1	C-P1212
	W/KEYLOCK HANDLE	HOFFMAN	1	C-WHK
PL1	PILOT LIGHT	ALLEN BRADLEY	3	800H-QR11R
PL2	PILOT LIGHT	ALLEN BRADLEY	3	800H-QR11G
SS1	2 POSITION SELECTOR SWITCH	ALLEN BRADLEY	1	800H-HR2B
SS2	2 POSITION SELECTOR SWITCH	ALLEN BRADLEY	2	800H-HR2B
TB	TERMINAL BLOCK	ALLEN BRADLEY	23	1492-W4
	W/ GROUND BLOCK	ALLEN BRADLEY	1	1492-WG4

BENFELD
CONTROL SYSTEMS INC.

WHITE PLAINS, NY

914-948-3231

RAMAPO LANDFILL VALVE CONTROL PANEL
BILL OF MATERIALS

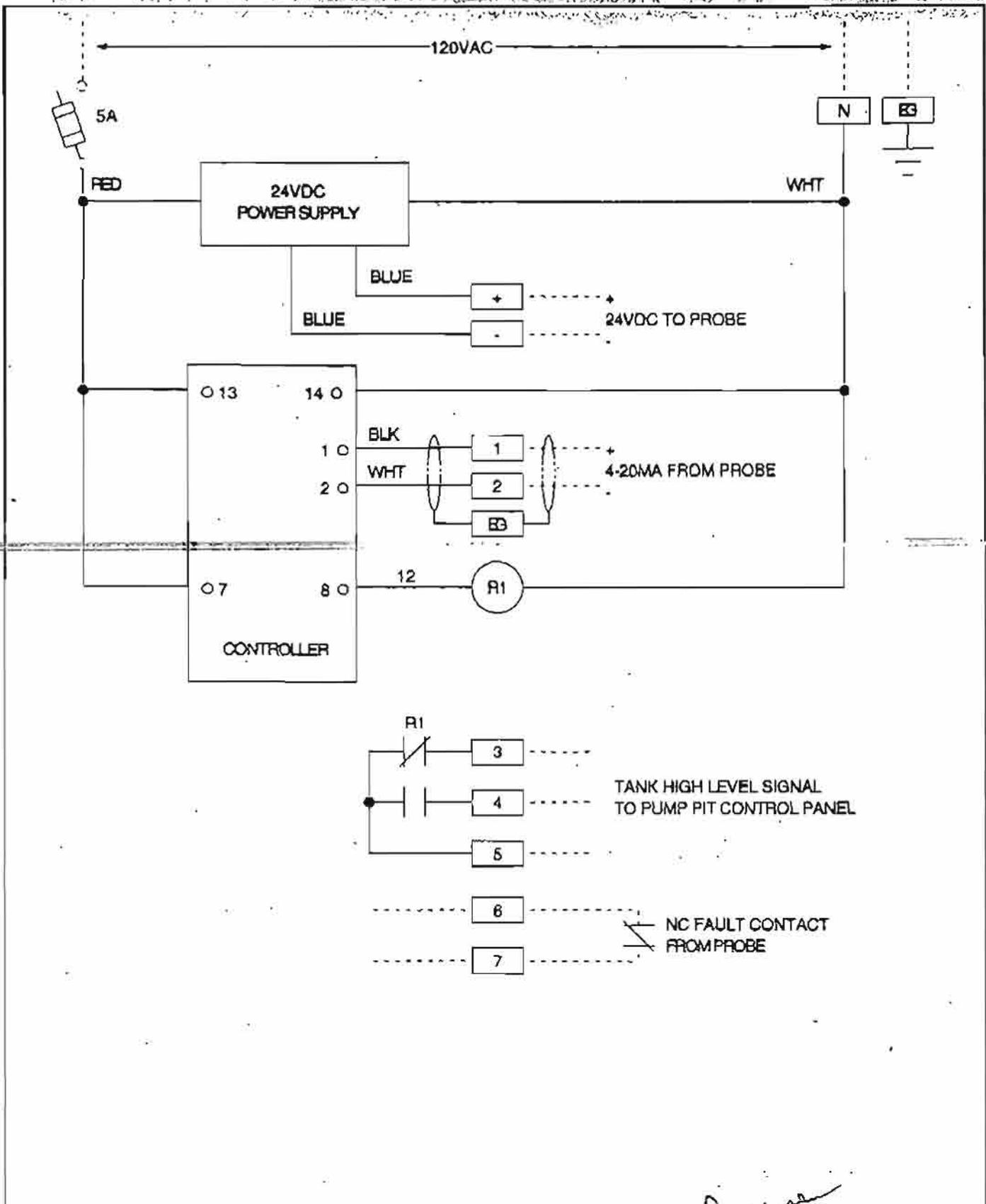
GEO-CON
Voorhees NJ

DATE 12/30/97

REV.

DRAWING NO.

PS3385.C4



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BENF ELD CONTROL SYSTEMS Inc. WHITE PLAINS NY 914-948-9231	RAMAPO LANDFILL TANK LEVEL CONTROL SYSTEM WIRING DIAGRAM <i>[Signature]</i>	DATE 11/18/96
	GEO-CON HILLBURN NY	REV.
		DRAWING NO. PS3385

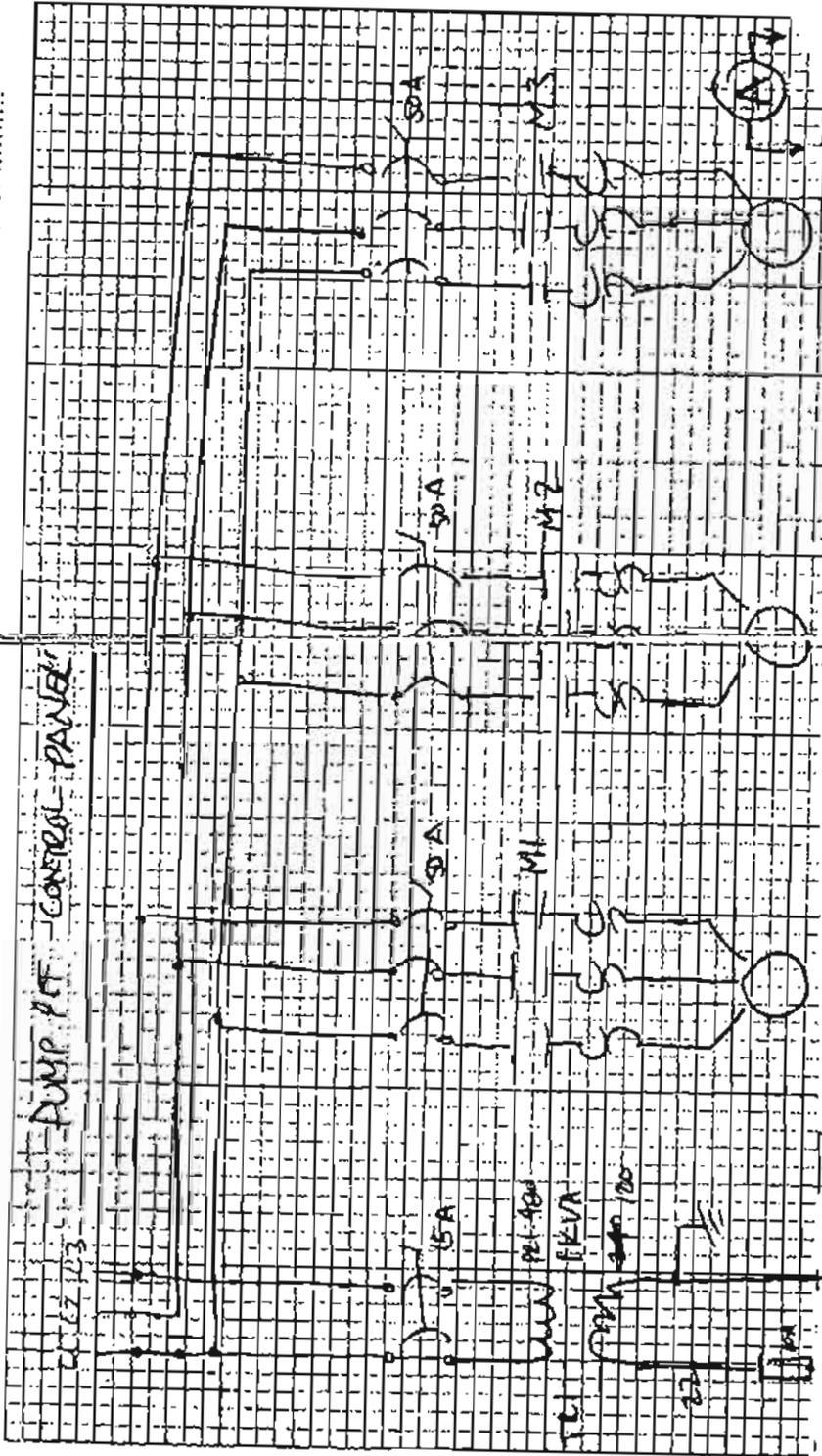
Environmental Restoration Systems

SUBJECT *Remaps Landfill*

PROJECT NUMBER.....
PHASE..... TASK.....
SHEET NUMBER..... OF.....

BY *RDS* DATE *8/20/97* CHECKED BY..... DATE.....

2167 123
PUMP #1 CONTROL PANEL



Brian H. Juppene