

EXHIBIT A.4

To

**ENVIRONMENTAL MONITORING, LABORATORY ANALYSIS
AND REPORTING SERVICES FOR CRRRA LANDFILLS
AGREEMENT**

**SCOPE OF SERVICES –WALLINGFORD
LANDFILL**

EXHIBIT A.4

SCOPE OF SERVICES

Environmental Monitoring, Laboratory Analysis and Reporting – Wallingford Landfill

Fiscal Years 2008, 2009, and 2010

BACKGROUND

The 82-acre Wallingford Landfill is located on the west side of South Cherry Street and Pent Road in the southeast portion of Wallingford, Connecticut. The landfill is bounded to the north by the Wallingford Sewage Treatment Plant and the Town of Wallingford Recycling and Leaf Composting Area, to the east by South Cherry Street and Pent Road, to the south by undeveloped land (the former Barberino property) which is owned by the Connecticut Resources Recovery Authority (CRRA), and to the west by the Quinnipiac River. A residential trailer park was formerly located on the former Barberino property. A general location plan showing the CRRA Wallingford Landfill and the former Barberino property is included as **Figure 1**.

Prior to September 4, 1988, the landfill was operated by the Town of Wallingford. Since that time, the CRRA has leased the landfill property from the Town of Wallingford consistent with the start-up operations of the Wallingford waste to energy facility, converting municipal solid waste to electricity and ash residue. From September 1988 to November 1995, ash residue as well as solid waste was placed at the landfill. Since November 1995, there have been no daily activities at the landfill except for the operation of a resident drop off area and bulky waste transfer station at the front of the landfill by the Town. Otherwise, the site is inspected, maintained and monitored on a routine basis.

A detailed site plan showing sampling locations is included as **Figure 2**. The landfill consists of the following waste management units, all of which have been closed:

- (a) MSW/Non-Processible Emergency by-pass Landfill (NPEL) Area: These disposal areas are located in the south-central portion of the site and have been utilized for the disposal of municipal solid waste (MSW) and non-processible/bulky wastes from the Wallingford Resource Recovery Facility. MSW disposal was conducted under private/town operations, while operation of the NPEL was overseen by CRRA.
- (b) RCRA Metal Hydroxide Cell: This cell, which is located in the northwest corner of the site, was operated between November 1980 and January 1984 for the disposal of approximately 3.8 million pounds of K063 hazardous waste and 0.2 million pounds of F006 hazardous wastes. A pre-RCRA metal hydroxide cell, located adjacent to the RCRA-regulated unit, was utilized for the disposal of similar metal hydroxide materials prior to November 1980.

- (c) Ash Residue Disposal Landfill: This disposal area is located in the southern section of the property, approximately 150 feet northwest of the intersection of Pent Road and Oliver Creek Road. The Connecticut Department of Environmental Protection (CTDEP) issued the permit for ash disposal on February 24, 1989, and the last load of ash residue was unloaded in this area on November 2, 1995. Grading of the final cover was completed in November 1996.
- (d) Former Bulky Waste Landfill: This area is located in the northeastern portion of the property near the intersection of Ball and South Cherry Streets. The CTDEP issued the permit for the bulky waste landfill on December 12, 1975, and the area was closed and given final cover in June 1992.

The site is equipped with various environmental control systems, including

- (a) A passive landfill gas venting system along the northern and western property lines, and
- (b) A stormwater collection and discharge system (overall site).

There is also an active resident drop-off area for MSW and bulky waste that is operated by the Town of Wallingford.

The landfill has various environmental permits, with specific sampling programs and reporting requirements associated with the various control systems and permits. Copies of all site-specific permits applicable to the environmental monitoring program, specifically groundwater discharge permit LF0000028, are included in **Appendix A**.

The former Barberino Property is bounded to the north by the Town of Wallingford Landfill, to the south by Cytec Industries, Inc. (formerly American Cyanamid) and to the east by Pent Road. The Quinnipiac River is located immediately west of the site. Environmental monitoring at the former Barberino property has been conducted quarterly since April 1993 to assess impacts to surface water and groundwater by leachate-impacted groundwater migrating onto the site from the Wallingford Landfill. CRRA purchased the former Barberino property in September 2001.

SCOPE OF SERVICES

Consultant's work shall be inclusive of all environmental monitoring and reporting required at the Wallingford Landfill and former Barberino property, unless otherwise indicated. Monitoring and reporting will be required for a three (3) year period starting July 1, 2007 and ending June 30, 2010.

- (c) Costs for monitoring work shall also include but are not limited to sample bottle preparation and delivery, sample collection, laboratory analysis, and reporting as further described in this Scope of Services.

The environmental media to be sampled under this Scope of Services include ground water, surface water, and stormwater. All sampling at the Wallingford Landfill will be performed to meet the requirements of all applicable permits issued to the Wallingford Landfill/CRRA by the fed-

eral, state, and local permitting authorities, as applicable. Refer to **Appendix A** for site-specific permit information. Since there are no applicable environmental permits associated with the former Barberino property, all sampling at the former Barberino property shall be performed as specified in this Scope of Services. All sample analyses shall be conducted by an analytical testing laboratory certified to perform such analyses by the State of Connecticut. The analytical testing laboratory will be subcontracted directly by the Consultant and approved by CRRA.

All work will be conducted pursuant to all applicable state and federal regulations and guidelines concerning groundwater, surface water, and stormwater sampling, monitoring and analysis. Consultant is to be familiar with and have reviewed all applicable landfill permits and requirements for site monitoring issued by CTDEP (and EPA, where applicable). Consultant shall be familiar with representative past monitoring reports prepared for the Wallingford Landfill and the former Barberino property, and shall prepare monitoring reports consistent in format with past monitoring reports, except that the monitoring results for both sites are to be reported under one cover. Consultant shall provide summary tables of data results, and reference, as applicable, drinking water standards and Connecticut Remediation Standards for monitoring wells, and surface water Numerical Criteria contained in the Connecticut Water Quality Standards. Consultant shall also be responsible for the timely submittal of stormwater discharge data to CRRA so that CRRA can meet its regulatory reporting obligations.

In accordance with the environmental permits for the Wallingford Landfill and with the historical monitoring program for the former Barberino property, Consultant shall conduct the monitoring program for the sampling points and parameters as summarized in **Tables 1 through 3**, on a quarterly basis except as otherwise indicated. In some instances, monitoring points may be inaccessible for regularly scheduled quarterly monitoring, such that arrangements should be made to sample the location(s) at other times. If it is not possible to sample in a timely manner within the quarterly monitoring event timeframe, CRRA will not be charged for sample collection and laboratory analysis for those portions of work not completed.

The environmental monitoring will include but not necessarily be limited to the following elements:

- Preparation for sampling, including bottle preparation, field measured parameter equipment, sample collection equipment, and means of access to sampling points.
- Completion of field (RCRA) data sheets for each sample point; modified as applicable for each type of sample point.
- Measuring of field parameters, and collection of samples in bottles for laboratory analysis and appropriate field and laboratory QA/QC in accordance with CTDEP's Solid Waste Management Program and EPA's Subtitle "D" regulations.
- Preservation and transport of samples to the laboratory.
- Analytical laboratory analyses of collected samples.

- Entering analytical results and other pertinent sample and/or laboratory test data into a database. Provide an electronic copy of the database to CRRA at the end of each calendar year to accompany the annual report, and after the completion of the April 2010 sampling event (i.e., the final sampling event under this Scope of Services).
- Data review and verification, cursory check for outliers, extreme exceedances and notification to CRRA of unusual results or “Significant Environmental Hazard” conditions under Public Act 98-134.
- Preparation of graphs and tables of data results, maps of sampling locations, groundwater elevation contours and isopleths of monitoring results as appropriate.
- Preparation of summary reports on status of each sample point and site environmental conditions.
- Preparation of draft quarterly and annual reports for CRRA review and comment prior to report finalization.
- Finalization, duplication, and distribution of reports following incorporation of CRRA comments.

The Consultant is responsible for maintaining clear access to all wells (i.e., by cutting back brush and trimming weeds and grass). Consultant is also responsible for maintaining well markers (i.e., stakes, flagging, and I.D. numbers) to assist field personnel in locating and identifying the wells.

The environmental monitoring program is outlined by task and description below. The format of the Not-To-Exceed Bid Price Form is consistent with the task listing that follows.

TASK 1: QUARTERLY ENVIRONMENTAL MONITORING, ANALYSIS, REPORTING AND ANNUAL REPORTING

Environmental permits issued to cover operations at the Wallingford Landfill require that quarterly monitoring of the ground water be completed. This CRRA Scope of Services requires that quarterly monitoring also be conducted at the former Barberino property, concurrent with the monitoring activities at the Wallingford Landfill. The activities under Task 1 of this Scope of Services describe the quarterly monitoring activities.

Task 1.1: Sampling and Documentation of Field Activities

Sampling Schedule

Quarterly environmental sampling of site ground water is to be performed in the following months:

- January
- April
- July
- October

Surface water sampling is to be performed on the former Barberino property on a semi-annual basis, in April and October. Sampling of groundwater and surface water can begin on the 1st day of the sampling month and must be completed by the last day of the sampling month.

Monitoring of Groundwater Wells

There are twenty-two (22) groundwater monitoring wells at the Wallingford Landfill and thirteen (13) groundwater monitoring wells at the former Barberino property that are monitored on a quarterly basis. **Table 1** summarizes the characteristics of each well. Consultant is responsible for supplying all equipment to the site as required for each quarterly monitoring event and its storage at a safe off-site location by Consultant's arrangement.

Due to the presence of the closed RCRA cell at the Wallingford Landfill, the Consultant shall develop and maintain a site-specific safety and health plan in accordance with 29 CFR 1910.120(b)(4). Additionally, the Consultant shall ensure that all sampling personnel "receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor," as required by 29 CFR 1910.120(e)(3)(ii). The Consultant shall also ensure that on-site supervisory personnel are trained in accordance with 29 CFR 1910.120(e)(4), and that all personnel (sampling personnel and supervisory personnel) are provided with annual refresher training under 29 CFR 1910.120(e)(8).

The following items are also highlighted for each quarterly sampling event:

- Keyed-alike well locks will be provided for all wells by CRRA.
- Permission to access off-site monitoring wells and surface waters will be coordinated through CRRA at the initiation of the monitoring contract. Access to some wells is by foot only, because of location and/or restrictions of vehicle use. Specifically, vehicles are NOT to be driven over the RCRA metal hydroxide cell or the pre-RCRA metal hydroxide cell.
- Consultant shall complete a "Monitoring Well Field Data Sheet" which summarizes well elevation data, well condition, purge data, observed water yield and quality comments, sampling data, and results of measured field parameters. An example of the proposed "Monitoring Well Field Data Sheet" is to be submitted for approval by CRRA before the first sampling event, at the initiation of the monitoring contract.
- Measure well's water depth using decontaminated equipment (depth to water, depth to bottom, depth of sample) referenced to top of PVC (or casing) and record on the data sheet.

- Provide an in-line meter (or equivalent methodology which mitigates exposure to the atmosphere) to concurrently measure pH, temperature, specific conductivity, dissolved oxygen (DO), and redox potential (RP), as applicable, during purging. Also, provide a device to measure turbidity. A minimum of four (4) readings of each parameter shall be taken and recorded during purging.
- Perform purging using dedicated bladder pump equipment [at twenty-three (23) of the sampled wells] or peristaltic pump with dedicated tubing [at twelve (12) of the sampled wells] at low flow rates, not taking the first reading until at least one pump volume plus one discharge tubing volume have passed. The purged groundwater may be discarded to the ground at the landfill. Sampling personnel are to monitor the drawdown in the wells and ensure that the drawdown is maintained at less than or equal to 0.3 feet during the entire purging and sampling process. Wells shall be purged at a rate of less than or equal to 300 ml/minute. Field parameter readings shall be recorded at a minimum of three minute intervals, until turbidity is stabilized such that three consecutive readings are within 10% of each other for readings >10 NTU, or readings are within 2 NTU of each other for readings <10 NTU. Per EPA's SOP, if the turbidity has not stabilized after four hours of purging, collect samples and provide full explanation of attempt to achieve stabilization. Provide a summary of periodic readings and time of reading for all parameters.
- Sample collection should proceed from high parameter volatility to low parameter volatility at a low flow rate. Samples for volatile parameters should be transferred slowly to the sample container to eliminate creation of air bubbles. Samples are to be collected in proper containers and properly preserved in the field.
- No filtering of samples is to occur, except where analysis of dissolved metals is specified. Where analysis of dissolved metals is specified, sample filtration is to be performed in the field during sample collection with an in-line 0.45-micron filter.
- Record all observations relating to the well sampling and any deviations from the sampling plan.

Surface Water Sampling

Surface water sampling consists of grab sample collection from as many as ten (10) surface water sampling locations at the former Barberino property on a semi-annual basis (April and October). The ten surface water sampling locations are designated as:

- SW-1
- SW-2
- SW-3
- SW-4
- SW-5
- SW-6
- SW-9
- SW-10
- SW-11
- SW-12

Surface water sampling shall consist of the collection of one grab sample from each surface water sampling location. A field data sheet shall be completed for each sample location. Field measurements of water temperature, air temperature, pH, specific conductance, and dissolved oxygen shall be recorded. Sampling equipment (i.e., peristaltic pump, dipper sampler, etc.), time and date of sample collection, sampler's name, depth of water, sample identification, and other pertinent information shall also be recorded on the field data sheet. In order to prevent the inadvertent collection of sediments during surface water sampling, surface water samples are to be collected only from those locations where the depth of water is at least one inch. All surface water samples collected for analysis of metals will be filtered in the field prior to acid preservation.

Preparation for Sampling

This task includes coordination between field monitoring personnel and the analytical laboratory for the bottle order, bottle delivery, sample preservation and chain of custody to complete the required sampling.

Sample collection scheduling shall allow enough time for completion of the sample analyses by the laboratory so that the quarterly reports can be assembled, reviewed, finalized and submitted in a timely manner according to permit requirements as further discussed below.

Consultant is responsible for coordinating equipment blanks, field blanks, trip blanks and duplicate samples as part of the sampling quality assurance program. In addition to any other approved EPA or CTDEP protocols, equipment blanks and field blanks are required for each day of sampling where non-dedicated equipment is used, with laboratory-supplied reagent water poured over the sampling equipment at the beginning of the sampling day and at the end of the sampling day and collected for analysis. Trip blanks, as supplied by the laboratory, are to be carried on each day that samples for VOC analyses are collected, and returned with the samples for analysis of USEPA's Appendix I VOC's. Duplicate samples are to be collected at two groundwater well locations (one well from the Wallingford Landfill, and one well from the former Barberino property) for each quarterly sampling event and analyzed for all the same parameters as the sampled wells.

As mentioned previously, ten of the monitoring wells at the Wallingford Landfill are equipped with dedicated 2-inch diameter bladder pumps (Marschalk brand SS/Teflon bladder pumps). Additionally, ten of the monitoring wells at the former Barberino property are equipped with Geoguard Master-Flo Model 57000M SS/Teflon Bladder Pumps (1.65" OD X 42" long with screen), while

the three deep wells at the former Barberino property are equipped with 2-inch diameter Grundfos submersible pumps (Grundfos MP1 Redi-Flo2 with 150' lead). All twenty-three pumps are owned by CRRA. The Consultant shall supply all equipment necessary to operate the bladder pumps and the Grundfos submersible pumps. Such equipment may include, but not necessarily be limited to, bladder pump controllers, oil-less air compressors, inert gas packs to drive the pump bladders, pneumatic hoses, fittings, Grundfos VFD controller, and a portable generator. It is the Consultant's responsibility to maintain the CRRA-owned pumps in good working order. This Scope of Services does not include costs associated with repairs to CRRA-owned pumps and equipment that may be necessary due to normal wear and tear. If the CRRA-owned pumps require maintenance, repair or replacement, the Consultant must notify CRRA, provide a price quote for the necessary work, and proceed with the work only after receiving approval from CRRA.

The Consultant shall also provide the peristaltic pump required for sampling those monitoring wells equipped solely with dedicated tubing for purging and sampling. The Consultant will also supply equipment required for measurement of field parameters. Field equipment calibration and decontamination shall be the responsibility of the Consultant. The Consultant shall supply any other equipment necessary to adequately and properly complete the work.

Field Measurements and Collection of Samples

This task includes measuring selected parameters in the field and collecting samples in laboratory-supplied bottles, varying with the sampling point's parameter matrix. Refer to **Table 2** for a summary of field and laboratory parameter requirements for each sampling point at the Wallingford Landfill and former Barberino property. **Table 1** provides summaries of monitoring well completion details with total well depth and screened interval depth of each monitoring well.

Consultant shall follow the "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846" (latest edition) and "RCRA Groundwater Monitoring" Draft Technical Guidance (latest edition) as well as all applicable CTDEP and USEPA regulations. Procedures described herein are not intended to be comprehensive, but to provide a clarification or to supplement the referenced regulations as they might pertain to certain site conditions. The various subsections below describe particulars for sampling at various types of sample locations.

Sampling methods described herein are to be utilized by Consultant during water quality monitoring events including monitoring of groundwater and surface water. Specific items that shall be performed during all water quality monitoring events and summarized in the quarterly reports include the following:

- Documentation of Field Activities

- Sample Handling
- Decontamination Procedures
- Monitoring and Sampling Techniques
- Field Quality Control Checks

Documentation of Field Activities shall include listing the procedures used to record data about the sampling event, the sampling locations, the samples themselves, and the handling and transport of the samples.

Sample Handling shall detail the source of the sample containers, sample preservation methods, and the chain-of-custody protocol that is followed from time of sample collection until sample acceptance by the laboratory performing the analysis.

Decontamination Procedures shall provide general data on field and in-house decontamination. Non-dedicated equipment used for purging, sampling, and filtering (to be completed only for analysis of dissolved metals) is to be decontaminated (unless replaced) between each sampling location. For the groundwater monitoring wells equipped with bladder or Grundfos submersible pumps, each pump is effectively “dedicated” to each sampling location. It is recommended in those instances where pumps are dedicated to individual wells, that they receive a thorough in-house decontamination as conditions warrant.

Monitoring and Sampling Techniques for groundwater and surface water locations shall include a description of the fundamental procedures for collection of samples. Specific procedures to be addressed include water level measurement; purging calculations, sample collection equipment and techniques utilized; and monitoring of field parameters (i.e., pH, temperature, specific conductivity, etc.) and their results. Surface water monitoring and sample techniques shall describe equipment purging (if applicable), monitoring of field parameters, method of filtering for dissolved metals and sample collection techniques.

Field Quality Control Checks shall describe typical QA/QC samples and their use. Monitoring events will include trip blanks, equipment blanks, field blanks, and duplicate samples. The trip blank is only associated with days when groundwater well monitoring is performed, because VOC’s are not analyzed in surface waters. The equipment blank and field blank are only necessary when non-dedicated sampling equipment is utilized for well purging or surface water sample collection. Duplicate samples will be collected at one (1) ground water monitoring well on the Wallingford Landfill, and at one (1) groundwater monitoring well on the former Barberino property.

Except where sample analysis in accordance with methods in 40 CFR Part 136 is required by permits, the methodologies to be utilized should be consistent with 40 CFR Part 258, Subpart E, Section 258.53 through 258.56, and as further detailed in EPA 530-R-93-017, "Solid Waste Disposal Facility Criteria - Technical Manual," November 1993; CTDEP's "Solid Waste Management Program Description", July 1993; USEPA's "RCRA Ground Water Monitoring Technical Enforcement Guidance Document", September 1986; and US EPA Region I Standard Operating Procedure GW-0001 - "Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells" (July 30, 1996 - Revision 2).

Task 1.2: Quarterly Laboratory Analysis

All sample analyses required under this Scope of Services shall be performed by a laboratory certified for such analyses by the Connecticut Department of Public Health or, in advance of any use, a laboratory approved in writing by the CTDEP. The laboratory shall analyze all samples submitted from the same monitoring event, at one time, such that duplicate samples and blanks are analyzed under the same conditions.

Preservation and Transport of Samples to Laboratory

Samples shall be properly preserved and kept cool. They shall be transported to the laboratory the same day they are collected per coordination with the lab by the Consultant's field personnel. Container types, preservatives and maximum holding times shall be per SW-846, latest edition, or 40 CFR 136, as applicable. Consultant is to coordinate re-sampling, at no additional cost to CRRA, if re-sampling is necessary due to loss of sample in bottle transport or in laboratory handling, or if the maximum holding times are exceeded.

Analytical Methods and Detection Limits

Analytical results for each parameter shall be reported together with the analytical method, method detection limits, date of analysis, and initials of analyst. The value of each parameter shall be reported to the maximum level of accuracy and precision possible. Monitoring required of surface water and groundwater which specify the use of analytical methods as listed in the permits and summarized in **Table 2** must be conducted to achieve the minimum levels for each of the parameters, where identified, unless an alternative method that is capable of achieving the minimum levels has been specifically approved in writing by the CTDEP.

Review of Lab Results, Quality Control Procedures and Invoices

Consultant is responsible for ensuring lab analyses are performed as required by the parameter list and that MDL limits are met. A summary of the lab's QA/QC procedures and results, including matrix spikes and surrogate recovery analyses, are to be reviewed by the Consultant and included in the quarterly

report. The laboratory must also provide signed "Laboratory Analysis QA/QC Certification Forms" that certify that the all reported data meet the CTDEP's requirements for "reasonable confidence." Consultant is to review the laboratory invoices for consistency with actual sample parameter analyses requested and completed.

Task 1.3: Quarterly Reports - Water Quality Monitoring

The following deadlines apply to the submission of finalized quarterly reports to the appropriate regulatory agencies:

Sampling Event	Report Deadline
January	February 28
April	May 31
July	August 31
October	November 30

Sampling shall be arranged to allow for a reasonable laboratory turnaround time for analysis and compiling of lab results, writing draft report, reviewing draft report, finalizing report and distributing report to appropriate parties.

The quarterly report shall include in the monitoring results an indication of parameters that exceed criteria appropriate to the sampling point of classification. This will include state and federal limits for maximum contaminant levels not to be exceeded in the aquifer(s) at the relevant point of compliance (per Subtitle D and permit requirements), groundwater and surface water protection criteria per CTDEP regulations in accordance with the classifications of the same, and acute aquatic life criteria for surface water locations.

The quarterly reports must include assessment of conditions of the groundwater monitoring wells and other sampling locations as applicable. The quarterly reports will also include a summary table of groundwater well construction details, and site maps which show groundwater contours in both the shallow overburden and the deep overburden aquifers across the two sites. The groundwater contours shall be developed on an AutoCAD drawing of the sites that includes site features and topography. CRRA will provide an AutoCAD disk of the sites for use by Consultant upon request.

During April and October, ground water elevation data will be collected at all available wells in the project vicinity as described in Task 1.4, regardless of whether or not the well is in the sampling program. The measured groundwater elevations at the additional well locations will be included on the groundwater contour maps. A Monitoring Well Field Data Sheet shall also be completed for each additional well.

Each quarterly report shall fully document the field activities and the laboratory work details, be formatted to support the annual report, and provide interim results and an update on impacts and exceedances. CRRA shall be notified immediately of

any significant variation from past results or exceedances of “Significant Environmental Hazard” reporting guidelines under Public Act 98-134.

A copy of the draft quarterly report, including sampling details and supporting analytical data, sample chains of custody, Monitoring Well Field Data Sheets, and a site map of groundwater elevations and possibly isopleths of results, is due to CRRA for review a minimum of ten (10) working days before the final report is due to the CTDEP. CRRA shall also be allowed sufficient time to review any other reports or forms prior to submittal to CTDEP.

Finalized quarterly reports are to be printed by the Consultant on double-sided pages. The report distribution and addresses will be provided. Six (6) finalized copies of each report are required to be generated by the Consultant. Consultant is responsible for mailing reports directly.

Task 1.4: Non-Sampled Well Condition Survey and Water Elevations

There are ten (10) ground water monitoring wells included in this sampling program that are not part of the quarterly sampling program as outlined herein. During the April and October sampling events, the ground water elevation shall be measured at each of the ten non-sampled wells, and a Monitoring Well Field Data Sheet (as described in Task 1.1) shall be completed to document each well’s condition. The groundwater elevations obtained at the non-sampled well locations should be used to supplement the groundwater contour maps developed as part of the applicable quarterly environmental monitoring report. Copies of the Monitoring Well Field Data Sheets shall be included in the applicable environmental monitoring report.

Task 1.5: Annual PCB, Dioxins, and Furans Monitoring, Lab Analysis and Reporting

Groundwater discharge permit number LF0000028 requires that three (3) wells (MW-3, MW-101A, and MW-200) be sampled for polychlorinated biphenyls (PCB’s), dioxins and furans annually, in July of each monitoring year. PCB’s are to be analyzed via EPA Method 8080, and dioxins and furans are to be analyzed via EPA Method 8280, as required by the permit. The Consultant will be responsible for performing the sampling for PCB’s, dioxins, and furans concurrent with the regular quarterly (July) sampling at these three wells.

The laboratory analytical results of the annual PCB, dioxin and furan monitoring, including calculations of the 2,3,7,8-TCDD toxicity equivalence, are to be summarized in the July quarterly report, including copies of the laboratory analytical reports.

Task 1.6: Annual Reports - Water Quality Monitoring

The annual report shall address the zone of influence of the discharge (defined as the area of soil and groundwater within which the treatment of the leachate by soils and mixing of leachate with groundwater occurs and could be reasonably expected to occur, and therefore within which some degradation of groundwater quality is antici-

pated to occur). The annual reports shall also provide an overall assessment of site conditions for the calendar year, including but not limited to the following:

- (a) Map depicting all groundwater and surface water monitoring locations, groundwater withdrawal locations, and the locations of the collection, treatment, and conveyance of stormwater;
- (b) Evaluation of groundwater and surface water quality, including graphical representations of monitoring results for at least the past three (3) years;
- (c) Condition of all monitoring wells and the need for repair or replacement of any wells;
- (d) Evaluation of the extent and potential extent of the leachate discharge to groundwater, and whether any impact on the surface water quality to any surface waters bodies including wetlands was detected or could reasonably be expected to occur;
- (e) Written request for modification of the groundwater and/or surface water monitoring program, as warranted by the data generated through the monitoring.

All annual reports are to be submitted as a draft to CRRA at least ten (10) working days prior to the submittal deadline of December 31st specified in permit number LF0000028. CRRA shall be supplied with electronic copies of all information included in the final annual report, as well as groundwater contour maps and other miscellaneous site plans in AutoCAD files.

Finalized annual reports are to be printed by the Consultant on double-sided pages. The report distribution and addresses will be provided. Six (6) finalized copies of the annual report are required to be generated by the Consultant. Consultant is responsible for mailing reports directly.

TASK 2: STORMWATER DISCHARGE SAMPLING, ANALYSIS AND REPORTING

The Wallingford Landfill is registered under the "General Permit for the Discharge of Stormwater Associated with Industrial Activity," issued October 1, 2002 and modified on July 15, 2003. The permit registration number is GSI000499.

In accordance with the General Permit, stormwater samples are to be collected and analyzed on an annual basis. Under this Scope of Services, annual sampling is to be completed by June 30th of each year. There are a total of two (2) locations that must be sampled annually: outfall 001 and outfall 003 (or outfall 003A if there is insufficient flow at outfall 003), both of which are outfall pipes that discharge to surface waters. Refer to Figure 2 for a map depicting the sampling locations.

Task 2.1: Stormwater Sampling

The General Permit requires that grab samples of stormwater be collected for analysis. The Consultant will also be required to collect a sample of uncontaminated rainfall, as required by the General Permit. The grab samples are to be collected from the sampling locations specified in the Stormwater Pollution Prevention Plan (SPPP) that has been prepared for the landfill and transfer station (refer to Figure 2). The Consultant is responsible for following proper sampling protocols to ensure that all collected samples are representative of the discharges and that contaminants are not artificially introduced into the samples.

Task 2.2: Laboratory Analysis

Samples shall be appropriately preserved and kept cool. They shall be transported to the laboratory the same day they are collected per coordination with the lab by Consultant. Container types, preservatives and maximum holding times per 40 CFR 136, latest revisions, shall be followed.

Both chemical analyses and acute toxicity biomonitoring shall be completed at each sampled outfall per the General Permit requirements. It is important to note that the samples from the two landfill outfalls must also be analyzed for the parameters specified in 40 CFR 445 (Landfill Point Source Category). The monitoring parameters are specified in **Table 3**.

Consultant is responsible for ensuring lab analyses are performed as required by the parameter list and that required methods are utilized. A summary of the lab's QA/QC procedures and results are to be reviewed. Consultant is to coordinate re-sampling at no additional cost to CRRA, if re-sampling is necessary due to loss of sample in bottle transport or in laboratory handling, or if the maximum holding times are exceeded. Consultant is to review the laboratory invoices for consistency with actual sample parameter analyses requested and completed.

Task 2.3: Reporting

CRRA is required to submit Stormwater Monitoring Reports (SMR's) to the CTDEP within ninety (90) days of the sampling event. In order to meet this reporting requirement, the Consultant shall provide to CRRA finalized laboratory reports, laboratory QA/QC results, sample chains of custody, and stormwater event data (i.e., sample date and time, sampler's name, magnitude of storm event, date and magnitude of previous storm event, etc.) within forty-five (45) days after the sampling event.

TABLE 1
Summary of Monitoring Well Construction
Wallingford Landfill and Former Barberino Property
Wallingford, Connecticut

Well Number	Dedicated Sampling Apparatus	Ground Elevation (feet)	Top of Steel Elevation (feet)	Measured Well Depth ^b (feet)	Well Bottom Elevation (feet)	Date of Installation
Upper Aquifer						
MW-1A	Tubing	58.50	62.37	26.77	35.60	09/01/81
MW-1B	Tubing	59.90	61.08	30.60	30.48	06/01/86
MW-2A	Tubing	59.50	61.13	32.05	29.08	11/01/88
MW-3	Tubing	22.60	23.59	11.90	11.69	09/01/81
MW-4R	Tubing	42.10	43.87	22.17	21.70	07/01/92
MW-5	Tubing	25.80	27.48	9.95	17.53	09/01/81
MW-9	Tubing	43.90	46.01	33.15	12.86	05/01/86
MW-10	Tubing	36.20	36.82	40.75	-3.93	05/01/86
MW-10A	Tubing	37.00	37.23	20.40	16.83	05/01/86
MW-11	Bladder Pump	49.80	51.12	72.55	-21.43	11/01/88
MW-12	Tubing	36.60	37.86	17.15	20.71	12/01/88
MW-13	Tubing	61.00	65.68	37.45	28.23	12/01/88
MW-100	Bladder Pump	51.70	53.90	40.62	13.28	11/01/83
MW-101R	Bladder Pump	54.50	55.84	40.37	15.47	07/01/92
MW-200	Tubing	29.10	30.64	14.45	16.19	12/01/88
MW-CEE1	Bladder Pump	N/A	34.59	12.35	22.24	11/24/92
MW-CEE2	Bladder Pump	N/A	37.48	18.18	19.30	11/24/92
MW-CEE3	Bladder Pump	N/A	31.46	13.88	17.58	11/11/92
MW-CEE4	Bladder Pump	N/A	30.37	14.54	15.83	03/26/93
MW-CEE5	Bladder Pump	N/A	37.82	14.13	23.69	03/25/93
MW-CEE6	Bladder Pump	N/A	34.95	14.02	20.93	03/29/93
MW-CEE7	Bladder Pump	N/A	30.88	14.87	16.01	03/26/93
MW-CEE8	Bladder Pump	N/A	29.05	14.80	14.25	03/29/93
MW-CEE9	Bladder Pump	N/A	27.99	14.52	13.47	03/26/93
MW-CEE10	Bladder Pump	N/A	32.15	14.82	17.33	03/29/93
Lower Aquifer						
MW-1	Bladder Pump	60.70	60.71	71.00	-10.29	10/23/01
MW-3A	Bladder Pump	35.60	37.02	165.00 ^a	-127.98	01/01/89
MW-9A	Bladder Pump	44.35	47.75	161.30 ^a	-113.55	09/11/02
MW-11A	Bladder Pump	49.70	51.19	186.00 ^a	-134.81	12/01/88
MW-12A	Bladder Pump	36.59	38.91	150.40 ^a	-111.49	09/16/02
MW-100A	Bladder Pump	52.00	53.30	136.00 ^a	-82.70	12/01/88
MW-101A	Bladder Pump	54.10	55.35	142.00 ^a	-86.65	12/01/88
MW-CEE6D	Grundfos Pump	N/A	34.45	174.5	-140.05	04/30/93
MW-CEE9D	Grundfos Pump	N/A	27.70	148.0	-120.30	04/16/93
MW-CEE10D	Grundfos Pump	N/A	31.86	151.5	-119.64	04/21/93

^a Historical depth to bottom of well casing

^b As measured from top of steel casing

Wells designated "MW-CEE-__" are located on the former Barberino property. All other wells are located on the Wallingford Landfill property.

N/A = Not Available

**Table 2
Monitoring Parameters
Wallingford Landfill and Former Barberino Property
Wallingford, Connecticut**

Parameters	Wallingford Landfill		Former Barberino Property	
	Nineteen (19) Wells	Three (3) Wells ¹	Thirteen (13) Wells ¹	Ten (10) Sur- face Water
Field Parameters:				
Depth to Water	Q	Q	Q	
Water Elevation (msl)	Q	Q	Q	
pH	Q	Q	Q	S
Temperature	Q	Q	Q	S
Specific Conductance	Q	Q	Q	S
Dissolved Oxygen	Q	Q	Q	S
Redox Potential	Q	Q	Q	S
Turbidity	Q	Q	Q	S
Inorganic Leachate Indicator Parameters:				
pH (Lab Analysis)	Q	Q	Q	S
Specific Conductance (Lab Analysis)	Q	Q	Q	S
Total Dissolved Solids (TDS)	Q	Q	Q	S
Total Suspended Solids (TSS)	Q	Q	Q	S
Alkalinity, Total	Q	Q	Q	S
Hardness	Q	Q	Q	S
Biochemical Oxygen Demand (BOD5)	Q	Q		
Chemical Oxygen Demand (COD)	Q	Q	Q	S
Chloride	Q	Q	Q	S
Nitrate (N)	Q	Q		
Ammonia (N)	Q	Q	Q	S
Total Organic Halogens (TOX)	Q	Q		
Total Organic Carbon (TOC)	Q	Q		
Sulfate, Total	Q	Q	Q	S
Fluoride	Q	Q		
Cyanide, Total	Q	Q		
Coliform Bacteria, Total	Q	Q		
Metals:				
Aluminum, Total	Q	Q	Q	
Aluminum, Dissolved				S
Antimony, Total	Q	Q		
Arsenic, Total	Q	Q		
Barium, Total	Q	Q	Q	
Barium, Dissolved				S
Beryllium, Total	Q	Q		
Cadmium, Total	Q	Q	Q	
Cadmium, Dissolved				S
Calcium, Total	Q	Q		
Chromium, Total	Q	Q		
Chromium, Hexavalent	Q	Q		
Cobalt, Total	Q	Q		
Copper, Total	Q	Q	Q	
Copper, Dissolved				S

**Table 2
Monitoring Parameters
Wallingford Landfill and Former Barberino Property
Wallingford, Connecticut**

Parameters	Wallingford Landfill		Former Barberino Property	
	Nineteen (19) Wells	Three (3) Wells ¹	Thirteen (13) Wells ¹	Ten (10) Sur- face Water
Iron, Total	Q	Q	Q	
Iron, Dissolved	Q	Q		S
Lead, Total	Q	Q	Q	
Lead, Dissolved				S
Magnesium, Total	Q	Q	Q	
Magnesium, Dissolved				S
Manganese, Total	Q	Q	Q	
Manganese, Dissolved	Q	Q		S
Mercury, Total	Q	Q		
Nickel, Total	Q	Q		
Potassium, Total	Q	Q	Q	
Potassium, Dissolved	Q	Q		S
Selenium, Total	Q	Q		
Silver, Total	Q	Q		
Sodium, Total	Q	Q	Q	
Sodium, Dissolved	Q	Q		S
Thallium, Total	Q	Q		
Vanadium, Total	Q	Q		
Zinc, Total	Q	Q	Q	
Zinc, Dissolved				S
Volatile Organic Compounds:				
VOC's in Appendix I of 40 CFR 258 via EPA Method 8260	Q	Q	Q	
Acrylamide via EPA Method 8032A	Q	Q	Q	
1,2-Dibromoethane (EDB); and 1,2-Dibromo-3-Chloropropane (DBCP) via EPA Method 504.1	Q	Q	Q	
Phenol & Total Phenolics:				
Method 9065	Q	Q		
Pesticides/Herbicides				
Methods 8081A & 8151A		Q ²		
Dioxins / Furans:				
Method 8280		A ³		
PCB's:				
Method 8080		A ³		
Q = Tested Quarterly S = Tested Semi-Annually in April and October A = Tested Annually in July				
Notes:				
1. For QA/QC purposes, one duplicate sample is to be collected from one of the three wells at the Wallingford Landfill that includes quarterly analysis for herbicides and pesticides, and one duplicate sample is to be collected from one of the thirteen wells at the former Barberino property.				
2. MW-1, MW-3, and MW-200 only.				
3. MW-3, MW-101A, and MW-200 only.				

**TABLE 3
STORMWATER SAMPLING PARAMETERS
Wallingford Landfill
Wallingford, Connecticut**

Parameter	Units	Required Analytical Method(s) ^{1,2}	Outfall 003	Outfall 001
Total Oil and Grease	mg/L	Per 40 CFR 136	✓	✓
Chemical Oxygen Demand	mg/L	Per 40 CFR 136	✓	✓
Total Suspended Solids ³	mg/L	Per 40 CFR 136	✓	✓
Total Phosphorous	mg/L	Per 40 CFR 136	✓	✓
Total Kjeldahl Nitrogen	mg/L	Per 40 CFR 136	✓	✓
Nitrate as Nitrogen	mg/L	Per 40 CFR 136	✓	✓
Total Copper	mg/L	Per 40 CFR 136	✓	✓
Total Lead	mg/L	Per 40 CFR 136	✓	✓
Total Zinc ³	mg/L	Per 40 CFR 136	✓	✓
Aquatic Toxicity (LC ₅₀)	%	See Note 5	✓	✓
pH ³	S.U.	Per 40 CFR 136	✓	✓
BOD ₅ ⁴	mg/L	Per 40 CFR 136	✓	✓
Ammonia (as N) ⁴	mg/L	Per 40 CFR 136	✓	✓
α-Terpineol ⁴	mg/L	Via EPA Method 625	✓	✓
Benzoic acid ⁴	mg/L	Via EPA Method 625 or 1625B	✓	✓
p-Cresol ⁴	mg/L	Via EPA Method 625 or 1625B	✓	✓
Phenol ⁴	mg/L	Via EPA Method 625 or 1625B	✓	✓
Aniline ⁴	mg/L	Via EPA Method 625 or 1625B		✓
Naphthalene ⁴	mg/L	Via EPA Method 625 or 1625B		✓
Pyridine ⁴	mg/L	Via EPA Method 625 or 1625B		✓
Arsenic ⁴	mg/L	Per 40 CFR 136		✓
Chromium ⁴	mg/L	Per 40 CFR 136		✓
pH of Uncontaminated Rainfall	S.U.	Per 40 CFR 136	✓	✓

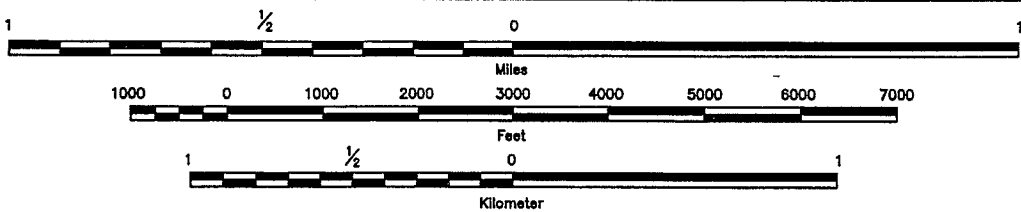
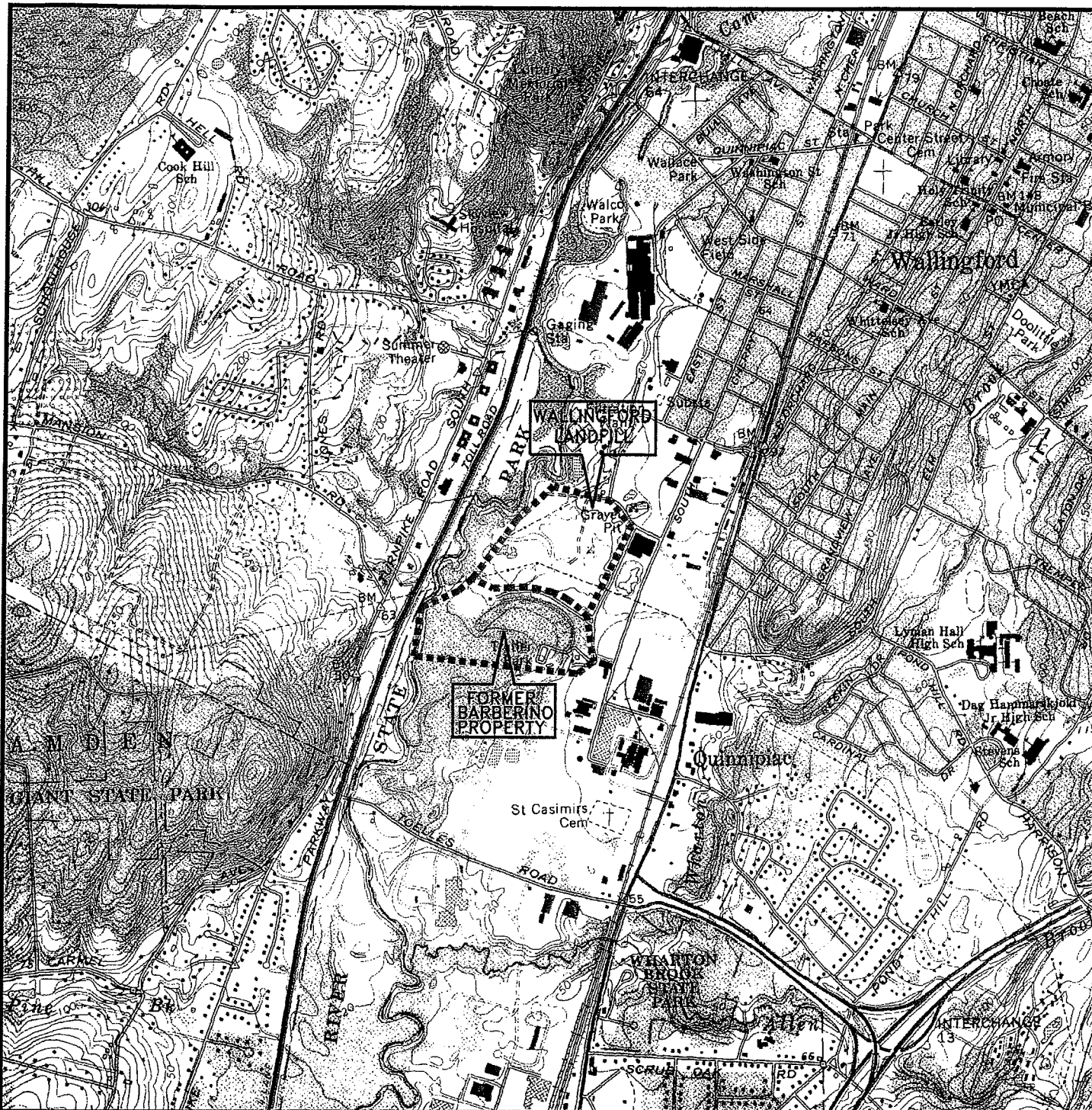
Notes:

1. All chemical analyses shall be performed using methods approved by the USEPA under 40 CFR 136 unless otherwise specified.
2. All chemical analyses shall be performed by a laboratory certified for such analyses by the Connecticut Department of Public Health.
3. TSS, Zinc, and pH are standard General Permit parameters, as well as parameters incorporated through 40 CFR 445.
4. Analysis of these parameters is required by the incorporation of 40 CFR 445 in the General Permit.
5. Acute toxicity biomonitoring shall be conducted according to the procedures specified in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 5th Edition (EPA 821-R-02-012), under the specific conditions listed in the General Permit.

FIGURES

Figure 1: Site Location Plan

Figure 2: Water Quality Monitoring Site Plan



USGS 7.5 MINUTE
 QUADRANGLE BASE MAP:
 WALLINGFORD, CONNECTICUT
 1967 - REVISED 1984

FIGURE 1
SITE LOCATION MAP

Compiled By: MAA	Date: 08-06-03
Reviewed By: RJD	Drawn By: MRH/JRM
Job No:	Filename:

**FORMER BARBERINO PROPERTY AND
 WALLINGFORD LANDFILL
 WALLINGFORD, CONNECTICUT**

LEGEND

- WALLINGFORD LANDFILL PROPERTY BOUNDARY
- FORMER BARBERINO PROPERTY BOUNDARY
- CONTOUR INTERVAL = 2 FEET
- ◇ MONITORING WELL
- ▽ SURFACE WATER SAMPLING LOCATION
- GROUNDWATER FLOW DIRECTION

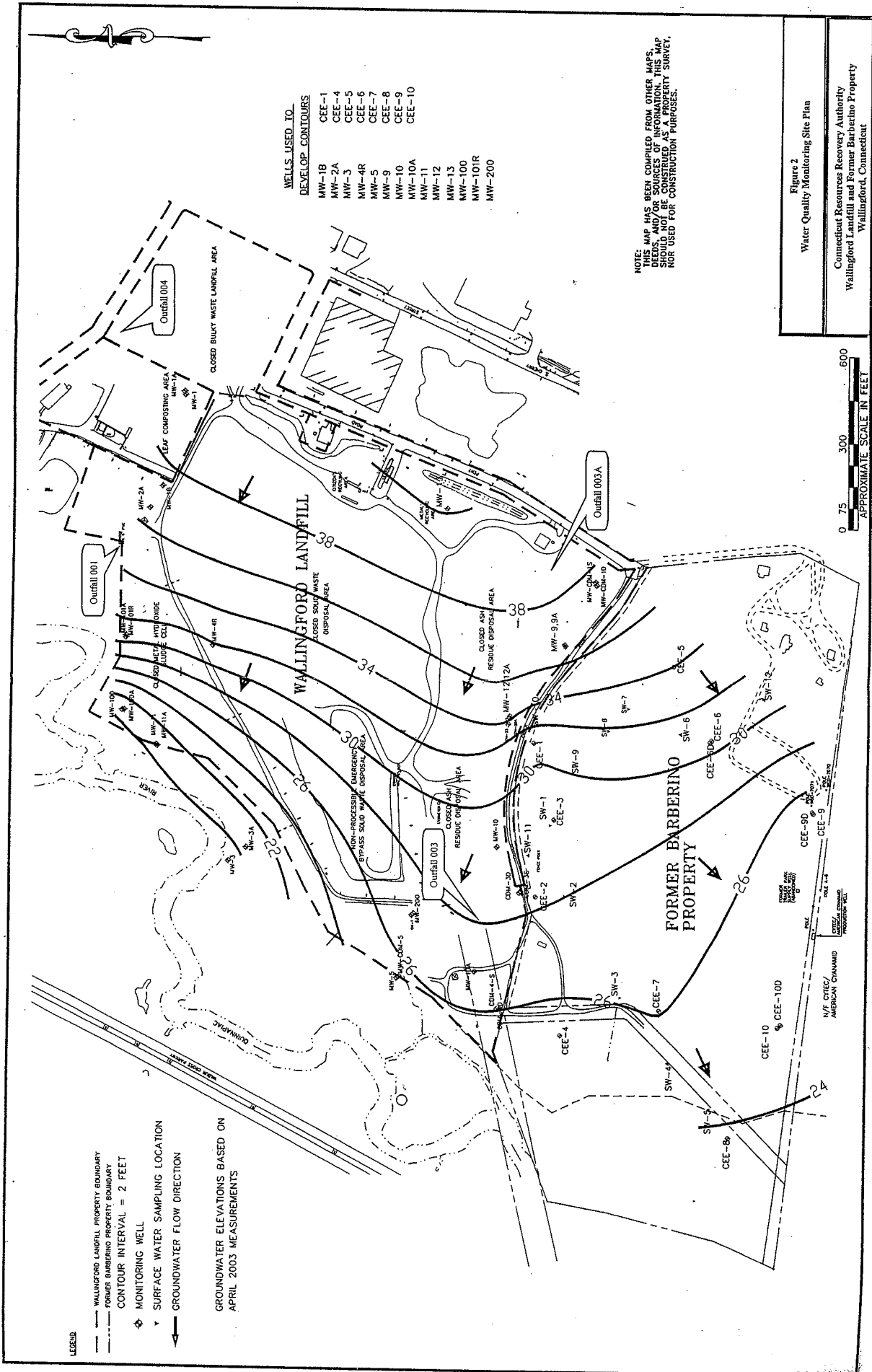
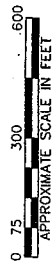
GROUNDWATER ELEVATIONS BASED ON APRIL 2003 MEASUREMENTS

- WELLS USED TO DEVELOP CONTOURS
- | | |
|---------|---------|
| MW-1B | CEE-1 |
| MW-2A | CEE-4 |
| MW-3 | CEE-5 |
| MW-4R | CEE-6 |
| MW-5 | CEE-7 |
| MW-9 | CEE-8 |
| MW-10 | CEE-9 |
| MW-10A | CEE-10 |
| MW-11 | CEE-11 |
| MW-12 | CEE-12 |
| MW-13 | CEE-13 |
| MW-100 | CEE-100 |
| MW-101R | CEE-101 |
| MW-200 | CEE-200 |

NOTE: THIS MAP HAS BEEN COMPILED FROM OTHER MAPS, DEEDS, AND/OR SOURCES OF INFORMATION. THIS MAP IS NOT TO BE CONSIDERED AS A PROPERTY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.

Figure 2
Water Quality Monitoring Site Plan

Connecticut Resources Recovery Authority
Wallingford Landfill and Former Barberino Property
Wallingford, Connecticut



APPENDIX A - Permits

**LF0000028 Discharge of Sanitary Landfill Leachate to Ground Water
(Dated July 18, 1989)
6 Pages**

7-21-89



STATE OF CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION



PERMIT

Connecticut Resource Recovery Authority
179 Allyn Street
Hartford, Conn. 06103

Re: DEP/WPG-148-113
Facility: Wallingford Landfill
Town of Wallingford
Quinnipiac River Watershed

Attention: Dennis J. Martin

This PERMIT modification is issued in accordance with Section 22a-430 of the Connecticut General Statutes, as amended. The Commissioner of Environmental Protection (hereinafter "the Commissioner") has found that the discharge from the operation and maintenance of the Wallingford Sanitary Landfill, as described below, will not cause pollution of the waters of the state.

- Description - Sanitary Landfill Leachate (Code 305002)
- Discharge Location - Groundwaters in the watershed of the Quinnipiac River (Basin Code 5200)
- Present/Future Water Quality Standard - GB/GC
- Average Daily Discharge Rate - 27,300 gallons per day
- Disposal Area Design Size 42.6 (acres)

The Commissioner, acting under Section 22a-430, hereby permits the Connecticut Resource Recovery Authority to operate and maintain a sanitary landfill with the resultant leachate discharged to the groundwaters of the state in accordance with the following conditions:

- 1) The sanitary landfill shall be operated and maintained in accordance with plans and specifications approved by the Assistant Director of Water Compliance on February 16, 1988. The sanitary landfill site consists of an 82 - acre parcel of land adjacent to the east bank of the Quinnipiac River and south of the Wallingford Sewage Treatment Plant. This permit allows landfilling to occur in a 32.1 - acre parcel as shown on plate No. 2, Landfill Expansion Study, Wallingford Landfill, Proposed Horizontal Expansion prepared by Fuss & O'Neill, Consulting Engineers, Revised November 4, 1987, in a 3.1 acre parcel as shown on the plan entitled As-Built Plan, By-Pass Area, Southwest Corner-Wallingford Landfill prepared by Fuss & O'Neill, Inc. dated February 1989 and in a 7.4 acre ash/residue disposal area as shown on plate No. 3, Groundwater Monitoring Program, Wallingford Landfill, prepared by Fuss & O'Neill, Consulting Engineers, dated December, 1988.

2) The groundwaters shall be monitored as follows:

A) Groundwater monitoring shall be conducted at the following locations; as identified on plate No. 3 of the report entitled "Groundwater Monitoring Program", prepared by Fuss & O'Neill, Inc. revised December, 1988.

- W-1:	Well #1	(up-gradient)
- W-2:	Well #1A	(up-gradient)
- W-3:	Well #1B	
- W-4:	Well #2A	
- W-5:	Well #3	
- W-6:	Well #3A	
W-7:	Well #4	
- W-8:	Well #5	
- W-9:	Well #9	
- W-10:	Well #9A	
- W-11:	Well #10	MW 4R
- W-12:	Well #10A	MW 101R
- W-13:	Well #11	
- W-14:	Well #11A	
- W-15:	Well #100	
- W-16:	Well #100A	
W-17:	Well #101	
- W-18:	Well #101A	
- W-19:	Well #12	
- W-20:	Well #12A	
- W-21:	Well #13	
- W-22:	Well #200	
W-23:	LC-1	
W-24:	DX-1	

B) Groundwater samples from each of the monitoring locations described in paragraph 2(A) shall be collected quarterly (four times per year) and analyzed for the following parameters:

1. Water level	(706)	18. Aluminum	(101)
2. Total Dissolved Solids (TDS)	(613)	19. Arsenic	(103)
3. Total Suspended Solids (TSS)	(614)	20. Barium	(104)
4. Alkalinity	(602)	21. Cadmium	(140)
5. COD	(303)	22. Chromium-Total	(109)
6. BOD-20 day	(302)	23. Copper	(111)
7. Dissolved Iron	(134)	24. Potassium	(142)
8. Dissolved Manganese	(139)	25. Lead	(136)
9. Ammonia	(201)	26. Magnesium	(135)
10. Nitrate	(204)	27. Mercury	(117)
11. Chloride	(502)	28. Nickel	(119)
12. Sodium	(620)	29. Vanadium	(126)
13. Hardness	(606)	30. Selenium	(120)
14. T.O.C.	(306)	31. Silver	(122)
15. pH	(609)	32. Sulfates	(507)
16. Conductivity	(611)	33. Zinc	(138)
17. Volatile Organics	(892)		
(EPA Methods 8010 & 8020)			

In addition at groundwater monitoring locations W-1, W-5, W-22, W-23, and W-24 groundwater samples shall be analyzed for the following parameters annually (in the July Sampling period):

34. Total Dioxins and Furans (EPA Method 8280) (985)
 35. PCB's (582)

- C) Following measurement of the water level in the monitoring wells, the wells shall be pumped immediately prior to sampling until at least three (3) times the volume of water standing in the well is evacuated to insure that a representative sample of the groundwater is obtained. All ground water samples shall be filtered in the field to remove excess suspended solids except for those samples to be analyzed for volatile organic compounds. The samples shall be analyzed by a laboratory certified by the State Health Department. All samples shall be placed in the appropriate container for the test to be conducted.
- 3) The pollutant load from the landfill, as defined by the Ultimate Oxygen Demand (U.O.D.) of the leachate will be added to and accounted for, in the NPDES Permit No. CT0100617 for the Town of Wallingford Water Pollution Control Facility after installation of facilities as required by Order No. 1262. The Connecticut Resource Recovery Authority shall be considered in compliance with this permit for Ultimate Oxygen Demand if the following condition is met:

Total average monthly quantity of ultimate oxygen demand as given in paragraph 2A of NPDES Permit No. CT0100617 is less than or equal to the summation of average monthly quantity ultimate oxygen demand for discharge Serial No. 001 - NPDES Permit No. CT0100617 (Wallingford Water Pollution Control Facility) and the Average Monthly Quantity Ultimate Oxygen Demand for the Wallingford Landfill, DEP/WPC-148-113 as calculated in paragraph 5 below.

- A) The average monthly quantity of U.O.D. shall be computed as kg/day. The U.O.D. is defined as: $U.O.D. = BOD_{20} + 4.6 (NH_3)$. BOD_{20} = Biochemical Oxygen Demand (20 Day); NH_3 = Ammonia. The Wallingford Landfill pollutant load is defined by the Ultimate Oxygen Demand (U.O.D.) of the leachate. The U.O.D. of the leachate shall be determined as the arithmetic average of the U.O.D. for monitor wells W-3, W-5, W-10A, W-100 and W-101 using computed groundwater flow at the time of sampling as follows:
1. The July monitoring data shall be used to compute the average monthly U.O.D. to determine compliance for the June 1 to September 30 period.
 2. The October monitoring data shall be used to compute the average monthly U.O.D. to determine compliance for the October 1 to October 30 period.
 3. The January monitoring data shall be used to compute the average monthly U.O.D. to determine compliance for the November 1 to March 31 period.

4. The April monitoring data shall be used to compute the average monthly U.O.D. to determine compliance for the April 1 to May 31 period.
5. The U.O.D. analysis of Wells 3, 5, 10A, 100, and 101 shall be averaged based on the relative transmissivities at the individual wells in accordance with the formula below:

$$E \text{ average} = E_3(T_3/T_{\text{Total}}) + \dots + E_{101}(T_{101}/T_{\text{Total}})$$

Where E average = average chemical quality

E_3 = quality at Well 3

T_3 = transmissivity at Well 3

T_{Total} = transmissivity at pertinent observation wells
(i.e. wells 3, 5, 10A, 100 and 101)

6. Transmissivities (see Analyses of Wallingford Landfill Ultimate Oxygen Demand, Dec. 1987 and letter dated Jan. 14, 1988, prepared by Fuss & O'Neill)

<u>Well</u>	<u>Transmissivity</u>
3	146
5	327
10A	86
100	105
101	118

7. Leachate Flow Determination

- a. Flow to River (Q) = K (permeability) x A (area of downgradient system) x i (hydraulic gradient)
- b. However, A area = b (saturated thickness) x W (width of plume)
- c. Therefore Q = K x b x W x i or TWI
- d. W = 1970' (effective): T = defined in F above.

- 4) The sampling, testing and pollutant load determination performed according to paragraphs 2 and 3 shall be done according to this schedule:

SAMPLES SHALL BE COLLECTED
IN THE FOLLOWING MONTHS

RESULTS SHALL BE REPORTED BY:

JANUARY
APRIL
JULY
OCTOBER

FEBRUARY 28
MAY 31
AUGUST 31
NOVEMBER 30

The results shall be reported to the Director of the Solid Waste Unit and Director of the Water Compliance Unit of the Department of Environmental Protection at 122 Washington Street, Hartford, Connecticut 06106. A copy of the sampling results shall also be sent to the Health Officer of the Town of Wallingford. A copy of the pollutant load determination shall also be sent to the Environmental Coordinator of the Town of Wallingford.

- 5) Beginning on December 31, 1988 and annually on that date thereafter, a summary report of the monitoring program shall be submitted for the review and approval of the Commissioner. The report shall include an assessment of changing trends in leachate concentration or constituents, impact on adjacent surface waters, changes in plume location, changes in the ground water levels, and potential impact on nearby water supply wells.
- 6) The zone of influence of the discharge which is hereby permitted is restricted to property owned by the Town of Wallingford. The zone of influence is defined as the soil and groundwater area needed to allow the treatment of leachate by soils and mixing of leachate with groundwaters and in which the groundwaters could be in violation of pertinent Federal and State drinking water standards.
- 7) Prior to disposing of ash/residue in any section of the 7.4 acre interim ash disposal area other than the shaded area shown on the as-built plan of the ash residue disposal area submitted on December 9, 1988, by Fuss & O'Neill, Inc., submit verification that the site has been prepared in accordance with the plans and specifications approved by the Assistant Director of Water Compliance on February 16, 1988.

This PERMIT requires the payment of an annual compliance determination fee as set forth in Section 22a-430-7 of the Regulations of State Agencies.

This PERMIT modification is issued under Section 22a-430 and shall expire on March 4, 1993.

The Commissioner reserves the right to make appropriate revisions to the permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the Clean Water Act or the Connecticut General Statutes. The PERMIT as modified or reissued under this paragraph may also contain any other requirements of the Clean Water Act or Connecticut General Statutes then applicable.

This permit shall be subject to the following sections of the Regulations of Connecticut State Agencies which are hereby incorporated into this permit:

Section 22a-430-3 General Conditions

- (a) Definitions
- (b) General
- (c) Inspection and Entry
- (d) Effect of a Permit
- (e) Duty
- (f) Proper Operation and Maintenance
- (g) Sludge Disposal
- (h) Duty to Mitigate

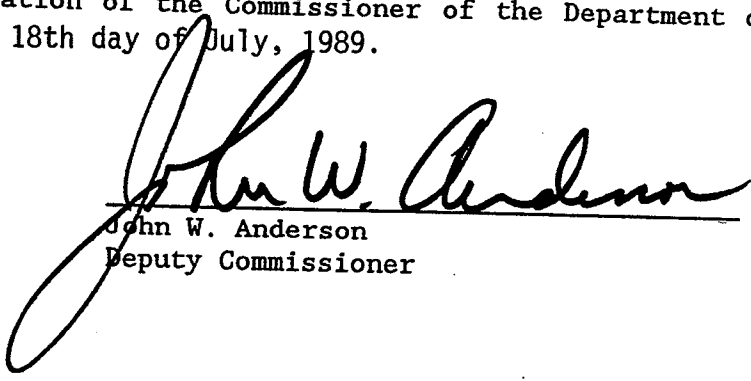
- (i) Facility Modifications; Notification
- (j) Monitoring, Records and Reporting Requirements
- (k) Bypass
- (l) Conditions Applicable to POTWs
- (m) Effluent Limitation Violations (Upsets)
- (n) Enforcement
- (o) Resource Conservation
- (p) Spill Prevention and Control
- (q) Instrumentation, Alarms, Flow Recorders
- (r) Equalization

22a-430-4 Procedures and Criteria

- (a) Duty to Apply
- (b) Duty to Reapply
- (c) Application Requirements
- (d) Preliminary Review
- (e) Tentative Determination
- (f) Draft Permits, Fact Sheets
- (g) Public Notice, Notice of Hearing
- (h) Public Comments
- (i) Final Determination
- (j) Public Hearings
- (k) Submission of Plans and Specifications. Approval.
- (l) Establishing Effluent Limitations and Conditions
- (m) Case by Case Determinations
- (n) Permit Issuance or Renewal
- (o) Permit Transfer
- (p) Permit Revocation, Denial or Modification
- (q) Variances
- (r) Secondary Treatment Requirements
- (s) Treatment Requirements for Metals and Cyanide
- (t) Discharges to POTWs - Prohibitions

Your attention is especially drawn to the notification requirements of subsection (i)(2), (i)(3), (j)(6), (j)(9)(C), (j)(11)(C), (D), (E), and (F), (k)(3) and (4) and (l)(2) of Section 22a-430-3.

Entered as a Permit modification of the Commissioner of the Department of Environmental Protection on the 18th day of July, 1989.


 John W. Anderson
 Deputy Commissioner

APPLICATION NO. 84-273
 PERMIT NO. LF0000028
 ORDER NO. WC9051M