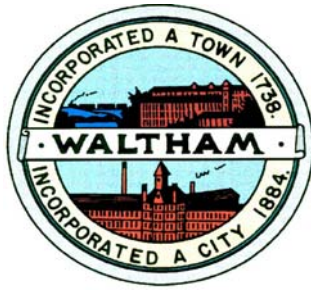


The City of Waltham



**Invites
Interested Parties
To propose the best offer and or bid
For the service or product herewith described:**

**Landfill Assessment,
Woerd Avenue**

The bid opening will be held: 10:00 AM Thursday March 19, 2015

Pre-bid meeting and project briefing: 10:00AM Thursday March 12, 2015

(Meet in the back Parking Lot at the end of Cove Street

Last day for Questions: 12 noon Friday March 13, 2015

Phone: 781-314-3244, Fax: 781-314-3245

Table of Contents:

- **Invitation to Bid**
- **Intent of the Project**
- **Agreement**
- **Instructions**
- **General Conditions**
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Invitation to Bid

The City of Waltham

Purchasing Department

REQUEST FOR BID (RFB)

Under the rules of M.G.L. Chapter 30b, the Chief Procurement Officer of the City of Waltham Purchasing Department hereby requests sealed bids for:

Landfill Assessment, **Woerd Avenue**

Price Proposals will be received at the office of the Purchasing Agent, City Hall, 610 Main Street, Waltham MA 02452, until,

The bid opening will be held: **10:00 AM Thursday March 19, 2015**

Pre-bid meeting and project briefing: **10:00AM Thursday March 12, 2015**

(Meet in the back Parking Lot at the end of Cove Street

Last day for Questions: **12 noon Friday March 13, 2015**

Specifications and information available on line by visiting the Waltham Purchasing Department web site at www.city.waltham.ma.us/open-bids

BIDS MUST BE SIGNED AND ENCLOSED IN A SEALED ENVELOPE AND MARKED:

BID FOR: Landfill Assessment

If the Bidder is a corporation, state your correct corporate name and State of incorporation. If Bidder is a partnership, state names and addresses of partners. If Bidder is a trust or other legal entity, state correct names and addresses of trustees or names and address of those legally authorized to bid and enter into contracts.

EXCEPTION OR ALTERNATES TO SPECIFICATIONS, TERMS OF SALE, AND DISCOUNTS AVAILABLE, MUST BE INCLUDED IN THE BID PRIOR TO OPENING DATE.

Intent of Project

The City of Waltham (City) is requesting proposals for professional services to be performed by a Professional Engineer with a background and experience in conducting landfill assessments related to closure of municipal solid waste landfills.

AGREEMENT

CITY OF WALTHAM

ARTICLE 1. This agreement, made this _____ day of _____, 2015 by and between the CITY OF WALTHAM, party of the first part, hereinafter called the CITY, by its MAYOR, and

_____ hereinafter called the CONTRACTOR.

ARTICLE 2. Witnesseth, that the parties to this agreement, each in consideration of the agreement on the part of the others herein contained, do hereby agree, the CITY OF WALTHAM for itself, and said contractor for his heirs, executors, administrators and assigns as follows:

To furnish all equipment, machinery, tools and labor, to furnish and deliver all materials required to be furnished (except as otherwise specified) and deliver in and about the project and to do and perform all work in strict conformity with the provisions of this Contract and of the Notice to Bidders, bid, Project Manual, and Drawings hereto annexed. The said Notice to Bidders, bid, Project Manual, and Drawings are hereby made a part of this contract as fully and to the same effect as if the same had been set forth at length and incorporated in the contracts.

ARTICLE 3. In consideration of the foregoing premises the CITY agrees to pay and the CONTRACTOR agrees to receive as full compensation for everything furnished and done by the CONTRACTOR under this contract, including all work required by not included in the items herein mentioned, and also for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any unforeseen obstruction or difficulty encountered in the prosecution of the work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the work specified, and for well and faithfully completing the work, and the whole thereof, as herein provided, such prices as are set forth in the accompanying bid.

Date for final completion of the project is 120 days from the date of the Notice to Proceed (NTP).

This Agreement entered into as of the day and year first written above.

CITY OF WALTHAM, MASSACHUSETTS

FOR THE CITY

Jeannette A. McCarthy, MAYOR,
City of Waltham
Date: _____

John B. Cervone, City Solicitor
Date: _____
APPROVED AS TO FORM ONLY

Catherine Cagle, Planning Director
Date: _____

Joseph Pedulla, CPO
Date: _____

Paul Centofanti, Auditor
Date: _____

**I CERTIFY THAT SUFFICIENT FUNDS
ARE AVAILABLE FOR THIS CONTRACT**

FOR THE COMPANY

CONTRACTOR (Signature),
Date: _____

Company

Address

Instructions

INSTRUCTIONS FOR BIDDERS

1. **READ ALL DOCUMENTS.**

Bidders should familiarize themselves with all the documents contained herein; it is mandatory that all Bids be in compliance with all the provisions contained in said documents.

2. **FORMS AND ATTACHMENTS.**

Bids are to be completed on the forms provided **ONLY** and enclosed in a sealed envelope marked on the outside "BID (title)" and the name and address of bidder. Attachments submitted in addition to the Waltham Purchasing Department produced forms may not be considered.

3. **PRINTED OR TYPED RESPONSE.**

All information must be typewritten or printed in ink, including the price the bidder offers in the space as provided on the bid form.

4. **CORRECTIONS.**

Bids that are submitted containing cross outs, white outs or erasures, will be rejected.

All corrections or modifications to the original bid are to be submitted in a separate envelope, properly marked on the outside, "CORRECTION/ MODIFICATION TO BID (title)" and submitted prior to the bid opening.

ALL DOCUMENTS SUBMITTED WITH YOUR RESPONSE WILL BE INCORPORATED INTO THE CONTRACT BY REFERENCE.

5. **PRICE IS ALL INCLUSIVE.**

Bid prices shall encompass everything necessary for furnishing all items, materials, supplies or services as specified, and in accordance with the specifications, including proper packing, cost of delivery, and in the case of services, completion of same, as per specifications.

6. **PRICE DISCREPANCY.**

In the event of a discrepancy between the Unit Price and the Extension, the Unit Price shall prevail.

7. **EXPLANATIONS, EXCEPTIONS**

Explanations, exceptions or other information pertinent to the specifications may be made in writing and included in the same envelope with the bid.

8. **BID DEPOSITS** *(if Required)*.

Bid deposits are to be made payable to the City of Waltham. In the event that the successful bidder fails to execute a Contract within (10) days of the receipt of said contract, such security shall be retained by the city as liquidated damages. Unsuccessful bidders' deposits will be returned immediately following the award to said successful bidder.

9. **WITHDRAW.**

A Bid may be withdrawn by written request prior to the schedule for the Bid Opening. No withdrawals are permitted after the bid opening date and time. Withdrawals after the bid opening date will cause the forfeit of the bid Deposit.

10. **AWARD.**

Bids will be awarded not later than (90) ninety days after the scheduled bid opening date, unless otherwise stated, in the specifications. Unless otherwise specified, bids will be evaluated on the basis of, completeness of your RFP response, responsiveness, responsibility, best price and experience.

11. **AWARD CRITERIA.**

Qualified and responsive proposals will be evaluated based on Price, Technical, and Compliance requirements.

12. **DISCOUNTS.**

Discounts for prompt payments will be considered when making awards.

13. **TAX EXEMPT.**

Purchases by the City of Waltham is exempt from any Federal, State or Massachusetts Municipal Sales and/or Excise Taxes.

14. **SAMPLES** *(if Required)*.

The City of Waltham may require the submission of samples either before or after the awarding of a contract. Samples are to be submitted, at no charge to the City, so as to ascertain the product's suitability. If specifically stated in the Bid that samples are required, said samples must be submitted with the Bid prior to the Official Bid Opening.

Failure to submit said samples would be cause for rejection of Bid. All samples must be called for and picked up within (30) thirty days of award or said samples will be presumed abandoned and will be disposed of.

15. **ACTIVE VENDOR LIST.**

Vendors who wish to remain on the Active Bid List must either submit a Bid, No Bid, or a letter requesting same, no later than the Official Bid Opening. This is applicable to those vendors who have received the Invitation to Bid.

16. **FUNDS APPROPRIATION.**

THE CONTRACT OBLIGATION ON BEHALF OF THE CITY IS SUBJECT TO PRIOR APPROPRIATION OF MONIES FROM THE GOVERNMENTAL BODY AND AUTHORIZATION BY THE MAYOR.

17. **THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS, OR ANY PART OF ANY BID, WHICH IN THE OPINION OF THE AWARDING AUTHORITY, IS IN THE BEST INTERESTS OF THE CITY OF WALTHAM.**

18. **THE TAX ATTESTATION CLAUSE, CERTIFICATION OF NON-COLLUSION AND THE CERTIFICATE OF VOTE AUTHORIZATION,** are required by statute and are an integral part of the Invitation for Bid and must be completed and signed by the person submitting the Bid, or by the person/persons who are officially authorized to do so. Failure to do so may disqualify the bid.

19. **STANDARD OF QUALITY.**

Where, in the specifications, one certain kind, type, catalog number, brand or manufacturer of material is named, it shall be regarded as the required standard of quality. Where two or more are named, these are presumed to be equal and the Bidder may select one or the other. If the Bidder proposes to offer a substitute as an equal, he shall so indicate on the Bid Form, the kind, type, catalog number, brand, or manufacturer of material that is offered as an equal, and describe where it differs from the specifications. Substituted items must be capable of performing all the functions and/or operational features described or indicated in the specifications. Failure to indicate the description of any substitute item on the Bid will be interpreted to mean that the Bidder will furnish the item or service as specified.

20. MODIFICATION.

No agreement, understanding, alteration or variation of the agreement, terms or provisions herein contained shall bind the parties, hereto unless made and executed in writing by the parties hereto.

21. ASSIGNMENT.

The final payment for work done under this Contract shall be made only after the Contractor has signed a statement under the penalty of perjury, certifying that he has completed the work described in the final estimate. Neither party hereto shall assign this Contract or sublet it in part or as a whole without the prior written consent of the other party hereto. The Contractor shall not assign any sum or sums due or becoming due to him hereunder without the prior written consent of the City.

22. DELIVERIES (if Required).

a) The Contractor shall pay all freight and delivery charges. The Waltham Purchasing Department does not pay for shipping and packaging expenses. Items must be delivered as stipulated in the specifications. All deliveries must be made to the inside of city buildings. Sidewalk deliveries will not be accepted. City personnel are not required to assist in the deliveries and contractors are cautioned to notify their shippers that adequate assistance must be provided at the point of delivery, when necessary.

b) All items of furniture must be delivered inside the building, set up, in place and ready for use. Deliveries are to be made between the hours of 8:30 a.m. and 3:00 p.m., Monday through Friday, except on holidays.

c) All damaged items, or items which do not comply with specifications will not be accepted and title therefore will not vest to the Waltham Purchasing Department until such items are accepted and signed for, in good order, by the receiving department.

d) The contractor must replace, without further cost to the Waltham Purchasing Department, such damaged or non-complying items before payment will be made.

23. LABELING (if Required).

All packages cartons or other containers must be clearly marked with (a) building and room destination; (b) description of contents of item number from specifications; (c) quantity; (d) City of Waltham Purchase Order Number and (e) Vendor's name and order number.

24. GUARANTEES.

Unless otherwise stipulated in the specifications, furniture, equipment and similar durable items shall be guaranteed by the contractor for a period of not less than one year from the date of delivery and acceptance by the receiving department. In addition, the manufacturer's guarantee shall be furnished. Any items provided under this contract which are or become defective during the guarantee period shall be replaced the contractor free of charge with the specific understanding that all replacements shall carry the same guarantee as the original equipment. The contractor shall make such replacement immediately upon receiving notice from the Purchasing Agent.

25. SINGLE VENDOR.

The Waltham Purchasing Department desires to award a single contract based on the Grand Total Price. However, where applicable, the City reserves the right to make multiple awards on a unit price basis if, in the opinion of the Waltham Purchasing Department, it is in the best interest of the Waltham Purchasing Department.

26. CHANGE ORDERS.

Change orders are not effective until, if, as and when signed by the Mayor and no work is to commence until the change orders are fully executed.

28. BID OPENING INCLEMENT WEATHER

If, at the time of the originally scheduled bid opening, City Hall is closed to inclement weather or another unforeseeable event, the bid opening will be extended until 2:00 PM on the next normal business day. Bids will be accepted until that date and time.

GENERAL CONDITIONS

GENERAL CONDITIONS

1. INFORMATION

All information shall come from the Office of the City Purchasing Agent. The Contractor shall inquire at this office for any information needed. Wherever the words “or equal as approved” are used, it is to be understood that the opinion of the City Purchasing Agent shall govern.

2. SUITS

The Contractor shall assume defense of and shall indemnify and hold the City and its agents harmless from all suits and claims against the City and its sub-contractors arising from the use of any invention, patent right labor or employment, or from any act of omission or neglect of the City, its agents, employees or any subcontractor in performing the work, under this contract.

3. LAWS AND REGULATIONS

The Contractor shall conform to all the applicable rules, regulations, laws and ordinances of the City of Waltham, the Commonwealth of Massachusetts, the United States of America and all agencies having jurisdiction over this contract.

4. PROTECTION OF PROPERTY

The Contractor shall take all proper precautions to protect the City’s property from damage and unnecessary inconvenience. Any City property damaged by the Contractor in carrying out the provisions of this contract shall be restored to its original condition, by and at the expense of the Contractor.

5. PROTECTION OF PERSONS

The Contractor shall take all proper precautions to protect persons from injury, unnecessary inconvenience, and shall be responsible for his failure to do so. The Contractor agrees to hold the City harmless from any and all liabilities of every nature and description, which may be suffered through bodily injury, including death, to any person, by reason of negligence of the Contractor, his agents or employees, or any subcontractor.

6. CONTRACT DURATION.

This contract is for the period required to complete the project but no later than 120 days from the date of the Notice to Proceed (NTP)

7. **INSURANCE**

A. **WORKMAN'S COMPENSATION:** The Contractor shall provide insurance for the payment of compensation and furnishing of other benefits under Chapter 152 of the General Laws of the Commonwealth of Massachusetts to all persons to be employed under this contract, the premiums for which shall be paid by the Contractor. Contractors shall provide insurance on a primary basis and the contractor's policy shall be exhausted before resorting to other policies. The contractor's policy is the primary one not the contributory.

B. **COMPREHENSIVE GENERAL LIABILITY**

Bodily Injury:	\$1,000,000 Each Occurrence
	\$2,000,000 Aggregate
Property Damage:	\$1,000,000 Each Occurrence
	\$2,000,000 Aggregate

C. **AUTOMOBILE (VEHICLE) LIABILITY**

Bodily Injury	\$2,000,000 Each Occurrence
Property Damage	\$1,000,000 Aggregate

D. **UMBRELLA POLICY**

General liability	\$1,000,000
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Your bid response must include a Certificate of Insurance with the above limits as a minimum. In addition, the Certificate of Insurance must have the following text contained in the bottom left box of the Certificate: *"The City of Waltham is a named additional insured for all insurances under the contract, excluding Automobile and Workers Compensation coverage"*. **Failure by the contractor to provide a current and updated insurance policy, during the entire duration of the contract, may result in additional legal liability.** The Certificate of Insurance must be mailed directly to:

Office of the Purchasing Agent
Purchasing Department
City of Waltham
610 Main Street
Waltham, MA 02452

8. **PERSONNEL:**

The Contractor shall employ a competent supervisor and all properly licensed personnel necessary to perform the services required in this contract. The City Purchasing Agent shall have the right to require the Contractor to remove and/or replace any of the personnel for nonperformance or for unprofessional behavior. The City Purchasing Agent may require the Contractor to submit a weekly performance record of the areas and of the work performed, on forms approved by the City Purchasing Agent. The Contractor or his supervisor shall be available to inspect such work as required by the City Purchasing Agent.

9. **MATERIALS** *(if Required)*.

The City or its Agent reserves the right to approve or reject any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any rejected supplies, materials or equipment, to the satisfaction of the City or its Agents.

10. **TERMINATION OF CONTRACT**

This contract may be terminated by the City upon deliverance to the Contractor of a five-day written notice of said termination.

11. **CONTRACT OBLIGATIONS**

Contract obligations on behalf of the City are subject to an annual appropriation to cover the contract obligation.

12. **BIDDER EXPERIENCE EVALUATION**

Each bidder shall submit with his bid, all the information relative to their experience and qualifications in performing the work required under this contract and shall have been in business for a minimum of five (5) years, in order for their bid to be considered.

15. **NOT-TO-EXCEED AMOUNT**

The bid amount proposed in your company's response is a "not-to- Exceed" amount unless the City makes changes, in writing, to the scope of work to be performed. The Change Order must be signed and approved by the City's Purchasing Agent, City Auditor, Law Department and the Mayor prior to the commencement of the change order work. No work is to begin until the proper approvals have been obtained. A

change order will be priced at the unit price. Failure to comply with this procedure will result in the cancellation of the contract and the non-payment of services provided

16. FINANCIAL STATEMENTS.

The City may require, within five (5) days after the bid opening, a complete and detailed Financial Statement prepared by a Certified Public Account, to determine a bidder's financial stability.

17 BREACH OF CONTRACT/ NON PERFORMANCE

If the Contractor shall provide services in a manner, which is not to the satisfaction of the City, the City may request that the Contractor refurnish services at no additional cost to the City until approved by the City. If the Contractor shall fail to provide services, which are satisfactory to the City, the City in the alternative may make any reasonable purchase or Contract to purchase services in substitution for those due from the Contractor. The City may deduct the cost of any substitute Contract for nonperformance of services together with incidental and consequential damages from the Contract price and shall withhold such damages from sums due or to become due to the Contractor. If the damages sustained by the City exceed sums due or to become due, the Contractor shall pay the difference to the City upon demand. The Contractor shall not be liable for any damages sustained by the City due to the Contractor's failure to furnish services under the terms of this Contract if such failure is in fact caused by the occurrence of a contingency the nonoccurrence of which was a basic assumption under which this Contract was made, including a state of war, embargoes, expropriation of labor strike or any unanticipated federal, state or municipal governmental regulation of order, provided that the Contractor has notified the City in writing of such cause within seven (7) days after its occurrence.

18 RIGHT TO AUDIT

The City of Waltham has the right to review and audit documents related to this contract. This right extends to any subcontractor, supplier or other entity used by the prime contractor to fulfill the obligations under this contract.

19. CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR, SEC. 3-12 OF THE CITY ORDINANCES.

All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor.

20. ACTIVE REPARATION CLAIMS

Does your company or any of its Principals have an active reparation Claim with the City. A claim is any demand by a contract for the payment of disputed invoices, payment penalties, labor disputes, interest, etc. YES _____, NO _____ (circle or check applicable). If YES Please explain the nature of the claim, date of the claim and City Department

(Add an additional page if necessary)

21. RECAPTURE OF FUNDS

Upon determination by the City that the Contractor has failed to comply with any portion of the terms of this Agreement, and in particular has inappropriately expended Grant funds, the City may take such steps as necessary, in order to protect its ability to fulfill its obligations to HUD, including but not limited to legal action, to recapture grant funds already released to and/or expended by the Contractor.

22. CONFLICT OF INTEREST

No member, officer, or employee of the City, or its designees or agents, no members of the governing body of Waltham, and no other public official of such locality or localities who exercise any functions or responsibilities with respect to the CDBG Program during his or her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, or work to be performed in connection with the project assisted under this Agreement.

No Contractor agency official shall participate in any decision relating to this Agreement which affects his personal interest or the interest of any corporation, partnership, or other business for profit association in which he is directly or indirectly interested or has

any personal or primary interest, direct or indirect, in this Agreement or the proceeds thereof. Individuals subject to conflict of interest provisions may nevertheless be members of, or associated with, or provide assistance to the Contractor agency so long as such persons do not have any financial interest in the activity or receive compensation for such services.

23. OFFICIALS NOT TO BENEFIT

No Members or Delegates to the Congress of the United States of America, and no Resident Commissioner, shall be admitted to any share or part hereof or to any benefit to arise here from.

24. LOBBYING AND RELIGIOUS ACTIVITIES

The Contractor agrees that Grant funds shall not be used by the Contractor for publicity or propaganda purposes designed to support or defeat legislation pending before Federal, State or local government. The Contractor also agrees Grant funds shall not be used for religious activities and/or religious promotion.

Specifications

Scope of Work

FEDERAL FUNDING OVERVIEW

This is a Federally Funded project. The City has applied for and received funds from the United States Government under the provisions of Title I of the Housing and Community Development Act of 1974, as amended, Public Law 93-383; and Catalog of Federal Domestic Assistance Number 14.218; “The Consultant, Engineering Firm and any subcontractors on this project must comply with HUD contract provisions 24CFR part 85.36(l), Nondiscrimination, Equal Employment Opportunity, Affirmative Action, Section 3 requirements, Anti-Kickback Act, Federal Occupational Safety and Health Act and Department of Labor Standards and Regulations as set forth in the Contract Documents. This municipality is an Equal Opportunity Employer, businesses owned by women or minorities are strongly encouraged to bid. At the time of contract the Engineering Firm must have a current DUNs number and active SAM.gov registration.

General Project Overview

The City of Waltham (City) is requesting proposals for professional services to be performed by a Professional Engineer with a background and experience in conducting landfill assessments related to closure of municipal solid waste landfills.

Project Site Background

The Woerd Avenue Landfill is located on the east side of Woerd Avenue and south of Crescent Street in Waltham (FIGURE 1). The landfill encompasses approximately 8.63 acres, and is surrounded by residential, industrial, and park uses, namely the 2.41-acre Moody Street / Koutoujian Playground. The landfill began operating for disposal of coal ashes from home heating furnaces in 1912. By 1935, some 35,000 tons of ashes were dumped there annually, along with old cars. When the Waltham Incinerator opened in 1946, the Woerd Avenue dump began accepting incinerator residue and other non-combustible wastes. The landfill was closed in 1973 and reportedly covered with clean fill, as required by the Massachusetts Department of Public Health.

Tasks of the Project

1. **Examine existing documents including but not limited to:**
 - Existing drawings, site plans, surveys and maps
 - Initial Site Assessment (prepared in 1997 by Camp Dresser and McKee)
 - Quarterly sampling reports (prepared in 1998-1997 by Camp Dresser and McKee)
 - Comprehensive Site Assessment (Prepared in 1999 by Camp Dresser and McKee)
 - i. Missing Volume I - Vendor to obtain from DEP
 - MassDEP communications (beginning in 1997 – 2005)
 - Current Locations of monitoring wells
2. **Prepare a survey of the landfill and the adjacent municipally owned Koutoujian Playground**
3. **Prepare scope of work for the Corrective Actions Alternative Analysis (CAAA)**
4. **Determine through meeting with MassDEP if scope of work is accepted and whether or not additional testing is required. If it is determined by MassDEP that additional testing must be performed, this service will be compensated under this award through hourly rates as an additional service. Indicate hourly rate on price sheet. (See Price sheet Par. "B")**
5. **Prepare for submission to MassDEP the Corrective Actions Alternative Analysis in accordance with 310 CMR 19.000**
6. **Construction oversight of landfill lining and final capping. The consultant shall be responsible for the Construction Oversight verifying installation consistent with design. The Consultant shall attend a pre-construction meeting. During construction, the Consultant shall conduct at least one site visit per week. If the City determines that it is necessary, the Consultant shall revise and/or clarify drawings necessitated by changes that arise in the field and are required to complete the construction. The Consultant shall review and approve all submittals/shop drawings and invoices plus the final inspection, punch list, and recommendations on final acceptance of the project. (See Price sheet Par. "C")**

Qualifications and base of Technical selection (70 points)

1. EXPERIENCE AS PROJECT MANAGER FOR MUNICIPAL LANDFILL CLOSURE

- (a) 5 years or more of experience = 30 points
- (b) 3-5 years of experience = 10 points
- (c) <3 years of experience = 0 points

2. YEARS ACTIVELY WORKING AS PE (based on resume of PE submitted)

- (a) 10 or more years of experience = 15 points
- (b) 7-10 years of experience = 7 points
- (c) <7 years of experience = 0 points

3. REFERENCES INCLUDING SUMMARY OF WORK COMPLETED SIMILAR IN SCOPE

- (a) 5 or more References = 15 points
- (b) 3 or more References = 7 points
- (c) <3 References = 0 points

4. COMPREHENSIVE PREPARATION OF BID RESPONSES

(Provide as much information as possible on the corporation / company / firm)

- (a) Maximum points allowable = 10 points

General Responsibilities

The PE must provide all labor, materials, tools, equipment, transportation and services and shall perform all work required for executing the Contract in a satisfactory and workmanlike manner to provide a complete project.

Project Schedule

The project shall be completed within 120 days from the date of the notice to proceed, unless MassDEP requires additional quarterly testing. In the event additional testing is required the project schedule will be amended and agreed upon by both parties. A schedule shall be submitted with fee proposal.

Recapture of Funds

Upon determination by the City that the Engineering Firm has failed to comply with any portion of the terms of this Agreement, and in particular has inappropriately expended Grant funds, the City may take such steps as necessary, in order to protect its ability to fulfill its obligations to HUD, including but not limited to legal action, to recapture grant funds already released to and/or expended by the Engineering Firm.

Conflict of Interest

No member, officer, or employee of the City, or its designees or agents, no members of the governing body of Waltham, and no other public official of such locality or localities who exercise any functions or responsibilities with respect to the CDBG Program during his or her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, or work to be performed in connection with the project assisted under this Agreement.

No agency official shall participate in any decision relating to this Agreement which affects his personal interest or the interest of any corporation, partnership, or other business for profit association in which he is directly or indirectly interested or has any personal or primary interest, direct or indirect, in this Agreement or the proceeds thereof. Individuals subject to conflict of interest provisions may nevertheless be members of, or associated with, or provide assistance to the Engineering Firm agency so long as such persons do not have any financial interest in the activity or receive compensation for such services.

Compliance

The compliance documents in this section must be completed, signed and returned **with your bid package.**

Purchasing Department

City of Waltham
610 Main Street
Waltham, MA 02452

Failure to submit the completed documents will cause the disqualification of the proposal.

Section Index

	Check when Complete
• Non-collusion form and Tax Compliance form.....	_____
• Corporation Identification Form.....	_____
• Certificate of Vote Authorization.....	_____
• Certificate of Insurance (showing all limits of WC &GL).....	_____
• Three (3) References.....	_____
• Debarment Certificate	_____

Your Company's Name: _____

Service or Product Bid _____

NOTE: Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

NON-COLLUSION FORM AND TAX COMPLIANCE FORM

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity or group of individuals. The undersigned certifies that no representations made by any City officials, employees, entity, or group of individuals other than the Purchasing Agent of the City of Waltham was relied upon in the making of this bid

(Signature of person signing bid or proposal) Date

(Name of business)

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, & 49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Signature of person submitting bid or proposal Date

Name of business

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

CERTIFICATE OF VOTE OF AUTHORIZATION

Date:

I _____, Clerk of _____ hereby certify that at a meeting of the Board of Directors of said Corporation duly held on the _____ day of _____ at which time a quorum was present and voting throughout, the following vote was duly passed and is now in full force and effect:

VOTED: That _____ (*name*) is hereby authorized, directed and empowered for the name and on behalf of this Corporation to sign, seal with the corporate seal, execute, acknowledge and deliver all contracts and other obligations of this Corporation; the execution of any such contract to be valid and binding upon this Corporation for all purposes, and that this vote shall remain in full force and effect unless and until the same has been altered, amended or revoked by a subsequent vote of such directors and a certificate of such later vote attested by the Clerk of this Corporation.

I further certify that _____ is duly elected/appointed _____ of said corporation

SIGNED:

(Corporate Seal)

Clerk of the Corporation:

Print Name: _____

COMMONWEALTH OF MASSACHUSETTS

County of _____

Date:

Then personally appeared the above named and acknowledged the foregoing instrument to be their free act and deed before me, _____

Notary Public;

My Commission expires: _____

CORPORATION IDENTIFICATION

The bidder for the information of the Awarding Authority furnishes the following information.

If a Corporation:

Incorporated in what state _____

President _____

Treasurer _____

Secretary _____

Federal ID Number _____

If a foreign (out of State) Corporation – Are you registered to do business in Massachusetts?

Yes _____, No _____

If you are selected for this work you are required under M.G.L.ch. 30S, 39L to obtain from the Secretary of State, Foreign Corp. Section, State House, Boston, a certificate stating that you Corporation is registered, and furnish said certificate to the Awarding Authority prior to the award.

If a Partnership: (Name all partners)

Name of partner _____

Residence _____

Name of partner _____

Residence _____

If an Individual:

Name _____

Residence _____

If an Individual doing business under a firm's name:

Name of Firm _____

Name of Individual _____

Business Address _____

Residence _____

Date _____

Name of Bidder _____

By _____

Signature

Title

Business Address

(POST OFFICE BOX NUMBER NOT ACCEPTABLE)

City

State

Telephone Number

Today's Date

PROVIDE THREE (3) SERVICE APPROPRIATE REFERENCES

1. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

2. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

3. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

NOTE

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.

DEBARMENT CERTIFICATION

In connection with this bid and all procurement transactions, by signature thereon, the respondent certifies that neither the company nor its principals are suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from the award of contracts, procurement or non procurement programs from the Commonwealth of Massachusetts, the US Federal Government and /or the City of Waltham. "Principals" means officers, directors, owners, partners and persons having primary interest, management or supervisory responsibilities with the business entity. Vendors shall provide immediate written notification to the Purchasing Agent of the City of Waltham at any time during the period of the contract of prior to the contract award if the vendor learns of any changed condition with regards to the debarment of the company or its officers. This certification is a material representation of fact upon which reliance will be placed when making the business award. If at any time it is determined that the vendor knowingly misrepresented this certification, in addition to other legal remedies available to the city of Waltham, the contract will be cancelled and the award revoked.

Company Name _____

Address _____

City _____, State _____, Zip Code _____

Phone Number (____) _____

E-Mail Address _____

Signed by Authorized Company Representative:

Print name _____

Date _____

BID PRICE FORM

(Follows)

BID PRICE FORM

My Company proposes the following, all inclusive and flat rate, price to provide the services described within this bid document.

a. TOTAL, BASE PRICE \$ _____

b. HOURLY RATE FOR POSSIBLE ADDITIONAL DEP REQUIRED WORK:

\$ _____

c. CONSTRUCTION OVERSIGHT OF LANDFILL LINING AND
FINAL CAPPING. \$ _____

My company recognizes receipt of addenda # __, __, __, __, __, __, __, __, __, __.

Company Name: _____

Authorized Signature: _____

Print Name: _____

E-Mail Address: _____

Date: _____



Massachusetts Department of Environmental Protection
Transmittal Form for Application and Payment

For DEP Use Only
 Permit No. _____
 Received Date _____
 Reviewer _____
 Permit Appr. Denied
 Decision Date _____

102380
 Transmittal # _____
 Facility ID (if known) _____

INSTRUCTIONS

1. Please type or print. Use a separate Transmittal Form for each application.

2. Use an *original*, 3-part Transmittal Form for each application. Photocopies *will not* be accepted for any application or payment. (You may use photocopies for reserve location, where applicable.)

3. Make check payable to **Commonwealth of Massachusetts**. Please mail check and **yellow** copy of Transmittal Form to: Department of Environmental Protection, P.O. Box 4062, Boston, MA, 02211.

4. Both fee exempt and non-exempt applicants **must mail yellow copy** of Transmittal Form to: Department of Environmental Protection, P.O. Box 4062, Boston, MA, 02211.

A Application Information

BWPSW12

Permit, Approval or Other Category (seven character code from the first page of the directions on How to Apply). Examples: BWPAQ01, BRPWP01, etc.

Initial Site Assessment and CSA Scope of Work

Category Name

ISA for Woerd Avenue Landfill

Brief Project Description

B Applicant or Legally Responsible Official

City of Waltham

Last Name

First Name

Middle Initial

610 Main Street

Address

Waltham, MA 02154

City/Town

State

Zip Code

(617) 893 - 4040 ext.

Telephone Number (including area code and extension)

Ronald G. Vokey, Planning Director

Contact

C Facility, Site or Individual Requiring Approval

Woerd Avenue Landfill

Name of Facility, Site or Individual

Woerd Avenue

Address

Waltham, MA 02154

City/Town

State

Zip Code

(617) 893 - 4040 ext.

Telephone Number (including area code and extension)

D Application Prepared By (if different from section B)

Camp Dresser & McKee Inc.

Last Name

First Name

Middle Initial

10 Cambridge Center

Address

Cambridge, MA 02142

City/Town

State

Zip Code

(617) 252 - 8000 ext. 8371

Telephone Number (including area code and extension)

Bruce W. Haskell, P.E.

Contact

LSP Number (for 21E only)

E Other Related Permits: if you are applying for other permits related to this application, please list them below.

Transmittal No.	Category	Description
NA		

F Amount Due

Special Provisions: **Fee Exempt*** (city, town, district, or municipal housing authority) (state agency if permit fee is \$100 or less)
 Hardship Request (payment extension according to 310 CMR 4.04(3)(c))
 Alternative Schedule Project Request (according to 310 CMR 4.05 and 4.10)

* There are no fee exemptions for 21E sites, regardless of the applicant's status.

Check No. _____ Dollar Amount \$ _____ Date _____

Make check payable to **Commonwealth of Massachusetts**. Please mail check and **yellow** copy of Transmittal Form to: Department of Environmental Protection, P.O. Box 4062, Boston, MA, 02211

WHITE: must accompany application YELLOW: must accompany payment PINK: retain for your records



Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Solid Waste Management

102380

Transmittal #

Facility ID (if known)

- BWP SW 12** Initial Site Assessment
- BWP SW 23** Comprehensive Site Assessment
- BWP SW 24** Corrective Action Alternative Analysis
- BWP SW 25** Corrective Action Design

Application for Landfill Assessment and Closure

A *BWP SW 12 Initial Site Assessment (310 CMR 19.150(4))*

DIRECTIONS:
Specify the report/
plan and page
numbers in which
the following
information is
located.

	Plan/Report #	Page #	DEP USE ONLY
1. Initial Site Assessment (310 CMR 19.150(4))			
a. Background information	Section 2	2-1	
b. Historical Research	Section 3	3-1	
c. Literature/Data Search	Section 4	4-1	
d. Hydrogeological Description	Section 5	5-1	
e. Site Visit	Section 6	6-1	
f. Mapping	Section 7	7-1	
g. Field Screening	NA		
2. Comprehensive Site Assessment Scope of Work	CSA Scope	Entire Rpt.	
3. Funding			
a. Corrective action and/or closure-post closure cost estimate	NA		
b. Funding mechanism and schedule	NA		

B *BWP SW 23 Comprehensive Site Assessment (310 CMR 19.150(5))*

a. ISA Summary	NA		
b. Mapping			
c. Drilling Program			
d. Determination of Hydraulic Conductivity			
e. Sampling and Analysis Plan			
f. Health and Safety Plan			
g. Project Schedule			
h. Baseline Risk Assessment			
i. Corrective Action Alternative Analysis Scope of Work Outline			



Massachusetts Department of Environmental Protection
Bureau of Waste Prevention - Solid Waste Management

102380

Transmittal #

Facility ID (if known)

- BWP SW 12** Initial Site Assessment
- BWP SW 23** Comprehensive Site Assessment
- BWP SW 24** Corrective Action Alternative Analysis
- BWP SW 25** Corrective Action Design

Application for Landfill Assessment and Closure

C *BWP SW 24 Corrective Action Alternative Analysis (310 CMR 19.150(6))*

	Plan/Report #	Page #	DEP USE ONLY
a. Corrective Action Objectives	NA		
b. Alternatives Analysis			
c. Recommended Alternative			

D *BWP SW 25 Corrective Action Design 310 CMR 19.151(2)(a)*

A. Corrective Action Design and/or closure plans	NA		
B. Implementation schedule			

E *Post Closure Plans*

1. Maintenance Plan (310 CMR 19.142(5))	NA		
2. Monitoring Plan (310 CMR 19.142(5))			
3. Post-Closure Use Plans (310 CMR 19.143) if applicable			
4. Record Notice of Landfill Operation (310 CMR 19.141)			

Note: Part E is only applicable when a closure plan has been submitted and closure is being implemented.

F *Certification (310 CMR 19.011)*

Any person, required by these regulations or any order issued by the Department, to submit papers shall identify themselves by name, profession, and relationship to the applicant and legal interest in the facility, and make the following certification: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties both civil and criminal for submitting false information including possible fines and imprisonment.

Bruce W. Haskell, P.E.
Print Name

Bruce W. Haskell
Authorized Signature

Project Manager
Position/Title

April 16, 1997
Date

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Permit Transmittal

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<i>Appendix B</i>		"Municipal Groundwater Supply Study, City of Newton, Massachusetts," prepared by IEP Geoscience, December 1982.	
<i>Appendix C</i>		"Report to Metropolitan District Commission on Charles River - Purgatory Cove Water Quality Improvement," prepared by Metcalf & Eddy Inc., February 1975.	
<i>Appendix D</i>		"Hydrogeologic Investigation Report - Parker Hannifin, Waltham, Massachusetts," prepared by TWM Northeast, January 1990.	
<i>Appendix E</i>		"Response Action Outcome Statement and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996.	
<i>Appendix F</i>		"Method 3 Risk Characterization and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996.	
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Section 1

Introduction

Presented here is the Initial Site Assessment (ISA) for the Woerd Avenue landfill in Waltham, Massachusetts. This report was prepared by Camp Dresser & McKee, Inc. (CDM) in accordance with the Massachusetts Department of Environmental Protection (DEP) Landfill Assessment and Closure (LAC) guidelines, revised September 1993. The purpose of the LAC assessment process is to determine the impact of the landfill on groundwater, surface water and air quality by qualitatively and quantitatively characterizing the nature and extent of any contamination, and assessing the associated risks to the public health and the environment. The ISA is the first phase of this three-phase LAC process.

The primary activities during the ISA are to gather and evaluate existing information related to the site, including: physical characteristics, prior environmental analyses performed, and potential receptors surrounding the site. This information is used to develop a conceptual model of the site hydrogeology and to develop a scope of work for the Comprehensive Site Assessment (CSA), the second phase of the LAC program. The CSA is comprised of field investigation and report preparation. The main objectives of the CSA are to:

- Determine if the landfill has had any negative impact on the local environment,
- Determine the need for remediation of the landfill site and the proper type of closure recommended, and
- Identify and characterize the extent of any impact which may be present.

The third phase of the LAC process is the Corrective Actions Alternative Analysis (CAAA) where alternative corrective actions are evaluated as required to remediate any potential impacts from the landfill sensitive receptors.

The ISA report has been organized generally as presented in the LAC guidance manual, as follows:

- Section 1.0 is the introduction.
- Section 2.0 presents background information on the site.
- Section 3.0 presents the results of historical research detailing past site users, waste types, waste quantities and past operational practices.
- Section 4.0 discusses the DEP and municipal file reviews, site worker interviews, United States Geological Services (USGS) data and sensitive receptors.
- Section 5.0 presents a summary of hydrogeological information on the site including site and regional hydrogeology and a summary of previous reports.
- Section 6.0 is an inspection report of the site visit performed for the ISA.

- Section 7.0 describes the mapping prepared for the ISA.

The scope of work for the Comprehensive Site Assessment (CSA) is attached to the ISA as a separate document.

Section 2 Background Information

2.1 Owner Information, Site Location, and Universal Transverse Mercator Coordinates

The City of Waltham, Massachusetts, is located immediately west of Boston. The landfill is located off Woerd Avenue near the Waltham/Newton municipal boundary. The location of the landfill is shown on Figure 2-1, Site Locus Plan.

The landfill site is owned by the City of Waltham, Massachusetts, 610 Main Street, Waltham, Massachusetts, 02154.

The Universal Transmercator (UTM) coordinates for the landfill site are 4,691,500 meters North and 331,600 meters East.

2.2 Site Status

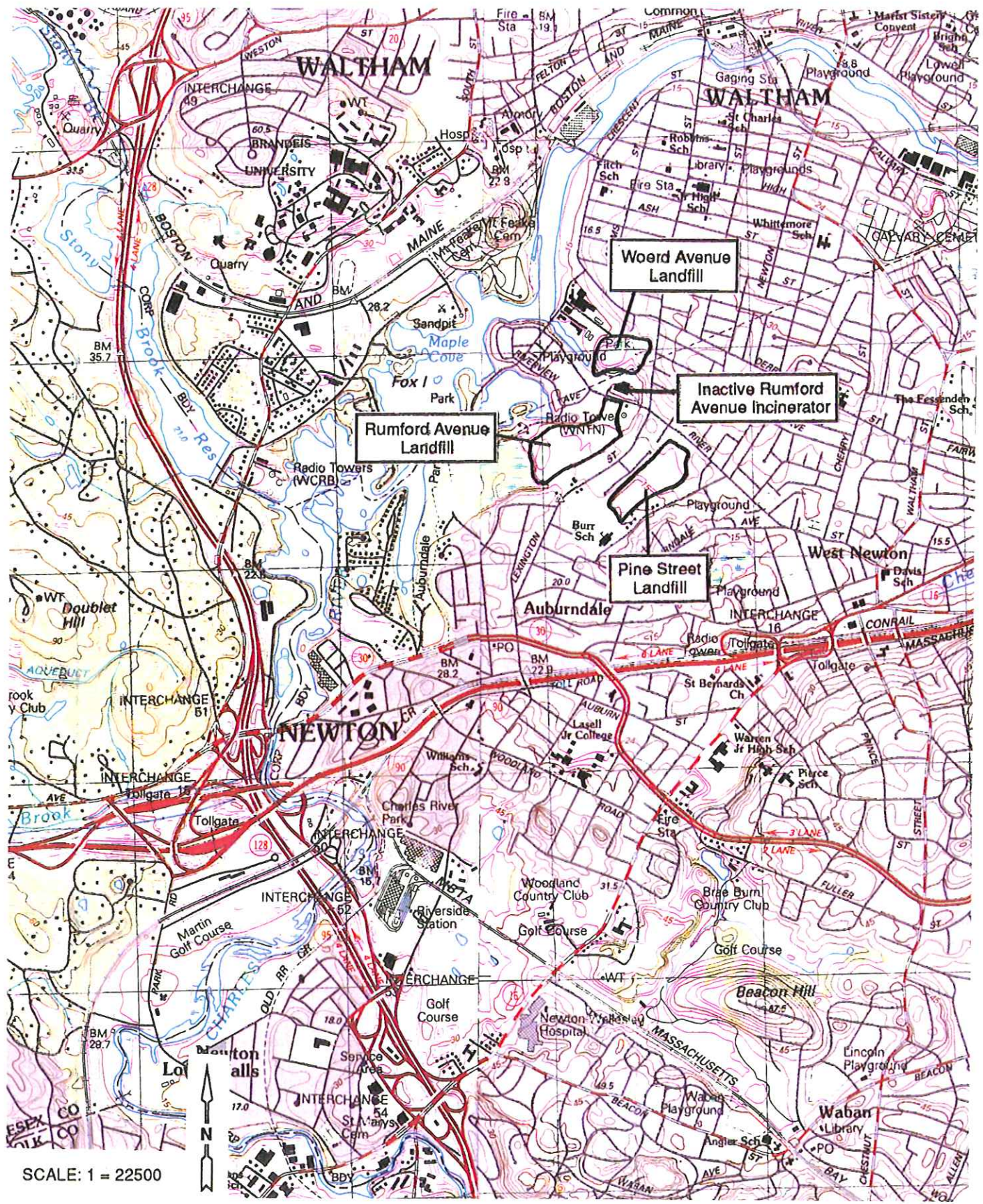
The landfill is currently inactive and does not receive any solid waste. The landfill did receive solid waste after April 26, 1971 and is, therefore, regulated as a solid waste landfill under the Solid Waste Management Regulation (310 CMR 19.000).

2.3 Acreage

The landfill site is comprised of an area of 8.69 acres. The area of the Moody Street playground, adjacent to the landfill to the northeast, consists of an additional 2.41 acres.

2.4 Abutting Property Owners and Land Uses

The abutting property owners provided from City records are summarized in Appendix A. The majority of properties within 500 feet of the landfill footprint are residential, with the remaining properties being manufacturing or similar facilities. The land use of adjacent properties is further discussed in Section 6.2 herein.



Woerd Avenue Landfill
Waltham, Massachusetts

Figure 2-1
Site Locus Plan

Section 3 Historic Research

3.1 Site Users

Because the landfill closed in the early 1970's, there is limited data available on site users or operational history. The site was reportedly used for ash residuals from an incinerator in Waltham as well as bypass waste, such as automobiles, that were not accepted at the incinerator.

3.2 Past Operational Practices and History

3.2.1 Operating History

The Woerd Avenue Landfill originally began as a small dump for coal ashes from home heating furnaces in about 1912. By 1935, approximately 35,000 tons of ashes were dumped there annually, as well as old cars. When the Waltham incinerator opened in 1946, the Woerd Avenue Landfill began accepting incinerator residue and other non-combustible waste. As other city dumps were closed down during the 1950's, the Woerd Avenue Landfill became a major acceptor of non-combustible items.

In the early 1970's the City began to receive complaints about the condition of the Landfill. An inspection by the Massachusetts Department of Public Health in March, 1972 found 11 violations of the "Regulations for the Disposal of Solid Waste by Sanitary Landfill."

After reportedly coming into full compliance with the regulations, the City of Waltham closed the Woerd Avenue Landfill on April 21, 1973. The dump was then reportedly completely covered with clean fill in accordance with the requirements of the State Department of Public Health.

3.2.2 Operational Practices

While the site was operated as a landfill for the disposal of incinerator ash and non-combustible waste, the City was cited and received complaints on numerous occasions for operational problems and violations. These included inadequate daily cover, vector problems, improper deposition of refuse, inadequate maintenance and general cleanliness.

Section 4

Literature and Data Search

4.1 Available Reports

The following reports were reviewed as part of the ISA:

- "Municipal Groundwater Supply Study, City of Newton, Massachusetts," prepared by IEP Geoscience, December 1982 (Appendix B)
- "Report to Metropolitan District Commission on Charles River - Purgatory Cove Water Quality Improvement," prepared by Metcalf & Eddy, Inc., February 1975. (Appendix C)
- "Hydrogeologic Investigation Report - Parker Hannifin, Waltham, Massachusetts," prepared by TWM Northeast, January 1990. (Appendix D)
- "Response Action Outcome Statement and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996. (Appendix E)
- "Method 3 Risk Characterization and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996 (Appendix F)

These reports are included in the appendices to the ISA and their results are summarized in Section 5.

4.2 File Reviews

CDM conducted file reviews of municipal files available for the Woerd Avenue Landfill. There were limited files available at DEP's Northeast Region (Woburn) office on the Woerd Avenue site. CDM reviewed DEP files on the Parker Hannifin Corporation property which abuts the Woerd Avenue Landfill on the northwestern end of the site. DEP files on the both the Rumford Avenue and Pine Street Landfills in Newton were also reviewed due to their close proximity to the Woerd Avenue site. Copies of pertinent correspondence can be found in Appendix G. Information from the file reviews are incorporated throughout this ISA report.

4.2.1 Review of Municipal Files

CDM reviewed files on the Woerd Avenue Landfill obtained from City Hall. The contents of the file contained mostly correspondence between various City and State offices, and is summarized below:

- On August 6, 1970, the Acting Commissioner of Health for the City of Newton sent a letter to the Director of the Waltham Health Department outlining several complaints received regarding roaches emanating from the Waltham City Dump, off Moody Street. The letter stated that an inspection of the landfill revealed improper operation and maintenance and requested that the City of Waltham take necessary steps to eliminate the health nuisance.
- On October 28, 1970 the Massachusetts Water Resources Commission (MWRC) sent a letter to the Mayor of the City of Waltham stating that they had received numerous complaints

concerning pollution of the Charles River caused by the Waltham City Dump. The MWRC ordered Waltham to retain a consulting engineer and have the conditions at the landfill corrected. The order was upheld in an adjudicatory hearing on January 8, 1971.

- On April 5, 1971, in a letter from the MWRC to the Mayor of Waltham, a pollution abatement program was outlined to correct the situation at the Waltham Dump. In this program, the requirement to hire a consulting engineer was waived contingent upon the removal of all debris from Cram's Cove and the submission of final plans and specifications for the closure of the Landfill by May 15, 1971. Also included in the program was the extension of the existing stormdrain (City of Newton's) up to the rear of the Eagle Signal Property.
- On March 14, 1972, the Department of Public Health (DPH) issued a Notice of Violation of the "Regulations for the Disposal of Solid Wastes by Sanitary Landfill". The letter was a summary of an inspection by the DPH at the landfill on March 8, 1972. Violations of code were noted regarding the following regulations: submission of plans, cover material, access roads, signs, deposition of refuse, maintenance and general cleanliness, spreading and compacting of refuse, depths of cover, removal of salvaged materials, vector control, and drainage of surface water.
- A letter dated April 27, 1972 was sent from the Director of Public Works for the City of Waltham to the Mayor of Waltham summarizing various aspects of the solid waste problem in Waltham.
- On May 10, 1973, the MWRC sent a letter to the Director of Public Works of Waltham noting their compliance with the Division Order and requested a letter from the City summarizing the measures that were taken. On May 16, 1973, the City of Waltham responded indicating that they had extended the existing culvert and made a general cleanup of Cram's Cove, removing the accumulated debris of several decades. Waltham also indicated that on April 21, 1973, the gates of the Woerd Avenue Landfill were closed forever.

4.2.2 DEP File Reviews

As discussed above, CDM reviewed files available on the Woerd Avenue landfill at the DEP's Northeast Regional Office in Woburn. DEP files on the Parker Hannifin site were also reviewed.

DEP's files on the Woerd Avenue dump were limited to several older letters and a 1980 newspaper article. According to this article, the landfill was still active for municipal solid waste disposal until March 1972 and was apparently closed in 1980. During its last few years of operation, the site reportedly only accepted street sweepings and brush.

There were several reports and some correspondence in the Parker Hannifin files obtained from the DEP. The following are the significant findings of CDM's file review on the Parker Hannifin property:

- TWM NORTHEAST/Normandeau, Inc. (TWM) was retained by the Nichols Division of the Parker Hannifin Corporation to perform a hydrogeological site assessment of the 11.5 acre Parker Hannifin site. The Hydrogeologic Investigation Report was submitted to the DEP on

May 21, 1990. The purpose of the investigation was to evaluate the hydrogeological conditions at the site and to evaluate whether petroleum and/or hazardous substances had been released at the property.

- The Parker Hannifin property, located at 48 Woerd Avenue, abuts the Woerd Avenue landfill along the northwestern portion of the landfill property. The Nichols Aircraft Division manufacturing building is located in the northern segment of the property and abuts residential properties consisting of condominiums and apartments. The southern segment of the property is an open space which previously contained a Mica processing building, and engineering building, two storage buildings and a boiler building. All of the facilities on the southern sections of the property were demolished and removed in 1995.
- Five of the six underground storage tanks on the Parker Hannifin property were excavated and removed in 1988. These included two 10,000 gallon heating fuel tanks, two waste machine oil tanks of unknown size and an empty tank of unknown size. According to the Plant Engineer who supervised the tank removal, no subsurface contamination was observed when the tanks were removed.
- The TWM report suggested that the Parker Hannifin site is downgradient from the City of Waltham landfill and that "some groundwater mounding may occur at the former City landfill, with contaminants migrating from the landfill to the subject (Parker Hannifin) site." The results of this report will be discussed further in Section 5.
- The Parker Hannifin site was listed by the DEP as a Location to be Investigated (LTBI) on July 12, 1990, based on the discovery of Volatile Organic Compounds (VOCs) and metals in shallow groundwater and soil in the southwest portion of the property.
- A letter from a Waltham City Solicitor to the DEP, dated July 31, 1990, expressed concern over the implication of the Waltham City Landfill as a source of contamination on the Parker Hannifin site. Subsequently the DEP contacted the City of Waltham and stated that "unless further information is obtained in the future, the City need not take any further action with this regard."
- A Response Action Outcome (RAO) Statement and a Method 3 Risk Characterization Report were prepared for the Parker Hannifin Corporation by Handex of New England (Handex) in August of 1996. Mentioned in the above report was that a Downgradient Property Status (DPS) was filed by Parker Hannifin in June of 1996. The DPS was filed based on concentrations of dissolved silver in groundwater samples collected from monitoring wells located near the southeast property boundary that abuts the Woerd Avenue Landfill. Handex states that the monitoring wells are located upgradient of the historical known release areas at the Parker Hannifin site and downgradient of the former landfill. The actual DPS form was not located in either the City's or the DEP's files.

4.3 Site Worker Interview

(To be completed..)

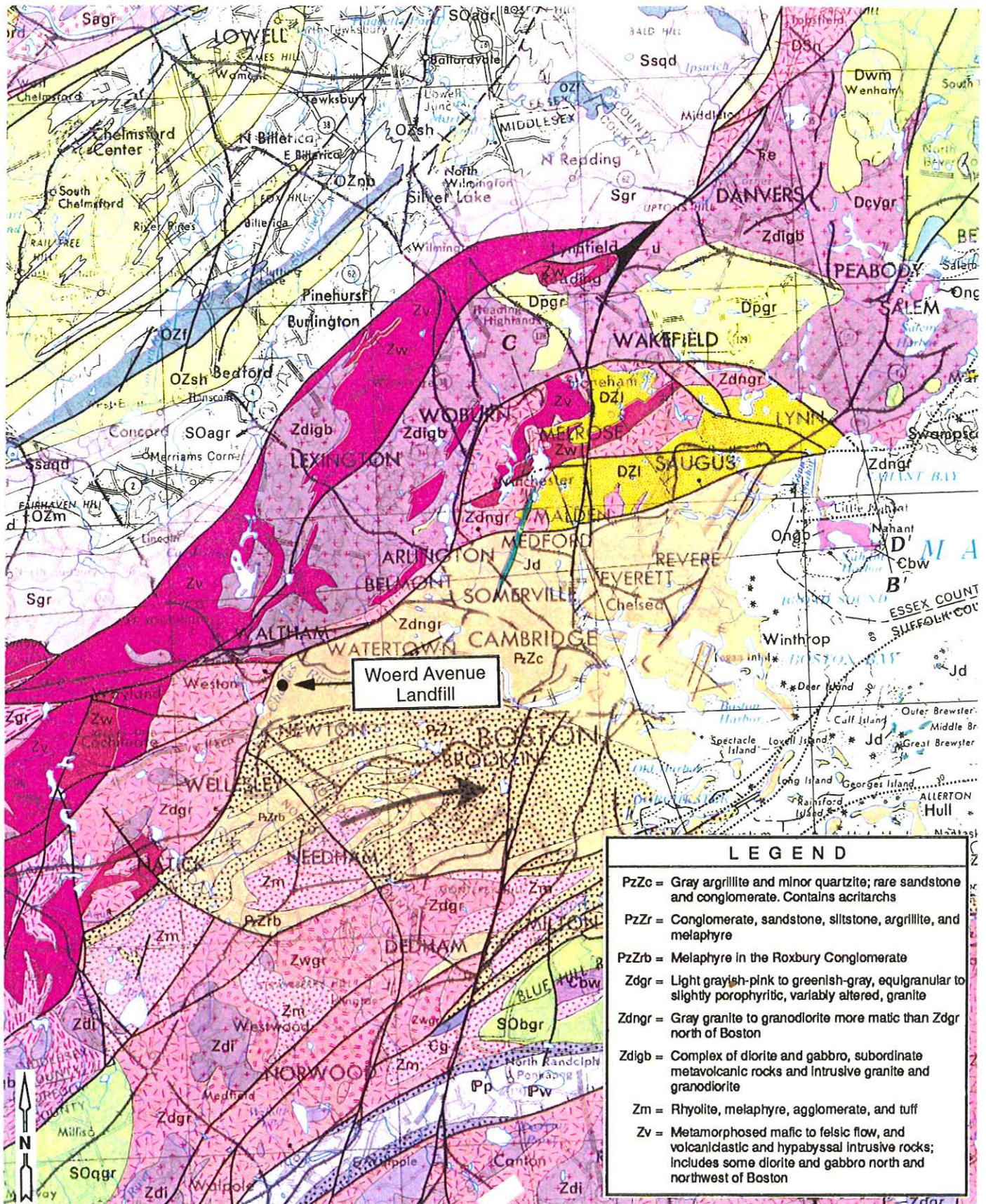
4.4 Relevant USGS Information

Information from the United States Geological Survey (USGS) was limited for the Woerd Avenue landfill site. CDM has included the USGS map for Waltham (Boston South quadrangle) as the locus plan (Figure 2-1). There are no USGS surficial or bedrock geology maps available for the Waltham area. However, a bedrock map for the vicinity based on the statewide mapping by Zen et al. is included as Figure 4-1.

4.5 Potential Environmental and Public Health Sensitive Receptors

Based on the file reviews and the site walk described in Section 6, CDM has identified the following potential environmental and public health sensitive receptors:

- **Drinking Water Supplies** - Based on a review of the MASS-GIS system available at CDM, there are no public drinking water supplies (Zone II's or Zone III's; Interim Wellhead Protection Areas; Zone A or a public surface water supply; or aquifer protection zones) within one-half mile of the landfill site. Public water supply through the Massachusetts Water Resources Authority (MWRA) is provided to Waltham and Newton residents.
- **Private Wells** - There are no known private wells in Newton or Waltham within one-half mile of the site.
- **Wetland Resource Areas** - The wetland area known as Cram's Cove (and the abutting Charles River) are sensitive environmental receptors. There are no known vernal pools near the landfill site.
- **Sensitive Terrestrial/Aquatic Habitats** - Based upon a review of the "Atlas of Estimated Habitats of Rare Wetland/Upland Wildlife" (DEP, 1993), there are no rare or endangered species identified near the landfill site.
- **Coastal and Inland Water Bodies** - The landfill is located adjacent to Cram's Cove which is part of the Charles River.
- **Schools** - The edge of landfilled waste is not located within 1,000 feet of any schools.
- **Residential Homes** - There are numerous residential homes located within 500 feet of the landfill including several apartment buildings as well as single-family dwellings.
- **Day Care Centers and Elderly Housing** - There are no known day care centers or elderly housing within 500 feet of the landfill site.
- **Farms** - There are no farms within 500 feet of the landfill site.
- **Hospitals** - There are no hospitals within 500 feet of the landfill site.



Woerd Avenue Landfill
Waltham, Massachusetts

Figure 4-1
Regional Bedrock Geology

4.6 Condition and Installation of Existing Monitoring Wells

There are currently no operating monitoring wells installed for the Woerd Avenue landfill site.

As a part of the hydrogeological investigation performed by TWM on the Parker Hannifin site, a total of 10 groundwater monitoring were installed between November 1987 and August 1988. Four of these monitoring wells, MW-2, MW-3, MW-3A, and MW-4, are adjacent to the Woerd Avenue landfill site.

The monitoring wells were installed in soil borings that were advanced to depths up to 16 feet, using 3.75-inch-diameter (ID) hollow stem augers. The monitoring wells consist of 2.0-inch ID, schedule 40 PVC well screen. The lower 5- to 10-foot section of each well was screened, with the screen positioned to straddle the water table. Details of the monitoring well installation are included in the report in Appendix D.

4.7 Evidence of Landfill Gas Emissions

There was no evidence of landfill gas emissions observed during the site visit. There is currently no landfill gas control system in-place at the landfill. Given the history of the site in accepting ash and DPW wastes, landfill gas is likely not a significant issue.

4.8 Summary of Existing Reports

The existing reports listed above are summarized in Section 5.

Section 5

Hydrogeological Description

5.1 Previous Studies

The following reports were reviewed as part of the ISA:

- "Municipal Groundwater Supply Study, City of Newton, Massachusetts," prepared by IEP Geoscience, December 1982 (Appendix B)
- "Report to Metropolitan District Commission on Charles River - Purgatory Cove Water Quality Improvement," prepared by Metcalf & Eddy, Inc., February 1975. (Appendix C)
- "Hydrogeologic Investigation Report - Parker Hannifin, Waltham, Massachusetts," prepared by TWM Northeast, January 1990. (Appendix D)
- "Response Action Outcome Statement and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996. (Appendix E)
- "Method 3 Risk Characterization and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996 (Appendix F)
- "Bedrock Geologic Map of Massachusetts," E-an Zen et al., Dated 1983.

5.2 Regional Surficial Geology

No USGS surficial geology map is available for the Boston South quadrangle where Waltham is located. However, in 1982, the City of Newton contracted with IEP Associates (IEP) to prepare an evaluation of alternative water supplies within Newton. As part of this evaluation, IEP mapped the surficial geology in Newton in accordance with USGS standards. A copy of this report is included in Appendix B.

Based on this mapping, the Woerd Avenue Landfill was mapped as glacial till (defined as compact and generally impervious mixture of clay, silt, gravel, cobbles and boulders deposited by ice).

The area to the west of the landfill, approximately around the Newton Rumford Avenue Landfill, was mapped as an area of stratified drift, defined as well sorted and well stratified sands and gravels with minor amounts of silts and clay deposited by glacial meltwater systems. This was confirmed during the CSA drilling program for the Rumford Avenue landfill site. The area of Flowed Meadow and Cram's Cove was mapped as swamp deposits of muck and peat.

5.3 Regional Bedrock Geology

Based on the statewide mapping performed by Zen et al. For the state of Massachusetts, the vicinity of the landfill is located within the Boston Basin area, specifically in an area of Cambridge Argillite which is a gray argillite and minor quartzite; rare sandstone and conglomerate. A portion of the Zen et al. Bedrock map with the site approximately located is given in Figure 4-1.

According to this mapping, the landfill is located near a deposit of Dedham Granite which is a light-grayish-pink to greenish-gray, equigranular to slightly porphyritic, variably altered, granite. There are no faults mapped in close proximity to the landfill (Zen et al.).

5.4 Groundwater Hydrology

5.4.1 Regional Hydrology

As part of their study of alternative water supplies in Newton, IEP prepared a regional groundwater elevation map for the City. The report and the map are included in Appendix B to the ISA. According to this study, the area around the landfill generally discharges towards the Charles River, which is situated immediately to the north of the site. The Charles River in this area flows to the North.

5.4.2 Historic Site Groundwater and Surface Water Sampling and Analysis

There is no information available on previous groundwater or surface water sampling at the Woerd Avenue landfill. However, there has been extensive groundwater and surface water sampling at the Parker Hannifin property which abuts the landfill along the northwestern property line.

As mentioned previously, TWM prepared a Hydrogeologic Investigation Report for the Parker Hannifin site which is included as Appendix D to the ISA. The report was prepared to evaluate hydrogeologic conditions at the site and to evaluate whether petroleum and/or hazardous substances had been released at the property. A total of ten groundwater monitoring wells were installed at the Parker Hannifin site, four of which abut the Woerd Avenue landfill.

TWM collected three rounds of water quality sampling between November 1987 and September 1988 from the monitoring wells. In addition, TWM collected water quality samples from two locations on Cram's Cove, one upstream (SW-1) towards the landfill and one downstream (SW-2) towards the Charles River, during the first round. The results of these samples can be found in Appendix D.

In summary, the groundwater results indicated concentrations of cadmium, in monitoring wells MW-3 and MW-4, and mercury, in monitoring well MW-3, exceeding recommended drinking water standards. Both monitoring wells MW-3 and MW-4 are adjacent to the Woerd Avenue landfill and in the vicinity of the former scrap metal storage area on the Parker Hannifin property. Both halogenated and aromatic hydrocarbons were detected in the vicinity of monitoring wells MW-3, MW-4 and MW-5, with the highest concentrations detected at MW-3. Organic compounds detected at concentrations exceeding drinking water standards included: 1,2-dichloroethane, trichloroethane and vinyl chloride.

The specific conductance of the surface water samples ranged from 284 umhos/cm (SW-2) to 918 umhos/cm (SW-1) with the specific conductance decreasing towards the Charles River. The concentrations of cadmium, lead and mercury exceeded the recommended drinking water standards at the upstream (SW-1) sampling location. Only the concentration of cadmium exceeded the recommended drinking water standards at the downstream (SW-2) sampling location. There was no detection of Volatile Organic Compounds (VOCs) in the surface water samples taken.

Additional groundwater sampling was performed on March 5, 1996. The results of the sampling is presented in a report by Handex of New England and can be found in Appendix E to the ISA. Dissolved metals detected during this round of groundwater sampling included: arsenic, barium, lead and silver. Monitoring well MW-4 was re-sampled on June 13, 1996 and analyzed for Polycyclic Aromatic Hydrocarbons (PAHs) and dissolved silver. The concentrations of these parameters were below laboratory analytical detection limits. Analysis for VOCs was not performed during this round of sampling, but sampling conducted in 1993 and 1994 indicated VOCs concentrations below Method 1 Risk Characterization Groundwater Category GW-2 and GW-3 standards.

5.4.3 Soil and Sediment Sampling

There is no record that any soil or sediment sampling has taken place on the Woerd Avenue landfill site. TWM collected soil samples from eight locations in the vicinity of the monitoring wells on the Parker Hannifin property. The soil sampling location plan and the results of the soil sampling can be found in Appendix D. VOCs detected during the soil sampling included: Vinyl Chloride, 1,1,1-Trichloroethane, Trichloroethene and Toluene.

Handex of New England collected samples from a total of 45 soil borings taken during July 1994, April 1995 and March 1996. The soil boring location plan and sampling results can be found in Appendix E. The soil samples were analyzed for VOCs, PAHs, Total Petroleum Hydrocarbons (TPH) and metals. TPH concentrations in soil samples GP-7, GP-12, GP-44 and MW-3A exceeded the Upper Concentration Limit (UCL) for soil.

5.5 Surface Water Hydrology - Regional Conditions

A majority of the surface water run-off from the landfill discharges into an existing swale running along the southwestern edge of the property that drains into Cram's Cove. There is an existing stream running along the southeastern edge of the landfill that collects run-off from behind the Rumford Avenue incinerator as well as the landfill.

Section 6

Site Visit

6.1 Introduction

In December 1997, CDM engineers conducted a site walkover of the landfill site and surrounding areas as required for the ISA. Below is a summary of this site visit.

6.2 Summary of Site Visit

Below are the significant observations during the site visit:

Condition of Landfill Surface

The landfill surface is well covered and heavily vegetated with mature trees. Access to many areas was limited by heavy vegetation. There was little exposed waste throughout the site except debris which appeared to be recently dumped along Cram's Cove.

Direction of Surface Water Run-off

Surface water flow is radial from the site towards Cram's Cove, the unnamed stream along the Newton City line and

Location and Conditions of Monitoring Devices

There are no existing monitoring devices at the landfill site.

Evidence of Leachate Break-outs

There was no evidence of leachate break-outs at the site. However, the unnamed stream along the Newton City line is discolored.

Evidence of Landfill Gas Emissions

There was no evidence of landfill gas emissions observed (e.g., stressed vegetation or odors) at the time of the site visit.

Location and Condition of Surface Water and Wetlands

There is a small stream which drains the south side of the site as well as the Rumford Avenue Incinerator in Waltham.

Landfill Operations Procedures

The landfill is inactive and has not been operated in any capacity since 1980.

Land Use of Adjacent Properties

Adjacent properties are residential and commercial/manufacturing. The Moody Street playground is located immediately to the east of the landfill mound.

Landfill Accessibility

The landfill site is accessible directly from the Moody Street playground. Other sides of the site have limited access due to fences and gates. A perimeter access road provides access to much of the site.

Local Geology

The area around the landfill is well developed and altered. Therefore, it was not possible to observe any natural geologic features. As would be anticipated, there were no bedrock outcrops or other features observed during the site visit.

Section 7

Mapping

7.1 Base Map

Figure 2-2 entitled "City of Waltham, Massachusetts, Woerd Avenue Landfill, ISA Site Plan" dated February 1997 is the current base map for the Initial Site Assessment.

Figure 2-2 includes the following items required in DEP's "Landfill Technical Guidance Manual."

- Site topography;
- Wetlands (including surface water bodies) and existing buildings within 500 feet of the edge of the landfill. There are no established water supplies, Areas of Critical Environmental Concern (ACECs) or Zone II/Interim Wellhead Protection Areas (IWPA) within this 500 foot area.

Property lines indicated on Figure 2-2 are approximate.

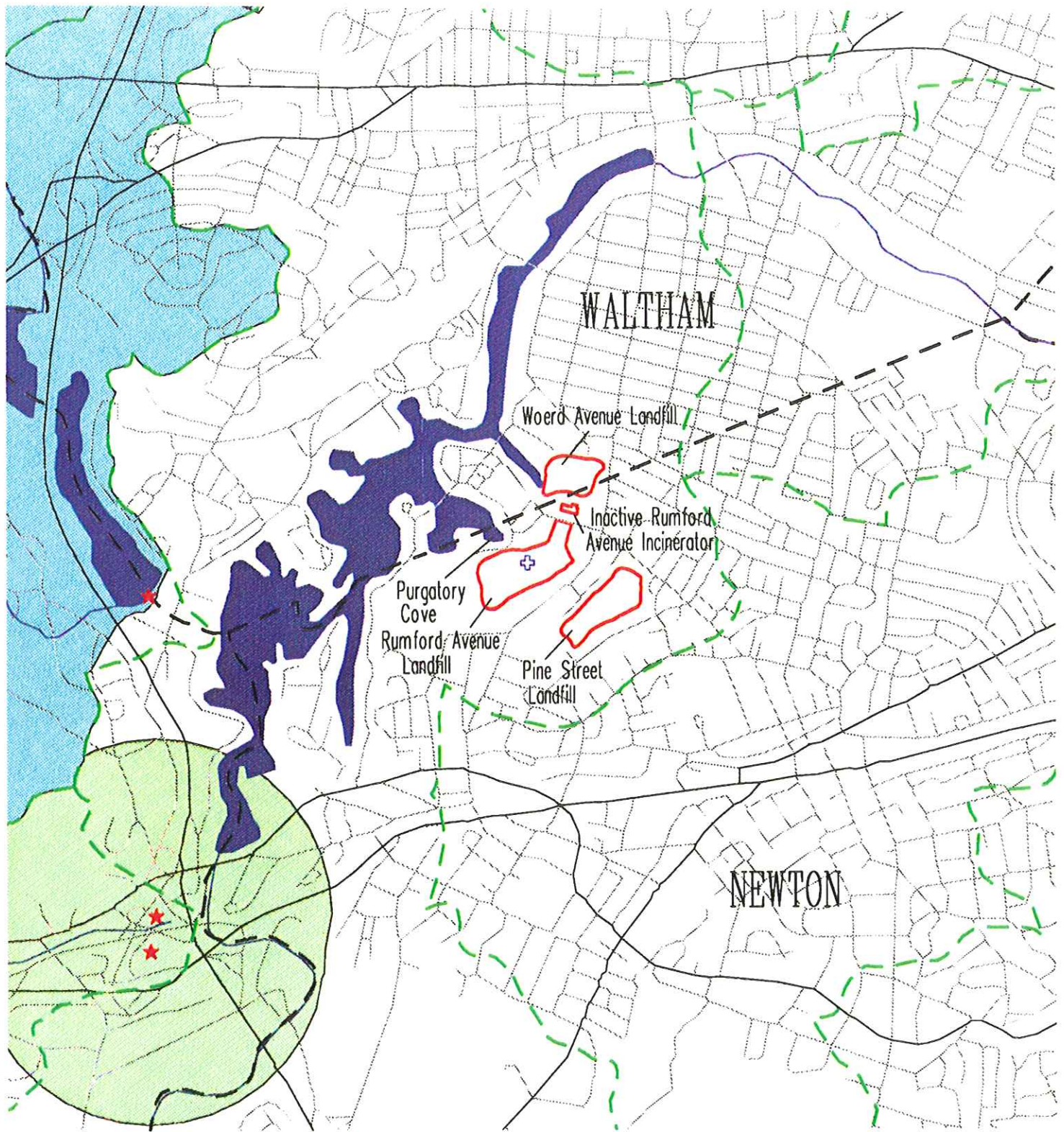
7.2 Regional Locus Map

In addition to the base map, regional locus maps have been prepared which show the following:

- Public and private water supplies, Zone II and Interim Wellhead Protection Areas (IWPA): As shown on Figure 7-1, the IWPA of two public drinking water wells located in Wellesley are within one-mile of the Woerd Avenue landfill. However, these wells are upgradient of the landfill. The landfill is also within one-mile of Outstanding Resource Areas associated with the Cambridge Reservoir and Stony Brook.
- Aquifer Protection zones: There are no Aquifer Protection zones within one-mile of the landfill.
- Areas of Critical Environmental Concern (ACECs): There are no ACECs within one-mile of the landfill site.
- Surface Water Bodies: The only surface water body within one-mile of the landfill site is the Charles River and its associated wetlands and floodplains.

According to mapping performed by the Federal Emergency Agency (FEMA), the area of Purgatory Cove to the west of the landfill and Flowed Meadow are areas of 100-year flood events.

- Surface Water Drainage Areas: The limits of watershed boundaries in the vicinity of the landfill are shown in Figure 7-1. According to the mapping, stormwater run-off from this area discharges to the Charles River, which agrees with CDM's onsite observations.



- | | |
|-----------------------------|--|
| Outstanding Resource Waters | Public Water Supply |
| Interim Wellhead Protection | Approximate Location of Rumford Avenue Landfill Site |
| Priority Wetlands Habitat | Watershed Boundary |
| Town Boundary | |

SCALE
FEET
0 2083
DATE: APRIL, 1994



Woerd Avenue Landfill
Waltham, Massachusetts

Figure 7-1
Map Showing Zone IIs, Public Water
Supplies, ORWs and Roads
Source: MassGIS (EOEA Data Center)

Appendix A
List of Abutters to Landfill Property

**Woerd Avenue Landfill
ABUTTERS**

March 3, 1997

Atlas Address	Owner Address
901 Moody Street	City of Waltham 610 Main Street Waltham, MA 02154
945 Moody Street	Bill Mitchell Family Trust 35 Suffolk Street Wellesley, MA 02181
74 Rumford Avenue	Pantos Family Trust 74 Rumford Avenue Waltham, MA 02154
90 Rumford Avenue	Henry J. & Virginia Riblet & Stanley Berenson, Trs. o/o Richard Ross 90 Rumford Avenue Waltham, MA 02154
44-66 Woerd Avenue	Parker Hannifin Corporation Corporate Tax Department 17325 Euclid Avenue Cleveland, OH 44112
17-18 Norumbega Terrace	MJPB Realty Trust 145 Harrington Road Waltham, MA 02154
5 Norumbega Terrace Unit 5-1F	Antonio Butera & Pasquale Butera 297 Webster Street Auburndale, MA 02166
5 Norumbega Terrace Units 5-2F, 5-2R	Orazio & Teresa Santangelo 266 Derby Street West Newton, MA 02165
5 Norumbega Terrace Unit 5-3R	Dorothy M. Bailey 5 Norumbega Terrace, 3R Waltham, MA 02154
5 Norumbega Terrace Unit 5-3F	Richard E. Paolino 383 River Street Waltham, MA 02154

6 Norumbega Terrace Unit 6-1F	Maria K. & James M. Guyer 39 Patty Lane Northboro, MA 01532
6 Norumbega Terrace, Units 6-2F, 6-2R	Antonio & Rosa Paola 327 Cherry Street W. Newton, MA 02165
6 Norumbega Terrace Unit 6-3F	Leo J. & Kathleen M. Hill c/o Janet M. Williamson 6-3F Norumbega Terrace Waltham, MA 02154
6 Norumbega Terrace Unit 6-1R	N. Edward & Marie A. Fantasia c/o James F. Kiley 5-6 Norumbega Terrace, Unit 4
6 Norumbega Terrace Unit 6-3R	Orazio & Teresa Santangelo 266 Derby Street W. Newton, MA 02165

Appendix B

"Municipal Groundwater Supply Study, City of Newton,
Massachusetts," prepared by IEP Geoscience,
December 1982.

Geoscience

consulting
geologists
hydrologists
groundwater
scientists

617-358-5156

~~617-899-7000~~

245-9173

MUNICIPAL
GROUND-WATER SUPPLY
STUDY
CITY OF NEWTON, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

DECEMBER 1982

a division of **IEP**
534 boston post road
wayland, ma 01778

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Figure 2	Saturated Thickness Map	detached
Figure 3	Ground-water Favorability Map	detached

1.0 INTRODUCTION

The City of Newton, like most other Metropolitan Boston communities, relies on water furnished by the Metropolitan District Commission (MDC). The MDC water system is one of the finest in the country, but, like any similar system, it draws on limited resources. Continued expansion of the MDC system is not the only way to meet member communities' water needs. Realizing the importance of local water sources, the City of Newton engaged the services of the Geoscience Division of IEP, Inc., to evaluate ground-water resources within its boundaries.

This report is presented in an expanded outline format, so that the reader may quickly find the desired information and easily understand the primary work products. These products include three hydrogeologic maps, cost estimates, recommendations for developing water supplies, and a bibliography of ground-water resource information for the City of Newton. In addition, new data gathered for this study are documented in this report and its appendices.

1.1 Objectives

The following objectives have been accomplished:

1. Extensively verify the location, quantity, quality, and flow characteristics of all existing and potential municipal ground-water resources in the City.

2. Define aquifer properties in key areas through an extensive program of test drilling and seismic refraction studies.
3. Provide a series of concise hydrogeologic maps of the City which delineate significant ground-water resource areas, such as municipal buried valley aquifers, aquifer recharge areas and areas which are highly susceptible to contamination. These maps shall be of an accuracy and have a format which shall make them useful to other City boards, such as the Conservation Commission, Planning Board and the Board of Health.
4. Document all results in a Final Report.

1.2 Methods of Investigation

1.2.1 Office Methods

Existing data considered pertinent to the study were gathered, verified, and compiled by Geoscience staff. These data, together with new data obtained during this study, were reduced to a useful form and plotted on working copies of the three hydrogeologic maps. Sources of these data are given in the attached Bibliography of Hydrogeologic Information for Newton. The data were contoured, where appropriate, and interpretations were made as to the practical applications of the data.

1.1.2 Field Methods

In order to supplement the existing data base in places where the greatest "return on investment" could be realized, we obtained new data by the following means:

1. Geologic reconnaissance - observation of bedrock and soil exposures throughout the City.
2. Seismic Refraction - Graphing of acoustic wave travel through various sub-surface layers to provide information on saturated thickness of water-bearing deposits. Locations of the seismic traverses are shown on Plate 3, and results of the work are given in Appendix 1.
3. Test boring and monitor well installation - drilling and soil sampling at selected locations, followed by installation of permanent wells for monitoring the quality of ground water. Logs of the borings, including diagrams of the monitor wells, are given in Appendix 2.

2.0 WORK PRODUCTS

The primary work products generated for this study are described below:

2.1 Surficial Geologic Map - Figure 1

This map depicts the various geologic materials exposed at the earth's surface. Bedrock underlies all other deposits and crops out at the surface at the indicated localities. Water yields from bedrock wells are generally low, although yields of several

hundred gallons per minute are possible at selected locations. These high-yield zones occur principally at bedrock fracture intersections and can be located by a technique known as "fracture trace analysis." Exploring and developing water in the bedrock is a relatively expensive and unsuccessful task, so the bedrock is not considered as an aquifer (water-bearing) unit for the purposes of this report.

Glacial till overlies bedrock at most locations and is a mixture of clay, silt, sand, and gravel deposited directly by glacial ice, with little or no sorting by running water. Till is dense and nearly impermeable, and, thus, is not an aquifer unit. Most of the till is in the form of "ground moraine" - a few feet to a few tens of feet directly overlying bedrock. In some areas, such as Mt. Ida in Newtonville, the till was deposited by the glacier in streamlined hills ("drumlins") over 100 feet thick. Outstanding examples of Drumlins are indicated on the map by the letter "D."

Stratified drift deposits consist of sand and gravel layers deposited by streams issuing from melting glacial ice. The stratified drift deposits have high porosity and permeability; they store and transmit water more readily than the other categories of deposits and thus constitute the major aquifer unit in Newton. Examples of specific glacial landforms, such as

eskers, kettles, and Kames, are indicated by letter symbols on the map. Eskers are sinuous linear ridges of sand and gravel which were deposited as subglacial, englacial, or superglacial streambeds. Kettles are depressions in the stratified drift landsurface, formed by collapse as sand and gravel deposits slumped when isolated blocks of glacial ice melted. Kames are conical hills of stratified drift formed as glacial streams dumped debris into low spots or holes in the glacial ice.

2.2 Saturated Thickness Map - Figure 2

The primary criterion for judging the most favorable locations for municipal water-supply test wells is saturated thickness. Saturated thickness is defined as the vertical distance from water table down through the saturated zone to some non-aquifer material, such as glacial till or bedrock. Without sufficient saturated thickness in the ground-water reservoir, the water table will have a tendency to drawdown excessively under heavy pumping. For municipal ground-water supplies, a saturated thickness of 30 feet is considered to be a minimal value. For irrigation wells (at ball parks, schools, etc.), a saturated thickness of 15 feet is a minimum value.

Saturated thickness is shown in stratified drift areas by contour of equal thickness at a 10-foot contour interval. Much of the City has at least 15 feet of saturated thickness, and

thickness on the order of 50-70 feet are found in a few areas adjacent to the Charles River. The occurrence of great saturated thickness adjacent to a major source of recharge, such as the Charles River, is a fortunate circumstance for the City in terms of obtaining large supplies of ground water.

2.3 Ground-water Favorability Map - Figure 3

This map takes over where the saturated thickness map leaves off. The transmissivity or total water-transmitting capacity of a column of saturated soil is a function of two factors: saturated thickness (as previously defined), and hydraulic conductivity. Hydraulic conductivity is a measure of the ability of a unit cross-sectional area (square foot, for example) of aquifer material to conduct water. Sum the water-conducting ability of each square foot of aquifer material from the top of the water table to the till or bedrock surface, and you have the "transmissivity" or total water-transmitting capacity of the saturated soil column.

Transmissivity values greater than 2,500 feet squared per day are generally considered adequate for development of municipal ground-water supplies. Several such areas are shown on the maps, and all of these are adjacent to the Charles River. Areas meeting the above criterion for transmissivity, as well as having greater than 30 feet of saturated thickness and adequate setback

distances (400 feet from deleterious land uses and one-half mile from landfills), are indicated by shaded pattern on the map. These areas also have more than adequate annual recharge rates, being adjacent to the Charles River, and acceptable access to potential well house locations.

Small water supplies for irrigation purposes can be obtained where transmissivity is greater than 500 feet squared per day. This contour is shown on the map as the first contour within the stratified drift deposits; any site from the 5 (500 feet squared per day) contour in the direction of increasing transmissivity can be considered as a good prospect for irrigation wells.

2.4 Water Supply Cost Estimates - Appendix 4

The appended estimates were developed to provide a basis for decision making. They can be refined for each individual site if a decision is made to proceed with water development. The costs for municipal well development are exclusive of land-taking, since most sites are already publically owned. Costs of treatment works are included, although treatment (for iron, manganese, and color) may not be necessary. The estimates include costs of exploring for and developing water supplies, as well as some of the major operating costs.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Municipal Supplies Outlook

The ground-water favorability map indicates several areas where large supplies could be obtained. Of these, the best is the immediately surrounding B-1. This site has quite high saturated thickness and transmissivity values. Additionally, it is in an excellent position to receive recharge from the Charles River. As a preliminary estimate, one or more wells at this site could yield about 2 million gallons per day.

The quality of water at this site would be largely a function of the quality of water in the Charles River. Our review of available data indicates that the quality of water would probably be satisfactory. Travel through the sand and gravel would purify the water to a great degree and filter out pathogens. The site has a large area of open space and wetland surrounding it, and these land-use categories would provide an excellent buffer zone to help protect water quality.

Another site which is highly favorable for municipal ground-water supply development is the area surrounding B-2. This site is located on City-owned land and could probably sustain withdrawals of somewhat over one-half million gallons per day. As with the other potential municipal well sites, wells in this area would receive recharge from the Charles River.

Two other sites indicated on the Ground-water Favorability Map deserve to be mentioned also. Boring B-3 was placed next to the Charles River on the City-owned conservation land north of Commonwealth Avenue and adjacent to the Marriott Hotel parking lot. The boring was located near the river, so that less dry soil would have to be drilled than if it had been located at a higher elevation on the conservation land. However, an actual production well would have to be drilled near the center of the conservation land in order to have a 400-foot radius setback from deleterious land uses. Our data from boring B-3 was somewhat less definitive than data from B-1 and B-2, but it appears likely that this site also could yield approximately one-half million gallons per day.

A fourth site which budget limitations did not allow us to test drill is located on MDC Charles River Reservation land, north of Pine Grove Avenue, west of Route 128, and south of the Charles River. Regional data indicate that this site could also provide approximately one-half million gallons per day.

In summary, four sites appear to have significant promise for large-scale municipal ground-water development. It appears quite likely that 2-3 million gallons per day could be obtained from these areas. This represents about 17-25% of the City's requirements and would significantly reduce the amount of water purchased from the MDC.

Transmissivity estimates and potential well yields are summarized in Appendix 3. Costs to develop water can be estimated only roughly at this point, and these rough estimates are given in Appendix 4. Costs would total approximately \$226,000 for a well and pumping station and an additional \$4,000,000 if a treatment plant is needed. Operating costs would be approximately \$1,500-1,800 per month for a pumping station and \$1 per 1000 gallons if a treatment plant is needed. Costs associated with connecting to the distribution system would be additional.

3.2 Irrigation Supplies Outlook

The cost to develop an irrigation well system would be much lower - approximately \$8000 per site. This estimate includes exploration, pump testing, supervision and installation of pumping equipment.

Two sites in the City were drilled with the expectation of finding sufficient water for irrigation purposes rather than for municipal supplies. Seismic traverses were made at each site in order to confirm the availability of sufficient saturated thickness.

Borings B-4 and B-5 were drilled at Albermarle Park. Two drilling methods were tried at this location in order to determine the most economical and effective method of well construction. Well B-4 was drilled by augering and inserting slotted well screen.

Well B-5 was installed by driving 4-inch diameter casing, washing out the native soil, inserting slotted well screen, backfilling with a pure silica filter sand, and withdrawing the 4-inch diameter casing. The procedure used in B-5 produced a much more efficient well. Apparently, silt and fine sand can slump against the well screen if a filter sand pack is not emplaced before the well casing is withdrawn. B-5 was pumped at 1.1 gallons per minute with a submersible pump (the pump's capacity). Drawdown while pumping that quantity of water was only 0.24 feet after ten minutes. The well was also pumped at approximately 5 gallons per minute with a boat pump and the drawdown was approximately one foot. It appears that an irrigation well at this site could yield approximately 50 gallons per minute for a short time. Additional testing would be needed to establish the number and spacing of wells which would provide an adequate flow of water for irrigation purposes.

Well B-6 was drilled at Cabot Park. This well pumped 1.27 gallons per minute with 0.33 feet of drawdown - a slightly lower specific capacity than for the Albermarle site. Both sites have the same usable saturated thickness - approximately 15 feet. It appears that an irrigation well system could be successful at this park also.

Based on these two sites, it appears that most of the City park land within the 500 foot squared per day contours on Figure 3

could be irrigated with locally derived water from shallow well systems. Two other park sites were investigated with seismic traverses. At the Oak Hill Playground east of the track, the seismic method revealed approximately 17 feet of saturated thickness. Thus the water supply situation here may be similar to that at the other two parks where wells were drilled. At Cold Spring Playground, however, seismic traverse T-5 indicated 4-13 feet of dry sand overlying glacial till with no significant saturated layer. Borings for proposed improvements in the northern portion of this playground indicated very fine sand and silt which would not be sufficiently permeable for irrigation wells.

3.3 Recommendations

This report has documented the potential for both municipal drinking water supplies and local irrigation water supplies. If the City wishes to tap these water sources for its use, we would recommend the following initial stages:

1. Negotiate with the M.D.C. concerning further testing in the vicinity of B-1.
2. Drill and develop a 4-inch diameter well at this site and pump at capacity with a submersible pump for 24 hours. Analyze drawdown and recovery data utilizing existing well as an observation point. Sample water at end of pumping period and have D.E.Q.E. test for standard drinking water parameters.

3. Follow above step at site surrounding B-2. Determine whether one or both sites should be subjected to a prolonged (5 day) pumping test.
4. Complete an irrigation well system at Albermarle playground as a demonstration project. The two wells already in place here will save some of the preliminary work. The City will then know the exact procedure and costs for similar irrigation well systems at other locations.
5. Encourage private institutions such as golf courses to obtain irrigation water in this way.
6. Protect existing open space surrounding sites found suitable for municipal ground-water supplies. Acquire additional open space in these areas if possible and critically review plans of development if any are proposed in or near these areas. Review any projects in Newton or upstream which might impact adversely the quality of water in the Charles River.

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APPENDIX 1

SEISMIC SURVEY RESULTS

1. Report of Weston Geophysical dated 10/21/82
2. Seismic Data Summary



Weston Geophysical

COMPANION

October 21, 1982
WGC R-434-1

IEP, Inc.
534 Boston Post Road
Post Office Box 438
Wayland, Massachusetts 01778

Attention: Mr. Andrew Miller

Subject: Results of Seismic Refraction Survey
Newton, Massachusetts

Gentlemen:

In accordance with your letter of authorization dated August 11, 1982, Weston Geophysical conducted seismic refraction measurements at three (3) locations in the City of Newton on Tuesday, October 12, 1982. These investigations were part of the hydrogeologic study for a municipal groundwater supply for the City of Newton, Massachusetts Department of Public Works.

The locations for the seismic refraction survey were selected by IEP and are shown on the enclosed plan maps (Figures 1 and 2). The results of the seismic refraction survey are shown in profile form on Figure 3 and are discussed below.

SITE 1

Site 1 is located on the Saw Mill Brook Reservation of the MDC (see Figure 1). Due to an MDC imposed restriction on use of explosives for seismic energy generation at this site, seismic energy was generated with a non-explosive energy source. A minimum depth to dense glacial till of 75 feet and a probable depth to bedrock of 125 feet are shown on the seismic profile for this site (see Figure 3). These horizons cannot be profiled with certainty due to the somewhat diminished quality of the seismic refraction data using a non-explosive energy source. However, the minimum thickness of 65 feet for water saturated overburden material evidenced by the seismic velocity of 5,000 ft/sec indicates that this site is desirable for further exploration by test drilling.

IEP
Attention: Mr. Andrew Miller

Page Two
October 21, 1982

SITE 2

Site 2 is located in the Auburndale Park recreation area (see Figure 2). Depths to bedrock at this site range from 38 to 73 feet (see profile, Figure 3). The overburden velocity of 6,400 ft/sec is indicative of dense glacial till; accordingly, no additional exploration is recommended at this location.

SITE 3

Site 3 is located adjacent to St. Josephs Noviate (see Figure 1). Depths to bedrock at this location range from 23 to 33 feet (see profile, Figure 3). The overburden velocity of 5,000 ft/sec is indicative of water saturated overburden material, however, this material may not be of sufficient thickness to support development of a municipal groundwater supply.

It has been our experience that municipal groundwater supplies are obtained from those areas where there is a sufficient thickness (usually 40 feet or greater) of material with a seismic velocity in the range of 4,800 to 5,300 ft/sec. Site 1 located at the Saw Mill Brook Reservation of the MDC meets these criteria and may warrant further exploration by test drilling.

We are pleased to provide these services and look forward to working with you on future projects.

Sincerely,

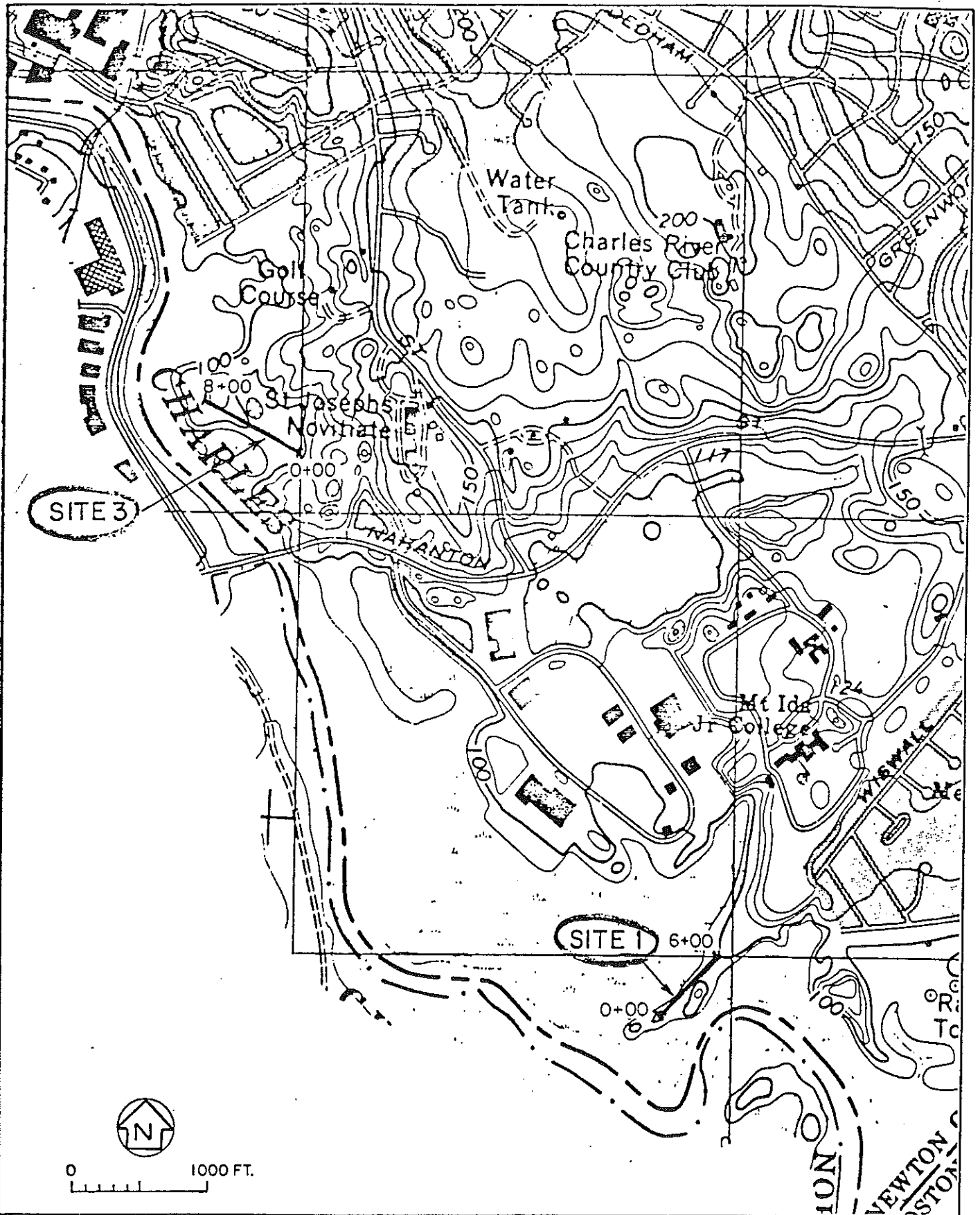
WESTON GEOPHYSICAL CORPORATION



Edward N. Levine

ENL:eag

Enclosure



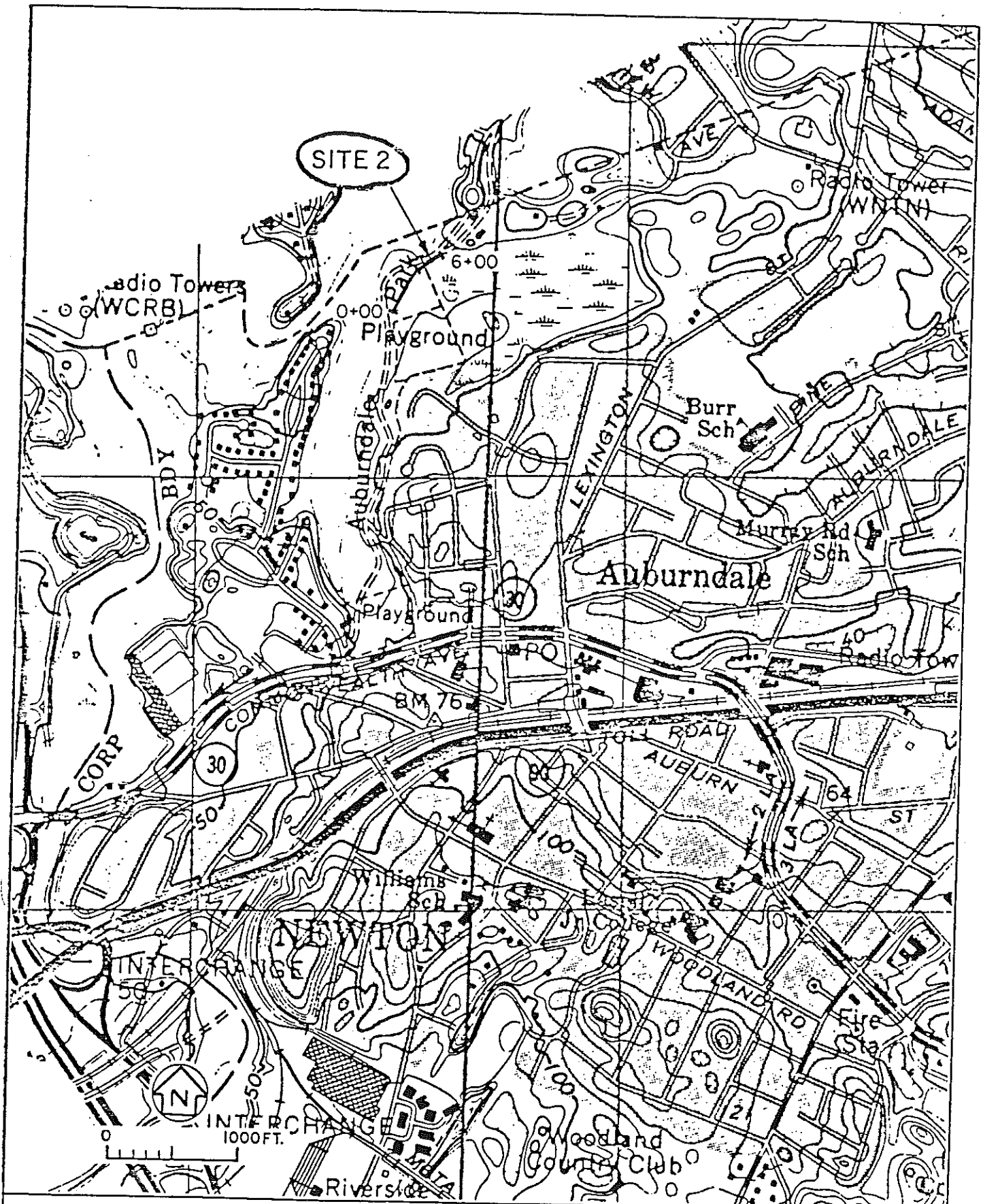
SEISMIC SURVEY
 MUNICIPAL GROUNDWATER SUPPLY STUDY
 NEWTON, MASSACHUSETTS
 for
 IEP, Inc.

PLAN MAP - SITES 1 AND 3

WESTON GEOPHYSICAL CORP.

October 1982

Figure 1



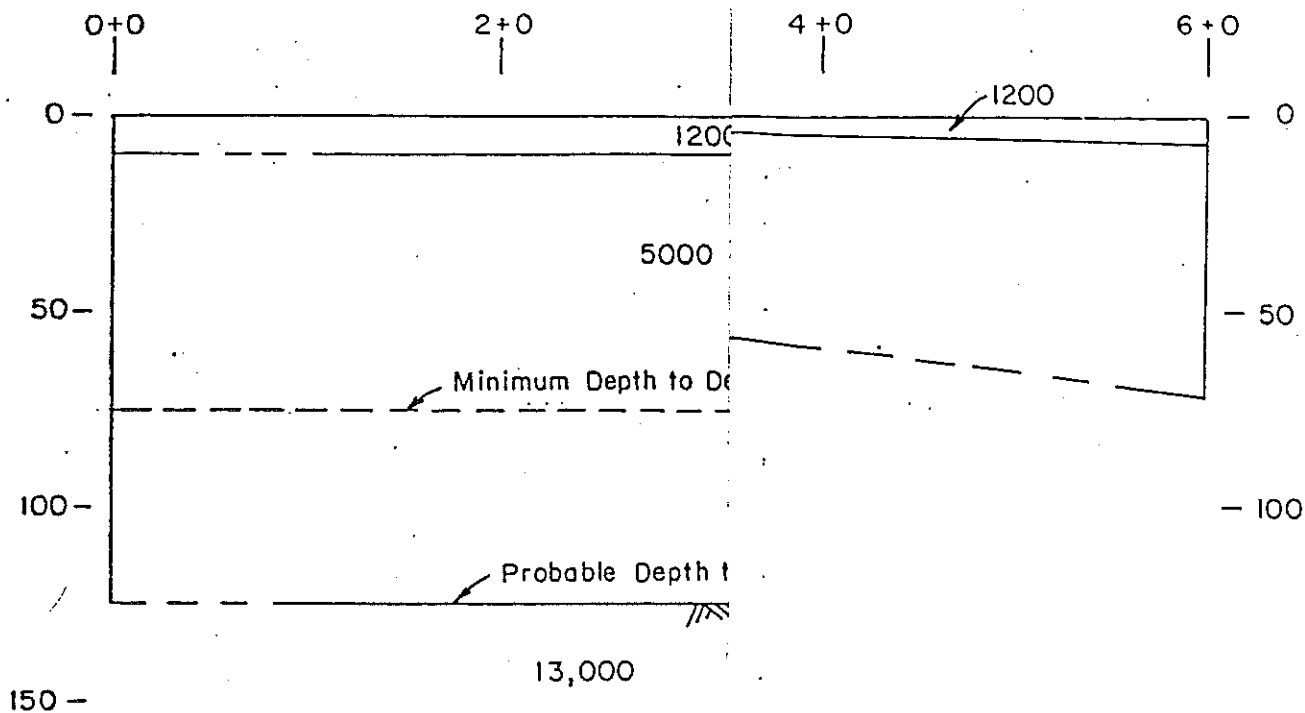
SEISMIC SURVEY
 MUNICIPAL GROUNDWATER SUPPLY STUDY
 NEWTON, MASSACHUSETTS
 for
 IEP, Inc.

PLAN MAP - SITE 2

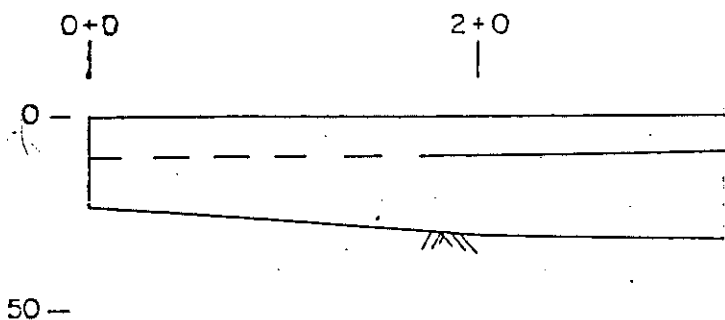
WESTON GEOPHYSICAL CORP.
 October 1982

Figure 2

SITE I (SAW MILL BROOK RESALE PARK)



SITE 3 (ST.)



VALUES ARE IN FEET/SECOND.

Y
SUPPLY STUDY
ISETS

SEISMIC PROFILE

WESTON GEOPHYSICAL CO.

October 1982

PROJECT NO: 82-31SHEET NO: 1 of 1TITLE: Newton Ground WaterDATE: 12/16/82BY: RH CK'D D. R.

SEISMIC DATA SUMMARY

Traverse No.	by	Depth Ranges (in feet)						
		Dry Sand		Sat. Sand		Till		Bedrock
		from	to	from	to	from	to	
S-1	Weston	0	10	10	75	75	130	130 —
S-2	Weston	0	0- 5	—	—	0- 5	40- 70	40- 70 —
S-3	Weston	0	10	10	20- 30	—	20- 30	—
S-4	Geoscience	0	8	8	30	—	30	—
S-5	Geoscience	0	8	8	42	—	42	—
S-6	Geoscience	0	21	21	54	—	54	—
S-7	Geoscience	0	3	3	20	—	20	—
S-8	Geoscience	0	4- 13	—	—	4- 13	? ?	? ? —

APPENDIX 2
BORING AND MONITOR WELL LOGS

DRILLER R. Glenn

SPECTOR D. Haines

DATE START 11/8/82

DATE FINISH 11/8/82

ARCHITECT
 ENGINEER

Casing HSA Sampler SS Core Barrel _____
 TYPE _____
 SIZE ID 2-1/2" 1-3/8" _____
 HAMMER WT _____ 140 _____
 HAMMER FALL _____ 30" _____

FILE NO. _____

SURFACE ELEV. _____

LINE & STATION _____

OFFSET _____

DEPTH	SAMPLE					COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	
	ND.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER						REC.
			0-6	6-12	12-18				
0'							1.0	Topsoil	
4'							4.0	Br. Fine-Crs. Sand and Gravel	
20'								Br. Fine-Crs. Sand, Tr. Fine-Crs. Gravel	
35'	S1	35.0-36.5	WASH SAMPLE						
40'									
50'									
60'									
70'									
75'							76.5		
75'	S2	75.0-76.5	8	13	18	18"			
80'									Bottom of Boring 76.5

SAMPLE IDENTIFICATION

- SPLIT SPOON
- THIN WALL TUBE
- UNDISTURBED PISTON
- OPEN END ROD
- WASH SAMPLE
- AUGER SAMPLE


PENETRATION RESISTANCE
 140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M-Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	V-Stiff
		31+	Hard

PROPORTIONS USED

- trace 0 to 10%
- little 10 to 20%
- some 20 to 35%
- and 35 to 50%

REMARKS:
 SCREEN
 BENTONITE
 OTTAWA SAND
 COL. A WELL DIAGRAM



NEW ENGLAND BORING CONTRACTORS, INC.
 P. O. Box 883
 Glastonbury, CT 06033
 203-633-8158

1387 Main Street
 Springfield, MA 01103
 413-733-1232

CLIENT I.E.P.
 PROJECT NAME Wells
 LOCATION Newton, MA

LOG NUMBER
B-2
 SHEET
 No 1
 of 1

DRILLER R. Glenn
 INSPECTOR D. Haines
 DATE START 11/9/82
 DATE FINISH 11/9/82

ARCHITECT
 ENGINEER

Casing Sampler Core Barrel
 TYPE HSA SS
 SIZE I.D. 2-1/2" 1-3/8"
 HAMMER WT. 140
 HAMMER FALL 30"

FILE NO. _____
 SURFACE ELEV. _____
 LINE & STATION _____
 OFFSET _____

DEPTH	SAMPLE					COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	
	ND.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER						REC.
			0-6	6-12	12-18				
0							1.0	Topsoil	
0	S1	30.0-31.5	14	14	13	18"		Br. Fine-Crs. Sand, Tr. Fine-Crs. Gravel	
60	S2	62.5-63.0	81			0"	61.0	Gray Till	
63.0							63.0	Bottom of Boring 63.0 Installed 2" Well @ 62.0 Materials: 20' Screen 44' Riser 1 Locking Protector Pipe	

SAMPLE IDENTIFICATION

— SPLIT SPOON
 T — THIN WALL TUBE
 U — UNDISTURBED PISTON
 — OPEN END ROD
 — WASH SAMPLE
 A — AUGER SAMPLE


PENETRATION RESISTANCE
 140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	V-Stiff
		31+	Hard

PROPORTIONS USED

trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

REMARKS:
 SCREEN
 COL. A WELL DIAGRAM



NEW ENGLAND BORING CONTRACTORS, INC.
 P. O. Box 683 1387 Main Street
 Glastonbury, CT 06033 Springfield, MA 01103
 203-633-8168 413-733-1232

CLIENT I.F.P.
 PROJECT NAME Wells
 LOCATION Newton, MA

BORING NUMBER B-3
 SHEET No. 1 of 1

DRILLER R. Glenn
 INSPECTOR D. Haines
 DATE START 11/9/82
 DATE FINISH 11/10/82

ARCHITECT ENGINEER
 TYPE HSA
 SIZE ID 2-1/2"
 HAMMER WT 140
 HAMMER FALL 30"
 Casing HSA
 Sampler SS
 Core Barrel 1-3/8"

FILE NO _____
 SURFACE ELEV. _____
 LINE & STATION _____
 OFFSET _____

DEPTH	SAMPLE					COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER					
			0-6	6-12	12-18			
							2.0	Black Topsoil
5'								
	S1	8.0-10.0						
10'								
5'								
								Br. Fine-Crs. Sand and Gravel, Some Cobbles, Tr. Boulders
20'								
5'								
	S2	35.0-31.5	21	20	26		35.0	
30'								
5'								
								Bottom of Boring 35.0 Installed 2" Well @ 25' Materials: 5' Screen, 22' Riser, 1 Locking Protector Pipe


- SAMPLE IDENTIFICATION
- SPLIT SPOON
 - THIN WALL TUBE
 - UNDISTURBED PISTON
 - OPEN END ROD
 - WASH SAMPLE
 - AUGER SAMPLE

PENETRATION RESISTANCE
 140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M. Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	V. Stiff
		31+	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS: SCREEN
TRIPLE RIFLE
COL. A 

NEW ENGLAND BORING CONTRACTORS, INC.
 P. O. Box 503
 Westonbury, CT 06033
 13-633-8168

1387 Main Street
 Springfield, MA 01103
 413-733-1232

CLIENT J.F.P.
 PROJECT NAME Wells
 LOCATION Newton, MA

NUMBER
B-4
 SHEET
 No. 1
 of 1

OWNER R. Glenn
 DIRECTOR D. Haines
 TEST START 11/10/82
 TEST FINISH 11/10/82

ARCHITECT
 ENGINEER

Casing HSA Sampler SS Core Barrel _____
 TYPE _____
 SIZE ID 2-1/2" 1-3/8"
 HAMMER WT. _____ 140
 HAMMER FALL _____ 30"

FILE NO. _____
 SURFACE ELEV. _____
 LINE & STATION _____
 OFFSET _____

DEPTH	SAMPLE					COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	
	NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER						REC.
			0-6	6-12	12-18				
								.5 Topsoil -	
								Br. Fine-Crs. Sand and Gravel, Tr. Cobbles	
								7.0	
								Br. Fine-Crs. Sand, Tr. Silt	
20'	SI	20.0-21.5	8	9	11	12"		23.0	
5'									
30'									
35'									
40'									

Gray Silt and Clay, Some Fine-Crs. Sand

Gray Silt and Clay, Some Fine-Crs. Sand and Gravel, Few Cobbles

Bottom of Boring 40.0
 Installed 2" Well @ 40.0
 Materials: 10' Screen, 32' Riser, 1 Locking Protector Pipe

SAMPLE IDENTIFICATION

S _____ SPLIT SPOON
 T _____ THIN WALL TUBE
 U _____ UNDISTURBED PISTON
 O _____ OPEN END ROD
 W _____ WASH SAMPLE
 A _____ AUGER SAMPLE


PENETRATION RESISTANCE
 140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesiveness	Density	Cohesive Consistency
0-4	Very Loose	0-2 Very Soft
5-5	Loose	3-4 Soft
10-25	Med Dense	5-8 M.Stiff
30-45	Dense	9-15 Stiff
50+	Very Dense	16-30 V.Stiff
		31+ Hard

PROPORTIONS USED

trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

REMARKS: SCREEN
BENTONITE
OTTAWA SAND

COL. A WELL DIAGRAM 

NEW ENGLAND BORING CONTRACTORS, INC.
 P. O. Box 283 1387 Main Street
 Glastonbury, CT 06033 Springfield, MA 01103
 203-633-8168 413-733-1232

CLIENT J.E.P.
 PROJECT NAME Wells
 LOCATION Newton, MA

LOG NUMBER
B-5
 SHEET
 No. 1
 of 1

DRILLER R. Glenn
 DIRECTOR D. Haines
 DATE START 11/10/82
 DATE FINISH 11/11/82

ARCHITECT
 ENGINEER
 TYPE _____
 SIZE ID _____
 HAMMER WT _____
 HAMMER FALL _____
 Casing HW
 Sampler SS
 Corr Barrel _____
4"
1-3/8"
300
140
24"
30"

FILE NO. _____
 SURFACE ELEV. _____
 LINE & STATION _____
 OFFSET _____

D	SAMPLE					COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS	
	NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER						REC.
			0-6	6-12	12-18				
								.5 Topsoil -	
								Br. Fine-Crs. Sand and Gravel, Few Cobbles	
							7.0		
10'	S1	10.0-11.5	15	16	20	16"		Br. Fine-Crs. Sand, Tr. Silt	
5'	S2	15.0-16.5	16	17	14	18"			
20'	S3	20.0-21.5	26	30	42	10"			
							23.0		
5'	S4	25.0-26.5	16	18	18	10"		Gray Silt and Clay, Some Fine-Crs. Sand	
							30.0		
30'								Bottom of Boring 30.0 Installed 2" Well @ 27.0 Materials: 10' Screen 19' Riser 1 Locking Protector Pipe	

SAMPLE IDENTIFICATION
 _____ SPLIT SPOON
 _____ THIN WALL TUBE
 _____ UNDISTURBED PISTON
 _____ OPEN END ROD
 _____ WASH SAMPLE
 _____ AUGER SAMPLE

PENETRATION RESISTANCE
 140 lb. Wt. falling 30" on 2" O.D. Sampler
 Cohesionless Density Cohesive Consistency
 0-4 Very Loose 0-2 Very Soft
 5-9 Loose 3-4 Soft
 10-29 Med. Dense 5-8 M.Stiff
 30-49 Dense 9-15 Stiff
 50+ Very Dense 16-30 V.Stiff
 31+ Hard

PROPORTIONS USED
 trace 0 to 10%
 little 10 to 20%
 some 25 to 35%
 and 35 to 50%

REMARKS: SCREEN
 SAND
 COL. A

NEW ENGLAND BORING CONTRACTORS, INC.
 P. O. Box 583
 1387 Main Street
 Springfield, MA 01103
 413-733-1232

CLIENT I.E.P.
 PROJECT NAME Wells
 LOCATION Newton, MA

BORING NUMBER
B-6

SHEET
 No. 1
 of 1

DRILLER R. Glenn

ARCHITECT
 ENGINEER

FILE NO. _____

SPECTOR C. Lyons

Casing Sampler Corr Barrel
 TYPE HW SS _____
 SIZE ID 4" 1-3/8" _____
 HAMMER WT. 300 140 _____
 HAMMER FALL 24" 30" _____

SURFACE ELEV _____

DATE START 11/11/82

LINE & STATION _____

DATE FINISH 11/11/82

OFFSET _____

DEPTH	SAMPLE						COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER			REC.			
			0-6	6-12	12-18				
							1.0	Topsoil	
							4.0	Br. Fine-Crs. Sand and Gravel	
5'	S1	5.0-6.5	10	14	21	12"		Br. Fine-Med. Sand	
							7.0		
10'	S2	10.0-11.5	60	42	40	4"		Br. Fine-Crs. Sand and Gravel, Little Silt	
5'									
20'							22.0		
							25.0	Gray Fine-Crs. Sand and Gravel, Silt and Clay	
25'								Bottom of Boring 25.0 Installed 2" Well @ 22.5 Materials: 10' Screen 14.5' Riser 1 Locking Protector Pipe	

- SAMPLE IDENTIFICATION**
- SPLIT SPOON
 - THIN WALL TUBE
 - UNDISTURBED PISTON
 - OPEN END ROD
 - WASH SAMPLE
 - AUGER SAMPLE


PENETRATION RESISTANCE
 140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M. Stiff
30-49	Dense	9-25	Stiff
50+	Very Dense	16-30	V. Stiff
		31+	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS: SCREEN
BENTONITE
OTHER SAND
 COL. A WELL DRAW



APPENDIX 3
TRANSMISSIVITY AND WELL YIELD ESTIMATES

PROJECT NO: 82-31

SHEET NO: 1 of 1

TITLE: Newton Ground Water

DATE: 12/16/82

BY: RH CK'D D.R.

*Estimated Transmissivity
and
Well Yields*

Site	Transmissivity		Well Yields	
	gal/day/ft	ft ² /day	gal/min.	million gal./day
B-1	70,000	9358	1400	2.02
B-2	19,000	2540	400	0.58
B-3	19,000	2540	400	0.58
B-4 B-5	7000	936	50 per well	0.07
B-6	5800	775	40 per well	0.06

APPENDIX 4
WATER SUPPLY DEVELOPMENT COST ESTIMATES

PROJECT NO: 82-31

SHEET NO: 1 of 2

TITLE: Newton Ground Water

DATE: 12/16/82

BY: D.R. CK'D RA

Water Supply Development Cost Estimates (1982 Dollars)

MUNICIPAL WELL EXPLORATION.

DRILL ADDITIONAL 4 IN. DIAM. WELL
TO SUPPLEMENT EXISTING 24 IN.
WELL. PUMP TEST USING SUBMERSIBLE
PUMP, MEASURING DRAWDOWN AND RE-
COVERY AT MONITOR WELL. \$ 3,000

DRILL ADDITIONAL 2 IN. DIAM. OBSER-
VATION WELLS (2) FOR LONG TERM
PUMPING TEST. \$ 3,000

DRILL 8 IN. DIAM. WELL AND PUMP
NEAR CAPACITY FOR AT LEAST 5 DAYS \$ 15,000

PROVIDE CONTINUOUS SUPERVISION OF
DRILLING AND PUMP TESTS. PREPARE
REPORT OF RESULTS \$ 5,000

TOTAL PER SITE \$ 26,000

PRODUCTION WELL DRILLING AND
DEVELOPMENT (70 FT. GRAVEL
PACKED WELL), PER SITE \$ 50,000

PROJECT NO: 82-31

SHEET NO: 2 of 2

TITLE: Newton Ground Water

DATE: 12/16/92

BY: D.R. CK'D DA

PUMPING STATION *

CONSTRUCTION OF COMPLETE STATION \$ 150,000

OPERATION AND MAINTENANCE PER MONTH \$ 1500-2000

TREATMENT PLANT **

CONSTRUCTION OF 2 MGD PLANT \$ 4,000,000

OPERATION AND MAINTENANCE \$ 12 / 1000 GALLONS

* AVERAGE STATION LIFE OF 10-15 YEARS (GIVE MAJOR OVERHAUL OF EQUIPMENT IS NEEDED).

** TYPICALLY FOR IRON, MANGANESE AND COLOR REMOVAL

IRRIGATION WELL EXPLORATION AND DEVELOPMENT

DRILL ADDITIONAL WELL AT EACH SITE AND PUMP AT CAPACITY FOR 8 HOURS, TAKING DRAWDOWN AND RECOVERY MEASUREMENTS. PREPARE REPORT SUMMARIZING RESULTS. \$ 2,000

DRILL ADDITIONAL WELLS AT DESIRED SPACING, PUMP AT CAPACITY AND MEASURE DRAWDOWN AT OBSERVATION WELL. \$ 4,000

INSTALL PERMANENT PUMP AND CONNECT TO SPINKLER SYSTEM. \$ 2,000

TOTAL PER SITE \$ 8,000

Appendix C

"Report to Metropolitan District Commission on Charles
River - Purgatory Cove Water Quality Improvement,"
prepared by Metcalf & Eddy Inc., February 1975.

BOARD
OF
HEALTH

CITY OF WALTHAM

MASSACHUSETTS

DESMOND B. BIGMAN, D.V.M.
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Member
MORRIS LIGDENCA, M.D.
Member

ROBERT O. MAILLOUX, M.S., C.H.C.
Director of Public Health

Mr. Lawrence Leone
City Councillor - Ward 8
Waltham City Council
Waltham, Ma., 02154

Dear Councillor Leone:

The following report is in answer to your request relative to an investigation conducted by MASPIRG of alleged health hazards at the former Woerd Ave. Landfill, Cram's Cove, and Purgatory Cove.

WOERD AVE. LANDFILL - With the opening of the Waltham Incinerator in 1946, the Woerd Ave. Landfill became relegated to accepting non-burnable items. As with any landfill, there is documentation of problems associated with this kind of operation until its final closing and capping in 1974. At that time, conditions for closing and capping were dictated by the State and the closing and capping process was closely monitored and inspected and approved by various state agencies. Presently, there is growth covering a major portion of the landfill. An inspection of the area revealed the cap to be well intact. There is fencing in place from the rear of Norumbega Terrace continuing southerly and westerly along the rear lot lines of the industrial areas on Woerd Ave. There is no fence along Cram's Cove nor along the easterly portion of the landfill abutting the Moody Street playground. While no fence exists along the Cove area, there is a physical separation between the face of the landfill and the Cove in the forms of a dirt road, vegetation, and trees. This serves as an effective warning and barrier to persons if they should wander into the area. The Moody Street playground abuts the easterly slope of the landfill which is gentle and not very high. I do not see any physical danger at either point. The landfill, as I stated previously, is holding its cap and does not pose any health hazard. It appears the area is currently being used by dirt bikes. As with any mechanical machine, if the operator does not exercise caution harm and injury may result. It may be prudent to have the police department increase their surveillance of the area in an attempt to curb this activity.

CRAM'S COVE - Cram's Cove is a narrow inlet from the Charles River approximately 875 feet long and 100 feet wide. The final 200 feet of the Cove abut the Woerd Ave. Landfill on the western slope. I have not been able to locate any results of any water testing done in Cram's Cove. While over the years some leachate from the landfill may have affected the water quality, the main problem of the cove appears to be one of hydraulics. (Much like the problems of Purgatory Cove.) There

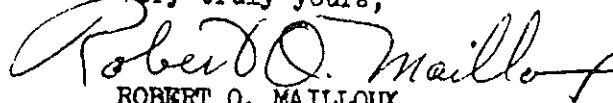
appears to be little or no movement of the water. Further, nutrients entering the Cove from the adjoining industrial sites and septic systems prior to the installation of the sewer system would have contributed much more heavily to the poor water quality of Cram's Cove than the landfill. The aesthetic value of Cram's Cove may not rate an "A" but I do not find a health hazard in this area.

PURGATORY COVE - Attached is a report completed by Metcalf and Eddy for the M.D.C. on Purgatory Cove. Again, the problems appear to be the hydraulics of the Charles River. Sections 1 and 6 of the report are very informative and should answer any further questions you may have. Again, I do not view Purgatory Cove as a health problem.

If you should have any further questions relative to this matter, please feel free to contact me.

For a healthier environment, I remain

Very truly yours,



ROBERT O. MAILLOUX
DIRECTOR OF PUBLIC HEALTH

enc.

1. M&E report to M.D.C. dated Feb. 28, 1975
2. Map of Woerd Ave. Landfill and adjacent areas

Metcalf & Eddy

Library

Boston

REPORT TO
METROPOLITAN DISTRICT COMMISSION
ON
CHARLES RIVER - PURGATORY COVE
WATER QUALITY IMPROVEMENT

February 28, 1975

3627



METCALF & EDDY INC

ENGINEERS & PLANNERS

BOSTON • NEW YORK • PALO ALTO • CHICAGO

Metcalf & Eddy, Inc. | Engineers & Planners

Statler Building/Boston, Massachusetts 02116 (617)423-5600 TWX 710 321-6365 Cable METEDD-BOSTON

February 28, 1975

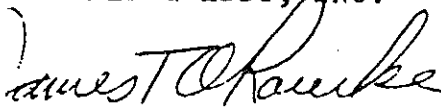
Mr. Alfred F. Ferullo
Director of Water Quality
Metropolitan District Commission
20 Somerset Street
Boston, Massachusetts 02108

Dear Mr. Ferullo:

In accordance with our agreement dated June 26, 1974, we are pleased to submit this report entitled "Report to Metropolitan District Commission on Charles River-Purgatory Cove Water Quality Improvement, February 28, 1975."

Very truly yours,

METCALF & EDDY, INC.


James T. O'Rourke
Senior Vice President

ACKNOWLEDGMENTS

We wish to acknowledge the assistance and cooperation of the personnel at the Metropolitan District Commission during the course of this study. In particular, we thank Mr. Alfred F. Ferullo, Director of Water Quality, Mr. Martin F. Cosgrove, Administrative Engineer, and Mr. James Jones, Principal Sanitary Engineer.

We also acknowledge the cooperation and assistance from the Waltham Conservation Commission, Mr. Carl Cunningham, Chairman; The City of Newton, Honorable Theodore D. Mann, Mayor; and the City of Waltham, Honorable Arthur J. Clark, Mayor.

This study was prepared by Messrs. Edward Morrison, Richard Check, Richard Corneille and Mrs. Carol Sweet under the direction of Bernard M. Center.

REPORT

CHAPTER 1
INTRODUCTION

Background Information

Purgatory Cove is a small cove whose inlet is on the right bank (facing down stream) of the Charles River about 10 miles west of Boston, Massachusetts, see Figure 1-1. It lies on the boundary line between Waltham to the north and Newton to the south. The cove is an inverted U shape, about 600 feet wide and 1,200 feet long, covering an area of approximately 13 acres. There is little water movement in its shallow depths of 3 to 4 feet. Fathometer readings indicate the cove bottom is virtually flat. Terrain around the cove is gently hilly with elevations ranging from 35 to 60 feet above mean sea level. Land uses include residential and park areas on all sides except along the southern margin where the City of Newton sanitary landfill exists see Figures 1-2 and 1-3. Observations made during site visits reveal that the cove is inhabited by an abundance of mallard ducks and painted turtles. A thick layer of peat covers the cove bottom. Decaying tree stumps (Figure 1-2) are scattered in the southwestern area of the cove, indicating the area was not always completely flooded.

Geologically Purgatory Cove lies in the western portion of the Boston Basin. It is underlain at some depth by Carboniferous (300 million years old) sedimentary rocks which were formed from the erosion of older bedrock hills to the west.



FIG. 1-2. VIEW FROM SOUTHWEST BANK
LOOKING TOWARD INLET-OUTLET



FIG. 1-3. VIEW FROM SOUTHEAST
LOOKING NORTH



FIG. 1-1. LOCATION MAP

Since Carboniferous time, the geologic environment has been primarily erosional, forming a gentle topography with occasional low hills. Overlying the bedrock is a thick unit of glacial drift deposited during the recent Wisconsin ice advance (14,000 years ago). The drift consists of a variety of soils including mixed sand, gravel, silt and clay (till), and stratified sand and gravel (outwash). Low-lying coastal areas below El 50 were submerged to below sea level by the weight of the surrounding ice. Marine clays up to about 100 feet thick were deposited in these areas during high stands of the sea. After rebound of the land mass, subsequent erosion by streams have established modern deposits of silt and/or sand with peat deposited in marshy areas.

* Purgatory Cove did not come into existence until installation of flash boards on the Moody Street Dam located on the Charles River in Waltham raised the flow line of the river. The granite dam was completed in 1836⁺ with a masonry crest elevation of 37.8 feet and with a top of flashboard elevation of 40.5 City of Waltham Datum (CWD). The CWD is 5.65 feet below the U.S.C.&G.S. datum of mean sea level. Therefore, to correct from CWD to U.S.C.&G.S. subtract 5.65 feet from CWD elevation. According to the boat rental operator, there have been times when the depth of the water in the cove has been too shallow for motor boat activity due to removal of the flashboards.

* The inlet-outlet for the cove originally had an opening of approximately 80 feet. However, with the improvement of the

Forest Grove Road, which crosses over the Inlet-outlet, the trestle bridge was replaced with a 15-foot diameter corrugated metal pipe (CMP) culvert. This restriction hampers water circulation into the cove.

The cove receives water from five prime sources: (1) storm-water runoff from the land adjacent to the cove, (2) direct rainfall on the cove surface, (3) stormwater from the 60-inch reinforced-concrete pipe (RCP) drain which empties into the southeast area of the cove, (4) the Charles River through the Inlet-outlet, and (5) groundwater.

The Charles River has been classified as Class B in the area of Purgatory Cove. The quality of the water of Purgatory Cove and the Charles River does not meet the Class B standard with regard to dissolved oxygen and coliform bacteria according to the previous data collected (Appendix A) and from our own water quality analyses.

Industries and municipalities along the Charles River have discharged untreated or partially treated wastewater into the river over a period of many years. Despite recent efforts to control such pollution, years of wastewater discharge have created sludge deposits on the river bottom. Increasing concentrations of nutrients have presented ideal conditions for algae blooms during the summer months. Microscopic algae of the blue-green variety create unpleasant odors and filamentous algae hamper boating and fishing. The Metropolitan District Commission (MDC) has in past summers treated the algae with a herbicide.

Normally, several treatments are required to effectively control

the algae.

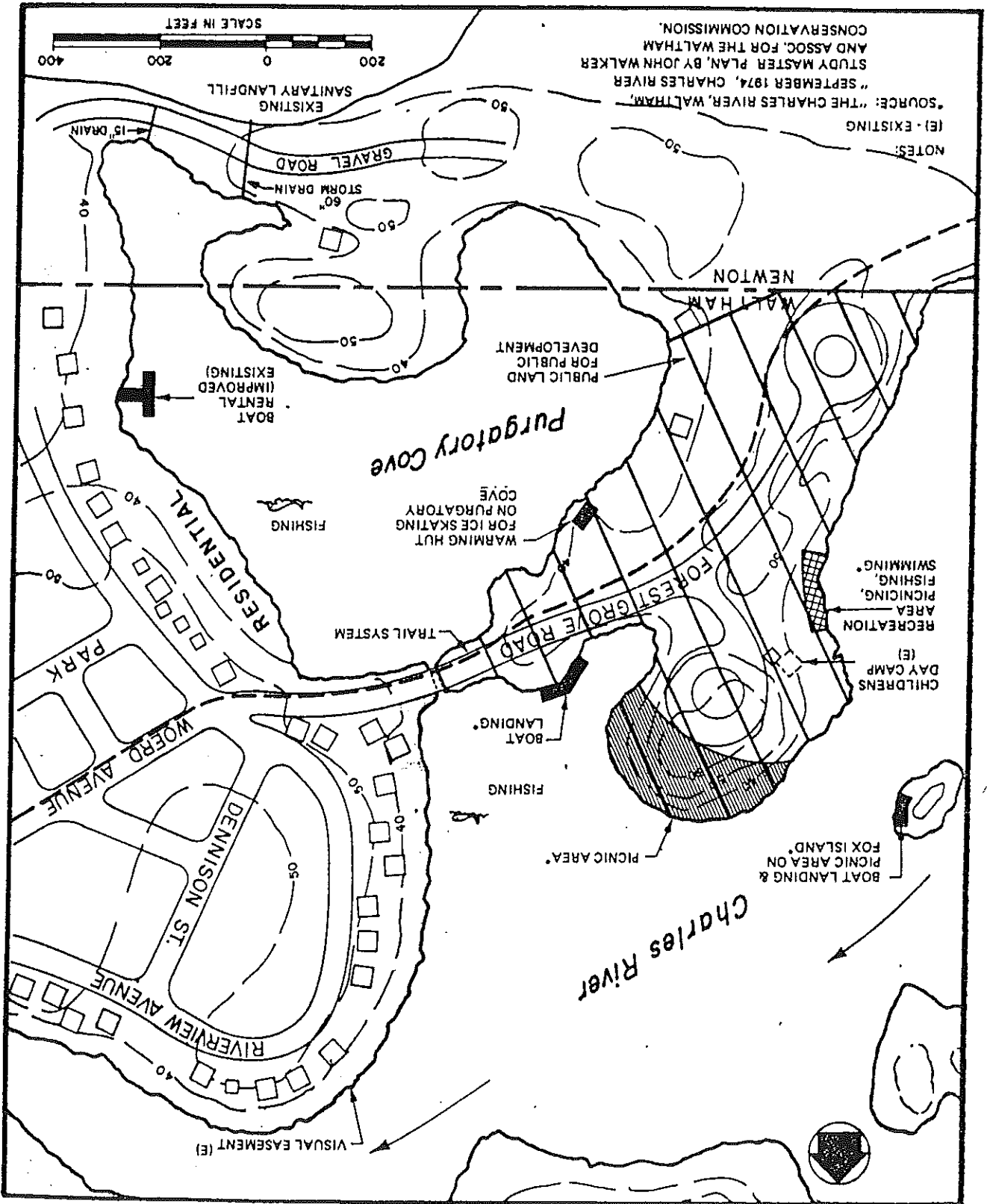
Our studies indicate that the dissolved oxygen (DO) concentration in the cove water is generally somewhat less than the DO in the river at comparable times. Thus, fish are less likely to be found in the cove. We have observed individuals fishing at the inlet to the cove on the Charles River side. The operator of the boat rental establishment told us that some pan fish are caught in the cove. This problem will be discussed later in this report.

Purgatory Cove and the surrounding land areas have

numerous uses. The eastern and southwestern shores of the cove are lined with residences. The western peninsula which jets out into the Charles River is public land which is utilized for picnicking, parking, and a children's day camp. The entire area is lightly wooded and scenic. The area adjacent to the southeastern shore which is owned by the City of Newton and is used as a sanitary landfill. This does not detract from the appearance of the cove. The landfill is well managed and does not present problems to future plans to further utilize the cove for recreational purposes. A report* by John Wacker and Associates to the Waltham Conservation Commission has proposed plans to use the cove as an integral part of creating an attractive recreation area on the Charles River with boating, picnicking, hiking, skating, and swimming facilities. (See Figure 1-4).

*"The Charles River Waltham," by John Wacker & Assoc., September 1974.

FIG. 1-4. PROPOSED USES FOR PURGATORY COVE



NOTES:
 (E) - EXISTING
 SOURCE: "THE CHARLES RIVER, WALTHAM, MA."
 STUDY MASTER PLAN, BY JOHN WALKER AND ASSOC. FOR THE WALTHAM CONSERVATION COMMISSION.
 "SEPTEMBER 1974, CHARLES RIVER"

VISUAL EASEMENT (E)

- a. Determine the degree of circulation within the cover.
 - b. Determine dissolved oxygen and temperature profiles within the cover.
 - c. Conduct subsurface investigations (bottom surveys and borings).
 - d. Determine oxygen demands, nutrient levels, chemical and biological parameters of cover water and bottom samples.
2. Gather additional data required to do a complete evaluation of the cover.
 1. Comprehensive review of available data pertaining to water quality in Purgatory Cove and the Charles River (near the cover).

The scope of this study includes the following:

Scope of Study

the water quality in the cover.

the problem, and recommend what action should be taken to improve poor water quality, investigate various alternatives to remedy

The purpose of this study is to identify the cause(s) of area to its full recreational potential.

to the cover. Poor water quality hinders the development of the root cause of complaints during the summer by residents adjacent communities of Waltham and Newton. Poor water quality is the

Purpose of Study

Purgatory Cove can be a recreational asset to the

- e. Analyze leachate samples from adjacent sanitary landfill for toxic metals and compare with analyses of cove water samples.
- 3. Assemble and analyze the data secured by sampling and surveys and relate to the potential uses for the cove.
- 4. Define potential solutions to the problems of water quality--odors, low oxygen levels, algae growth, etc., based on the collected data.
- 5. Develop a preliminary design for each solution and estimate the capital and operating costs required.
- 6. Develop an evaluation of the environmental impact of modifying the water quality in the cove in terms of its use for recreation or unimproved land.
- 7. Recommend what action(s) should be taken to improve the water quality in Purgatory Cove.

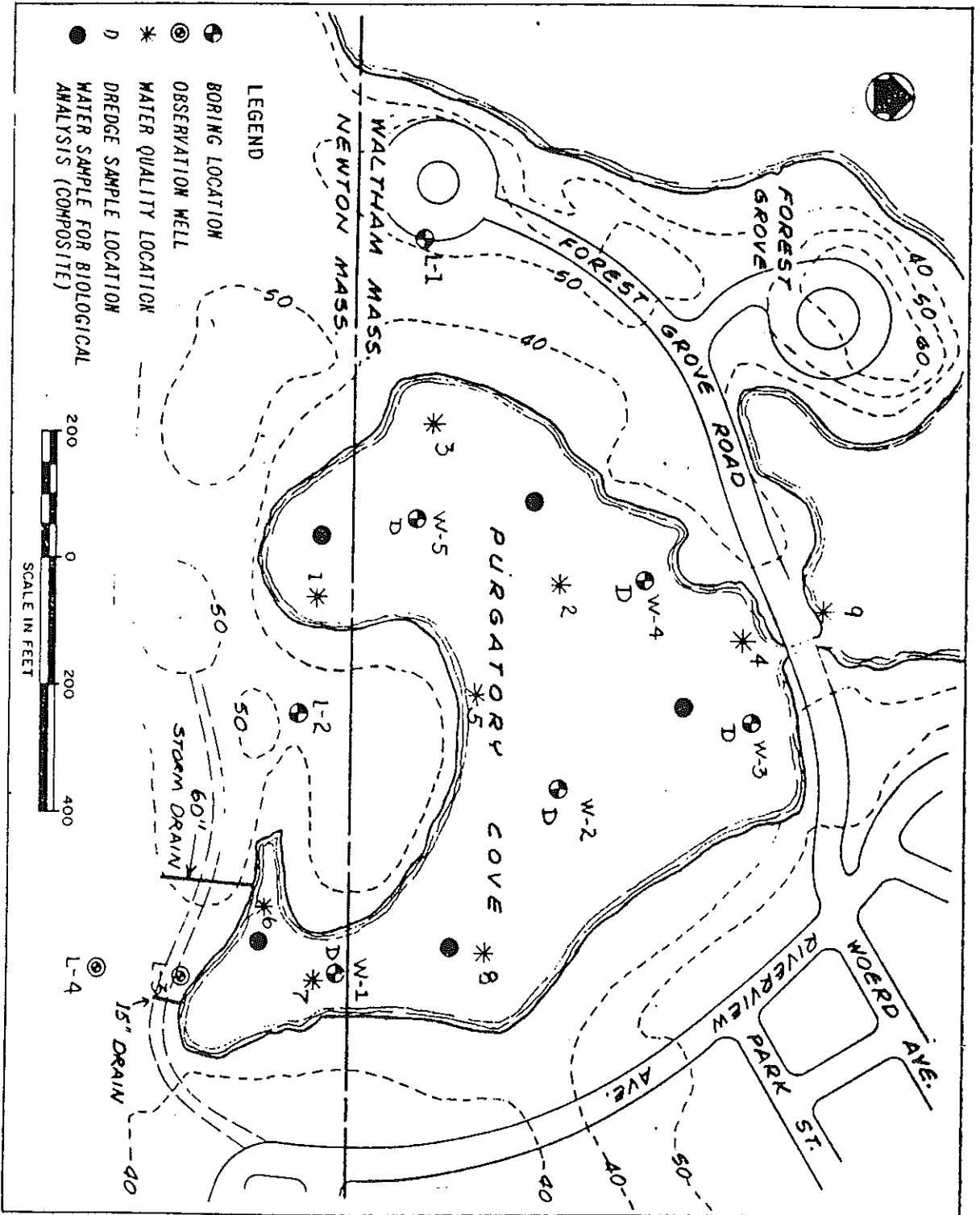


FIG. 2-2 EXPLORATION PROGRAM

The cove has been included in plans proposed to the Waltham Planning Commission as an integral part of creating a recreational area on the Charles River for boating, picnicking, hiking, skating, and swimming facilities.

the cove with an herbicide. experienced in the cove and the MDC in past summers has treated lower than that in the Charles River. Algae blooms have been Concentrations of dissolved oxygen in the cove is generally

Landfill. eastern area contains leachate from the City of Newton sanitary (5) groundwater. Groundwater entering the cove from the south-cove, (4) the Charles River through the inlet-outlet, and (3) stormwater from a 60-inch drain in the southeast area of the adjacent land, (2) direct rainfall on the cove water surface, the cove comes from five sources: (1) stormwater runoff from diameter CMP pipe in the northern end of the cove. Water entering built. Water from the Charles enters the cove through a 15-foot The cove came into existence when the Moody Street Dam was Gallons.

between 2 to 4 feet with a total water volume of about 12.4 million the Newton-Waltham boundary line. The cove water depth varies Purgatory Cove is a 13-acre cove in the Charles River on

Summary

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

CHAPTER 6

A General field and water quality survey was performed to complement existing data. The geotechnical survey included:

- (1) determining cove water depths using a recording fathometer,
- (2) DO, pH, temperature, and conductivity measurements of cove water, (3) drilling four land and five "in water" soil borings,
- (4) installing two observation wells in the area of Newton sanitary landfill for leachate analysis and determination of groundwater elevations, and (5) bottom sediments (benthic deposits) were obtained for laboratory analysis.

Cove water circulation was measured using a sensitive current meter at the 15 foot inlet-outlet of the cove. No velocity of flow was recorded on three separate occasions. In addition, a detailed analysis of all surface water sources tributary to the cove were performed. An average surface flow of 62.4 million gallons per year enters the cove of which about 68 percent of the total is attributable to the 60 inch storm drain.

Samples of cove water were taken for microscopic and bacterial analysis. The presence of certain organisms in the laboratory analysis indicate organic pollution. The ratio of fecal to total coliform bacteria was low for all the samples. In addition, the total coliform bacteria count was greater than that allowed for Class B waters in three of the five samples. Qualitative water conditions were noted when water quality samples were taken. Filamentous algae were determined to be a

problem on August 21, 1974 and an herbicide treatment was performed on August 22, 1974. Qualitative observations on September 6 indicated that the treatment was effective.

Leachate samples were collected at the two observation wells and samples were taken simultaneously in the cove at two locations to determine the affect on the cove.

Laboratory analyses on the bottom deposit sediments included microscopic, bacterial, chemical and organic tests.

Oxygen depletion kinetics of the deposits were determined by determining reaction rates, "K" values, by BOD analysts. The average "K" rate, was 0.021 days^{-1} .

An oxygen balance was performed on the cove to quantify the oxygen demand of the cove. Calculations for oxygen demands of the benthic deposits show that 550 pounds per day of oxygen are required. The BOD of the cove water accounts for an oxygen demand of 150 pounds per day. "Natural" reaeration was assumed to be 100 pounds per day of oxygen. The net production of oxygen by photosynthesis was assumed to be zero. The net amount of oxygen required by the cove is, therefore, 600 pounds per day.

Five technically feasible alternative systems were sized to provide the necessary oxygen to satisfy the cove's oxygen demand and maintain Class B quality water with respect to DO.

The five alternatives are as follows: (1) pumping Charles River water into the cove, (2) pumping saturated Charles River water into the cove, (3) siphoning water out of the cove to downstream

study:

The following conclusions have been reached regarding this

Conclusions

cover was discussed.

The environmental impact of changing water quality in the

is about \$300,000.

depths. The cost of dredging the cover to a water depth of 6 feet

alternatives IV and V as aeration systems require greater water

continue to use the cover. Also dredging would be required for

Dredging of the cover is required if motor boats are to

at the Moody Street Dam should be investigated by the MDC.

possibility of "flushing" the cover by lowering the flashboards

end of the cover, and (4) enlarging the inlet-outlet. The

using a low head screw pump to create flow into the southwest

River to divert flow into the cover via an open channel, (3)

end of the cover, (2) construction of a levee into the Charles

Charles River upstream of the cover outlet to the southwestern

they include: (1) construction of an open channel from the

as these would not significantly upgrade the cover's water quality,

Other alternatives were considered, but were not recommended.

requirements, and "pros" and "cons" for each alternative.

alternatives including capital and operating costs, equipment

diffused aeration of the cover. Table 6-1 summarizes the five

the cover, (4) mechanical surface aeration of the cover, and (5)

of the Moody Street Dam thereby allowing river water to enter

TABLE 6-1. SUMMARY OF ALTERNATIVES TO IMPROVE PURGATORY COVE'S WATER QUALITY

Alternative	I	II	III	IV	V
Equipment requirements	Complete pumping station with 34 mgd capacity, and force main.	Complete pumping station with 21 mgd capacity, mechanical aerator, and force main.	Surface intakes, and gravity pipe with capacity of 34 mgd.	4-10 horsepower mechanical floating aerators with MCC and control building.	2-40 hp blowers (1 standby) and housing, diffused air piping and tubing.
Capital costs	\$405,000	\$415,000	\$1,650,000	\$95,000	\$258,000
O&M costs	\$ 58,000	\$ 57,000	\$ 58,000	\$28,000	\$ 28,000
Advantages:	<ol style="list-style-type: none"> 1. Greatly improved circulation in the cove. 2. System would not interfere with recreational uses of cove. 	<ol style="list-style-type: none"> 1. Greatly improve circulation in cove. 2. Positive system for adding DO to cove. 3. System would not interfere with recreational uses of the cove. 	<ol style="list-style-type: none"> 1. No energy requirement. 2. Low maintenance requirement. 3. Greatly improved circulation in cove. 4. Alt. would not interfere with recreational uses of cove. 	<ol style="list-style-type: none"> 1. Can easily be turned off or on as necessary by timers or DO probes. 2. Low estimated capital investment. 3. Positive and simple system to add DO to cove. 4. Instantaneous reaction to dropping DO values. 5. Low O&M costs. 	<ol style="list-style-type: none"> 1. Can be turned off and on as necessary by timers or DO probes. 2. Equipment would not interfere with recreational uses. 3. Positive and relatively simple system to add DO to cove. 4. Second lowest capital investment. 5. Instantaneous reaction to dropping DO values.
Disadvantages:	<ol style="list-style-type: none"> 1. Relying on Charles River to have a greater DO than the cove. 2. Flow rate is higher than minimum discharge of river, therefore, could be circulating same river water through cove more than once. 3. Relatively large capital investment. 4. System would not instantaneously react to a deficiency of DO in the cove. 5. Less flexibility than the positive aeration system. 	<ol style="list-style-type: none"> 1. Relatively large capital investment. 2. More complicated to operate than the other systems. 3. System would not instantaneously react to a deficiency of DO in the cove. 	<ol style="list-style-type: none"> 1. Flow through the siphon can be greater than flow in Charles River thereby necessitating throttling of flow out of cove during low flow periods (i.e., Sept., Oct.). 2. Large capital investment. 3. Relying on Charles River to have a greater DO than the cove. 4. Less flexibility than the positive aeration system. 	<ol style="list-style-type: none"> 1. Would not be as aesthetically pleasing as diffused air. 2. Would limit use of cove somewhat in area directly around aerator. 3. Unit more subject to vandalism than pumping. 4. Alt. does not improve circulation. 	<ol style="list-style-type: none"> 1. Diffuser tubing must be cleaned periodically and small nozzles are subject to clogging. 2. Diffuser tubing and air piping subject to vandalism. 3. Alt. does not improve circulation.

1. The existing cove bottom is virtually flat with an average water depth of 3 feet.
2. A 15 to 54 foot layer of peat underlies the cove's bottom.
3. Dissolved oxygen in the cove is generally lower than the concentration of DO in the Charles River.
4. The cove does not meet Class B water quality standards with regard to DO and total coliform.
5. Groundwater levels correspond closely to the level of the cove and, therefore, there is no significant groundwater flow into the lagoon.
6. Circulation in the cove is inadequate. Water is turned over in the cove only once or twice in the critical summer months and on the average only five times in a year.
7. The bottom deposits account for the major oxygen demand in the cove.
8. ~~The contaminants contributed to the cove by the~~ leachate and storm drainage are insignificant in terms of their affect on the concentrations in the cove. Therefore, interception and treatment of these flows is not recommended.
9. Five alternative systems are technically feasible to improve the cove's water quality.

*
*
*

chain from aerobic microorganisms to aerobic macroorganisms will adequate DO in all areas and depths of the cove, a complete food would accumulate. However, it is our belief that by providing that without any flushing action pollutants and algal growths not improve the circulation in the cove. It could be assumed The major drawback to the aeration system is that it does it can be easily controlled automatically by DO probes or timers. and is a positive means of adding DO to the cove. In addition, operating expenditures. The system is simple to operate, flexible, be installed. This alternative involves the least capital and to DO, we recommend alternative IV - mechanical surface aeration To upgrade the cove's water quality to Class B in regard to removing some oxygen demanding organic deposits.

would widen the use of the cove by small motor boats in addition that the cove be dredged to an average depth of 6 feet. This To realize the cove's full potential, we would recommend sports can be heightened by improving the water quality. tional center for boating, fishing, picnicking, and water contact considerable costs involved. The use of the area as a recrea- upgrading the water quality of Purgatory Cove may outweigh the scope of this study, we are of the opinion that the benefits from Although a detailed cost-benefit analysis is beyond the

Recommendations

10. The environmental impact of improving the cove's water quality is desirable in terms of its recreational value.

condition. The mechanical aeration system offers the shortest anticipated mechanical life (10 years). If a superior system is developed or the Charles River water quality improves substantially, a new technique might be tried without a substantial cost penalty. Table 6-1 summarizes the costs and advantages and disadvantages of the five alternatives. Because of the intangibles involved in cost/benefits of amenities, the Metropolitan District Commission is better able to select the most advantageous alternative. For instance, if aesthetics is a major consideration, the diffused aeration system would be more desirable than

The aeration system can effectively improve the cove's water quality without regard to the Charles River water quality condition. The aeration system can effectively improve the cove's water quality without regard to the Charles River water quality condition. The aeration system can effectively improve the cove's water quality. directly dependent on improving the Charles River water quality. blooms. Therefore, improving the cove's water quality is tions of total phosphorus which would be conducive to algal does not meet Class B requirements. It contains high concentra- irrespective of costs, is that the Charles River water presently Our major objection to the flushing alternatives, herbicides as necessary by monitoring water quality. bloom occurs, we recommend the continued treatment with To control algal growth and to correct any problems before a would expect less algal activity with improved water quality. expect that maintaining DO will prevent algal blooms, but we develop which will control these accumulations. We do not

the surface aeration alternative. The Commission must also decide if the benefits of improving the water quality of Purgatory Cove justify the costs, since there may be other such inlets and covers along the Charles which need water quality upgrading.

Respectfully submitted,

METCALF & EDDY, INC.

James T. O'Rourke
James T. O'Rourke
Senior Vice President

Registered Professional Engineer
Massachusetts License No. 25912



Appendix D

"Hydrogeologic Investigation Report - Parker Hannifin,
Waltham, Massachusetts," prepared by TWM Northeast,
January 1990.

Parker Hannifin Corporation
Nichols Division
48 Woerd Avenue, Box 9115
Waltham, MA 02254-9115
Phone: (617) 894-0650
Fax: (617) 899-7057 (Sales)
Fax: (617) 894-9235
Telex: 2839905

May 21, 1990

Massachusetts Department of
Environmental Protection
Metropolitan Boston - Northeast Region
5 Commonwealth Avenue
Woburn, Massachusetts 01801

Attn: John Fitzgerald

Gentlemen:

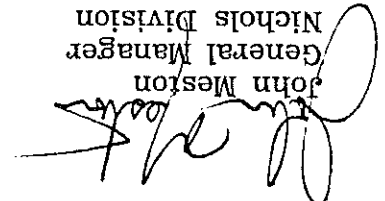
Parker Hannifin Corporation hereby submits the enclosed "Hydrogeologic Investigation Report" prepared by TWM Northeast with respect to the property located at 48 Woerd Avenue, Waltham, Massachusetts.

The enclosed submission is made pursuant to Section 7 of the Massachusetts Oil and Hazardous Material release Prevention and Response Act (General Laws of Massachusetts, Chapter 21E), and shall constitute notification that a release of hazardous materials has occurred at 48 Woerd Avenue.

Representatives of Parker Hannifin Corporation are available to meet with you at any time to discuss the enclosed report. Please let us know if you have any questions.

Very truly yours,

PARKER HANNIFIN CORPORATION


John Weston
General Manager
Nichols Division

Enclosure

cc: Waltham Board of Health



January, 1990

R-698004.30/JN

TWM NORTHEAST
The Concord Center
Box 7, 10 Ferry Street
Concord, New Hampshire 03301

Prepared by

PARKER HANNIFIN CORPORATION
Waltham, Massachusetts

Prepared for

HYDROGEOLOGIC INVESTIGATION REPORT
PARKER HANNIFIN
48 WOOD AVENUE
WALTHAM, MASSACHUSETTS

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TWM NORTHEAST/Normandean Engineers, Inc. (TWMNE) was retained by the Nichols Division of the Parker Hannifin Corporation to perform a hydrogeological site assessment of an 11.5 acre parcel located in Waltham, Massachusetts. The purpose of the investigation was to evaluate the hydrogeologic conditions at the site and to evaluate whether petroleum and/or hazardous substances have been released at the property, specifically with respect to the strict liability and lien provision of Massachusetts General Law Chapter 21E. The investigation has been conducted in two phases. Phase I of the investigation included an electromagnetic geophysical survey, the installation of six ground water monitoring wells and the collection and analysis of ground water and surface water quality samples. The results of the Phase I investigation were presented in a Summary Report prepared by TWMNE and dated December, 1987. The findings and recommendations of Phase I Hydrogeologic Investigation included:

1) Relatively low concentrations of several volatile organic compounds (VOCs) were detected in four of the six monitoring wells installed during the Phase I investigation. The largest number of VOCs were detected in monitoring well MW-3. Trichloroethene, vinyl chloride, benzene and 1,2-dichloroethane were detected in MW-3 at concentrations slightly higher than the MDEP guidelines for these compounds in public drinking water supplies. Trichloroethene and vinyl chloride were also detected at concentrations slightly higher than the MDEP guidelines in the sample from MW-1.

2) Vinyl chloride is known to be a degradation product of trichloroethene. Trichloroethene is a common industrial solvent which has been used at the site and was also present at low concentrations in the three wells where vinyl chloride was detected. 1,2-Dichloroethane is known to be a degradation product of 1,1,1-trichloroethane. 1,1,1-Trichloroethane is also a common industrial solvent and was also detected in well MW-3, the only

3) sampling location where 1,2-dichloroethane was detected. Benzene may also be used as a solvent; however, it is also a constituent of petroleum products, such as gasoline. Benzene was only detected at substantial concentrations in the sample from well MW-3 and appears to be related to a release of gasoline, as other common petroleum constituents (i.e., ethylbenzene, toluene and xylenes) were also detected at this location. Petroleum constituents were also detected at MW-4, 6, 7 and 8.

4) Potential sources of the VOCs detected in MW-3 include the Waltham landfill and/or VOC surface migration on the Parker Hannifin Property.

5) The ground water contamination detected at the site does not appear to threaten public or private drinking water supplies. Private water supply wells are not known to exist at the site or in the vicinity of the site, since the area is provided with municipal water from the Quabbin Reservoir, located in central Massachusetts. Ground water at the site could potentially impact the surface water quality of Gram's Cove and the Charles River. However, no VOCs were detected in surface water samples collected from Gram's Cove.

6) Additional investigations would be necessary to further evaluate the direction of ground water flow, the source and extent of ground water contamination and the risk to the public and the environment.

A Phase II Hydrogeological Investigation was subsequently conducted, including the installation of four additional ground water monitoring wells and the collection and analysis of a second round of water quality samples.

The southern parcel (11 acres) currently consists of a complex of Industrial manufacturing and office facilities. These facilities include the Nichols Division administrative offices and main manufacturing complex in the northeast corner of the property, four storage buildings and exists at the site today. This parcel presently appears to be undeveloped. In the early 1900's, the small northern parcel of land was the site of a boathouse owned by the Nichols family. No evidence of the boathouse

1.2 SITE HISTORY

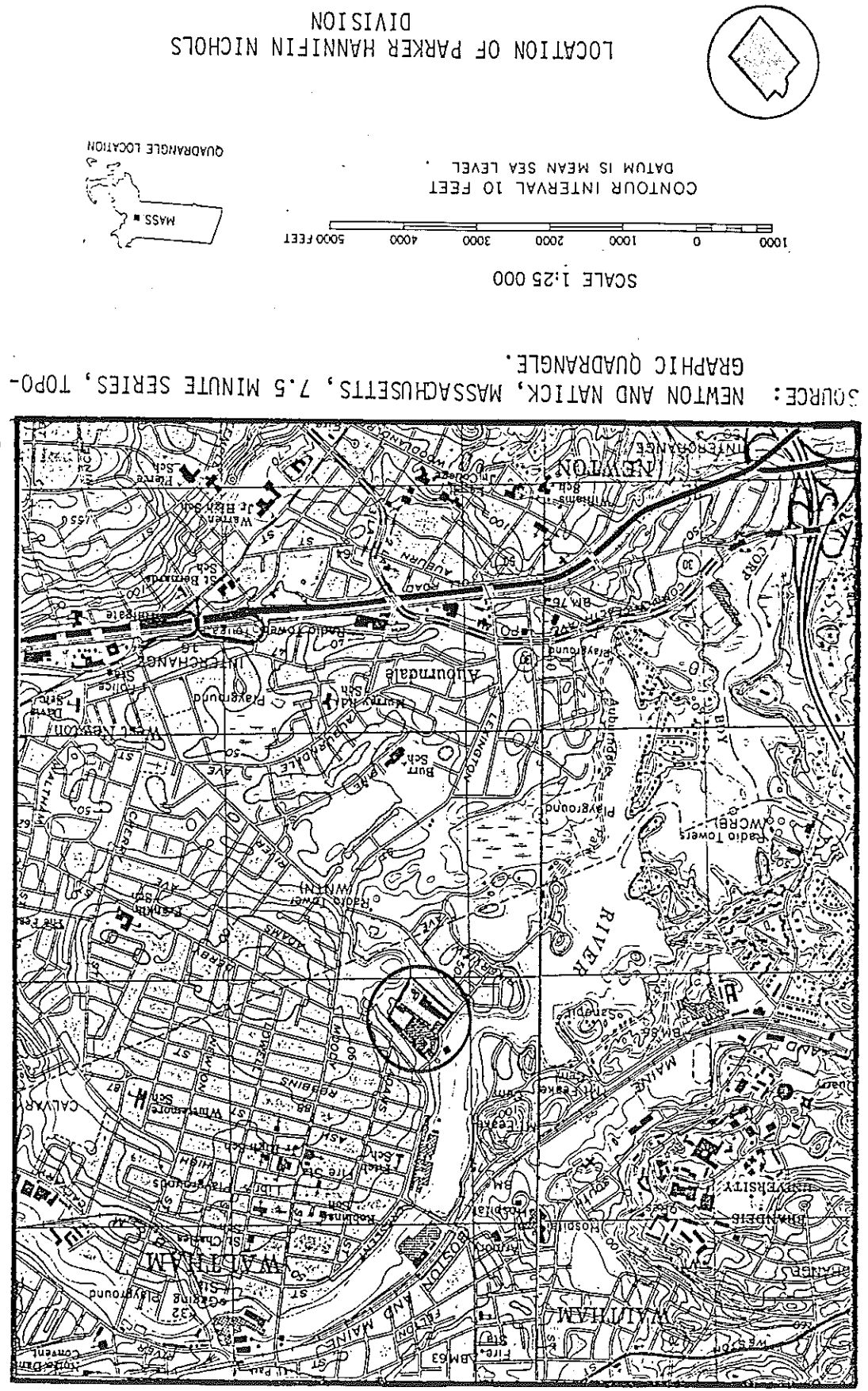
Corporation presently owns both parcels of land. northwest (Figure 2). The Nichols Division of the Parker Hannifin Corporation former City of Waltham landfall to the southeast, an embayment of the Charles River to the southwest (Gram's Cove) and Woerd Street to the southern lot is bounded by residential properties to the northeast, the park to the east and west, and Woerd Avenue to the south. The larger small, undeveloped northern plot consists of approximately 14,000 square feet (0.3 acres) and is bounded by the Charles River to the north, a City study area consists of approximately 11.5 acres on two city lots. The mile north of Interstate 90 and one mile east of Route 128 (Figure 1). The Nichols facility is located at 48 Woerd Avenue, approximately one

1.1 SITE LOCATION

This report incorporates the findings from Phase I Hydrogeologic Investigation and presents the findings of the Phase II Hydrogeologic Investigations. The following report documents the methods used during these investigations, discusses the investigations results and presents TWNNE's conclusions and recommendations. All field and laboratory data are summarized and included in the report.

A soil gas investigation was also performed as part of the Phase II activities in the vicinity of MW-3 to identify potential source areas for the VOCs identified in MW-3. Soil samples were collected and submitted for the laboratory analysis of VOCs.

FIGURE 1. LOCATION MAP OF PARKER HANNIFIN NICHOLS DIVISION, WALTHAM, MASSACHUSETTS.



The Nichols Division manufactures metal parts for commercial, computer and aerospace industries. Both solid and liquid wastes are generated at the site. Liquid wastes include; coolants, mineral spirits,

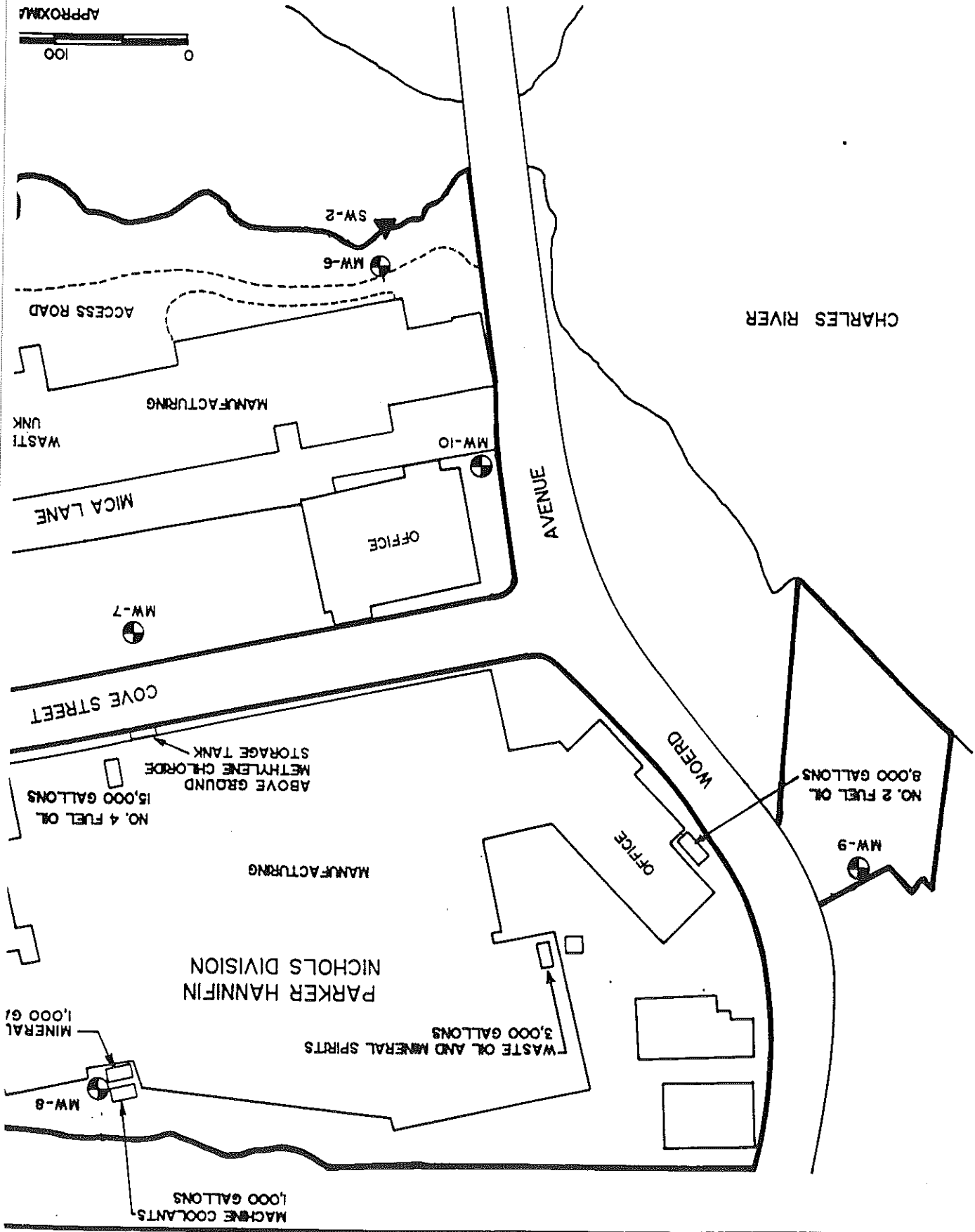
1.3 EXISTING CONDITIONS

Based upon a review of the files of the City of Waltham's Board of Health and the State of Massachusetts' Department of Environmental Protection (Hazardous Waste and Solid Waste Bureau) no complaints or violations are on record for the Nichols Facility.

The W. H. Nichols Company leased the manufacturing buildings south of Mica Lane to the New England Mica Company (dates uncertain). The New England Mica Company manufactured mica insulators. Waste mica was encountered in the subsurface in the areas south of the New England Mica Company building and adjacent to Gram's Cove. Mica is an abundant, naturally occurring mineral. Mica is not an EPA listed hazardous waste, and would not be expected to exhibit the characteristics of a hazardous waste, as defined by EPA.

The original manufacturing facilities were constructed from 1913 to 1958 by the W.H. Nichols Company. The original facility included the complex of buildings located north of Cove Street, near Woerd Avenue, and a building south of Mica Lane, adjacent to Gram's Cove. Additions to the original manufacturing complex were constructed in the 1930's, 1950's, 1960's and 1970's. The W.H. Nichols Company was purchased by Parker Hannifin in 1984. No additional structures have been constructed since the acquisition of the property by Parker Hannifin.

parking areas in the southern portion of the property, a light-manufacturing complex along the western portion of the property and an office complex in the northwestern portion of the property (Figure 2).



PARKER HANNIFIN
 WALTHAM, MASSACHUSETTS

FIGURE 2
 SITE LOCATION PLAN AND LOCATION OF
 UNDERGROUND STORAGE TANKS AND
 GROUND WATER MONITORING WELLS.

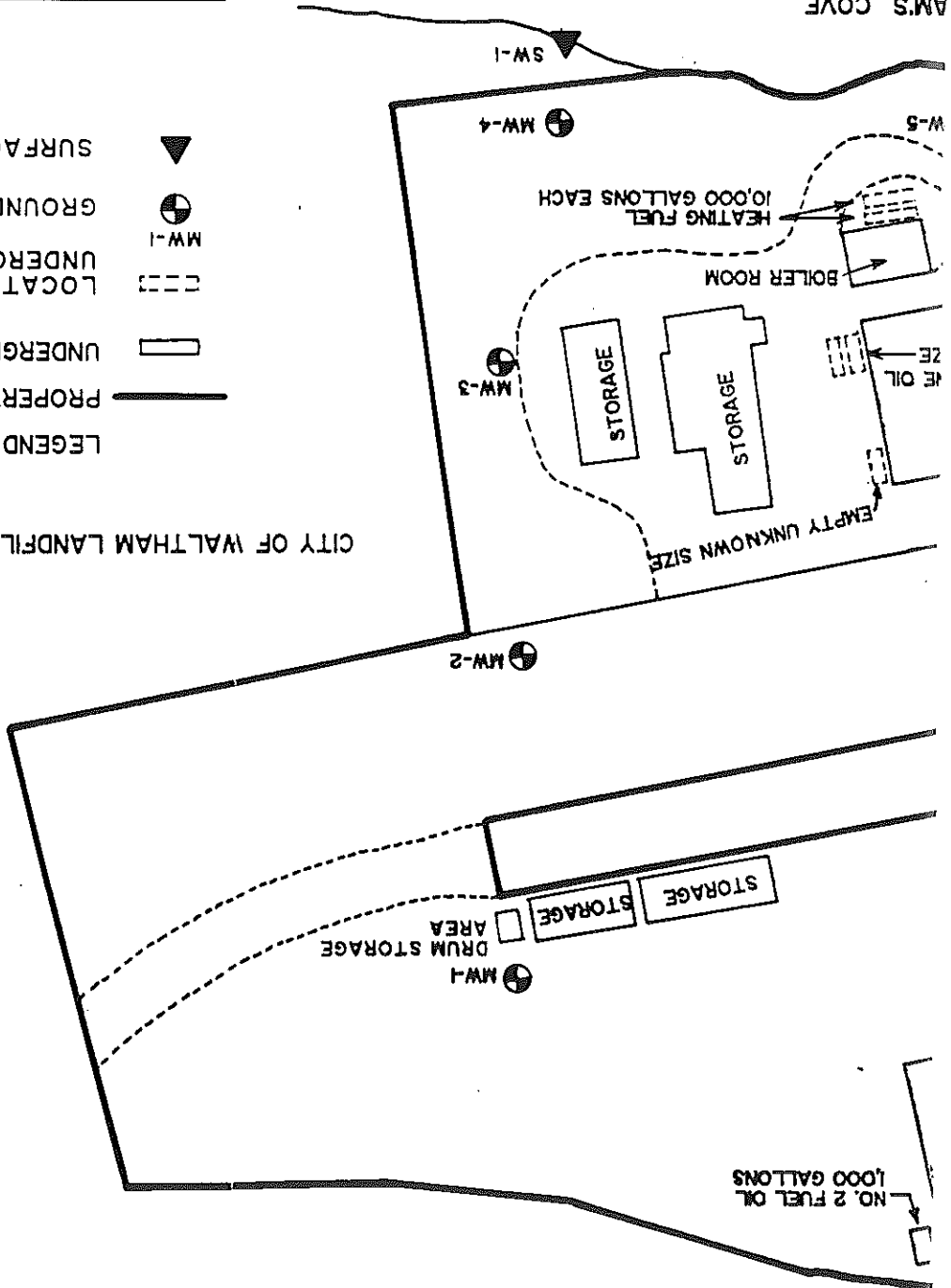
FEET IN FEET

200 300

AMS COVE

- LEGEND
- PROPERTY LINE
 - ▭ UNDERGROUND STORAGE TANK
 - - - LOCATION OF FORMER UNDERGROUND STORAGE TANK
 - ⊕ MW-1 GROUND WATER MONITORING WELL
 - ▼ SURFACE WATER SAMPLING STATION

CITY OF WALTHAM LANDFILL



MW-2

MW-3

SW-1

MW-4

MW-5

HEATING FUEL 10,000 GALLONS EACH

BOILER ROOM

STORAGE

STORAGE

NO. 2 FUEL OIL

EMPTY UNKNOWN SIZE

DRUM STORAGE AREA

STORAGE

STORAGE

NO. 2 FUEL OIL 1000 GALLONS

Freon, paint, nitric acid, zylo dye. Liquid wastes are either discharged to the sanitary sewer or contained and shipped off site for disposal or recycling. Solid wastes include: scrap metal and swarf. These wastes are either reclaimed or disposed of off site.

A total of six underground storage tanks were present at the site during this investigation. The tanks are used for the storage of machine coolants, mineral spirits, waste machine oils, and No. 2 and No. 4 heating oil. The location and volumes of these tanks are shown in Figure 2. Based upon a discussion with the Plant Engineer, all of the tanks, except the waste machine oil storage tanks, are currently registered with the State of Massachusetts (pers. comm.).

Five of the tanks were excavated and removed from the property in the spring of 1988. These included two 10,000 gallon heating fuel tanks, two waste machine oil tanks of unknown size and an empty tank of unknown size. The tanks were excavated and removed from the property by a certified subcontractor. According to the Plant Engineer who supervised the tank removal, no subsurface contamination was observed when the tanks were removed.

An electromagnetic geophysical survey was performed to determine whether significant concentrations of inorganic contaminants were present in the ground water at the site and to optimize the locations selected for the installation of ground water monitoring wells. The electromagnetic terrain conductivity meter (Geonics EM-34) records the electrical conductivity of the subsurface materials (both saturated and unsaturated) by measuring the response of these materials to an induced electromagnetic field. The higher the concentration of conductive materials in the

2.1 ELECTROMAGNETIC GEOPHYSICAL SURVEY

Hydrogeologic Investigations.

The following section documents the methods used in these

- soil gas survey and soil analysis.
- collection and analysis of additional surface water and ground water samples, and
- installation and surveying of four additional ground water monitoring wells,
- tasks:
- The Phase II Hydrogeologic Investigation consisted of the following
 - collection and analysis of surface water and ground water samples.
 - installation and surveying of six ground water monitoring wells, and
 - an electromagnetic terrain conductivity survey,

The hydrogeologic conditions at the site were investigated to evaluate the potential for on-site release of petroleum and/or hazardous substances, in accordance with Massachusetts General Law/Chapter 21E. The Phase I Hydrogeologic Investigation consisted of the following tasks:

2.0 SITE INVESTIGATION

Six ground water monitoring wells were installed at the Nichols site during the Phase I investigation (November 24-25, 1987) and four additional monitoring wells were installed during the Phase II

2.2 INSTALLATION OF GROUND WATER MONITORING WELLS

On November 21, 1987 an electromagnetic (EM) conductivity survey was conducted at the subject property. Three survey traverses were completed. Two traverses were conducted in the vicinity of the southern property line with the City of Waltham landfill (refer to Appendix A). The third traverse was conducted along the western property line near Cram's Cove. Terrain conductivity measurements were recorded at 50-foot intervals along each traverse. At each station, two measurements were recorded; one measurement with the instrument's coils in the horizontal dipole mode (HDM), and the second with the coils in the vertical dipole mode (VDM). Using a coil separation of ten meters, the EM-34 measures the apparent conductivity of the subsurface materials from the ground surface to a depth of 7.5 meters (25 feet) in HDM, and 15 meters (50 feet) in VDM. The results of the terrain conductivity survey are discussed in section 3.2.

- the concentration of dissolved electrolytes in the ground water.
- the presence of power lines or landfill refuse,
- geologic variations in the subsurface including; textural changes, depth to bedrock, and depth to the water table,
- the presence of power lines or landfill refuse,

There are several factors which are capable of significantly influencing conductivity measurements. These factors include:

the measured conductivity values are higher than those measured at background or uncontaminated areas. contaminants are present in the ground water at significant concentrations, (such as dissolved salts and metals) are typically conductive. Where these subsurface, the higher the electrical conductivity. Inorganic contaminants

A portion of each soil sample was placed in a glass jar, which was then sealed with aluminum foil. The headspace (i.e., air) within each jar was subsequently screened for volatile organic compounds (VOCs) using an HNU photoinitiation instrument. The total VOCs reading in several of the soil samples were up to 200 parts per million (ppm) greater than ambient levels. The HNU readings are shown on the boring logs presented in Appendix B. The HNU readings are a relative indication of the total concentrations of VOCs, relative to a known standard. The HNU cannot distinguish the concentrations of individual compounds. The results of the headspace analysis are discussed in Section 3.3.

The monitoring wells were installed in soil borings that were advanced to depths up to 16 feet, using 3.75-inch-inside-diameter (ID) hollow stem augers, per the American Society of Testing Materials (ASTM) method D-1452, per ASTM method D-1586. The soil samples were identified using the Burmister Soil Classification System.

One monitoring well (MW-5) was installed in the vicinity of the 10,000 gallon underground storage tanks located near the boiler building and well MW-6 was located downgradient from the facility, along Grams Cove. In Phase II, two monitoring wells (MW-9 and MW-10) were installed near Word Avenue and the Charles River, one well (MW-7) was installed near the center of the site and one monitoring well (MW-8) was installed in the vicinity of the 1,000-gallon machine coolant and 1,000-gallon mineral spirit tanks, (Figure 2). The remaining wells were located throughout the facility for the collection of additional ground water flow and water quality data.

Investigation (August 11 and 12, 1988). The monitoring well installation was performed by Carr-Dee Corp. (Medford, Massachusetts) and Soil Exploration Corp. (Leominster, Massachusetts), respectively, and observed by an TWNNE hydrogeologist.

Each boring was completed as a monitoring well. The monitoring wells consist of 2.0-inch ID, schedule 40 PVC riser pipe fitted with a 0.010 inch slot schedule 40 PVC well screen (Figure 3). The lower 5 to 10 foot section of each well was screened, with the screen positioned to extend above and below the water table. The annular space around the well screen was backfilled with clean sand to at least one foot above the top of the screen. The sand backfill was then sealed with a layer of bentonite clay. The bentonite seal was hydrated with a minimum of five gallons of water before sealing the remainder of the boring with a cement grout. A locking steel casing or flush-mounted roadbox was installed at the ground surface to protect the well. Figure 3 shows the general well construction details; the specific construction details of each well are presented on the boring logs in Appendix B.

All downhole drilling equipment was thoroughly decontaminated between borings. Decontamination was performed by steam cleaning augers, drill rods and sampling spoons.

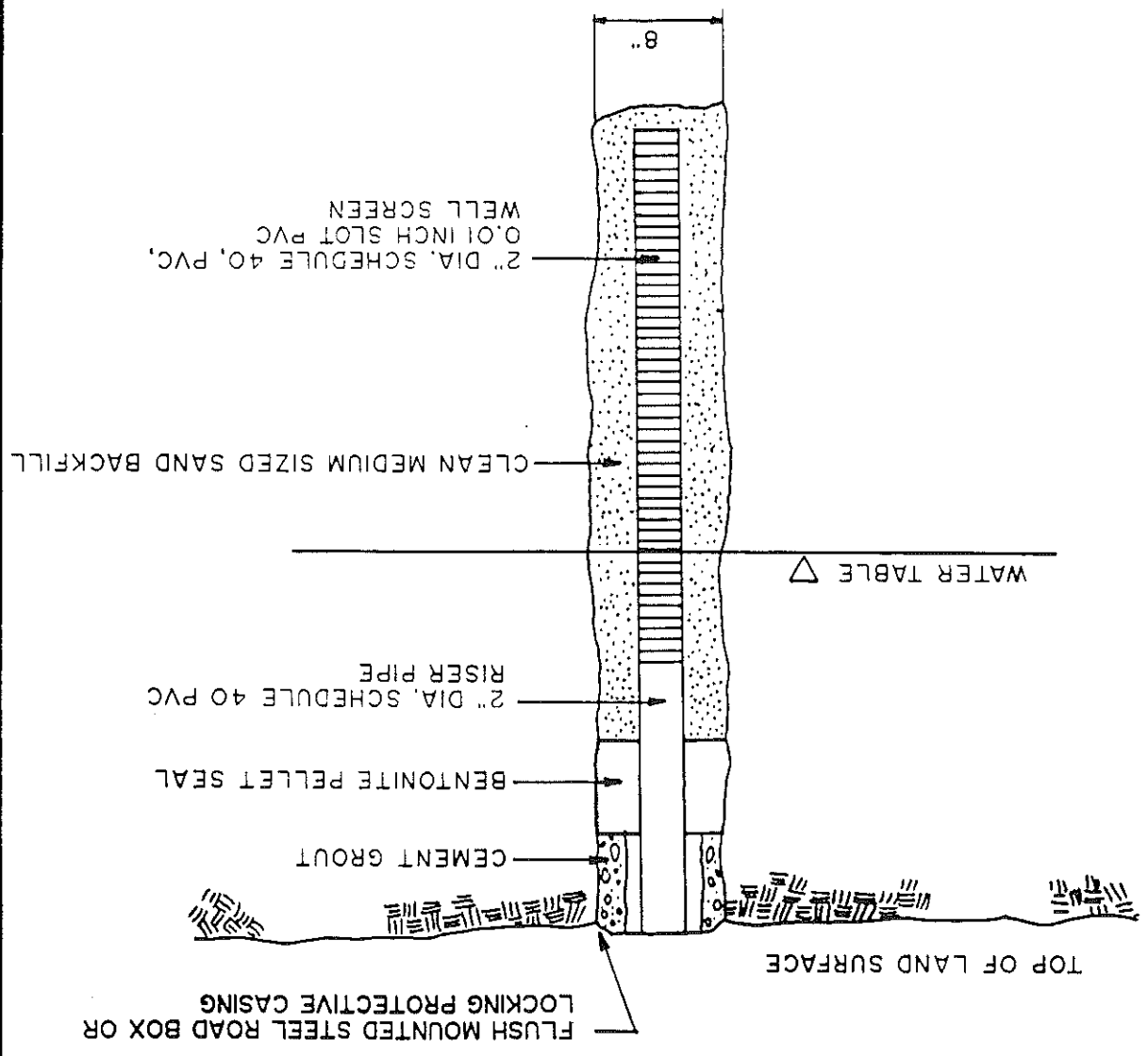
Following installation, the elevations of the wells were surveyed and ground water levels measured to evaluate the direction and gradient of ground water flow. The elevation data are presented in Table 1. The evaluation of ground water flow is discussed in Section 3.4.

On November 30, 1987 (Phase I) and August 25, 1988 (Phase II) TWNNE collected water quality samples from each of the ground water monitoring wells installed at the site and at two locations on Gram's Cove. On September 1, 1988 a second round of water quality samples were collected from the four monitoring wells installed during the Phase II investigation in August, 1988, so that two samples would be obtained and analyzed from each well during these investigations. Field blank and duplicate samples were also submitted with the samples from each round to evaluate the reliability of the laboratory results.

2.3 WATER QUALITY SAMPLING

FIGURE 3. TYPICAL CONSTRUCTION DETAILS FOR SHALLOW GROUND WATER MONITORING WELL AT PARKER HANNIFIN NICHOLS DIVISION, WALTHAM, MASSACHUSETTS.

NOT TO SCALE



NOTE: All elevations referenced to City of Waltham Datum.
 Refer to Table 2 for Top of Casing elevations and ground water elevations.

MONITORING WELL	GROUND* ELEVATION (FT)	DEPTH OF BORING (FT)	DEPTH OF WELL (FT)	ELEVATION OF TOP WELL SCREEN (FT)	ELEVATION OF BOTTOM (FT)
MW-1	42.96	13.0	13.0	39.6	29.26
MW-2	44.46	13.0	13.0	41.46	31.46
MW-3	46.70	12.5	12.5	44.20	34.20
MW-4	43.00	12.0	12.0	41.00	31.00
MW-6	37.39	6.5	6.5	35.89	30.89
MW-7	41.39	15.6	13.3	38.09	28.09
MW-8	41.72	14.5	13.3	38.42	28.42
MW-9	39.80	13.5	12.4	37.40	27.40
MW-10	40.89	14.5	12.6	38.29	28.29

TABLE 1. SUMMARY OF GROUND WATER MONITORING WELL CONSTRUCTION DETAILS

To evaluate the potential sources for the VOCs identified at monitoring well MW-3, TWME collected soil samples from eight locations in the vicinity of the monitoring well. The sampling points were located in a radial pattern surrounding the well so that the direction and extent of the

2.5 SOIL SAMPLING AND ANALYSES

The water quality analysts are discussed in Section 3.5. Laboratory analyses are presented in Appendix C. In addition to the (GC/MS) techniques, per EPA Method 624 (EPA, 1982). The results of the volatile organic compounds using gas chromatograph/mass spectrometer techniques, per EPA Method 200 (EPA, 1983). The samples were analyzed for The samples were analyzed for metals using atomic absorption

1988 were analyzed for the priority pollutant volatile organic compounds. metals analysis. The four ground water samples collected in September, results, only eight of the samples were selected for priority pollutant pollutant volatile organic compounds. However, based on the initial were also analyzed by Skinner and Sherman Laboratories for the priority listed volatile organic compounds. The samples collected in August, 1988 priority pollutant volatile organic compounds, plus EPA hazardous substance Skinner and Sherman Laboratories for priority pollutant metals and the The water quality samples collected in November, 1987 were analyzed by

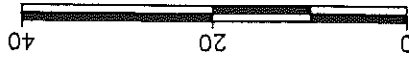
2.4 WATER QUALITY ANALYSES

Massachusetts), under chain-of-custody protocol. guidelines, and sent to the Skinner and Sherman Laboratories (Waltham, bottles provided by the laboratory, preserved per EPA recommended were collected using a stainless steel bailer. The samples were placed in prior to sampling. The wells were purged using a hand pump and samples A minimum of three well volumes of water were purged from each well

contamination could be assessed (Figure 4). The eight soil borings were performed in January, 1989. The borings were drilled using a 1.5 inch diameter auger sampler with a 0.5 inch diameter drill. The borings were advanced to depths ranging from 0.5 to 3.5 feet depending upon subsurface conditions. Soil samples were collected at 0.5 foot intervals in glass vials and glass jars. The samples placed in glass jars were then screened for the presence of VOCs using a photionization meter. Four samples having the highest VOC readings were submitted for laboratory analysis.

698004-4

SCALE IN FEET

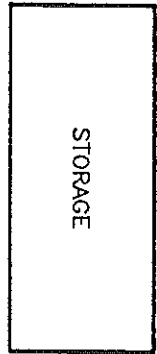


LEGEND
● SOIL SAMPLING LOCATION
⊙ MONITORING WELL LOCATION

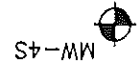
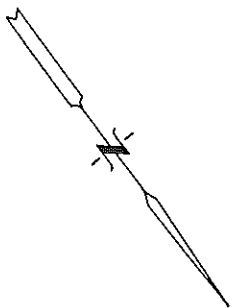


FENCE

CITY OF WALTHAM
LANDFILL



PARKING LOT



S-4

S-6

S-5

S-8
MW-3S S-1

S-3

S-7

S-2

FENCE

The site is underlain by silts, sands and gravels and man-made fill (Figure 5). In the eastern portion of the property, a five to eight foot layer of sand and gravel fill overlies fine to coarse sand and gravel, with wetland deposit associated with the former stream channel.

collected at 10 feet below grade at boring MW-2. This peat may represent a former meander of the river. Peat was identified in a soil sample the channel of the Charles River and Gram's Cove potentially represents a proximity to the Charles River, this area may have once been occupied by from the Charles River. Based upon the topography of the site and the valley. The site may also be underlain by more recent alluvial deposits streams that flowed northeastward in what is presently the Charles River. The glacial outwash sediments were apparently deposited by meltwater and/or alluvium, and man made fill (refer to geologic logs in Appendix B). flat, with the site underlain by unconsolidated glacial outwash deposits. The topography in the immediate vicinity of the site is relatively

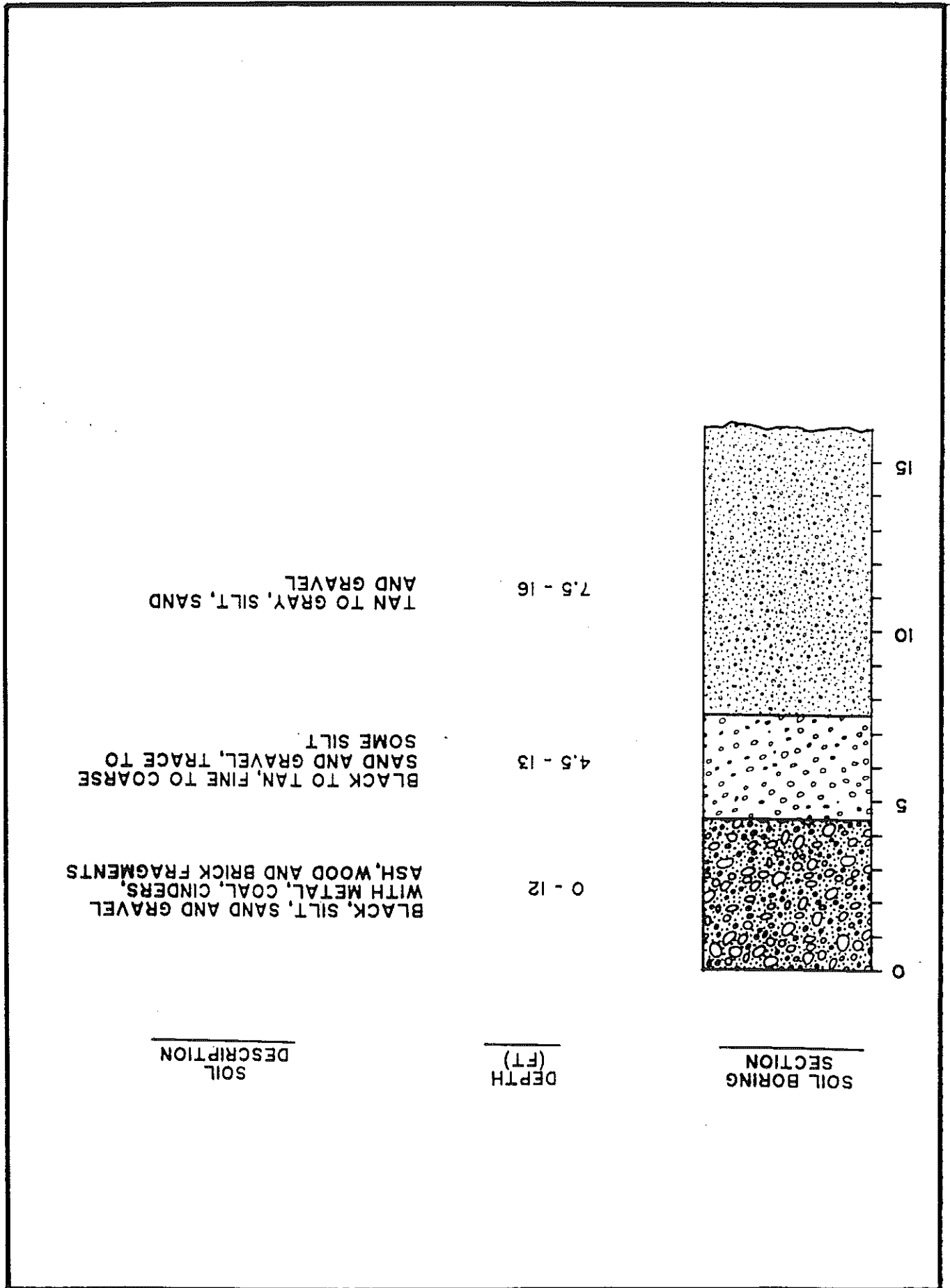
an embayment bordering the site to the west (Figure 1 and 2). River is located approximately 100 feet to the northwest of the site, with Charles River, the principal drainage in the study area. The Charles 1976). The wetlands are drained by small streams which discharge to the which are underlain by glacial outwash or alluvial deposits (Walker, et al. covered bedrock uplands bordered by low-lying, poorly drained wetlands topography and drainage. In general, the study area consists of fill commercial and industrial use, with significant alterations to both topographic relief. The area has been heavily developed for residential, The topography of the Waltham area consists of rolling hills, with low

3.1 HYDROGEOLOGIC SETTING

The following section presents the results of the site investigation. This section includes discussions of the hydrogeologic setting of the property and the quality of ground water at the site.

3.0 RESULTS OF INVESTIGATION

FIGURE 5 GENERALIZED STRATIGRAPHY OF SOIL BORINGS FOR PARKER HANNIFIN NICHOLS DIVISION, WALTHAM, MASSACHUSETTS



The eastern parking lot is reportedly underlain by municipal trash since this area was apparently once part of the Waltham City landfill. According to the Plant Engineer trash was reportedly encountered in this area during the excavation of a utility trench.

The western portion of the property is underlain by fill, which consists of sand and gravel, with coal and steel fragments. Along the western property line and in the vicinity of borings MW-4 and MW-5, the fill consists of silt, sand and gravel with waste muscovite mica. The mica was probably disposed of as waste and used as fill during the former on-site manufacturing operations of the New England Mica Company. Bedrock was not encountered in any of the borings which penetrated to depths up to 16 feet below grade, at the site.

3.2 RESULTS OF GEOPHYSICAL SURVEY

The results of the EM survey are presented in Appendix A. In general, the conductivity readings for the site, when compared to background conditions, are relatively high along the eastern and southern property lines. To establish a baseline conductivity values for the area, conductivity values were measured on an undeveloped parcel of land northwest of the site, at locations immediately adjacent to the Charles River. The conductivity readings in this area were an order of magnitude lower than the readings recorded at the site, indicating that conductive materials are present beneath the Parker Hannifin property. The conductivity readings recorded at the site appear to indicate that dissolved electrolytes are present in ground water beneath the site at concentrations higher than background levels. However, the fill deposited at the site may contain ferrous material, which could contribute to the higher readings detected on the property.

In general, the conductivity data indicates that conductive materials are present at relatively shallow depths (<25 feet) beneath the property. The highest conductivities were recorded in the parking lot located adjacent to the former Town of Waltham landfill (transsect A-A') which is reportedly underlain by fill material (refer to Figure in Appendix A).

of MW-7. could suggest that a surficial spill is the source of VOCs in the vicinity measured in the soil sample collected in the unsaturated fill. This result However, at monitoring well MW-7, the highest headspace VOC reading was within the ground water, rather than coming from local surface spills. immediately below the water table suggesting that the VOCs are migrating highest VOC concentrations were measured from soil samples collected at or collected from the saturated zone (5-6.5 feet) at MW-3. Typically the in Appendix B). The highest VOC reading, 250 ppm, was recorded in a sample than 5 ppm at MW-2, MW-3, MW-4, MW-7, MW-8 and MW-9 (refer to geologic logs soils ranged from less than 5 ppm at MW-1, MW-5, MW-6 and MW-10 to greater unsaturated and saturated zone at the site. The total HNU VOCs readings in borings indicate the presence of volatile organic compounds (VOCs) in the Headspace readings (HNU) of soil samples collected from the soil

3.3 RESULTS OF SOIL HEADSPACE READINGS

this area. electrolytes were present at significant concentrations in ground water in evaluate the composition of the subsurface material and to determine if Three ground water monitoring wells (MW-4, MW-5 and MW-6) were installed to solids in fill or dissolved electrolytes in the ground water in this area. of this transect. The high conductivities encountered may reflect either amount of fill material has been placed along Gram's Cove in the vicinity building. A review of aerial photographs indicates that a significant Town of Waltham landfill and adjacent to the former mica manufacturing vary randomly. The highest conductivities were recorded near the former The electrical conductivities recorded along transect C-C' appeared to this transect.

this area three monitoring wells (MW-1, MW-2 and MW-3) were installed along significant concentrations of electrolytes were present in ground water in dissolved electrolytes in ground water in this area. To determine if generally higher than background levels indicating lower concentrations of conductivities were lower than those recorded along transect A-A' but Along transect B-B' (further downgradient from the landfill),

Regionally, ground water flows through the study area from recharge areas located in the till-covered uplands to the north and east of the site, to the Charles River and the embayment (Cram's Cove).

a landfill. a common occurrence and can result in the radial flow of ground water from precipitation at the landfill. Ground water mounding beneath landfills is the waste materials and resulting in the increased infiltration of beneath the landfill in response to the higher permeability and porosity of downgradient of the landfill. Localized mounding of ground water may occur water levels recorded at monitoring well MW-3 located immediately landfill along the southeastern property line as reflected by elevated Ground water may also flow to the site from the former City of Waltham the fill from the north-northeast to the south-southwest (Figure 6). Based upon the ground water elevation data recorded at the site, ground water appears to flow unconfined through the silt, sand and gravel and in approximately 2.1 feet (MW-6) to 10.4 feet (MW-3) below grade (Table 2). Ground water was encountered at the site at depths ranging from

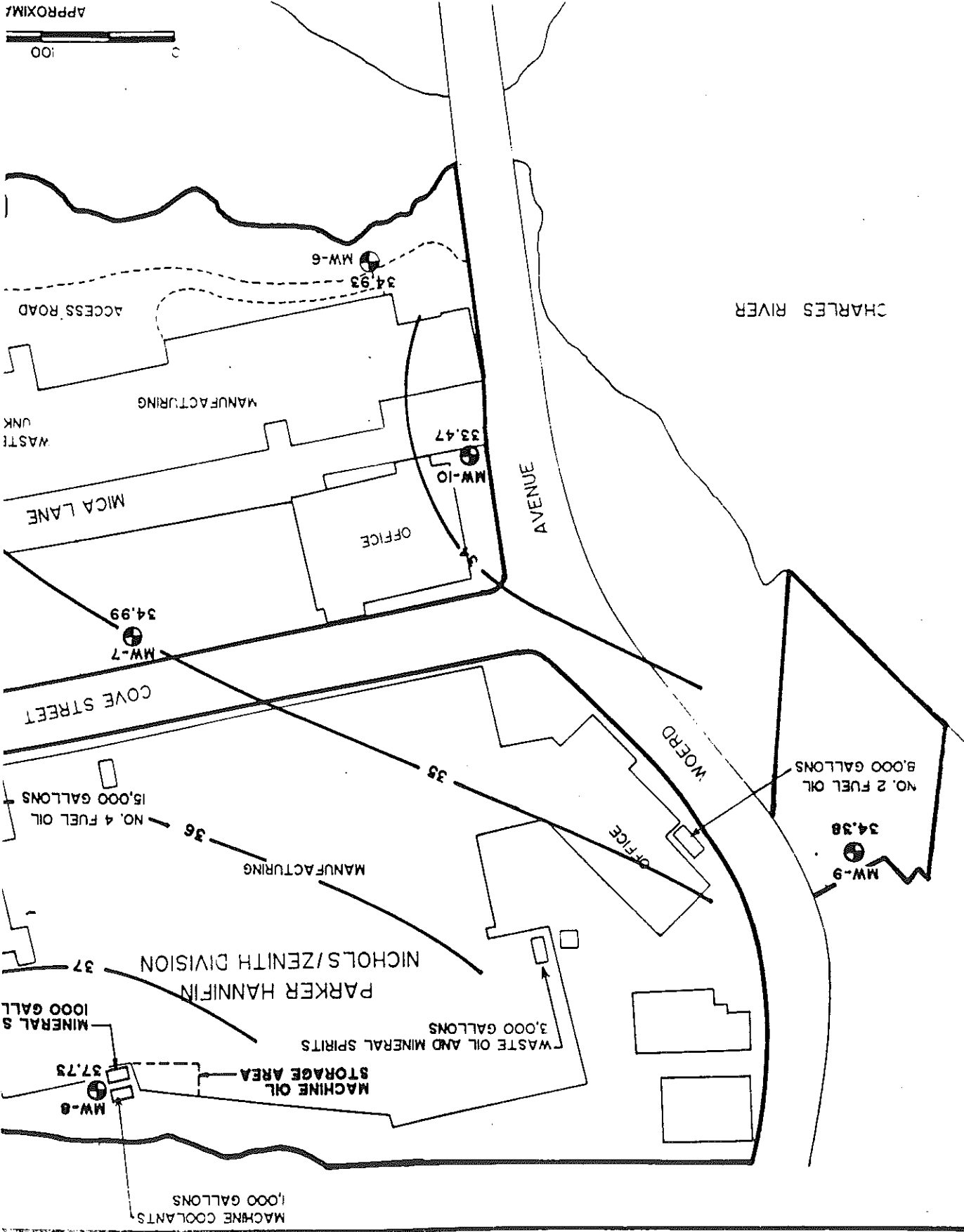
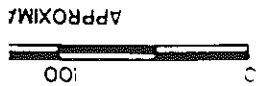
3.4 GROUND WATER HYDROLOGY

Section 3.6. MW-7 and MW-8. For further discussion of the ground water quality refer to in ground water samples obtained from monitoring wells MW-3, MW-4, MW-6, using gas chromatograph/mass spectrometer techniques. VOCs were detected samples were collected from each monitoring well and analyzed for VOCs To evaluate the ground water quality at the site, water quality

TABLE 2. SUMMARY OF GROUND WATER MONITORING WELL AND WATER TABLE ELEVATIONS

Monitoring Well	Ground Elevation (ft)	Top of Casing Elevation (ft)	November 30, 1987		December 7, 1987		August 25-26, 1988		September 28, 1988	
			Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MM-1	42.96	42.96	6.39	36.57	6.49	36.47	6.49	36.47	6.90	36.03
MM-2	44.46	44.46	8.10	36.38	8.08	36.38	8.19	26.27	8.59	35.87
MM-3	46.70	49.65	13.23	36.01	13.64	36.01	13.63	36.02	14.10	35.55
MM-4	43.00	45.38	10.07	35.36	10.02	35.36	10.24	35.14	10.44	34.94
MM-5	38.70	41.81	6.92	35.11	6.70	35.11	7.04	34.77	7.26	34.55
MM-6	37.39	37.39	2.12	35.28	2.11	35.28	2.43	34.96	2.46	34.93
MM-7	41.39	41.39	-	-	-	-	6.00	35.39	6.40	34.99
MM-8	41.72	41.72	-	-	-	-	3.65	38.07	3.99	37.73
MM-9	39.80	41.67	-	-	-	-	7.17	34.50	7.29	34.38
MM-10	40.89	40.89	-	-	-	-	7.19	33.70	7.42	33.47

NOTE: All elevations referenced to City of Waltham Datum.



NORTH EAST
NORTH EAST ENGINEERS INC. CONCORD, MASSACHUSETTS

DRAWN BY R.F.C. CHECKED BY P.J.K. 6980 04.30 DEC 1988

PARKER HANNIFIN
WALTHAM, MASSACHUSETTS

FIGURE 6
GROUND WATER ELEVATION AND
-CONTOUR MAP FOR WATER LEVELS
RECORDED SEPTEMBER 28, 1988

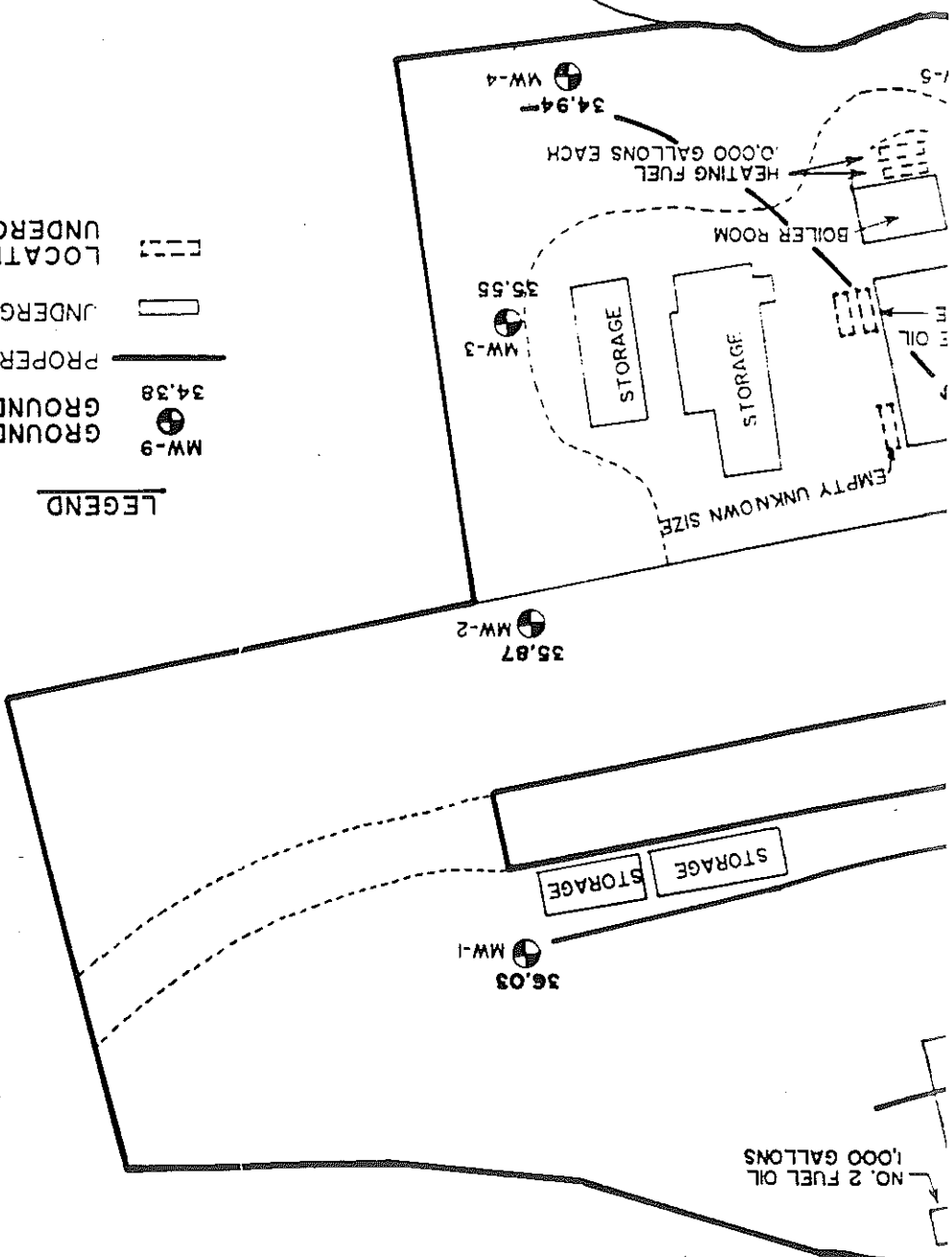
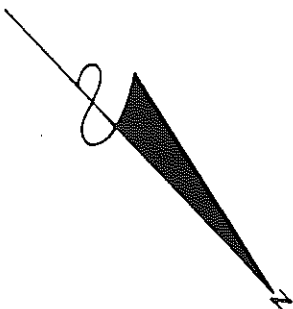
E IN FEET



MS COVE

- LEGEND**
- MW-9 34.38
GROUND WATER MONITORING WELL AND
GROUND WATER ELEVATION IN FEET
 - PROPERTY LINE
 - UNDERGROUND STORAGE TANK
 - LOCATION OF FORMER
UNDERGROUND STORAGE TANK

CITY OF WALTHAM LANDFILL



NO. 2 FUEL OIL
1,000 GALLONS

MW-1
36.03

MW-2
35.87

MW-3
35.55

MW-4
34.94

HEATING FUEL
1,000 GALLONS EACH

BOILER ROOM

STORAGE

STORAGE

STORAGE

STORAGE

EMPTY UNKNOWN SIZE

NO. 2 FUEL OIL

former scrap metal storage area. adjacent to the former Waltham landfill and in the vicinity of the exceeding the standard. Both monitoring wells MW-3 and MW-4 are mercury was detected at monitoring well MW-3 at a concentration concentrations exceeding recommended drinking water standards, while Dissolved cadmium was detected in monitoring wells MW-3 and MW-4 at from selected monitoring wells.

dissolved metals in ground water, a second round of samples as collected the concentrations shown in Table 4. To evaluate the presence of as a preliminary screening for metals. Several metals were detected at collected in November, 1987 were analyzed for total recoverable metals water and surface water samples collected from the site. The samples Total recoverable and dissolved metals were analyzed in the ground

3.5.1.2 Metals

decreased with increasing distance from the landfill. MW-4 and MW-5). In general, the specific conductance of ground water the wells located adjacent to the former landfill (MW-1, MW-2, MW-3, former Waltham landfill. The highest conductivities were recorded at 343 umhos/cm at MW-6, near Gram's Cove to 2,520 umhos/cm (MW-3) near the England (Table 3). The specific conductance of ground water ranged from which is considered mildly acidic and typical of ground water in New The pH of the ground water ranged from 6.02 (MW-9) to 6.77 (MW-3),

3.5.1.1 Inorganics

3.5.1 Ground Water Quality

4 and 5. below and are also presented in Appendix C and summarized in Tables 3, the priority pollutant metals. The analytical results are discussed temperature, pH, specific conductance, volatile organic compounds, and collected. The water quality samples were analyzed for water During the investigation three rounds of water quality samples were

3.5 WATER QUALITY

TABLE 3. SUMMARY OF WATER TEMPERATURE, pH AND SPECIFIC CONDUCTIVITY DATA FOR GROUND WATER AND SURFACE WATER AT THE PARKER HANNIFIN SITE

Monitoring Well	November 30, 1987		August 25, 1988		September 1, 1988	
	pH	Specific Conductance (umhos/cm)	pH	Specific Conductance (umhos/cm)	pH	Specific Conductance (umhos/cm)
MH-1	6.42	765	6.27	835	-	-
MH-2	6.60	904	6.15	789	-	-
MH-3	6.77	1,172	6.42	2,520	-	-
MH-4	6.67	1,385	6.52	1,504	-	-
MH-5	6.70	1,069	6.46	1,005	-	-
MH-6	6.55	353	6.17	343	-	-
MH-7	-	-	6.37	1,416	6.11	510
MH-8	-	-	6.24	413	6.43	483
MH-9	-	-	6.56	500	6.02	545
MH-10	-	-	6.42	651	6.16	825
SURFACE WATER						
<u>SAMPLING STATION</u>						
SW-1	6.86	918	6.54	299	-	-
SW-2	6.68	287	6.46	317	-	-

TABLE 4. SUMMARY OF TOTAL AND DISSOLVED METALS DETECTED IN GROUND WATER AND SURFACE WATER AT THE PARKER HANNIFIN SITE.

Priority Pollutant Metal	Drinking Water Standard (ppb)	MONITORING WELLS									
		MH-1		MH-2		MH-3		MH-4		MH-5	
		1987	1988	1987	1988	1987	1988	1987	1988	1987	1988
Antimony	NE	41	NS	42	NS	75	<60	167	<60	<25	<60
Arsenic	50	39	NS	319	NS	600	17	1640	<5	40	<5
Beryllium	NE	10	NS	11	NS	7	<5	54	<5	<3	<5
Cadmium	10	5	NS	<4	NS	36	17	149	12	15	<10
Chromium	50	214	NS	355	NS	368	<20	1730	<20	106	<20
Copper	1000	443	NS	784	NS	5000	13	2790	16	1050	<10
Lead	50	501	NS	8120	NS	1570	<50	3520	<50	2350	<50
Mercury	2	7.8	NS	7.3	NS	4.2	2	1.9	0.2	<.2	<0.2
Nickel	NE	216	NS	200	NS	419	36	3780	37	646	<10
Selenium	10	<5	NS	<5	NS	<5	<5	<5	<5	<5	<5
Silver	90	<5	NS	<5	NS	138	<10	<5	<10	<5	<10
Thallium	NE	<5	NS	<5	NS	<5	NA	<5	NA	<5	<NA
Zinc	5000	3670	NS	4840	NS	1400	101	7030	89	3410	43

Notes:

All concentrations reported in parts per billion.
 1987 samples collected 11/30/87 and analyzed for total recoverable metals.
 1988 samples collected 8/25-8/26 and analyzed for dissolved metals (ground water) and total metals (surface water).
 Drinking Water Standards - US EPA primary (P) and Secondary (S) Maximum Contaminant Levels (MCLs) for Public Drinking Water Supplies.
 MCLs for primary compounds are based on health-related criteria and are legally enforceable. MCLs for secondary compounds are based on non-health related criteria, such as odor and taste, and are not enforceable.

NE = Not Established
 NA = Not Analyzed
 NS = Not Sampled

TABLE 4. SUMMARY OF TOTAL AND DISSOLVED METALS DETECTED IN GROUND WATER AND SURFACE WATER AT THE PARKER HANNFIN SITE. (CONTINUED)

Priority Pollutant Metal	MONITORING WELLS				SURFACE WATER						
	MH-6		MH-7		MH-8		MH-9		MH-10		
	1987	1988	1988	1988	1988	1988	1987	1988	1987	1988	
Antimony	<25	<60	NS	<60	NS	<25	<60	<25	<60	<25	<60
Arsenic	30	<5	NS	<5	ns	6	<5	<5	<5	<5	<5
Beryllium	5	<5	NS	<5	NS	<3	<5	<3	<5	<5	<5
Cadmium	13	<10	NS	<10	NS	22	<10	13	<10	<10	<10
Chromium	118	<20	NS	<20	NS	14	<20	<10	<20	<20	<20
Copper	436	<10	NS	<10	NS	28	<10	9	<10	<10	<10
Lead	847	<50	NS	<50	NS	70	<50	6	<50	<50	<50
Mercury	<.2	<0.2	NS	0.5	NS	2.1	0.3	<0.2	<0.2	0.6	0.6
Nickel	102	<10	NS	<10	NS	10	<10	<10	<10	<10	<10
Selenium	<5	<5	NS	<5	NS	<5	<5	<5	<5	<5	<5
Silver	<5	<10	NS	<10	NS	<5	<10	<5	<10	<10	<10
Thallium	<5	NA	NS	NA	NS	<5	NA	<5	<5	NA	NA
Zinc	8810	28	NS	51	NS	140	48	31	47	47	47

Notes:

1987 samples collected 11/30/87 and analyzed for total recoverable metals.
 1988 samples collected 8/25-8/26 and analyzed for dissolved metals (ground water) and total metals (surface water).
 All concentrations reported in parts per billion.
 Drinking Water Standards - Proposed and existing USEPA and MDEP Drinking Water Guidelines for Public Drinking Water Supplies.

NE = Not Established
 NA = Not Analyzed
 NS = Not Sampled

TABLE 5. SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUND WATER AND SURFACE WATER AT THE PARKER HANNIFIN PROPERTY, NOVEMBER 30, 1987, AUGUST 25-26, 1988 AND SEPTEMBER 1, 1988

Volatile Organic Compounds (ppb)	Drinking Water Standard (ppb)		MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Acetone	ND	ND	ND	ND	ND	ND	DL	ND	ND	ND	ND	ND	ND	ND
Benzene	5M	ND	ND	ND	TR	30	9	9	3	4	<2	2	ND	ND
Chlorobenzene	NE	ND	ND	ND	ND	110	18	16	ND	ND	ND	ND	ND	ND
Chloroethane	NE	ND	ND	ND	ND	1300	940	864	300	357	30	26	ND	ND
Chloroform	NE	ND	ND	ND	ND	ND	4	TR	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	NE	ND	ND	ND	ND	600	541	529	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5M	ND	ND	ND	ND	13	11	9	ND	ND	ND	ND	ND	ND
1,2-Dichloroethanes	140E	12	15	ND	ND	44	14	12	ND	ND	ND	ND	ND	ND
Ethylbenzene	700E	ND	ND	ND	ND	10	TR	TR	ND	ND	ND	ND	ND	ND
Methylene Chloride	NE	ND	ND	ND	ND	160	69	68	<5	ND	ND	ND	ND	ND
Tetrachloroethene	5E	ND	ND	ND	ND	3	ND	28	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200M	ND	ND	ND	ND	ND	29	8	ND	ND	ND	ND	ND	ND
Trichloroethene	5M	14	11	ND	ND	6	9	35	ND	ND	ND	ND	ND	3
Trichlorofluoromethane	100M	ND	ND	ND	ND	ND	35	18	ND	ND	ND	ND	ND	ND
Toluene	2,000 PMCL	ND	TR	ND	ND	20	12	TR	10	TR	3	TR	ND	ND
M,P,O-Xylenes	10,000 PMCL	ND	ND	ND	ND	61	35	19	<2	2	ND	ND	ND	ND
Vinyl Chloride	2E	4	11	ND	ND	7	29	25	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	NE	ND	ND	ND	ND	7	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	NE	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	100M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL	30	37	ND	TR	2381	1755	1605	320	363	35	28	ND	3	

Notes: All concentrations in parts per billion
M - MDEP Chronic Drinking Water Number
TR - Trace
DUP - Duplicate Analysis
NE - Not Established

PMCL - USEPA Proposed Maximum Contaminant Level (MCL)
ND - Not Detected
DL - At Detection Limit
E - USEPA Final MCL

1 - November 30, 1987 2 - August 25-26, 1988 3 - September 1, 1988

TABLE 5. SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUND WATER AND SURFACE WATER AT THE PARKER HANNIFIN PROPERTY, NOVEMBER 30, 1987, AUGUST 25-26, 1988 AND SEPTEMBER 1, 1988. (Continued)

	MONITORING WELLS										SURFACE WATER	
	MW-7		MW-8		MW-9		MW-10		BLANKS		SH-1	SH-2
	2	3	2	3	2	3	2	3	1	2	1	2
Acetone	TR	ND	ND	42	ND	ND	ND	ND	DL	ND	ND	ND
Benzene	2	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	TR	ND	TR	6	ND	ND	ND	ND	ND	TR	TR	ND
1,1-Dichloroethane	5	ND	5	14	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethenes	17	14	ND	TR	ND	ND	ND	5	ND	ND	ND	ND
Ethylbenzene	ND	ND	9	4	ND	ND	TR	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	4	4	ND	ND	ND	ND	ND	ND	ND	7	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	8	ND	ND	ND	ND	ND	ND	ND	ND
m,p,O-Xylenes	4	4	50	21	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	16	10	ND	ND	ND	ND	ND	TR	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL	48	32	64	97	ND	ND	TR	5	DL	7	ND	ND

Notes: All concentrations in parts per billion
 TR - Trace
 ND - Not Detected
 DL - At Detection Limit

Several of the chlorinated compounds detected in the ground water (e.g., trichloroethene, tetrachloroethene, 1,1,1-trichloroethane) are common industrial solvents. Based upon the results of recent research, (Wood, et al 1986) both tetrachloroethene and trichloroethene have been found to transform, due to biochemical processes, into cis-1,2-dichloroethene and vinyl chloride. The source of 1,1-dichloroethane, 1,2-dichloroethane and chloroethane may also be the result of the degradation of as impurities in solvents previously used at the facility or may have been used as solvents themselves.

The total concentration of VOCs ranged from zero (MW-9) to 2381 parts per billion (ppb) (MW-3). The volatile organic compounds detected at the site include both halogenated hydrocarbons (e.g., chloroethane) and non-halogenated aromatic compounds (e.g., benzene).

Relatively low concentrations of volatile organic compounds (VOCs) were detected in samples from nine of the ten ground water monitoring wells installed at the site (Table 5). However, only trichloroethene, vinyl chloride, benzene and 1,2-dichloroethane were detected at concentrations greater than the current Massachusetts Drinking Water Guidelines and Standards for these compounds in public drinking water supplies.

3.5.1.3 Volatile Organic Compounds

The higher concentrations of metals in the unfiltered samples is due to the presence of silt and clay-size particles in the samples. These particles are dissolved in the preparation of the samples for the metals analysis, releasing adsorbed metal constituent ions into the sample. The clay particles were removed, by filtration, prior to the analysis of the second round of samples for the analysis of dissolved metals. The concentrations of dissolved metals sampled in the second round are more representative of the migration of metals with the ground water since sediments are not typically transported with ground water.

The halogenated hydrocarbons were detected in three general locations: near the waste solvent storage area (MW-1), in the central parking areas (MW-7), and in the vicinity of a former waste storage area and/or the City of Waltham Landfill (MW-3). Monitoring well MW-1 is located within 20 feet of a former waste solvent storage area. According to the Plant Engineer, all waste materials are currently stored in Building No. 8 and not stored outside. The past practice of the storage of drums outside of the maintenance building may have resulted in a release and the contamination of ground water in this area. This area is also located within 50 feet of the former City of Waltham Landfill. Waste TCE may have been disposed of in the landfill upgradient of this monitoring well and migrated to the site with the ground water.

The second area is located in the central parking lot in the vicinity of monitoring well MW-7. Vinyl chloride was detected in a concentration of 16 ppb) which exceeds the MDEP drinking water guidelines for vinyl chloride (1 ppb). This monitoring well was installed in an area which is underlain by fill material. The third area in which both halogenated and aromatic hydrocarbons were detected is located near several storage barns, the southern property line adjacent to the former City of Waltham Landfill and Gram's Cove in the vicinity of Monitoring Wells MW-3, MW-4 and MW-5. The highest concentrations of these compounds were detected at MW-3 (Table 5). Organic compounds detected at concentrations exceeding existing and/or proposed State and/or Federal drinking water standards for public drinking water supplies included: benzene, 1,2-dichloroethane, trichloroethane and vinyl chloride (Table 5).

Although these compounds were detected at concentrations greater than applicable standards, they are typically within the same order of magnitude as the standard. Higher concentrations would be expected in ground water in the immediate vicinity of the source area. In addition, several of the organic compounds identified are known to be degradation products of 1,1,1-trichloroethane and tetra/trichloroethane. The relatively low

In the samples collected from Gram's Cove, the concentration of cadmium, lead and mercury exceeded the recommended drinking water standards at the upstream sampling station (Table 4). The concentration of these metals was lower at the downstream surface water sampling station (SW-2). Only the concentration of cadmium exceeded the drinking water standards at this location. These parameters also indicate an improvement in water quality as it flows past the site.

3.5.2.2 Metals

The pH of the water collected from Gram's Cove ranged from 6.46 (SW-2) to 6.86 (SW-1) (Table 3). The pH of surface water is mildly acidic, with the water becoming less acidic towards the Charles River. The specific conductance of surface water ranged from 284 umhos/cm (SW-2) to 918 umhos/cm (SW-1) with the specific conductance of surface water decreasing towards the Charles River. These water quality parameters indicate a general improvement of the water quality as it flows past the subject site.

3.5.2.1 Inorganics

Surface water samples were collected from two locations on Gram Cove (See Figure 2). One sampling station was located upstream in the vicinity of monitoring MW-4 (SW-1), while the second downstream sampling station was located in the vicinity of monitoring well MW-6 (SW-2). Samples were collected and analyzed for pH, specific conductivity, priority pollutant metals and the priority pollutant volatile organic compounds.

3.5.2 Surface Water Quality

Lower concentrations of some of the compounds detected at MW-3 were also detected at monitoring wells MW-4 and MW-5. These wells are located hydraulically downgradient from MW-3 (Figure 5).
 an upgradient source.
 number of degradation compounds present in the ground water would suggest concentrations of parent and daughter product compounds along with the

3.5.2.3 Volatille Organic Compounds

Only trace concentrations (i.e., less than 2 ppb) of chloroethane and chloroform were detected in the surface water samples (Table 5). Based upon the absence of any volatile organic compounds in the samples collected from Gram's Cove, the surface water quality does not appear to be significantly impacted by the migration of VOCs, via ground water flow, from the property.

4.0 ENVIRONMENTAL ASSESSMENT

4.1 SOURCES OF CONTAMINATION

Although low concentrations of VOCs were detected in nine of the ten monitoring wells at the site, VOCs were only detected in three monitoring wells MW-1, MW-3 and MW-7 at concentrations which exceed MDEP drinking water standards. Monitoring well MW-1 is located in the vicinity of a former waste solvent drum storage area and is also located downgradient of the former City of Waltham landfill. The concentrations detected in the ground water at MW-1 are consistent with the potential for incidental small spills from drums stored in this area; although VOCs may also be migrating to the site from the adjacent landfill.

At monitoring well MW-3 both chlorinated hydrocarbons and aromatic hydrocarbons were detected in ground water. The VOCs detected at this location may be associated with the former wastes stored in this area or the result of the migration of contaminants from the former City of Waltham landfill. Based upon a review of aerial photographs, the area between the storage buildings and the former City of Waltham landfill has been used as a scrap metal storage area. Prior to the commencement of this investigation the storage area was regraded and waste materials were placed into two piles. The piles consisted of scrap steel, rubber tires, crushed steel drums and miscellaneous debris.

To evaluate the potential source of the VOCs detected at MW-3, eight shallow (0.5 to 3.5 foot deep) soil borings were performed in the vicinity of the monitoring well. Based upon the results of a headspace analysis of the soil samples collected from these borings four samples were forwarded for the laboratory analysis of VOCs. The laboratory results are summarized in Table 6 and presented in Appendix D. VOCs were detected in measurable concentrations in only two of the samples (Table 6). The VOCs detected included vinyl chloride, 1,1,1-trichloroethane, trichloroethene (in S-1) and toluene (in S-4). The highest concentrations of VOCs were detected in sample S-1 which was collected at a depth of 0.5-1.5 feet at a location

approximately 10 feet southeast of MW-3. Considering the shallow depth of the contaminated soil (0.5 - 1.5 feet) and the depth to ground water (greater than 13 feet) the most likely source of these VOCs was a release at or near the ground surface. The chlorinated hydrocarbons vinyl chloride, 1,1,1-trichloroethane and trichloroethane were also detected in the ground water at monitoring well MW-3. Several additional chlorinated hydrocarbons and aromatic compounds were also detected in the ground water which were not identified in the soil samples. The presence of these additional VOCs in the ground water and their absence in the soil samples would suggest an upgradient source for several of these compounds. A potential upgradient source for these compounds is the former City of Waltham landfill.

Toluene was detected in sample S-4, which was collected at a depth of 1.5 - 2.5 feet, at a location approximately 55 feet southeast of monitoring well MW-4. The shallow depth of the soil contamination and the depth to ground water (greater than 10 feet) suggests that toluene was released at the ground surface. The presence of toluene in the ground water samples collected from monitoring well MW-4 may be related to either releases on the Parker Hannifin Property or from a source hydraulically upgradient of monitoring well MW-4.

At monitoring well MW-7, vinyl chloride was detected at concentrations exceeding the MDEP guidelines for drinking water supplies. Vinyl chloride can be used as a solvent and is also the end product of the biotransformation of tetrachloroethene or trichloroethene. The source(s) for vinyl chloride at this well may include the fill material placed in this area or surface releases prior to the paving of this area. As the monitoring well was installed, soil samples were collected from the unsaturated zone and screened for VOCs. Headspace concentrations of VOCs ranged from 110 to 170 ppm and decreased from the surface to the water table. The trend of decreasing concentrations with depth suggests that the VOCs may have been formerly released to the ground surface at this location.

Table 6. Summary of Organic Soil Analysis Data for
 Parker Hannifin Corporation,
 Waltham, Massachusetts
 January 25, 1989.

Compound	Boring Identification				
mg/kg	S-1	S-3	S-4	S-5	
Vinyl Chloride	0.4	ND	ND	ND	ND
1,1,1-Trichloroethane	0.6	ND	ND	ND	ND
Trichloroethene	1.2	ND	ND	0.3	
Toluene	ND	ND	0.7	ND	ND

Note: ND = Not Detected at EPA Detection Limit Method 8240

4.2 POTENTIAL RECEPTORS

Based upon our evaluation of the local ground water flow pattern, the ground water at the site discharges to Cram's Cove and the Charles River. Properties located west-southwest of Cram's Cove consist of commercial, industrial and residential properties. Municipal water is provided to these properties by the City of Waltham; the municipal water supply is obtained from the Quabbin Reservoir which is located in central Massachusetts.

Cram's Cove is an embayment of the Charles River. The Charles River is presently classified as a Class B stream and has a designated use as a warm water fishery and primary and secondary contact recreation. This reach of the Charles River is not designated for use as a municipal water supply and based on the surface water samples obtained during this investigation, the water quality in Cram's Cove has not been measurably impacted by the subject site.

5.0 CONCLUSIONS AND RECOMMENDATIONS

In consideration of the data collected during our hydrogeologic site assessment, the following conclusions are presented:

1. The subsurface materials encountered at the site consist of from 4 feet to greater than 12 feet of fill material, which overlies glacial outwash or alluvial deposits. The fill material was found to consist of sand and gravel containing what appears to be coal fragments, brick fragments, metal fragments and mica. The glacial outwash or alluvial deposits encountered beneath the fill consist of fine to coarse sand with some silt. Domestic trash was not encountered in any of the borings although it is expected that the far eastern portion of the site may be constructed on a portion of the former City of Waltham landfill. Bedrock was not encountered in any of the borings.

2. Ground water was encountered at depths ranging from 2.1 to 10.4 feet below the existing grade. Ground water at the site appears to discharge to Gram's Cove and the Charles River. Based on the available water level data, it appears that much of the ground water at the site discharges to Gram's Cove, which in turn discharges to the Charles River. Some ground water mounding may occur at the former City landfill, with contaminants migrating from the landfill to the subject site.

3. Concentrations of dissolved cadmium and mercury were detected in monitoring wells MW-3 and MW-4 at levels greater than the EPA Maximum Concentration Levels (MCL) for these metals in public drinking water supplies.

4. Volatile organic compounds (VOCs) were detected in monitoring wells MW-1, MW-3, and MW-7 at concentrations which exceed the MDEP drinking water guidelines. The VOCs included trichloroethene, vinyl chloride, benzene and/or 1,2-dichloroethane. Each of these VOCs were detected in concentrations exceeding the MDEP guidelines at monitoring well MW-3. Trichloroethene and vinyl chloride were detected at monitoring well MW-1 and vinyl chloride was detected at monitoring well MW-7 in concentrations exceeding the MDEP drinking water guidelines.

5. The results of the laboratory analysts of shallow soil samples collected from a former waste material storage area indicate the presence of VOCs in soils in the vicinity of monitoring wells MW-3 and MW-4. The VOCs included vinyl chloride, 1,1,1-trichloroethane, trichloroethene and toluene. The limited areal and vertical extent of the VOCs and the documented past use of this area for storage suggests that surface releases of VOCs may have occurred in this area of the Nichols-Division property. Furthermore, other VOC's detected in ground water samples collected from well MW-3 appear to be migrating from the former City of Waltham landfill.

6. Non-aqueous phase liquids (such as petroleum products) were not detected as a separate floating layer on the ground water surface in any of the monitoring wells installed at the site. Volatile organic compounds typically associated with petroleum products, such as benzene, toluene, ethylbenzene and xylenes, were not detected in the ground water at concentrations that would indicate that extensive petroleum contamination exists at the site.
7. The ground water contamination detected at the site does not appear to presently threaten public or private drinking water supplies. Private water supply wells are not known to exist at the site or in the vicinity of the site, since as this area is provided with municipal drinking water. The City of Waltham reportedly obtains its drinking water from the Quabbin Reservoir located in west-central Massachusetts. Conditions at the subject site will not impact this water supply. Ground water at the site is expected to discharge to Gram's Cove and the Charles River. The Charles River is a Class B stream, and is not designated as a municipal drinking water supply. Gram's Cove appears to be a entroying embayment of the Charles River, and is probably impacted by the former City of Waltham landfill located upstream from the subject site.
8. No significant hazard appears to exist with respect to the potential for the public to come into direct contact with contaminated soils or ground water (i.e., inhalation and/or adsorption exposure routes). Public access to the site is limited and ground water migrates only a short distance before discharging to Gram's Cove or the Charles River.
9. Ground water at the site is not expected to have a measurable impact the quality of surface water quality of Gram's Cove and the Charles River. No VOCs were detected in the samples from Gram's Cove and the metal concentrations were found to decrease significantly when comparing the sample obtained at an upstream location (SW-1) with the sample obtained at the downstream location (SW-2).
10. Pursuant to M.G.L. Chapter 21E, the property may be classified as a Disposal Site by the MDEP. However, using MDEP criteria, the subject property does not appear to be a Priority Disposal Site because:
 - a) There is no physical access to areas of contamination. Releases have occurred to the subsurface, therefore limiting the potential for direct contact with hazardous substances.

12. We recommend that the Massachusetts Department of Environmental Protection (MDEP) be notified that evidence of past releases of hazardous materials has been discovered at the site, in accordance with the Massachusetts Oil and Hazardous Materials Release Prevention Act, Section 7, and that a copy of this report be provided to the MDEP for review.

11. Based on our present knowledge of the site, we recommend the implementation of actions to limit the potential for any future releases to the environment. (i.e., implementation of a tank management plan.) Based on our present knowledge of the site conditions and evaluation of the risks posed to human health and the environment, it does not appear that significant additional investigations or long-term remedial actions are warranted, with the exception of confirmatory monitoring.

h) The release of hazardous materials at the site will not impact the human food chain. No significant concentrations of contaminants have been detected in surface water adjacent to the site (recreational fishing) and no crops are grown on the property thus limiting any potential impact to the food chain.

g) No air emissions of hazardous materials are anticipated which could adversely impact human or environmental receptors.

f) There is no threat of fire and/or explosion from the releases at the site. Releases have occurred to the subsurface and the contaminants are found in low concentrations limiting the potential for fires and/or explosions.

e) There is no evidence of a release to surface water that has resulted in a concentration which exceeds ambient water quality criteria for the protection of aquatic life or human health.

d) There is no evidence of a release of hazardous materials from the property to adjacent potable surface water supplies. No contaminants have been detected in significant concentrations in surface water adjacent to the site.

c) Ground water contamination does not occur within 2000 feet of a municipal water supply well, within a mapped cone of influence of municipal water supply wells or of private water supply wells. No municipal or private water wells are within 2000 feet of the property.

b) No uncontained, migrating, free-floating oil and/or hazardous materials were encountered at the site.

The purpose of this investigation was to assess the potential environmental liabilities at the subject site, with respect to

Massachusetts General Law Chapter 21E, based on a limited number of test borings, monitoring wells and chemical analyses. The conclusions

presented in this report are based only on the observations made during this investigation and data provided by others. The report presents a

description of the subsurface conditions observed at each test pit and boring location conducted during this investigation. The subsurface

conditions at other locations may vary significantly from those observed during this investigation. The subsurface conditions may also vary

significantly from those observed during this investigation. The

subsurface conditions may also vary with time, particularly with respect to ground water elevations and ground water quality. Should any additional

data become available, these data should be reviewed by TWNNE and the

conclusions presented herein modified, as appropriate.

Information provided by others was utilized in assessing the site

conditions. The accuracy of conclusions drawn from this information is

inherently based on the accuracy of the information that was provided. No

attempts were made to check the compliance of the present or past owners of the site with federal, state or local laws and regulations.

This report has been prepared exclusively for Parker Hannifin

Corporation in accordance with TWNNE's Standard Terms and Conditions. No

other warranty, expressed or implied, is made.

- American Society of Testing and Materials (ASTM). 1980. Soil investigation and sampling by auger borings method D-1452. ASTM Committee D-18 on soil and rock. Philadelphia, Pa.
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- Walker, E.H., Wandle, Jr., S.W., and Caswell, W.W., 1975. Hydrology and Water Resources of the Charles River Basin, Massachusetts, United States Geological Survey Hydrologic Investigation HA-554.
- Wood, P.R., Lang, R.F., and Payan, I.L. 1986. Anaerobic Transportation, transport, and removal of volatile chlorinated organics in ground water. In ground water quality. EDS: Ward, C.H., Giger, W., and McCarthy, P.L.: John Wiley and Sons.

"Response Action Outcome Statement and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996.

Appendix E



**RESPONSE ACTION OUTCOME STATEMENT AND
SUPPORTING DOCUMENTATION**

*Parker Hannifin Corporation
Nichols Aircraft Division
48 Woerd Avenue
Waltham, Massachusetts
MADEP Case #3-3260*

August 9, 1996

Prepared For:

*Parker Hannifin Corporation
17325 Euclid Avenue
Cleveland, Ohio 44112-1290*

Prepared By:

*Handex of New England
398 Cedar Hill Street
Marlborough, MA 01752
(508) 481-5750*

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12	17.0 CONCLUSIONS

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The disposal site does not encompass soil borings GP-7, GP-8, and GP-37 through GP-41 that are located on City of Waltham property as shown on Figure 3, Soil Boring Locations. A recent professional survey of Parker Hannifin property revealed that the property boundary was approximately 36 feet east of the assumed property boundary. As a result, soil borings GP-7, GP-8, and GP-37 through GP-41 are located on City of Waltham property. The City of Waltham property, as described in Section 3.0, is a former landfill with Massachusetts Department of Environmental Protection (MADep) Solid Waste Registration # SL00308.004. This RAO does not encompass investigated areas of the City of Waltham property as there are no known releases to this property from the Parker Hannifin site. In addition, the City of Waltham property is adequately regulated under the

The subject property is located at 48 Woerd Avenue in the City of Waltham, Massachusetts and consists of approximately 1.5 acres of land. The property boundaries were determined using City of Waltham Assessor's Map (Map 76, Lots 20-28) and are shown on Figure 2, Site Information Map. Figure 1, Locus Map, illustrates the property in relation to surrounding topography and drainage. Cove Street bisects the property from east to west. The Nichols Aircraft Division manufacturing building is located in the northern segment of the property and abuts residential properties consisting of condominiums and apartments. The southern segment of the property is an open space which previously contained a Mica processing building, an engineering building, two storage buildings and a boiler building. All of the facilities on the southern sections of the property were demolished and removed in 1995.

2.0 SITE DESCRIPTION

This information is provided in support of a Class A-3 Response Action Outcome (RAO) Statement. This document applies to the disposal site as described below, and it is the second RAO that has been prepared for this location. A Method 3 Risk Characterization, based on 310 CMR 40.0990, was performed to determine if a condition of No Significant Risk exists at the subject site. The Risk Characterization was conducted with an Activity and Use Limitation (AUL) consideration. The RAO does not address silver impacted groundwater. Parker Hannifin Corporation filed a Downgradient Property Status (DPS) due to an apparent upgradient source.

1.0 INTRODUCTION

**RESPONSE ACTION OUTCOME STATEMENT
AND
SUPPORTING DOCUMENTATION
August 9, 1996
Nichols Aircraft Division
Parker Hannifin Corporation
48 Woerd Avenue, Waltham, Massachusetts
MADep # 3-3260**

TWMNE represents TWM Northeast/Normandean Engineers, Inc. and AET represents Atlantic Environmental Technologies, Inc.

December 1987	Phase I Investigation by TWMNE
December 1993	Environmental Site Assessment by AET
November 1994	Phase II Site Investigation by Handex

<u>Document Date</u>	<u>Document Title</u>
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The following reports have also been prepared for Parker Hannifin but have not been submitted to the MADRP:

January 1990	Phase II Hydrogeological Site Assessment by TWMNE
May 1996	Release Abatement Measure Plan by Handex
June 1996	Downgradient Property Status by Handex

<u>Document Date</u>	<u>Document Title</u>
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The site was listed by the MADRP as a Location to be Investigated (LTBI) on July 12, 1990, based on the discovery of Volatile Organic Compounds (VOCs) and metals in shallow groundwater and soil in the southwest portion of the property. In addition, Release Tracking Number (RTN #3-10944) was assigned to a portion of the site containing a #2 fuel oil underground storage tank (UST). A #2 fuel oil release was discovered during tank removal activities on April 30, 1994. Remedial actions were undertaken and an RAO statement for RTN #3-10944 was filed with the MADRP on August 26, 1994. The following additional documents have been submitted to the MADRP for Case #3-3260:

4.0 REGULATORY STATUS

The site is situated within an area of Waltham with dense residential and commercial development. The northern portion of the site is bound by residential properties to the north, a former City of Waltham municipal landfill to the east, Cove Street to the south and Woerd Avenue to the west. The southern portion of the site is bounded by the former City of Waltham Landfill to the east, Crams Cove (an embayment of the Charles River) to the south, Woerd Avenue to the west and Cove Street to the north. The Charles River is located approximately 50 feet west of the site.

3.0 SURROUNDING PROPERTIES

Massachusetts Solid Waste Regulations as defined in 310 CMR 40.0110.

The lithology at the site was characterized during assessment activities conducted by Handex in 1994. The eastern portion of the site is underlain mainly with fill material such as paper,

7.0 SITE GEOLOGY

On June 13, 1996 monitoring well MW-4 was re-sampled for laboratory analysis of dissolved silver. Groundwater quality results indicated non-detectable ($> 7 \mu\text{g/l}$) concentrations of dissolved silver.

A Downgradient Property Status (DPS), pursuant to 310 CMR 40.0180, was filed by Parker Hannifin in June of 1996. The DPS was filed based on concentrations of dissolved silver in groundwater samples collected from monitoring wells MW-3A and MW-4 on March 5, 1996. The location of monitoring wells MW-3A and MW-4 are shown on Figure 2. The silver concentrations were $36 \mu\text{g/l}$ and $49 \mu\text{g/l}$, respectively. Monitoring wells MW-3A and MW-4 are located near the southeast property boundary which abuts the former Woerd Avenue Landfill owned by the City of Waltham. Monitoring wells MW-3A and MW-4 are located upgradient of historical known release areas at the site and downgradient of the former landfill.

6.0 DOWNGRADIENT PROPERTY STATUS

There are several residential properties in the vicinity of the site. No schools, day-care centers, or agricultural areas are located within 500 feet of the site. No Areas of Critical Environmental Concern (ACEC) or NHESP Estimated Habitats of Rare Wetlands Wildlife are located within 1/2 mile of the site. However, several areas classified as Open Space and Recreational Facilities are located within 1/2 mile of the site. Refer to Appendix A for a MADEP 21E Geographic Information Systems (GIS) Map for the relative location of the Open Space and Recreational Facility.

The site is not located within a potentially productive aquifer, a sole source aquifer, a MADEP-approved wellhead protection area (Zone II) or Interim Wellhead Protection Area (IWPA). The nearest surface water bodies are Crams Cove (an embayment of the Charles River) which abuts the site to the south and the Charles River which is approximately 50 feet west of the site.

The site and surrounding properties are serviced by the City of Waltham municipal water supply system. The municipal water supply is obtained from the Quabbin Reservoir which is located in central Massachusetts. There are no documented public or private drinking water supply wells within 1/2 mile of the site.

5.0 POTENTIAL RECEPTORS

Extensive soil sampling has been conducted by Handex at the site. Historical OHM

<u>Metals (total and dissolved)</u>	<u>Volatile Organic Compounds</u>
antimony	acetone
arsenic	benzene
barium	chlorobenzene
beryllium	chloroethane
cadmium	chloroform
chromium	1,1-dichloroethane
copper	1,2-dichloroethane
lead	1,2-dichloroethenes
mercury	ethylbenzene
nickel	methylene chloride
selenium	tetrachloroethene
silver	1,1,1-trichloroethane
zinc	trichloroethene
	trichlorofluoromethane
	toluene
	xylenes
	vinyl chloride
	1,4-dichlorobenzene
	1,2-dichlorobenzene
	cis-1,2-dichloroethane
	chloroethane
	methyl tertiary butyl ether

Environmental assessment activities have been conducted at this site since 1987. Metals and VOCs historically detected in site groundwater samples are listed below; historical groundwater quality data are summarized in Tables 1 and 2.

8.0 OIL OR HAZARDOUS MATERIALS (OHM)

Appendix B. Observed during soil borings conducted at the site. Soil boring logs are provided as exhibited brown and black fine to coarse sand and gravel with some silt. Bedrock was not coarse sand and gravel. Geoprobe locations north and west of the Parker Nichols building 4 feet in the area adjacent to Crams Cove. Below the mica was brown and black fine to of discarded mica to a depth of approximately 12 feet in the area of the boiler room and to coarse sand and gravel. Samples obtained south of the former Mica building consisted glass, metal products, wood, ash, cinders, cement and building debris mixed with brown fine

Groundwater samples were obtained from eight monitoring wells (MW-1, MW-2, MW-3A, MW-4, MW-7, MW-8, MW-10 and MW-11) on March 5, 1996. Monitoring wells MW-3 and MW-5 were inaccessible to sampling, MW-6 had been destroyed and MW-9 is located on private property not accessible to sampling. The locations of all wells are depicted on Figure 2. All samples were transported to a MADEF certified environmental laboratory under Chain of Custody protocol and analyzed for dissolved metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Dissolved metals detected in site

10.0 SUMMARY OF RECENT GROUNDWATER QUALITY DATA

Groundwater gauging events conducted by Parker Hannifin in 1988 and 1993 indicated a local groundwater flow direction of west and southwest across the site. On March 18, 1996, Handex surveyed the elevations of the monitoring wells and measured the depth to groundwater using an electronic interface probe. As summarized in Table 6, the depth to groundwater ranged from 1.65 feet below grade in MW-11 to 8.69 feet in MW-3 and MW-4. The well gauge data indicated a local groundwater flow direction to the west and southwest as illustrated on Figure 2. All groundwater elevations are based on a known point which was set as an arbitrary datum of 100 feet.

9.0 MONITORING WELL GAUGING

<p><u>Metals</u> arsenic barium cadmium chromium lead mercury selenium silver</p>	<p><u>VOCS</u> benzene chlorobenzene 1,2-dichlorobenzene 1,1-dichloroethene ethylbenzene tetrachloroethylene toluene 1,1,1-trichloroethane trichloroethylene vinyl chloride xylenes</p>	<p><u>PAHS</u> acenaphthene acenaphthylene anthracene benzo(a)anthracene benzo(a)pyrene benzo(b)fluoranthene benzo(k)fluoranthene benzo(ghi)perylene chrysene dibenzo(a,h)anthracene fluoranthene fluorene indeno(123-cd)pyrene naphthalene pyrene phenanthrene</p>
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detected in site soil samples are listed below; historical soil quality data are summarized in Tables 3 through 5.

(a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and

are:
Subsurface investigations have revealed that a majority of the site is underlain with layers of fill material consisting of wood, ash, cinders and building debris. The fill material is more prominent in the eastern portion of the site and decreases from easterly to westerly across the site. The identification of fill material is critical in determining background concentrations of OHM at the site. The MCP defines "background" as those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which

12.0 BACKGROUND OHM CONCENTRATIONS

Soil borings were advanced using Geoprobe drilling techniques in July 1994, April 1995 and March 1996. Samples were collected from a total of 45 locations (GP-1 through GP-44 and MW-3A) shown on Figure 3. Soil samples were submitted to a certified environmental laboratory under chain of custody protocol and analyzed for VOCs, PAHs, Total Petroleum Hydrocarbons (TPH) and metals. Soil quality data are summarized in Tables 3, 4 and 5. March 1996 laboratory analytical reports are attached as Appendix D. Referencing Table 5, TPH concentrations in soil samples GP-7, GP-12, GP-44 and MW-3A exceeded the Upper Concentration Limit (UCL) for soil. These areas were excavated as part of a Release Abatement Measure (RAM) discussed in Section 13. All other OHM detected in on-site soil were below the UCLs.

11.0 SUMMARY OF SOIL QUALITY DATA

Analysis of VOCs was not conducted in the latest round of groundwater sampling. Referring to Table 1, VOC levels have decreased since 1987. The last two rounds of groundwater samples that were analyzed for VOCs, conducted in 1993 and 1994, indicated that concentrations of VOCs were below Method 1 Risk Characterization Groundwater Category GW-2 and GW-3 standards.

groundwater samples included arsenic, barium, lead and silver. Groundwater analytical data from the sampling activities conducted on March 5, 1996, are summarized in Table 2 and re-sampled on June 13, 1996 and analyzed at a certified environmental laboratory for Polycyclic aromatic hydrocarbons (PAHs) and dissolved silver. Groundwater quality data indicated concentrations of PAHs and silver below laboratory analytical detection limits.

Response actions conducted relative to MADEP RTN #3-3260 include soil excavation as part of a RAM Plan submitted to the MADEP on May 3, 1996. The RAM consisted of soil excavation in areas of the site where TPH concentrations exceeded the UCL for soil. As shown on Figure 6, Release Abatement Measure Soil Excavation Locations, soil was

13.0 RESPONSE ACTIONS

Background concentrations of PAHs in groundwater are expected to be below laboratory analytical detection limits. Laboratory analysis of a groundwater sample collected from monitoring well MW-4 on June 13, 1996 indicated PAH concentrations below laboratory analytical detection limits. The MADEP has not derived urban and/or residential PAH background concentrations for groundwater.

The background levels of VOCs in groundwater were considered to be below analytical detection limits. Metals in groundwater were compared against MADEP calculated background levels which are presented in "Background Documentation For the Development of the MCP Numerical Standards, 1994". The most recent round of metals analysis indicates that dissolved arsenic and silver concentrations in several monitoring wells are above those that could be considered background.

The western portion of the site is underlain with fill material at depths ranging from 1 to 12 feet below grade. The fill consists of ash and wood debris. Soil borings GP-35 and GP-36 in the central portion of the site revealed fill material at depths between 1 and 9 feet which consisted of ash and fill debris. Soil boring GP-31 in the southwest corner of the site revealed fill materials at depths of 1 to 5 feet. On the western side of the site, the fill material decreases in thickness from 4 feet thick to 1 feet in a south to north direction across the site. Several borings along the northern portion of the site did not contain fill material. Based on subsurface lithology, the following sample locations were chosen to represent background: GP-15 through GP-20, GP-31, GP-32, GP-34, GP-35 and GP-36. Boring logs for the background samples are attached as Appendix B. The background samples were selected based on the presence of fill material in the subsurface as well as an upgradient location on the property that was representative of background. OHM evaluated in the background samples included PAHs, TPH and eight heavy metals. The compounds detected in these borings represent background concentrations of OHM related to historic fill materials. Table 7 summarizes soil quality data collected from the background soil sample locations including average and median concentrations.

(b) attributable to geologic or ecologic conditions, atmospheric deposition of industrial processes or engine emissions, fill materials containing wood or coal ash, releases to groundwater from a public water supply system, and/or petroleum residues that are incidental to the normal operation of motor vehicles.

An AVL, pursuant to 310 CMR 40.1070, has been filed for portions of this property. The AVL has been filed to restrict current and future human exposure to OHM impacted subsurface soil at the site. In reducing human exposure to site OHM, the overall potential harm to the public is reduced.

14.0 ACTIVITY AND USE LIMITATION (AVL)

Release Abatement Measure activities were conducted prior to a professional survey of the Parker Hannifin property boundaries. A professional property boundary survey conducted in July 1996 revealed that the Parker Hannifin property boundaries were approximately 36 feet east of the assumed property boundary. As a result, Soil Excavation #1 was actually on City of Waltham property.

On June 14, 1996 the stockpiled soil was transported by Franklin Environmental Services, Inc. to American Reclamation Corporation (AMREC) of Chariton Massachusetts for incorporation into an asphalt batch process. A total of 60.64 tons of soil was transported to AMREC. The MADEP Bill of Lading used for management of the soil is attached as Appendix F.

A base of excavation soil sample was collected from each excavation prior to backfilling. Each soil sample was analyzed at a certified environmental laboratory for TPH by EPA Method 418.1. Select soil samples were additionally analyzed for PAHs and TPH by EPA Method 8100. Post excavation soil quality results are summarized in Table 8 and a copy of the laboratory analytical results are attached as Appendix E. Referring to Table 8, TPH concentrations ranged from 260 mg/kg to 1,600 mg/kg and PAHs were detected at concentrations which were less than the UCL for soil. TPH analysis by Method 8100 classified the petroleum as indicative of heavy oil and gasoline.

A total of approximately 40 yards of soil was stockpiled on plastic sheeting and covered with same. A composite soil stockpile sample was collected and analyzed for future acceptance to an asphalt batching facility for disposal. All three excavation areas were backfilled with clean fill material, graded and re-seeded.

excavated in three discrete locations to depths of eight to ten feet below grade. Soil samples were screened for VOCs using an HNU photoionization detector and the jar head-space technique. Soil exhibiting visual evidence of TPH impact and elevated headspace VOC concentrations was stockpiled for future disposal at a licensed facility. Post excavation soil samples were also screened for TPH with a PetroFlag Hydrocarbon Test Kit calibrated to a #2 fuel oil standard. If the TPH screening results were less than 1,000 parts per million (ppm), a base of excavation soil sample was collected for laboratory analysis.

The risk characterization evaluated human health risks associated with exposure to subsurface soil in Exposure Area #3, as shown on Figure 5. Exposure to soils in Exposure Areas #1, #2 and #4 were not evaluated. Exposure Areas #1 and #2 are restricted with an AUL, as described in Section 14.0 and OHM in Exposure Area #4 are considered representative of background. The risk characterization also evaluated exposure to OHM vapors that could potentially migrate from groundwater to indoor air.

A Method 3 Risk Characterization, as described in 310 CMR 40.0990, was used to characterize the risk of harm to health, public welfare and the environment. The human health risk assessment estimated non-carcinogenic risks, represented as the Hazard Indices (HI), and carcinogenic risks, represented as the Excess Lifetime Cancer Risks (ELCR) associated with current and reasonably foreseeable site use.

15.0 RISK CHARACTERIZATION

Further land-use restrictions are also applied to Portions of the Property. Portions of the Property contain PAH concentrations in soil which are above Soil Category 3 (S-3) standards as listed in 310 CMR 40.0975(6)(c). Additional land use restrictions on Portions of the Property are applied to address potential human exposures from construction activities (soil excavation) and unauthorized site visitors such as neighborhood residents. AUL Portion "1" and "2" are enclosed by a chain-linked fence which will be maintained and secured. Any future soil excavation work conducted on Portions of the Property will be performed under the supervision of a Licensed Site Professional (LSP). Construction workers involved with soil excavation on Portions of the Property will be required to wear, at a minimum, Level "D" personal protective equipment (PPE) pursuant to 29 CFR 1910.120. PPE grades would be based on appropriate site monitoring. Utilization of appropriate PPE will prevent human exposure to OHM impacted soil.

In general, the AUL prevents future site development for residential, outdoor recreational and child-care purposes on Portions of the Property. By restricting residential, outdoor and recreational and child-care type uses, potentially sensitive human receptors (i.e. children) and potential high-impact exposure scenarios (i.e. children playing in contaminated soil) are eliminated from the risk assessment process.

The AUL has been applied to two portions of the property (hereinafter referred to as "Portions of the Property"). The Portions of the Property, designated as AUL Portion "1" and AUL Portion "2" are shown on Figure 4, Activity and Use Limitation Locations.

1. There is no evidence of past or present releases to environmental receptors.
2. There is negligible groundwater migration potential of OHM to environmental receptors.
3. There is minimal potential for surface runoff of OHM to environmental receptors.
4. There is no visible evidence of stressed vegetation due to OHM at the site.

A Stage I Environmental Screening, pursuant to 310 CMR 40.0095, was conducted to evaluate potential impacts to environmental receptors. The environmental screening is presented in the Method 3 Risk Characterization. Conclusions of the environmental screening are presented below.

Risk to safety and public welfare was also evaluated. Current OHM concentrations in subsurface soil are below the Upper Concentration Limits (UCL). There are no open pits or lagoon, no rusted or corroded hazardous waste drums and no reports of odors emanating from the site.

Referring to the above table, the Hazard Indices for each exposure scenario are two to five orders of magnitude less than the MCP non-carcinogenic risk limit of 1.0. The Excess Lifetime Cancer Risk for each exposure scenario is also less than the MCP carcinogenic risk limit of 1×10^{-5} .

Exposure Scenario #	Hazard Index	ELCR	MCP Risk Limits
1	7.3×10^{-4}	3.0×10^{-6}	1.0 1×10^{-5}
2	1.6×10^{-4}	2.0×10^{-6}	
3	5.5×10^{-4}	4.0×10^{-7}	
4	4.9×10^{-5}	6.0×10^{-7}	
5	0.033	4.0×10^{-6}	

The Hazard Index and Excess Lifetime Cancer Risk that was calculate for each exposure scenario is summarized in the table below.

- Scenario #1: Future On-Site Resident (Child)
- Scenario #2: Future On-Site Resident (Adult)
- Scenario #3: Future Construction Worker
- Scenario #4: Future Utility Line Worker
- Scenario #5: Current & Future On-Site Factory Worker

Five hypothetical human exposure scenarios were evaluated. These exposure scenarios are listed below:

1. A Method 3 Human Health Risk Characterization determined that non-carcinogenic and carcinogenic risks for current and future site uses are less than the promulgated MCP risk conditions at 48 Woerd Avenue in Waltham, Massachusetts:
The following conclusions were reached based on the Method 3 Risk Characterization of

17.0 CONCLUSIONS

The financial costs associated with further remediation responses are not justified. Current concentrations of OHM in Areas #1 and #2 are above background but the land is restricted through the implementation of an AUL. OHM in Area #3 soil is above MADEP derived background levels. The combined square footage of Areas #1, #2 and #3 is substantial. The cost of remediating these areas via technologies proven to be effective in remediating the types of OHM found at the site (i.e., soil excavation) is considerable. OHM in these two areas have low mobility and will likely continue approaching background levels through natural processes (i.e., biodegradation).

An evaluation of achieving background concentrations can be summarized by the following:
Background concentrations for OHM encountered in the soil at the site are summarized in Table 7. The risk characterization evaluated four potential exposure areas at the site. Of the four exposure areas, one is consistent with background (Area #4) and two are restricted with an AUL (Areas #1 and #2) and contain OHM levels greater than background. Area #3 does not contain fill material, therefore OHM concentrations in soil can not be related to site specific background levels. As a result, the OHM in Area #3 are compared against MADEP derived background levels for PAHs (0.5 mg/kg). As described in the Method 3 risk characterization, OHM levels in Area #3 do not pose a threat to the environment or human health. Background concentrations for volatile organic compounds in groundwater are presumed to be below laboratory analytical detection limits. Metal concentrations in groundwater are compared against background concentrations presented in "Background Documentation For the Development of the MCP Numerical Standards, April, 1994". Dissolved arsenic and silver concentrations are above background in several monitoring wells.

16.0 EXTENT OF REDUCTION TO BACKGROUND

5. Environmental conditions at the site supports a conclusion that there is minimal potential for impacts to aquatic and terrestrial habitats and organisms.
Based on the Stage I Environmental Screening, a condition of No Significant Risk to environmental receptors has been achieved for this location.

- criteria.
2. The site does not pose a risk to safety and public welfare.
 3. A Stage I Environmental Screening concluded that a condition of No Significant Risk to environmental receptors exists.
 4. A Condition of No Significant Risk to human health and the environment exists.

Parker Hannifin Corporation ("Client") and those who may use or rely upon the report and the work performed by Handex (hereafter "Report") expressly accepts the Report upon the following specific conditions. The Report is based upon a limited investigation and analysis of the site on the dates performed as specifically described. Changes in use, tenants, work practices, storage, federal, state or local laws, rules or regulations may affect the Report. The Report is based in part upon the documents and statements of persons, including Client, and their representations, if inaccurate, may affect the conclusions of the Report. Other than as described, no other investigation or analysis has been requested by the Client or performed by Handex for the site Report. Handex assumes no responsibility or liability for the failure to discover or otherwise locate any type of contamination, defect or information which would lead to discovery of contamination or a defect in, at or near the site for any reason whatsoever or for accuracy and reliance upon drawings, reports or statements obtained, received or reviewed.

LIMITATIONS

Table 1
Groundwater Quality Data
Historical VOC Concentrations
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

Parameter	Dates	MW-1					MW-2					MW-3				
		1	2	4	5		1	2	4	5		1	2	4	5	
Acetone		ND	ND	ND	ND		ND	ND	ND	ND		TR	ND	320	ND	
Benzene		ND	ND	ND	ND		ND	TR	ND	ND		30	9	ND	ND	
Chlorobenzene		ND	ND	ND	ND		ND	ND	ND	ND		110	18	ND	ND	
Chloroethane		ND	ND	ND	ND		ND	ND	ND	ND		1,300	940	ND	ND	
Chloroform		ND	ND	ND	ND		ND	ND	ND	ND		ND	4	ND	ND	
1,1 Dichloroethane		ND	ND	ND	ND		ND	ND	ND	ND		600	541	ND	ND	
1,2 Dichloroethane		ND	ND	ND	ND		ND	ND	ND	ND		13	11	ND	ND	
1,2-Dichloroethenes		12	15	ND	ND		ND	ND	ND	ND		44	14	ND	ND	
Ethylbenzene		ND	ND	ND	ND		ND	ND	ND	ND		10	TR	ND	ND	
Methylene Chloride		ND	ND	ND	ND		ND	ND	ND	ND		160	69	ND	ND	
Tetrachloroethene		ND	ND	ND	ND		ND	ND	ND	ND		3	ND	ND	ND	
1,1,1-Trichloroethane		ND	ND	ND	ND		ND	ND	ND	ND		ND	29	ND	ND	
Trichloroethene		14	11	ND	36		ND	ND	ND	ND		6	9	ND	ND	
Trichlorofluoromethane		ND	ND	ND	ND		ND	ND	ND	ND		ND	35	ND	ND	
Toluene		ND	TR	ND	ND		ND	ND	ND	ND		20	12	ND	ND	
M,P,O-Xylenes		ND	ND	ND	11		ND	ND	ND	ND		61	35	ND	ND	
Vinyl Chloride		4	11	ND	ND		ND	ND	ND	ND		7	29	ND	ND	
1,4-Dichlorobenzene		ND	ND	ND	ND		ND	ND	ND	ND		7	ND	ND	ND	
1,2-Dichlorobenzene		ND	ND	ND	ND		ND	ND	ND	ND		10	ND	ND	ND	
Chloromethane		ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND	
Cis-1,2-Dichloroethene		NS	NS	7	ND		NS	NS	ND	ND		NS	NS	ND	ND	
MTBE		NS	NS	ND	ND		NS	NS	19	ND		NS	NS	23	ND	
Chloroethene		NS	NS	ND	ND		NS	NS	ND	ND		NS	NS	55	ND	

- 1 = November 30, 1987
- 2 = August 25-26, 1988
- 3 = September 1, 1988
- 4 = 1993
- 5 = August 3, 1994

ND = Not detected
 NS = Not sampled
 TR = Trace
 Concentrations reported as µg/l (parts per billion)
 MTBE represents methyl tertiary butyl ether

- Continued -



Table 1
Groundwater Quality Data
Historical VOC Concentrations
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

Parameter	Dates	MW-4					MW-5					MW-6				
		1	2	4	5		1	2	4	5		1	2	4	5	
Acetone		ND	ND	ND	ND	ND	ND	ND	ND	ND	TR	ND	ND	ND	ND	
Benzene		3	4	ND	ND	<2	2	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroethane		300	357	ND	ND	30	26	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroform		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1 Dichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2 Dichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethenes		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ethylbenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methylene Chloride		<5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Tetrachloroethene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1,1-Trichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Trichloroethene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Trichlorofluoromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Toluene		10	TR	ND	ND	3	TR	ND	ND	ND	ND	ND	ND	ND	ND	
M,P,O-Xylenes		<2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Vinyl Chloride		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,4-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Cis-1,2-Dichloroethene		NS	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	
MTBE		NS	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	
Chloroethene		NS	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	

- 1 = November 30, 1987
- 2 = August 25-26, 1988
- 3 = September 1, 1988
- 4 = 1993
- 5 = August 3, 1994

ND = Not detected
 NS = Not sampled
 TR = Trace
 Concentrations reported as µg/l (parts per billion)
 MTBE represents methyl tertiary butyl ether

- Continued -

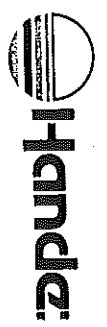


Table 1
Groundwater Quality Data
Historical VOC Concentrations
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

Parameter	Dates	MW-7					MW-8					MW-9				
		2	3	4	5		2	3	4	5		2	3	4	5	
Acetone	TR	ND	ND	ND	ND		ND	42	ND	ND	ND	ND	ND	NS	ND	
Benzene	2	ND	ND	ND	ND		ND	2	ND	ND	ND	ND	ND	NS	ND	
Chlorobenzene	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Chloroethane	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Chloroform	TR	ND	ND	ND	ND		TR	6	ND	ND	ND	ND	NS	ND		
1,1 Dichloroethane	5	ND	ND	ND	ND		5	14	ND	ND	ND	ND	NS	ND		
1,2 Dichloroethane	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
1,2-Dichloroethenes	17	14	ND	ND	ND		ND	TR	ND	ND	ND	ND	NS	ND		
Ethylbenzene	ND	ND	ND	ND	ND		9	4	ND	ND	ND	ND	NS	ND		
Methylene Chloride	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Tetrachloroethene	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
1,1,1-Trichloroethane	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Trichloroethene	4	4	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Trichlorofluoromethane	ND	ND	ND	ND	ND		ND	8	ND	ND	ND	ND	NS	ND		
Toluene	ND	ND	ND	ND	ND		ND	21	ND	ND	ND	ND	NS	ND		
M,P,O-Xylenes	4	4	ND	ND	ND		50	ND	ND	ND	ND	ND	NS	ND		
Vinyl Chloride	16	10	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
1,4-Dichlorobenzene	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
1,2-Dichlorobenzene	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Chloromethane	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NS	ND		
Cis-1,2-Dichloroethene	NS	NS	NS	7	ND		NS	NS	ND	ND	ND	ND	NS	ND		
MTBE	NS	NS	NS	ND	ND		NS	NS	ND	ND	ND	ND	NS	ND		
Chloroethene	NS	NS	NS	ND	ND		NS	NS	ND	ND	ND	ND	NS	ND		

1 = November 30, 1987
 2 = August 25-26, 1988
 3 = September 1, 1988
 4 = 1993
 5 = August 3, 1994

ND = Not detected
 NS = Not sampled
 TR = Trace
 Concentrations reported as µg/l (parts per billion)
 MTBE represents methyl tertiary butyl ether

- Continued -



Groundwater Quality Data
 Historical VOC Concentrations
 Parker Hannifin
 48 Woerd Avenue
 Waltham, Massachusetts

Parameter	Dates	MW-10					MW-11
		2	3	4	5	5	
Acetone		ND	ND	ND	ND	ND	
Benzene		ND	ND	ND	ND	ND	
Chlorobenzene		ND	ND	ND	ND	ND	
Chloroethane		ND	ND	ND	ND	ND	
Chloroform		ND	ND	ND	ND	33	
1,1 Dichloroethane		ND	ND	ND	ND	ND	
1,2 Dichloroethane		ND	5	ND	ND	ND	
1,2-Dichloroethenes		TR	ND	ND	ND	81	
Ethylbenzene		ND	ND	ND	ND	ND	
Methylene Chloride		ND	ND	ND	ND	ND	
Tetrachloroethene		ND	ND	ND	ND	ND	
1,1,1-Trichloroethane		ND	ND	ND	ND	ND	
Trichloroethene		ND	ND	ND	ND	ND	
Trichlorofluoromethane		ND	ND	ND	ND	110	
Toluene		ND	ND	ND	50	4/0	
M,P,O-Xylenes		ND	ND	ND	ND	ND	
Vinyl Chloride		ND	TR	ND	ND	ND	
1,4-Dichlorobenzene		ND	ND	ND	ND	ND	
1,2-Dichlorobenzene		ND	ND	ND	ND	ND	
Chloromethane		ND	ND	9	ND	ND	
Cis-1,2-Dichloroethene		NS	NS	ND	ND	ND	
MTBE		NS	NS	ND	ND	ND	
Chloroethene		NS	NS	ND	ND	ND	

1 = November 30, 1987
 2 = August 25-26, 1988
 3 = September 1, 1988
 4 = 1993
 5 = August 3, 1994
 MTTBE represents methyl tertiary butyl ether
 ND = Not detected
 NS = Not sampled
 TR = Trace
 Concentrations reported as ug/l (ppb)
 -- = Groundwater Standard not established



Table 2
Groundwater Quality Data
Historical Metals Concentrations
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

PARAMETER	DATES	MW-1					MW-2					MW-3				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
ANTIMONY		41	NS	NS	NS	NS	42	NS	NS	NS	NS	75	<60	NS	NS	NS
ARSENIC		39	NS	NS	<5.0	<50	319	NS	NS	16	14	600	17	NS	35	NS
BERYLLIUM		10	NS	NS	NS	NS	11	NS	NS	NS	NS	7	<5	NS	NS	NS
CADMIUM		5	NS	ND	<10	<10	<4	NS	ND	<10	<10	36	17	ND	92	NS
CHROMIUM		214	NS	NS	12	<10	355	NS	NS	11	<10	368	<20	NS	70	NS
COPPER		443	NS	NS	NS	NS	784	NS	NS	NS	3.6	5,000	13	NS	NS	NS
LEAD		501	NS	ND	68	<3.0	8,120	NS	ND	160	NS	1,570	<50	ND	2,900	NS
MERCURY		7.8	NS	NS	<0.50	<0.50	7.3	NS	NS	<0.50	<0.50	4.2	2	NS	0.70	NS
NICKEL		216	NS	NS	NS	NS	200	NS	NS	NS	NS	419	36	NS	NS	NS
SELENIUM		<5	NS	NS	<5.0	<5.0	<5	NS	NS	<5.0	<5.0	<5	<5	NS	<5.0	NS
SILVER		<5	NS	NS	<30	<10	<5	NS	NS	<30	<10	138	<10	NS	160	NS
THALLIUM		<5	NS	NS	NS	NS	<5	NS	NS	NS	NS	<5	NA	NS	NS	NS
ZINC		3,670	NS	ND	NS	NS	4,840	NS	50	NS	NS	1,400	101	50	NS	NS
BARIUM		NS	NS	NS	<200	<50	NS	NS	NS	850	810	NS	43,000	NS	24,000	NS

1 = November 30, 1987 - Total Recoverable Metals ND = Not detected
2 = August 25, 1988 - Dissolved Metals NS = Not sampled
3 = 1993 - Total Recoverable Metals Concentrations reported as ug/l (ppb)
4 = August 3, 1994 - Total Recoverable Metals
5 = March 5, 1996 - Dissolved Metals

- Continued -



Table 2
Groundwater Quality Data
Historical Metals Concentrations
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

PARAMETER	DATES	MW-4					MW-5					MW-6				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
ANTIMONY		167	<60	NS	NS	NS	<25	<60	NS	NS	NS	<25	<60	NS	NS	NS
ARSENIC		1,640	<5	NS	19	<5.0	40	<5	NS	NS	NS	30	<5	NS	35	NS
BERYLLIUM		54	<5	NS	NS	NS	<3	<5	NS	NS	NS	5	<5	NS	NS	NS
CADMIUM		149	12	ND	13	<10	15	<10	NS	NS	NS	13	<10	ND	<10	NS
CHROMIUM		1,730	<20	NS	16	<10	106	<20	NS	NS	NS	118	<20	NS	76	NS
COPPER		2,790	16	NS	NS	NS	1,050	<10	NS	NS	NS	436	<10	NS	NS	NS
LEAD		3,520	<50	26	76	<3.0	2,350	<50	NS	NS	NS	847	<50	ND	430	NS
MERCURY		1.9	0.2	NS	<0.50	<0.50	<2	<0.2	NS	NS	NS	<2	<0.2	NS	<0.50	NS
NICKEL		3,780	37	NS	NS	NS	646	<10	NS	NS	NS	102	<10	NS	NS	NS
SELENIUM		<5	<5	NS	<5.0	<5.0	<5	<5	NS	NS	NS	<5	<5	NS	<25	NS
SILVER		<5	<10	NS	43	49	<5	<10	NS	NS	NS	<5	<10	NS	<30	NS
THALLIUM		<5	NA	NS	NS	NS	<5	<NA	NS	NS	NS	<5	NA	NS	NS	NS
ZINC		7,030	89	50	NS	NS	3,410	43	NS	NS	NS	8,810	28	50	NS	NS
BARIUM		NS	6,600	NS	6,900	9,100	NS	660	NS	NS	NS	NS	43	NS	480	NS

- 1 = November 30, 1987 - Total Recoverable Metals
- 2 = August 25, 1988 - Dissolved Metals
- 3 = 1993 - Total Recoverable Metals
- 4 = August 3, 1994 - Total Recoverable Metals
- 5 = March 5, 1996 - Dissolved Metals

ND = Not detected
 NS = Not sampled
 Concentrations reported as ug/l (ppb)

- Continued -



Table 2
Groundwater Quality Data
Historical Metals Concentrations
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

PARAMETER	DATES	MW-7					MW-8					MW-9				
		2	3	4	5		2	3	4	5		2	3	4	5	
ANTIMONY		NS	NS	NS	NS		<60	NS	NS	NS		NS	NS	NS	NS	
ARSENIC		NS	NS	37	<5.0		<5	NS	52	<5.0		NS	NS	NS	NS	
BERYLLIUM		NS	NS	NS	NS		<5	NS	NS	NS		NS	NS	NS	NS	
CADMIUM		NS	ND	55	<10		<10	ND	<10	<10		NS	NS	NS	NS	
CHROMIUM		NS	NS	390	<10		<20	NS	28	<10		NS	NS	NS	NS	
COPPER		NS	NS	NS	NS		<10	NS	NS	NS		NS	NS	NS	NS	
LEAD		NS	ND	2,800	<3.0		<50	9	180	<3.0		NS	NS	NS	NS	
MERCURY		NS	NS	0.60	<0.50		0.5	NS	<0.50	<0.50		NS	NS	NS	NS	
NICKEL		NS	NS	NS	NS		<10	NS	NS	NS		NS	NS	NS	NS	
SELENIUM		NS	NS	<50	<5.0		<5	NS	7	<5.0		NS	NS	NS	NS	
SILVER		NS	NS	<50	<10		<10	NS	<30	NS		NS	NS	NS	NS	
THALLIUM		NS	NS	NS	NS		NA	NS	NS	NS		NS	NS	NS	NS	
ZINC		NS	40	NS	NS		51	50	NS	NS		NS	NS	NS	NS	
BARIIUM		NS	NS	660	430		210	NS	<200	230		NS	NS	NS	NS	

- 1 = November 30, 1987 - Total Recoverable Metals ND = Not detected
2 = August 25, 1988 - Dissolved Metals NS = Not sampled
3 = 1993 - Total Recoverable Metals Concentrations reported as ug/l (ppb)
4 = August 3, 1994 - Total Recoverable Metals
5 = March 5, 1996 - Dissolved Metals

- Continued -



Table 2
Groundwater Quality Data
Historical Metals Concentrations
Parker Hamifin
48 Woerd Avenue
Waltham, Massachusetts

PARAMETER	DATES	MW-10			MW-11		MW-3A
		2	3	4	4	5	5
ANTIMONY		NS	NS	NS	NS	NS	NS
ARSENIC		NS	NS	15	82	11	7.1
BERYLLIUM		NS	NS	NS	NS	NS	NS
CADMIUM		NS	ND	<10	22	<10	<10
CHROMIUM		NS	NS	51	700	<10	<10
COPPER		NS	NS	NS	NS	NS	NS
LEAD		NS	26	210	790	<3.0	<3
MERCURY		NS	NS	0.70	0.60	<0.50	<0.5
NICKEL		NS	NS	NS	NS	NS	NS
SELENIUM		NS	NS	<25	<50	<5.0	<5.0
SILVER		NS	NS	<30	<50	<10	36
THALLIUM		NS	NS	NS	NS	NS	NS
ZINC		NS	40	NS	NS	NS	NS
BARIUM		NS	NS	270	2,200	510	6,000

1 = November 30, 1987 - Total Recoverable Metals ND = Not detected
 2 = August 25, 1988 - Dissolved Metals NS = Not sampled
 3 = 1993 - Total Recoverable Metals Concentrations reported as ug/l (ppb)
 4 = August 3, 1994 - Total Recoverable Metals
 5 = March 5, 1996 - Dissolved Metals



Table 3
Soil Quality Data
EPA Method 8270
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts

Sample Date: July 25 & 26, 1994

COMPOUNDS	GP-12	GP-15	GP-16	GP-18	GP-20	GP-23	GP-24	GP-27	GP-28	GP-29	GP-30
ACENAPHTHENE	ND	ND	ND	ND	ND	ND	ND	ND	1,100	ND	ND
ACENAPHTHYLENE	ND	ND	ND	1,100	ND	ND	ND	ND	550	ND	ND
ANTHRACENE	ND	1,100	ND	1,200	ND	ND	ND	ND	2,300	ND	ND
BENZO(A)ANTHRACENE	ND	3,500	ND	4,200	ND	1,300	1,200	950	6,400	ND	ND
BENZO(A)PYRENE	ND	3,600	ND	4,400	4,400	1,100	1,000	680	5,300	ND	ND
BENZO(B)FLUORANTHENE	ND	3,300	ND	3,900	1,300	1,200	1,000	440	3,900	ND	ND
BENZO(K)FLUORANTHENE	ND	3,100	ND	3,500	950	960	920	450	3,900	ND	ND
BENZO(G,H,I)PERYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	2,100	5,700	1,600	5,600	1,000	1,500	1,500	1,200	7,000	ND	ND
DIBENZO(A,H)ANTHRACENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	1,200	9,000	2,600	ND	1,100	2,300	2,800	2,400	14,000	860	560
FLUORENE	ND	6,300	ND	8,600	ND	ND	ND	ND	1,000	ND	ND
INDENO(1,2,3-CD)PYRENE	ND	9,500	ND	ND	ND	ND	ND	ND	2,100	ND	ND
NAPHTHALENE	3,300	ND	ND	ND	ND	ND	ND	5,900	580	1,200	ND
PHENANTHRENE	2,200	ND	2,000	5,000	ND	1,100	1,900	2,500	9,400	1,300	420
PYRENE	5,100	ND	4,100	11,000	1,400	2,700	2,700	5,400	12,000	2,800	470

- Continued -



TABLE 3
Soil Quality Data
EPA Method 8270
Parker Hannifin
48 Woerd Avenue
Waltham, MA

Sample Date: April 13, 1995

COMPOUNDS	GP-31	GP-32	GP-33	GP-33	GP-34	GP-34	GP-35	GP-35	GP-36	GP-36	GP-36
ACENAPHTHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	ND	ND	170	ND	ND	ND	ND
ANTHRACENE	290	ND	200	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	800	ND	970	ND	ND	ND	730	ND	ND	ND	ND
BENZO(A)PYRENE	550	ND	710	ND	ND	ND	560	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	370	ND	600	ND	ND	ND	530	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	510	ND	670	ND	ND	ND	630	ND	ND	ND	ND
BENZO(G,H,I)PERYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	810	ND	1,000	ND	ND	ND	770	ND	ND	ND	240
DIBENZO(A,H)ANTHRACENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	1,700	ND	1,900	ND	350	ND	1,100	ND	300	450	ND
FLUORENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	230
PHENANTHRENE	1,200	ND	900	ND	210	ND	450	ND	ND	ND	ND
PYRENE	1,400	ND	1,500	ND	300	ND	1,400	300	260	430	ND

- Continued -



Table 3
Soil Quality Data
EPA Method 8270 and TPH
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts
Sample Date: March 13, 1996

COMPOUNDS	MW-3A	GP-42	GP-43	GP-44
ACENAPHTHENE	5,100	510	ND	ND
ACENAPHTHYLENE	ND	600	ND	ND
ANTHRACENE	9,500	1,600	ND	ND
BENZO(A)ANTHRACENE	13,000	5,100	790	ND
BENZO(A)PYRENE	7,600	3,700	620	ND
BENZO(B)FLUORANTHENE	4,400	1,900	ND	ND
BENZO(K)FLUORANTHENE	4,000	1,900	ND	ND
BENZO(G,H,I)PERYLENE	11,000	2,800	1,500	ND
CHRYSENE	18,000	7,300	1,200	4,300
DIBENZO(A,H)ANTHRACENE	3,900	2,300	ND	ND
FLUORANTHENE	14,000	4,300	1,000	6,300
FLUORENE	8,100	870	ND	ND
INDENO(1,2,3-CD)PYRENE	10,000	6,000	1,200	ND
NAPHTHALENE	7,700	560	580	12,000
PHENANTHRENE	30,000	4,900	1,700	7,200
PYRENE	61,000	14,000	5,600	6,300

Notes:
 ND indicates not detected above method detection limit.
 Results reported as ug/kg (ppb).
 Shaded results exceed S-1 and S-2 soil standards.



Table 4
 Soil Quality Data
 EPA Method 8240
 Parker Hannifin
 48 Woerd Avenue
 Waltham, Massachusetts
 Sample Date: July 25 - 26, 1996

COMPOUNDS	GP-12	GP-15	GP-16	GP-17	GP-18	GP-19	GP-20
BENZENE	31	12	ND	ND	ND	ND	ND
CHLORO BENZENE	1,300	ND	ND	ND	ND	ND	ND
1,2-DICHLORO BENZENE	1,100	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
ETHYL BENZENE	300	ND	ND	ND	ND	ND	ND
TETRACHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND
TOLUENE	120	6	28	ND	ND	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHYLENE	59	10	100	ND	ND	ND	ND
VINYL CHLORIDE	ND	97	100	ND	ND	6	ND
XYLENES	1,500	ND	160	ND	ND	ND	ND

- Continued -



Table 4
Soil Quality Data
EPA Method 8240
Parker Hannifin
48 Woerd Avenue
Waltham, Massachusetts
Sample Date: July 25 - 26, 1996

COMPOUNDS	GP-22	GP-25	GP-26	GP-27	GP-28	GP-29	GP-30
BENZENE	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	3	ND	61	ND	340	ND
ETHYLBENZENE	ND	ND	ND	1,700	ND	73	ND
TETRACHLOROETHYLENE	ND	ND	ND	1,200	ND	1,300	3
TOLUENE	ND	ND	ND	250	ND	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	490	ND
TRICHLOROETHYLENE	ND	ND	ND	47	7	4,100	64
VINYL CHLORIDE	ND	ND	ND	ND	ND	ND	ND
XYLENES	ND	ND	ND	13,000	ND	510	ND

Notes: Results reported as ug/kg (ppb).
ND indicates not detected above the method detection limit.

Table 5
Soil Quality Data - RCRA 8 Metals and TPH
Parker Hannifin
Woerd Avenue
Waltham, Massachusetts
Sample Date: July 25, 1994

COMPOUNDS	GP-1	GP-2	GP-3	GP-4	GP-5	GP-6	GP-9	GP-10	GP-11
ARSENIC	NA	NA	NA	NA	NA	NA	11	12	6
BARIUM	NA	NA	NA	NA	NA	NA	76	3,600	250
CADMIUM	NA	NA	NA	NA	NA	NA	<1	5	<1
CHROMIUM	NA	NA	NA	NA	NA	NA	31	160	29
LEAD	NA	NA	NA	NA	NA	NA	88	1,400	2,000
MERCURY	NA	NA	NA	NA	NA	NA	0.098	2	0.16
SELENIUM	NA	NA	NA	NA	NA	NA	<3	2	<0.62
SILVER	NA	NA	NA	NA	NA	NA	<3	21	<4
TPH Method (418.1)	NA	NA	NA	NA	NA	NA	40	2,300	6,500
TPH.8015 GASOLINE STD.	ND	ND	44	ND	ND	ND	NA	NA	NA

- Continued -



Table 5
Soil Quality Data - RCRA 8 Metals and TPH
Parker Hannifin
Woerd Avenue
Waltham, Massachusetts
Sample Date: July 25, 1994

COMPOUNDS	GP-12	GP-13	GP-14	GP-15	GP-16	GP-17	GP-18	GP-19	GP-20
ARSENIC	6	10	12	39	11	7	9	9	5
BARIUM	160	180	230	170	220	450	130	66	100
CADMIUM	<1	<1	<1	<1	5	<1	2	3	3
CHROMIUM	65	19	6	42	42	11	46	69	61
LEAD	300	560	340	280	1,100	660	550	240	480
MERCURY	0.45	0.25	0.18	0.20	0.066	0.060	0.27	0.085	0.090
SELENIUM	<2	<3	<3	<3	3	.94	<0.63	<0.54	<2
SILVER	<3	<4	<4	<4	<4	<3	4	<3	<3
TPH Method (418.1)	13,000	110	520	460	2,600	1,400	1,900	1,100	540
TPH,8015 GASOLINE STD.	NA	NA	NA	NA	NA	NA	NA	NA	NA

- Continued -



Table 5
Soil Quality Data - RCRA 8 Metals and TPH
Parker Hannifin
Woerd Avenue
Waltham, Massachusetts
Sample Date: July 25, 1994

COMPOUNDS	GP-26	GP-27	GP-28	GP-29	GP-30
ARSENIC	3	19	12	7	9
BARIUM	<22	170	94	100	320
CADMIUM	<1	<1	<1	1	1
CHROMIUM	8	21	16	28	16
LEAD	18	940	250	330	920
MERCURY	<0.054	0.090	0.25	0.097	0.12
SELENIUM	<0.54	1	<0.62	1	<0.67
SILVER	<3	<4	<4	<4	<4
TPH Method (418.1)	NA	NA	NA	NA	NA
TPH,8015 GASOLINE STD.	1	2,800	ND	30	ND

- Continued -



Table 5
Soil Quality Data - RCRA 8 Metals and TPH
Parker Hannifin
Woerd Avenue
Waltham, Massachusetts
Sample Date: March 13, 1994

COMPOUNDS	GP-42	GP-43	GP-44	MW-3A
ARSENIC	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA
LEAD	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA
SILVER	NA	NA	NA	NA
TPH Method (418.1)	2,100	3,000	13,000	26,000
TPH,8015 GASOLINE STD.	NA	NA	NA	NA

Notes: NA indicates not analyzed.
 ND indicates not detected above method detection limit.
 Results reported as mg/kg (ppm).
 TPH indicates total petroleum hydrocarbons.
 Shaded results exceed S-1 soil standards.
 Shaded/bold results exceed S-1 and S-2 soil standards.

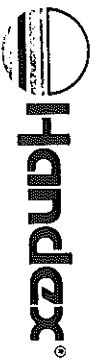


TABLE 6

OBSERVATION WELL GAUGE REPORTS

CLIENT: PARKER HANNIFIN
 LOCATION: WALTHAM - 48 WORD ST
 STATE: MA
 CLIENT CODE:
 HANDEX CODE: 108226

Print date: 7/31/96 Page 1

MONITORING DATE	WELL TYPE-#	C	PRODUCT DEPTH (feet)	WATER DEPTH (feet)	PRODUCT THICK. (feet)	PRODUCT ELEV. (feet)	GW ELEV. (feet)	CORR GW ELEV. (feet)
18-Mar-96	MW-1		4.35	4.35		96.36	96.36	96.36
18-Mar-96	MW-2		6.15	6.15		95.96	95.96	95.96
18-Mar-96	MW-3		11.53	11.53		0.00	0.00	0.00
18-Mar-96	MW(A)-3		8.69	8.69		95.86	95.86	95.86
18-Mar-96	MW-4		8.69	8.69		92.64	92.64	92.64
18-Mar-96	MW-5		5.50	5.50		92.26	92.26	92.26
18-Mar-96	MW-7		3.90	3.90		95.08	95.08	95.08
18-Mar-96	MW-8		2.26	2.26		96.99	96.99	96.99
18-Mar-96	MW-10		5.08	5.08		93.55	93.55	93.55
18-Mar-96	MW-11		1.65	1.65		95.37	95.37	95.37

"Comments: [P = Pumping; N = Non-pumping; B/A = Before/After Adjustment] [I = Well Inaccessible; # = nth Monitoring Event of Day] [D = Dry Well; F = Film or Trace of Product] 108226



TABLE 7
BACKGROUND SOIL DATA SUMMARY
POLYAROMATIC HYDROCARBONS and TOTAL PETROLEUM HYDROCARBONS

Compounds	DATA SUMMARY STATISTICS							MCP Background
	Number Detected	Number Analyzed	Minimum	Maximum	All Data - Ave. Conc.**	Median**	90th Percentile	
Acenaphthene	0	12	<0.17	<2.1	N/A	N/A	N/A	0.50
Acenaphthylene	2	12	0.17	1.1	0.51	0.28	1.0	0.50
Anthracene	3	12	0.29	1.2	0.53	0.36	1.1	0.50
Benzo(a)anthracene	4	12	0.73	4.2	1.2	0.48	3.5	0.50
Benzo(a)pyrene	5	12	0.55	4.4	1.4	0.56	4.4	0.50
Benzo(b)fluoranthene	5	12	0.37	3.9	1.0	0.46	3.3	0.50
Benzo(k)fluoranthene	5	12	0.51	3.5	0.95	0.57	3.1	0.50
Benzo(g,h,i)perylene	0	12	<0.17	<2.1	N/A	N/A	N/A	0.50
Chrysene	6	12	0.77	5.7	1.4	0.79	5.6	0.50
Dibenzo(a,h)anthracene	0	12	<0.17	<2.1	N/A	N/A	N/A	0.50
Fluoranthene	7	12	0.30	9.0	1.6	1.0	2.6	0.50
Fluorene	2	12	6.3	8.6	1.6	0.25	6.3	0.50
Indeno(1,2,3-ce)pyrene	1	12	9.5	9.5	1.2	0.25	1.0	0.50
Naphthalene	0	12	<0.17	<2.1	0.49	0.25	1.0	0.50
Phenanthrene	5	12	0.21	5.0	1.0	0.68	2.0	0.50
Pyrene	8	12	0.26	11	1.9	1.0	4.1	0.50
Total Petroleum Hydrocarbons	6	6	460	2,600	1,300	1,300	2,600	N/A

Notes: ** Average and median values calculated using 1/2 detection limit for non-detect results.
Concentrations reported as mg/kg (ppm).
MCP Background represents DEP calculated background concentrations for urban areas.



TABLE 7
BACKGROUND SOIL DATA SUMMARY - METALS

Compounds	DATA SUMMARY STATISTICS							
	Number Detected	Number Analyzed	Minimum	Maximum	All Data - Ave. Conc.**	Median**	90th Percentile	MCP Background
Arsenic	6	6	5	39	13	9	---	32
Barium	6	6	66	450	190	150	---	45#
Cadmium	4	6	2	5	2.3	2.5	---	2.0#
Chromium	6	6	11	69	45	44	---	105*
Lead	12	12	42	1,100	440	420	800	69
Mercury	6	6	0.06	0.27	0.13	0.88	---	1.0
Selenium	2	6	0.94	3.0	1.2	0.97	---	0.5#
Silver	1	6	4.0	4.0	1.8	2.1	---	0.6#

Notes:
 ** Average and median values calculated using 1/2 detection limit for non-detect results.
 Concentrations reported as mg/kg (ppm).
 MCP Background represents DEP calculated background concentrations for urban areas.
 *Chromium background represents Cr(VI).
 # DEP Background concentrations for rural and suburban locations.



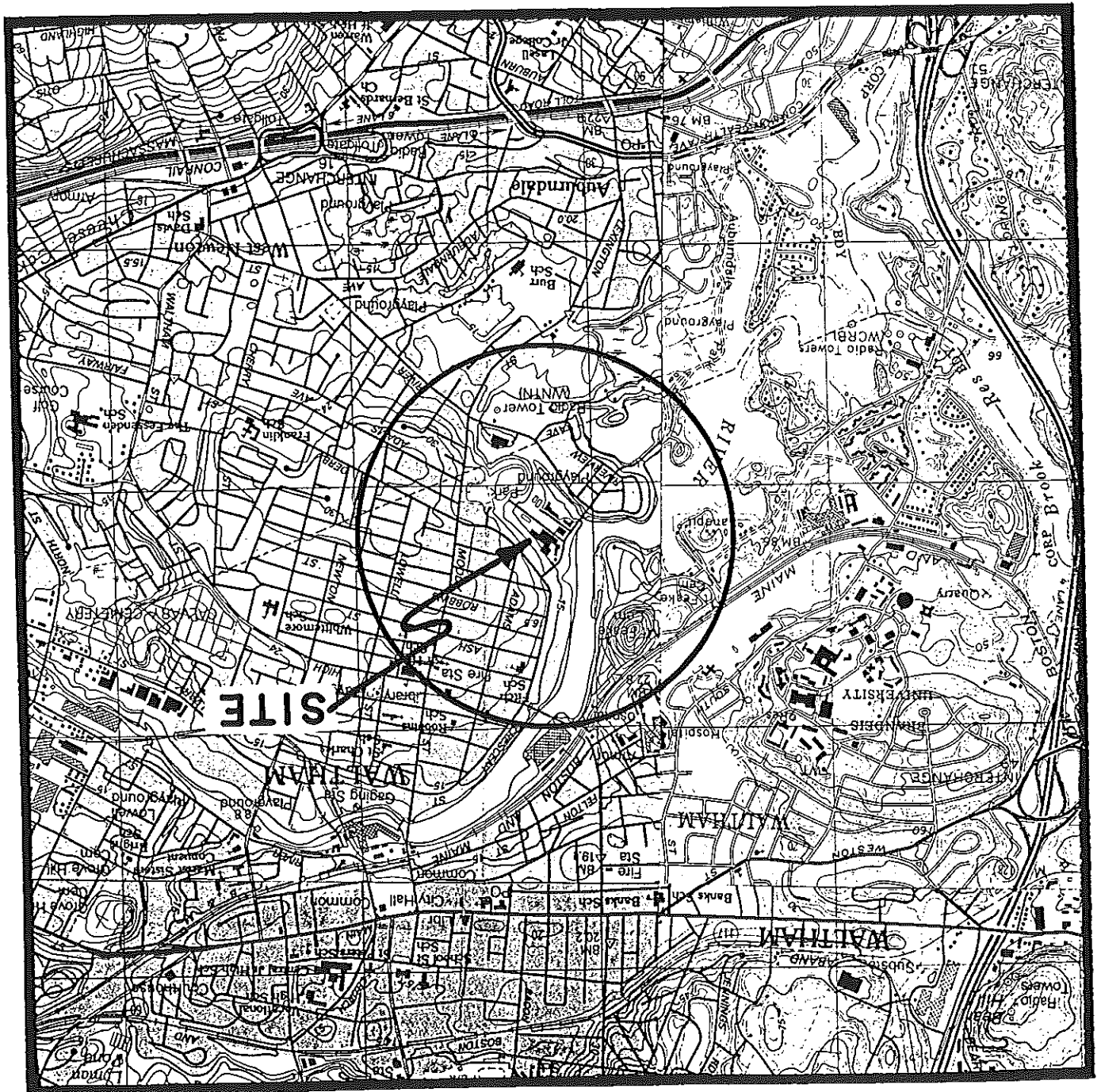
TABLE 8
Release Abatement Measure
Post Excavation Soil Quality Data
EPA Method 8270 and TPH
Parker Hannifin
Woerd Avenue, Waltham, MA
April 30, 1996


Compounds	Excavation #1	Excavation #2	Excavation #3 (south)	Excavation #3 (north)
ACENAPHTHENE	< 220	< 230	380	NA
ACENAPHTHYLENE	< 220	< 230	< 230	NA
ANTHRACENE	< 220	< 230	700	NA
BENZO (A) ANTHRACENE	290	290	2,700	NA
BENZO (A) PYRENE	< 220	340	2,900	NA
BENZO (B) FLUORANTHENE	< 220	350	2,400	NA
BENZO (K) FLUORANTHENE	< 220	< 230	1,700	NA
BENZO (G,H,I) PERYLENE	< 220	< 230	4,500	NA
CHRYSENE	420	400	3,400	NA
DIBENZO (A,H) ANTHRACENE	< 220	< 230	780	NA
FLUORANTHENE	450	610	5,500	NA
FLUORENE	< 220	< 230	340	NA
INDENO (1,2,3-CD) PYRENE	< 220	< 230	3,000	NA
NAPHTHALENE	480	< 230	< 230	NA
PHENANTHRENE	400	260	3,800	NA
PYRENE	680	560	5,800	NA
TPH (mg/kg)	1,600	260	260	620

Notes: Results reported as µg/kg (ppb) unless otherwise noted.
 ND indicates not detected above the method of detection limit.
 NA indicates not analyzed.



398 CEDAR HILL STREET MARLBORO, MA 01752	
FIGURE 1 LOCUS MAP	
LOCATION	48 WOERD AVENUE WALTHAM, MA
JOB NO.	108226-01
SCALE	1" = 2000' APPROX.

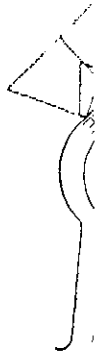



SCALE	1" = 200' APPROX
JOB NO.	108226-01
LOCATION	48 MOERD AVENUE WALTHAM, MA
FIGURE 2 SITE INFORMATION MAP	
	
398 CEDAR HILL STREET MARLBORO, MA 01752	

DATA COLLECTED ON 3-18-96

- LEGEND
- MW-2 MONITORING WELL W/WATER
95.96 TABLE ELEVATION IN FEET
 - ☒ MW-6 DESTROYED MONITORING WELL
 - 367 HOUSE NUMBER
 - U/O USED/OIL
 - F/O FUEL/OIL
 - H/O HEATING/OIL
 - UST(S) UNDERGROUND STORAGE TANK(S)
 - SMH-2 SEWER MANHOLE
 - 95.6 WATER TABLE CONTOUR W/WATER
TABLE ELEVATION IN FEET
 - PROPERTY BOUNDARY APPROX.
 - SITE PROPERTY BOUNDARY APPROX.

NEWTON

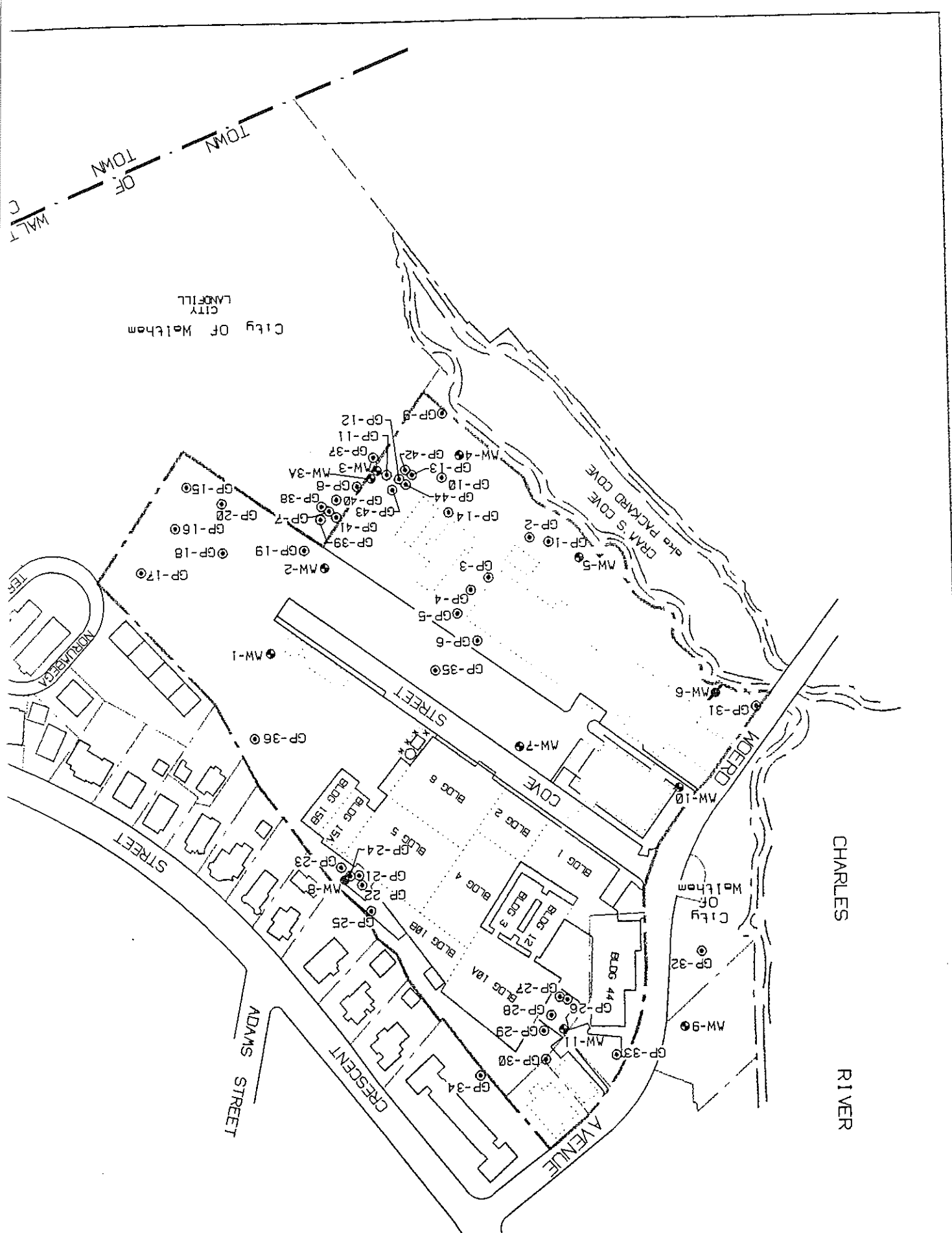



SCALE	1" = 200' APPROX
JOB NO.	108226-01
LOCATION	48 WOERD AVENUE WALTHAM, MA
SOIL BORING LOCATIONS FIGURE 3	
398 CEDAR HILL STREET MARLBORO, MA 01752	
	

NEWTON

- LEGEND
- MW-2 MONITORING WELL
 - ⊗ MW-6 DESTROYED MONITORING WELL
 - ⊙ GP-19 GEOPROBE LOCATION
 - PROPERTY BOUNDARY APPROX.
 - SITE PROPERTY BOUNDARY APPROX.



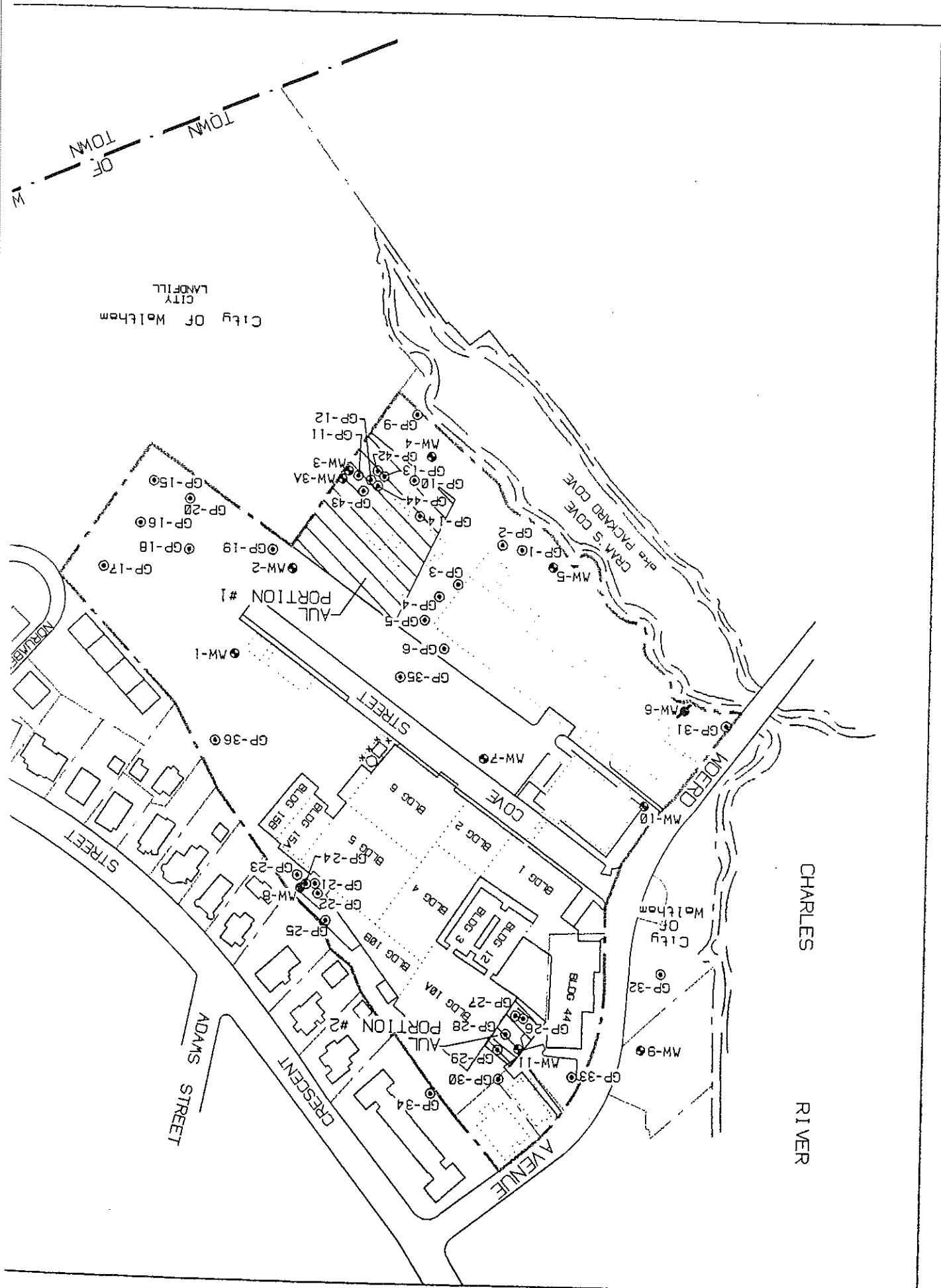



SCALE		1" = 200' APPROX
JOB NO.		108226-01
LOCATION		48 MOERD AVENUE WALTHAM, MA
FIGURE 4 ACTIVITY & USE LIMITATION LOCATIONS		
398 CEDAR HILL STREET MARLBORO, MA 01752		
		

NEWTON

- LEGEND
- WM-2 MONITORING WELL
 - ☒ WM-6 DESTROYED MONITORING WELL
 - ⊙ GP-19 GEOPROBE LOCATION
 - ▨ ACTIVITY & USE LIMITATION (AUL PORTIONS #1 & #2)
 - PROPERTY BOUNDARY APPROX.
 - SITE PROPERTY BOUNDARY APPROX.



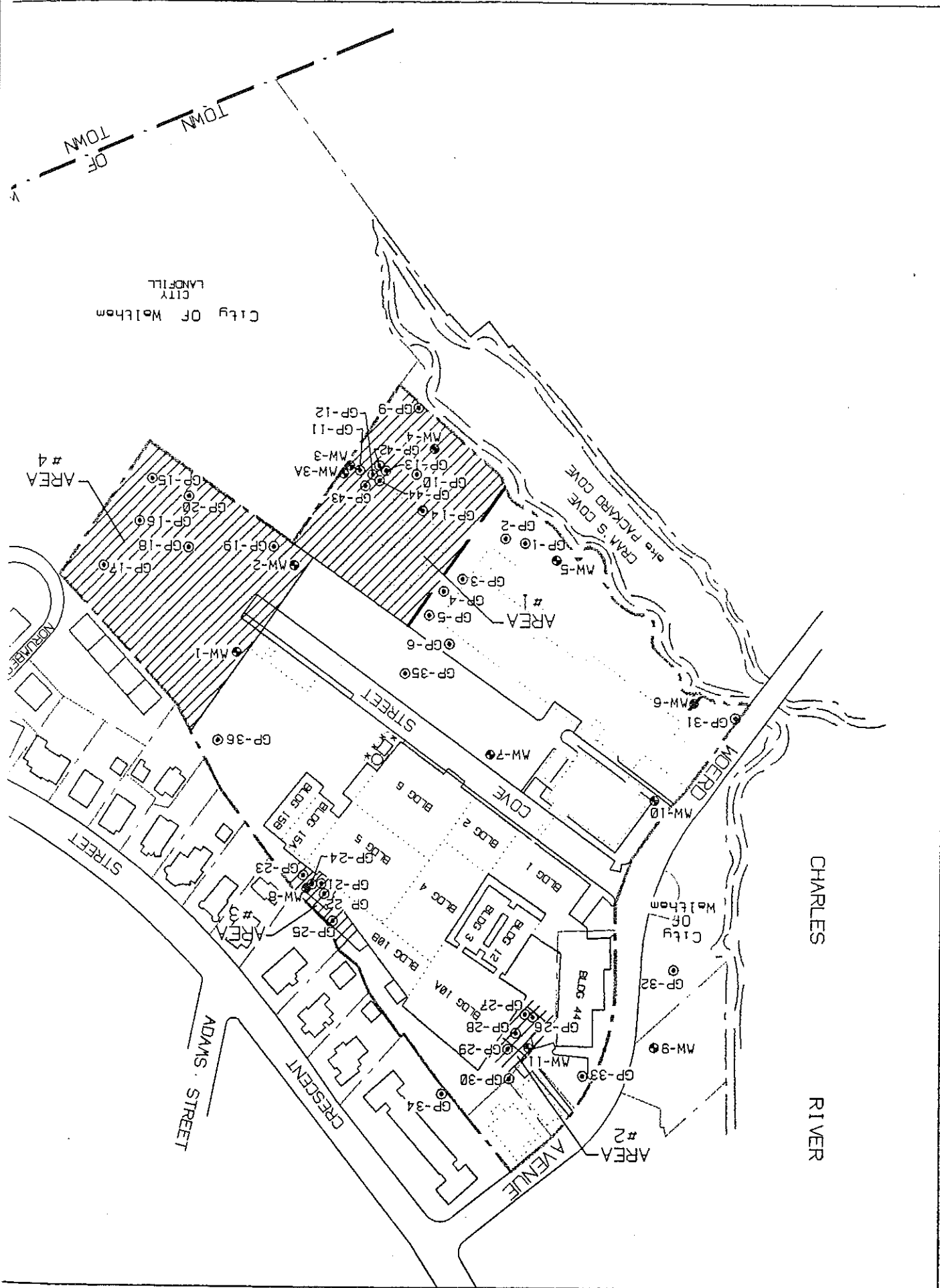



SCALE	1" = 200' APPROX.
JOB NO.	108226-01
LOCATION	48 WOERD AVENUE WALTHAM, MA
FIGURE 5 POTENTIAL EXPOSURE AREAS	
	
398 CEDAR HILL STREET · MARLBORO, MA 01752	

NEWTON

- LEGEND
- WM-2 MONITORING WELL
 - ⊗ WM-6 DESTROYED MONITORING WELL
 - ⊙ GP-19 GEOPROBE LOCATION
 - PROPERTY BOUNDARY APPROX.
 - SITE PROPERTY BOUNDARY APPROX.

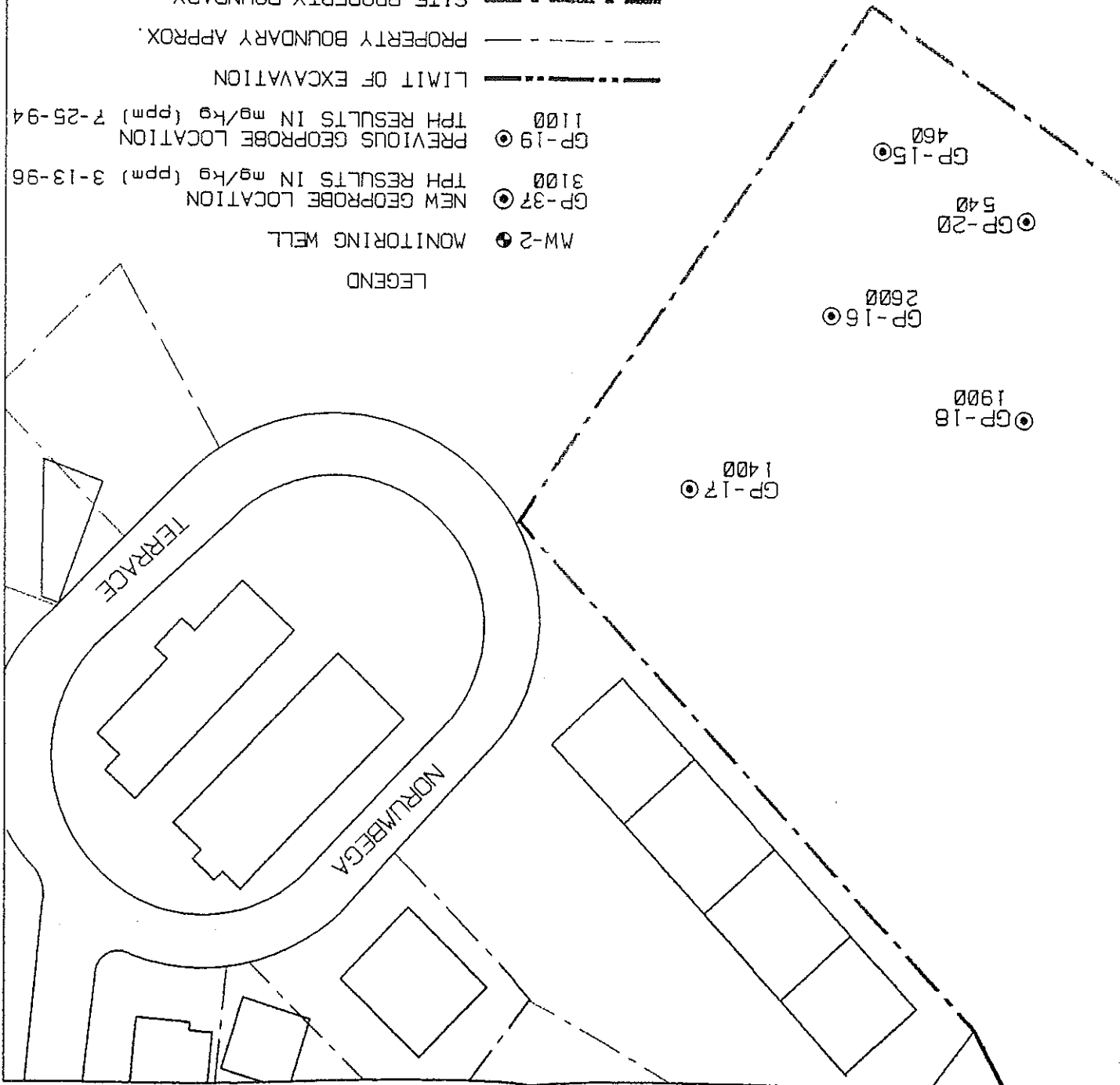




SCALE 1" = 60' APPROX.		1082265E
JOB NO. 108226-01		
LOCATION WALTHAM, MA		
48 WOERD AVENUE		
SOIL EXCAVATION LOCATIONS		
RELEASE ABATEMENT MEASURE		
FIGURE 6		
398 CEDAR HILL STREET MARLBORO, MA 01752		
		

DATA COLLECTED ON 7-24-94 & 3-13-96

--- SITE PROPERTY BOUNDARY APPROX.
 - - - PROPERTY BOUNDARY APPROX.
 - - - LIMIT OF EXCAVATION
 ● NEW GEOPROBE LOCATION
 ● PREVIOUS GEOPROBE LOCATION
 ● MONITORING WELL
 ● TPB RESULTS IN mg/kg (ppm) 3-13-96
 ● TPB RESULTS IN mg/kg (ppm) 7-25-94



CITY OF WA
CITY
LANDFILL

GRAM'S COVE
aka PACKARD COVE

GP-9
40

WM-4

GP-37
3100

GP-42
2100

GP-10
2300

GP-11
6000

WM-3

GP-12
4000

GP-13
110

WM-3A

GP-44
3000

GP-43
3000

GP-38
3200

GP-40
3100

EXCAVATION AREA #2

GP-7

GP-39
1500

EXCAVATION AREA #1

GP-19
1100

WM-2

GP-14
520

GP-2

GP-3

GP-4

GP-5

GP-6

STREET

COVE

GP-35

WM-

"Method 3 Risk Characterization and Supporting Documentation, Parker Hannifin Corporation," prepared by Handex of New England, August 9, 1996.

Appendix F

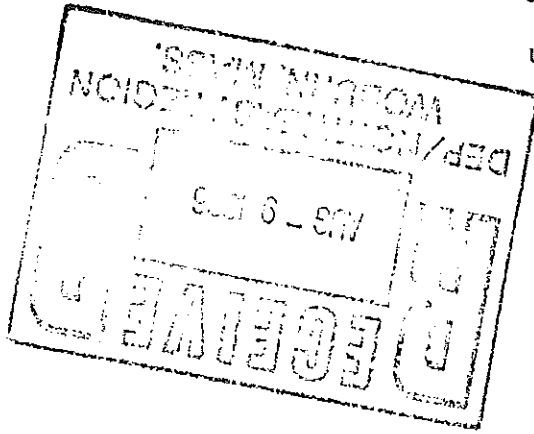
Handex of New England, Inc.
398 Cedar Hill Street
Marlboro, MA 01752

Prepared By:

Parker Hannifin Corporation
17325 Euclid Avenue
Cleveland, Ohio 44112-1290

Prepared For:

August 9, 1996



**METHOD 3 RISK CHARACTERIZATION
AND
SUPPORTING DOCUMENTATION**
Parker Hannifin Corporation
Nichols Aircraft Division
48 Woerd Avenue
Waltham, Massachusetts
MA DEP Case #3-3260

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The subject site is located at 48 Woerd Avenue in the City of Waltham, Massachusetts and consists of approximately 11.5 acres of land. The property boundaries of the subject site were determined using City of Waltham Assessor's Map (Map 76, Lots 20-28) and are shown on Figure 2, Site Information Map. Figure 1, Locus Map, illustrates the site in relation to surrounding topography and drainage. Cove Street bisects the site from east to west. The Nichols Aircraft Division manufacturing building is located in the northern portion of the site and abuts residential properties consisting of condominiums and apartments. The southern portion of the site is an open space which previously contained

2.0 SITE DESCRIPTION

- Hazard Identification
- Exposure Assessment
- Dose-Response Assessment
- Risk Characterization
- Risk Characterization Uncertainty Analysis
- Safety & Public Welfare Risk Characterization
- Stage I Environmental Screening

The purpose of the risk characterization is to evaluate the potential risk to health, safety, public welfare and the environment which may be posed by oil or hazardous materials (OHM) which were detected in environmental media at the site. This evaluation is based on potential human exposure under current and future foreseeable site uses and conditions. Risks are estimated for the potential human receptors based on assumptions regarding the characteristics of the receptor groups, the types of OHM detected in different environmental media, and the amount of exposure in terms of how often and how much a person may be exposed to site-related contaminants. The risks are also based on the implementation of an Activity and Use Limitation (AUL) which is discussed in detail later in this document. This risk characterization consists of the following components:

As part of a Class A-3 Response Action Outcome (RAO) pursuant to the Massachusetts Contingency Plan (MCP), Handex of New England, Inc. (Handex) has performed this Method 3 Risk Characterization for the Parker Hamflin Corporation, Nichols Aircraft Division property located at 48 Woerd Avenue in Waltham, Massachusetts. The risk assessment was conducted in accordance with the Massachusetts Department of Environmental Protection (DEP) "Guidance For Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan" (DEP, 1995). The risk assessment relies on information presented in a Phase I (1987) and Phase II Site Assessment (1990) conducted by TWM Northeast/Normandeau Engineers, Inc. and Phase II Site Investigation (1994) and Class A-3 RAO (1996) conducted by Handex.

1.0 INTRODUCTION

RISK CHARACTERIZATION

a Mica processing building, an engineering building, two storage buildings and a boiler building. All of the facilities on the southern portion of the site were demolished and removed in 1995.

3.0 SURROUNDING PROPERTIES

The site is situated within an area of Waltham with dense residential and commercial development. The northern portion of the site is bound by residential properties to the north, a former City of Waltham municipal landfill to the east, Cove Street to the south and Woerd Avenue to the west. The southern portion of the site is bounded by the former City of Waltham Landfill to the east, Crams Cove (an embayment of the Charles River) to the south, Woerd Avenue to the west and Cove Street to the north. The Charles River is located approximately 50 feet west of the site.

4.0 REGULATORY STATUS

The site was listed by the Massachusetts Department of Environmental Protection (DEP) as a Location to be Investigated on July 12, 1990, based on the discovery of volatile organic compounds (VOCs) and metals in shallow groundwater and soil in the southwest portion of the property. A Release Abatement Measure Plan was submitted to the DEP on May 3, 1996 to excavate petroleum impacted soil. A Downgradient Property Status Opinion was filed with the DEP on June 18, 1996.

5.0 CURRENT AND FUTURE FORESEEABLE SITE USES

The Parker Nichols Aircraft Division manufacturing building is currently located on the northern portion of the site. The western portion of the site is currently open space consisting of grass and wooded areas. Parker Hannifin has future plans of moving the Nichols Aircraft Division to another location, demolishing the existing buildings and selling the entire property. Possible future uses of the site would be for commercial and/or industrial purposes. Future outdoor recreational, residential and child day-care services is restricted for portions of the property by an Activity and Use Limitation (AUL). The AUL is described in Section 6.0.

6.0 ACTIVITY AND USE LIMITATION (AUL)

An AUL, pursuant to 310 CMR 40.1070, has been filed for portions of this property. The AUL has been filed to restrict current and future human exposure to OHM impacted subsurface soil at the site. In reducing human exposure to site OHM, the overall potential harm to the public is reduced.

The groundwater categories for this site were determined pursuant to 310 CMR 40.0932. Based on the available information, Groundwater Category 1 (GW-1) is not relevant to the groundwater beneath this site. All public water in the area is supplied by the Massachusetts Water Resources Authority (MWRA) and there are no known private water supply wells in the vicinity of the site.

8.0 GROUNDWATER CATEGORIES

Based on the information summarized in Table 40.933(9) of the MCP regulation, Soil Categories S-1 and S-3 apply to different areas of the site. A majority of subsurface soil at the site is classified as S-3 due to uses of the site, accessibility of the soil and implementation of an AUL. The southern part of the site, apart from AUL Portion #1 is an open grassy field. This portion of the property is not AUL restricted so future residential use is possible. In addition, the grass covered field is currently accessible to trespassers and site visitors. S-1 soil category is applicable for these reasons.

7.0 SOIL CATEGORIES

Further land-use restrictions are also applied to Portions of the Property. Portions of the Property contain PAH concentrations in soil which are above Soil Category 3 (S-3) standards as listed in 310 CMR 40.0975(6)(c). Additional land use restrictions on Portions of the Property are applied to address potential human exposures from construction activities (soil excavation) and unauthorized site visitors such as neighborhood residents. AUL Portion "1" and "2" are enclosed by a chain-linked fence which will be maintained and secured. Any future soil excavation work conducted on Portions of the Property will be performed under the supervision of a Licensed Site Professional (LSP). Construction workers involved with soil excavation on Portions of the Property will be required, at a minimum, to wear Level "D" personal protective equipment (PPE) pursuant to 29 CFR 1910.120. PPE grades would be based on appropriate site monitoring. Utilization of appropriate PPE will prevent human exposure to OHM impacted soil.

In general, the AUL prevents future site development for residential, outdoor recreational and child-care purposes on Portions of the Property. By restricting residential, outdoor recreational and child-care type uses, potentially sensitive human receptors (i.e. children) and potential high-impact exposure scenarios (i.e. children playing in contaminated soil) are eliminated from the risk assessment analysis.

The AUL has been applied to two portions of the property (hereinafter referred to as "Portions of the Property"). The Portions of the Property, designated as AUL Portion "1" and AUL Portion "2" are shown on Figure 4, Activity and Use Limitation Location.

The groundwater beneath the site is located less than 15 feet below grade and within 30 feet of an existing building. As a result, Groundwater Category 2 (GW-2) is relevant to the northern portion of the site. The southern portion of the site is currently open space and GW-2 does not apply to this area. All groundwater is assumed to eventually discharge to surface water, therefore, Groundwater Category 3 (GW-3) is also relevant to the site.

9.0 HAZARD IDENTIFICATION

9.1 Identification of Oil and/or Hazardous Materials

OHM detected in groundwater and on-site subsurface soils are presented in Tables 1 through 5. The OHM can be grouped into four categories; volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), metals and total petroleum hydrocarbons (TPH). PAHs are a class of compounds consisting of three or more fused aromatic rings. PAHs are products of incomplete combustion of organic materials and are components of heavy lubricating oils. Specific PAH compounds are listed in Table 3. VOCs detected in on-site soil and groundwater are chemicals commonly found in petroleum hydrocarbons (i.e., benzene) as well as metal degreasing products (i.e., trichloroethylene). Specific VOCs detected at the site are presented in Tables 1 and 4. Metals detected in on-site environmental media are presented in Tables 2 and 5. TPH represents a quantitative measurement of gross petroleum hydrocarbon concentrations in environmental samples and does not identify specific compounds. Fingerprint analysis of petroleum in on-site soil samples identified the petroleum as primarily heavy lubricating oil with some gasoline. A copy of the fingerprint analysis is attached as Appendix A. TPH concentrations are presented in Table 5.

9.2 Source of OHM Release

There are many suspected sources of OHM to the subsurface. VOCs in groundwater and soil are likely a result of historical on-site manufacturing activities and the abutting landfill formerly operated by the City of Waltham. Metals in groundwater and soil are attributed to a combination of natural occurring levels, releases from historical manufacturing activities and the abutting landfill. A Downgradient Property Status Opinion, pursuant to 310 CMR 40.0174, was submitted to the current owners of the landfill regarding the elevated silver concentrations in groundwater on the northeast portion of the site. PAHs and TPH in subsurface soils are attributable to former underground storage tanks and fill material which are widespread beneath the site and surrounding area. The former USTs contained heating oil, waste oil, and mineral spirits.

(b) attributable to geologic or ecologic conditions, atmospheric deposition of industrial processes or engine emissions, fill materials containing wood or coal ash, releases to groundwater from a public water supply system, and/or petroleum residues that are incidental to the normal operation of motor vehicles.

(a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and

are:
Subsurface investigations have revealed that a majority of the site is underlain by layers of fill material consisting of wood, ash, cinders and building debris. The fill material is more prominent in the eastern portion of the site and decreases from easterly to westerly across the site. The identification of fill material is critical in determining background concentrations of OHM at the site. The MCP defines "background" as those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which

9.4 Background OHM Concentrations

The highest levels of PAHs and TPH are located in the eastern portion of the site near the former landfill, as shown on Figure 3. The impacted soil is located at depths ranging from 2 to 12 feet below grade. The site contains a considerable amount of fill material; site specific background levels of metals, PAHs and TPH are discussed in Section 6.4. Two areas of elevated PAHs also exist near a former waste oil/mineral spirits USTs located in the northwest corner of the property (shown as Exposure Area #2 on Figure 5) and near a former mineral spirits UST located in the northeast portion of the site (shown as Exposure Area #3 on Figure 5). The PAHs are located at depths ranging from 2 to 6 feet below grade in Exposure Areas #2 and #3.

Historical groundwater VOC quality data presented in Table 1 indicates that GW-2 and GW-3 groundwater standards have not been exceeded since 1988. The horizontal extent of VOC impacted groundwater does not appear to extend beyond the site boundaries. The extent of dissolved metals in groundwater appears to incorporate both the former Woerd Avenue Landfill and the site. Groundwater sampling conducted in March 1996 indicated that dissolved silver exceeded the GW-3 standard in wells MW-3A and MW-4. The most recent groundwater sample collected from MW-4 on June 13, 1996 indicated a silver concentration of $> 7.0 \mu\text{g/l}$ which is below the GW-3 standard. The extent of silver in groundwater downgradient of MW-4 is not fully defined, however, the most recent groundwater sample collected from MW-4 suggests that dissolved silver does not exist at concentrations higher than those detected in MW-3A and MW-4 downgradient of MW-4.

9.3 Extent of Contamination

Chemicals of Concern (COCs) for the human health Risk Characterization may be identified by: a) comparing OHM levels against available or applicable "background" values, b) eliminating OHM with low detection frequencies, and c) eliminating OHM that are considered laboratory contaminants and not related to the OHM release. In addition, OHM that are not detected above the laboratory reporting limit may also be removed from further consideration as a COC.

9.5 Chemicals of Concern

Subsurface soil at the site which do not contain fill material were classified as native material. Soil borings considered to contain exclusively native material include GP-21 through GP-25 and GP-33. DEP derived OHM background levels for urban areas were utilized as background concentrations in the native material. OHM detected in soil borings GP-21 through GP-25 and GP-33 consisted primarily of PAHs. The DEP derived background concentrations of PAHs is 0.5 mg/kg.

The western portion of the site is underlain with fill material at depths ranging from 1 to 12 feet below grade. The fill consists of ash and wood debris. Soil borings GP-35 and GP-36 in the central portion of the site revealed fill material at depths between 1 and 9 feet which consisted of ash and fill debris. Soil boring GP-31 in the southwest corner of the site revealed fill materials at depths of 1 to 5 feet. On the western side of the site, the fill material decreases in thickness from 4 feet thick to 1 feet in a south to north direction across the site. Some borings along the northern portion of the site did not contain fill material (soil borings GP-21 through GP-25). Based on subsurface lithology, the following sample locations were chosen to represent background: GP-15 through GP-20, GP-31, GP-32, GP-34, GP-35 and GP-36. The background samples were selected based on the presence of fill material in the subsurface as well as an upgradient location on the property that was representative of background. Soil samples collected from the background soil boring locations were analyzed for PAHs, heavy metals and TPH. The compounds detected in these borings represent background concentrations of OHM related to historic fill materials. Table 6 summarizes soil quality data collected from the background soil sample locations including average and median concentrations. All soil boring locations are shown on Figure 3 and soil boring logs are attached as Appendix B.

RISK CHARACTERIZATION:

PARKER HANNIFIN CORPORATION, 48 WORD AVENUE, WALTHAM, MA

9.5.1 COC - Subsurface Soil

Historically detected OHM in subsurface soil include the following:

Metals	VOCS	PAHs
arsenic	benzene	acenaphthene
barium	chlorobenzene	acenaphthylene
cadmium	1,2-dichlorobenzene	anthracene
chromium	1,1-dichloroethene	benzo(a)anthracene
lead	ethylbenzene	benzo(a)pyrene
mercury	tetrachloroethylene	benzo(b)fluoranthene
selenium	toluene	benzo(k)fluoranthene
silver	1,1,1-trichloroethane	benzo(ghi)perylene
	trichloroethylene	chrysene
	vinyl chloride	dibenz(ah)anthracene
	xylenes	fluoranthene
		fluorene
		indeno(123-cd)pyrene
		naphthalene
		pyrene
		phenanthrene

In addition to the above criteria, COCs in soil for the human health risk characterization were chosen based on the implementation of an AVL, as described in Section 6.0. The AVL eliminates current and future human exposure to subsurface soil in Exposure Areas 1 and 2. The calculation of site specific background concentrations of OHM, as described in Section 9.4, determined that all OHM detected in soil in Exposure Area 4 were consistent with background. With the elimination of three of the four potential exposure areas, only OHM detected in Exposure Area 3 were considered COCs for the risk assessment. Chemicals of Concern in subsurface soil that were evaluated throughout the risk assessment include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene and pyrene. Analytical data for these COCs are summarized in Table 7, including range and mean concentrations. All other PAHs in Exposure Area #3 were below the laboratory analysis method detection limit (MDL) and were not considered further in this risk characterization.

VOCS in soil were analyzed in two soil samples (GP-22 and GP-25) in Exposure Area #3. All VOCS were below the laboratory analysis MDL and therefore, all VOCS were removed from the risk characterization involving exposure to soils.

Metals were not analyzed in soil in Exposure Area #3. Metals resulting from site activities in this area were not expected and therefore not included in the risk assessment. All OHM detected in soil were evaluated as part of a Method 3 Stage I Environmental Screening (Section 14.0).

A description of the potential health effects associated with each chemical of concern is

9.6 Toxicity Profiles

Metals detected in groundwater were not chosen as COCs as there is no potential direct contact with groundwater and metals are not volatile.

Groundwater Categories for this site were determined to be GW-2 and GW-3. Human exposure to OHM in groundwater is limited to potential volatilization from groundwater to ambient air.

VOCs in groundwater were evaluated from 1987 to 1994. VOCs that were detected above the method detection limit during the last two rounds of groundwater sampling (1993 and 1994) were selected as COCs. All other VOCs were dropped from the risk assessment as they have not been detected in site groundwater since 1988 or earlier. VOCs selected as COCs include acetone, 1,1-dichloroethane, ethylbenzene, trichloroethene, toluene, xylenes, cis-1,2-dichloroethene, methyl tertiary butyl ether and vinyl chloride.

Metals (total and dissolved)	Volatile Organic Compounds
antimony	acetone
arsenic	benzene
barium	chlorobenzene
cadmium	chloroform
chromium	1,1-dichloroethane
copper	1,2-dichloroethane
lead	1,2-dichloroethenes
mercury	ethylbenzene
nickel	methylene chloride
selenium	tetrachloroethene
silver	1,1,1-trichloroethane
zinc	trichloroethene
beryllium	trichlorofluoromethane
	toluene
	xylenes
	vinyl chloride
	1,4-dichlorobenzene
	1,2-dichlorobenzene
	cis-1,2-dichloroethane
	chloroethane
	methyl tertiary butyl ether

Historically detected OHM in site groundwater include the following:

9.5.2 COC - Groundwater

The dose-response assessment for carcinogens assumes that there is no threshold dose for carcinogenicity (i.e. there is no dose of a carcinogenic substance which is associated with zero risk). The evaluation of carcinogenic effects is a weight-of-evidence determination whether a compound is a human or animal carcinogen based on human and/or animal data. The system for characterizing the overall weight of evidence for a chemical's carcinogenicity developed by USEPA is based on the availability of animal, human and other supportive data. The weight of evidence classification rates the likelihood that an agent is a human carcinogen. The quality of evidence from human studies, the quality of evidence from

10.2 Carcinogenic Assessment

For non-carcinogenic health effects, it is believed that a dose (or exposure) level exists at and below which no adverse health effects would be expected. Such a level is referred to as a threshold dose. Although a threshold dose may be impossible to determine, it is possible to approximate this dose in a health-protective manner by identifying a sub-threshold dose. The sub-threshold dose is typically derived from the No Observable Adverse Effects Level (NOAEL) of an animal study by application of uncertainty factors (UF) and a modifying factor (MF). Uncertainty factors are applied to account for interspecies variation, exposure duration and protection of sensitive populations. An additional UF may be applied if the toxicological study identified a Lowest Observable Adverse Effects Level (LOAEL), rather than a NOAEL. Each UF is typically equal to a factor of ten, and the product of all the UFs may be as high as 10,000. The MF may be applied to reflect additional uncertainties in the critical study and other items not addressed by the UFs. The value to the MF is greater than zero and less than or equal to ten with a default value of one. The sub-threshold dose in units of mg/kg/day to which daily exposure of a human population is likely to be free of appreciable risk of adverse health effects during a lifetime is termed a Reference Dose (RfD). The RfD for each COC at the site is presented in Table 9.

10.1 Noncarcinogenic Assessment

The purpose of the dose-response assessment under the MCP is to quantitatively describe the relationship between the dose of a compound and the potential for increased incidence of adverse effects. Table 9 summarizes the USEPA carcinogen classification and health criteria for each COC. The compounds are classified by the USEPA as noncarcinogenic or potentially carcinogenic, based on human and/or laboratory animal data. The health criteria in the dose-response assessment were then used in the risk characterization.

10.0 DOSE-RESPONSE

profiles provide a summary of the potential adverse human health effects which may be associated with exposure to a particular contaminant.

animal studies and other supportive information such as mutagenicity data and structure-activity data are major factors considered in characterizing the overall weight of evidence. USEPA lists carcinogens into five broad categories which are summarized below:

Group A - Human Carcinogen: This category indicates there is sufficient human data from epidemiology studies to support a causal association between an chemical and human cancer;

Group B - Probable Human Carcinogen: Group B1 indicates there is limited epidemiology data suggesting carcinogenicity to humans and Group B2, there is sufficient evidence of carcinogenicity in animals.

Group C - Possible Human Carcinogen: Group C indicates there is limited animal carcinogenicity data;

Group D - Not Classified: This category indicates that animal carcinogenicity data is inadequate or not available.

Group E - No Evidence of Carcinogenicity to Humans: This category indicates that there is evidence of non-carcinogenicity in animal or epidemiology studies.

10.3 Uncertainty in the Dose-Response Assessment

Major sources of uncertainty concerning the dose-response assessment include:

1. For chemicals causing systemic effects, the RfD is used as a basis for comparison. The RfD is a threshold value that compensates for uncertainty through the application of safety factors. As described in Section 10.1, these safety factors (uncertainty factors) may lower the NOAEL by as much as 10,000. Due to the margin of safety built into the RfD value, exceeding the number has no immediate meaning concerning specific health effects, the frequency of effects or the magnitude of effects. Exceedance of the RfD value should serve as a warning that the potential for unacceptable exposure does exist and precautions should be taken to limit exposure.

2. There are many uncertainties associated with the estimates of risk from carcinogens. Human epidemiology studies utilized in estimating carcinogenic risks have well documented uncertainties inherent in the process. The difficulty in using animal studies to estimate human carcinogenicity is also well documented. In particular, the procedure of extrapolating high doses over a short period (12 to 24 months) in test animals to low doses over a long period (75 years) in humans.

11.0 EXPOSURE ASSESSMENT

The purpose of the exposure assessment is to evaluate the magnitude, frequency and duration of potential human contact with OHM in each medium at the site. The assessment includes identification of potential human receptors, exposure points, and exposure routes associated with both the current and reasonably foreseeable future uses of the site. The potential receptors which were evaluated include current and future on-site factory workers, future on-site residents, potential construction workers and potential utility line workers. Exposure point concentrations were calculated based on site data, as described in Section 11.4. Average Daily Doses (ADD) were calculated using the calculated exposure point concentrations and specific exposure scenarios which estimate the intake of each compound via each route of exposure.

11.1 Identification of Potential Human Receptors

The current and reasonably foreseeable site uses are discussed in Section 5.0. Parker Hanfin has filed an AUL on portions of the property which will limit human exposure to subsurface soil. Current site uses and conditions in conjunction with the AUL will limit on-site employees and site visitors from being exposed to subsurface soils. The AUL limits future development of portions of the property for residential purposes, but not the entire property. Potential future receptors include current and future on-site factory workers, future on-site residents, potential construction workers and potential utility line workers.

11.2 Exposure Profiles

11.2.1 Future On-Site Resident - Child: Future foreseeable site use could result in residential scenarios outside the two AUL portions of the property. A future resident child could be exposed to subsurface soil. Contact with groundwater is not expected. The risk assessment for the child will evaluate potential future dermal contact, incidental ingestion and inhalation of fugitive dust.

A child, 1 to 8 years old, is assumed to be exposed to soil in his/her yard. The child is assumed to play in their yard from April 1 to October 1 (130 days/year) for an average of 6 hours per day. The exposure is assumed to occur over a 7 year period. The child's hands, arms, legs and feet are assumed to be exposed to the soil. The child is assumed to ingest 100 mg of soil during each event. The exposure assumptions are summarized in Table 10.

11.2.2 Future On-Site Resident - Adult: A future resident adult could be exposed to subsurface soil. Contact with groundwater is not expected. The risk assessment for the adult will evaluate potential future dermal contact, incidental ingestion and inhalation of fugitive dust from OHM impacted soil.

An adult, aged 18 to 43 years old, is assumed to be exposed to soil in his/her yard during gardening and/or recreation activities. The adult is assumed to work in their yard from

April 1 to October 1 (130 days/year) for an average of 3 hours per day. The exposure is assumed to occur over a 25 year period. The adults hands, forearms, lower legs and feet are assumed to be exposed to the soil. The adult is assumed to ingest 50 mg of soil per event. The exposure assumptions are summarized in Table 11

11.2.3 Construction Workers: Construction workers (18-25 years old) could be exposed to contaminants in soil and air during future redevelopment of the site. The risk assessment for the construction worker evaluates dermal contact with soils, incidental ingestion of soils, and inhalation of fugitive dusts. It is assumed that excavation work conducted below the water table would include dewatering and treatment of groundwater. Exposure to groundwater would therefore be negligible.

The construction worker may be involved in activities for the length of the construction project: conservatively assumed to be 1 year. The worker works 8 hours per day for 7 months (April, May, June, July, August, September, October). The workers hands, forearms, lower legs and feet would be exposed to the soil which roughly translates to 30% of the skin area exposed. The incidental soil ingestion rate for this receptor is assumed to be 100 mg/day which is higher than the average adult ingestion rate. A higher rate is selected for this receptor group as they are in direct contact with soil during work. The exposure assumptions for this scenario are summarized in Table 12.

11.2.4 Subsurface Utility Line Worker: Due to the nature of the work done by a utility worker, there is a potential exposure pathway associated with the excavation of soils during work on future installed underground utilities (water, sewer, natural gas). The subsurface utility line worker could be exposed to subsurface soils (> 2 feet) when repairing the utilities on the site. The risk assessment for the subsurface utility line worker evaluates dermal contact with soils, incidental ingestion of soils, and inhalation of fugitive dusts. It is assumed that any work conducted below the water table would include dewatering and treatment of groundwater. Exposure to groundwater would therefore be negligible.

The worker repairing the utility line may do so every year over a 25 year period, and each year would work 8 hours a day for 10 days to complete the repairs. Conservatively, it is assumed that the workers hands, forearms, lower legs and feet would be exposed to the soil which roughly translates to 30 % of the skin area. The incidental soil ingestion rate for this receptor is assumed to be 100 mg/day which is higher than the average adult ingestion rate. A higher rate is selected for this receptor group as they are in direct contact with soil during work. The exposure assumptions for this scenario are summarized in Table 13.

11.2.5 On-site Worker: Current and future on-site workers could potentially be exposed to OHM vapors that have volatilized from groundwater to indoor air. Direct exposure to groundwater or subsurface soil is not expected. The risk assessment evaluates potential inhalation of OHM vapors. The on-site worker is assumed to be exposed to the OHM vapors 5 days/week for 8 hours per day over a 50 week work year (2 weeks vacation). The factory worker is assumed to work at the same job for 25 years. The exposure assumptions

are summarized in Table 14.

11.3 Estimating Average Daily Doses (ADD)

Daily doses are calculated for noncarcinogenic and potentially carcinogenic compounds for each exposure route through which uptake might occur. Separate ADDs are calculated for ingestion, inhalation and dermal contact routes of exposure, where appropriate. The ADD is estimated according to the general equation:

$$ADD = \frac{\text{Total Amount of Chemical Intake}}{(\text{Body weight})(\text{Averaging Period})}$$

Two ADDs are calculated for each exposure route; $ADD^{chronic}$ and ADD^{lile} . The $ADD^{chronic}$ is used to evaluate systemic effects and represents the chemical intake during the exposure period and is calculated as the average daily dose over the period of exposure (typically 1 to 7 years). The ADD^{lile} is used to evaluate carcinogenic effects and represents the chemical intake averaged over a 75-year lifetime. The equations for calculating the ADD and the exposure assumptions used in the ADD equations are listed for each receptor group in Appendix D, Average Daily Dose/Risk Estimate Spreadsheets.

11.4 Exposure Point Concentrations: Exposure point concentrations of contaminants in soil were evaluated for four discrete areas on the site. Each area (Area #1 through Area #4) is shown on Figure 5 and discussed below.

11.4.1 Exposure Area #1: Area #1 is located in the southeast portion of the site and abutting the former Woerd Avenue landfill. An AUL was implemented for Area #1, referred to as AUL Portion #1 on Figure 4. As part of the AUL, the area was enclosed in a chain-linked fence and will be monitored and secured. In addition, a 3 foot cover of clean fill material and vegetation will be maintained to limit erosion. Future excavation work will be conducted utilizing personal protective equipment under the supervision of an Licensed Site Professional (LSP). Future land use will be restricted to commercial/industrial activities. As a result of the AUL, there are no current or future foreseeable human exposures to contaminants in soil in Area #1. Volatilization of dissolved VOCs from groundwater to indoor air is a potential future exposure pathway. The highest levels of VOCs detected in groundwater at the site were utilized to estimate indoor air levels as discussed in Section 11.4.5.

Potential migration of OHM in the subsurface downgradient of AUL Portion #1 was evaluated. PAHs, metals, VOCs and TPH impacted soil is located at depths of 2 feet to 12 feet below grade. Groundwater is approximately 8 feet below grade in this area. Leaching of PAHs and TPH to groundwater, with subsequent migration downgradient of Area #1, is considered minimal due to total organic carbon (TOC) levels in soil ranging from 260,000 to 470,000 mg/kg. High TOC levels in conjunction with the soil sorption coefficients and low solubility of the PAH and TPH compounds will greatly inhibit movement of OHM in

the subsurface. Migration of VOCs is also expected to be inhibited due to the TOC levels in soil. Metals are generally insoluble and immobile from soil to groundwater.

11.4.2 Exposure Area #2: Area #2 is a portion of the property located on the northwestern side of the site that formally contained a used oil underground storage tank. Subsurface soil in Area #2 is impacted with PAHs and metals. An AUL is implemented for the entire Area #2, referred to as AUL Portion #2 in Figure 4. The AUL is comprised of maintaining secured fencing and/or an impermeable surface (asphalt). The AUL will restrict trespassers and require future excavation work to be conducted utilizing the appropriate personal protective equipment under the supervision of an LSP. Future site use will be limited to commercial/industrial. As a result of the AUL, there are no current or future foreseeable human exposures to subsurface soil. Volatilization of dissolved VOCs from groundwater to indoor air is a potential future exposure pathway. The highest levels of VOCs detected in groundwater at the site were utilized to estimate indoor air levels as discussed in Section 11.4.5.

11.4.3 Exposure Area #3: Area #3 is a portion of the property located on the north central part of the site that formally contained machine coolant and mineral spirits underground storage tanks. There are no AUL restrictions on Area #3 and OHM detected in soil is not consistent with site specific background concentrations. Exposure point concentrations in subsurface soil are presented in Table 15 and consist of average concentrations of samples collected from soil borings GP-21 through GP-25. Concentrations of COCs below laboratory analytical method detection limits (MDL) were averaged using 1/2 the detection limit. Groundwater quality data from Area #3 (MW-8) indicated levels of volatile organic compounds were below laboratory analytical MDLs. Dissolved metals in samples collected from MW-8 were also below laboratory analytical MDLs.

11.4.4 Exposure Area #4: Area #4 is located in the north, northeasterly portion of the site. The exposure point concentrations of PAHs, TPH, and metals in soil are presented in Table 15 and are average concentrations of samples collected from soil borings GP-15 through GP-20. The exposure point concentrations in Area #4 are considered to be consistent with background as soil borings GP-15 through GP-20 are included as part of the background data set and no releases to the subsurface are known to have occurred in this portion of the site. As a result, the evaluation of human exposure to OHM impacted soil in this area is not required. Exposure to groundwater is not expected in Area #4. There are no drinking water wells on the site and the depth to water is approximately 6 feet below grade. Volatilization of dissolved VOCs from groundwater to indoor air is a potential future exposure pathway. The highest levels of VOCs detected in groundwater at the site were utilized to estimate indoor air levels as discussed in Section 11.4.5.

11.4.5 Modeling - VOC Migration from Groundwater to Indoor Air

The transport of VOCs from groundwater to enclosed space (indoor air) was estimated by utilizing a model developed by P.C. Johnson and R.A. Etinger¹. The Johnson and Etinger vapor transport model has been utilized by the MADEP to develop GW-2 groundwater standards in the Massachusetts Contingency Plan and by the American Society For Testing and Materials (ASTM) in their development of the "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites" (E-1739-95). The vapor transport model was utilized in this risk assessment to estimate COC vapor concentrations in indoor air of a current and future foreseeable commercial/industrial facility, based on dissolved COC levels in groundwater. To be conservative, the highest concentrations of each COC detected in groundwater, as opposed to an average concentration, was utilized in the model. Some basic assumptions of the vapor transport model include the following:

a constant dissolved chemical concentration in groundwater;

equilibrium partitioning between dissolved chemicals in groundwater and chemical vapors at the groundwater table;

steady state vapor and liquid-phase diffusion through the capillary fringe, vadose zone, and foundation cracks;

no loss of chemical as it diffuses towards ground surface (i.e. no biodegradation) and;

steady, well-mixed atmospheric dispersion of the emanating vapors within the enclosed space, where the convective transport into the building through foundation cracks or openings is negligible in comparison with diffusive transport.

Site specific input variables include total soil porosity, capillary fringe thickness and vadose zone thickness. The soil porosity was estimated to be 0.33 based on the subsurface lithology (primarily sand and gravel)². The average depth to water at the site is approximately 5.0 feet below grade. The summation of the capillary fringe (rise) thickness and vadose zone thickness will equal the depth to water. The capillary rise in the soil is dependent upon the pore size. As the pore size decreases in soil, the capillary rise tends to increase. For example, the capillary rise in coarse sand ranges from 0.4 to 0.6 feet, whereas in clay, the capillary rise ranges from 25 to 75 feet³. For this site, the capillary fringe is estimated to

¹ ASTM, "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites", E-1739-95, American Society For Testing and Materials.

² Freze, Allan R. and Cherry, John A., "Groundwater", 1979, Prentice-Hall, Inc., Englewood Cliffs, NJ.

³ Das, Braja M., "Principles of Geotechnical Engineering, Second Edition", 1990, PWS-Kent Publishing Co., Boston, MA.

To estimate carcinogenic risks, the carcinogenic potency factor is multiplied by the lifetime Average Daily Dose (ADD_{life}). The resulting value gives the Excess Lifetime Carcinogenic

To estimate the noncarcinogenic risk, the chronic Average Daily Dose (ADD_{chronic}) is divided by the appropriate chronic or subchronic RFD. The resulting ratio is known as a Hazard Index (HI). According to MADBEP guidance, an HI of 1.0 (100% of the RFD) or less is considered acceptable.

12.1 Methodology for Estimating Risk

The risk characterization is the final step of the human health risk characterization process. In this step, the results of the Hazard Identification, Dose-Response Assessment and Exposure Assessment are combined to estimate the potential cancer and non-cancer risk associated with a receptor's exposure to the compounds of concern. The mathematical model for each exposure scenario including exposure parameter values, calculated dose and non-carcinogenic/carcinogenic risk are shown in Appendix D. A brief description of the methodology which was used to calculate noncarcinogenic and potential carcinogenic risks is presented below.

12.0 RISK CHARACTERIZATION

2. It is assumed that the same construction worker and utility line worker would be involved throughout each of work periods. This is a reasonable but conservative assumption in that different work crews would most likely be involved in various aspects of the construction and utility line work.

1. Many assumptions are made to develop estimates of dose. In this risk assessment the major assumptions, considered conservative in nature, are estimates of the amount of soil incidentally ingested, inhaled or contacting the skin. Normal protective clothing such as gloves, boots and full length pants would greatly reduce the exposed skin surface area.

Sources of uncertainty in the exposure assessment include the following:

11.5 Uncertainty in the Exposure Assessment

The chemicals of concern utilized in the vapor migration model and the resulting indoor air concentration (exposure point concentrations) are summarized in Table 16.

range from 0.4 to 4 feet based on subsurface lithology. To be conservative, a capillary thickness of 1.0 foot will be used. The resulting vadose zone thickness is 4.0 feet. Using a smaller capillary fringe thickness in the vapor migration model will estimate higher indoor air vapor concentrations. Appendix E summarizes the vapor modeling equations and associated input parameters.

The purpose of this section is to identify potentially applicable or suitably analogous public

Guidelines and Policies

12.3 Identification of Applicable or Suitably Analogous Public Health Standards,

Section 12.4, Table 18.

below the MCP risk limit of 1×10^{-5} . All HI and ELCR risk estimates are summarized in future land use exposure scenarios, the risk estimates for all the exposure scenarios are respectively. Under the conservative assumptions of the dose-response assessment and The ELCR for the construction worker and utility line worker is 4.0×10^{-7} and 6.0×10^{-7} , the residential scenarios are 3.0×10^{-6} and 2.0×10^{-6} for the child and adult, respectively. The ELCR for hypothetical exposed population is the same as discussed in Section 12.2.3. The ELCR for evaluated potential exposure to carcinogenic COCs and their associated health risks. The 12.2.4 Reasonably Foreseeable Site Use - Excess Lifetime Cancer Risk: The risk assessment

estimates are considered an "insignificant" risk as defined by the MCP. construction worker scenario is 5.5×10^{-4} and the utility worker is 5.0×10^{-5} . All HI scenarios are 7.3×10^{-4} and 1.6×10^{-4} for the child and adult respectively. The HI for the Groundwater was not considered a potential exposure point. The HI for the residential COC in soil through incidental ingestion, dermal contact and inhalation of fugitive dust. repair of underground utilities. The potential receptors were assumed to be exposed to worker involved in construction related activities and a utility line worker involved with use, this risk assessment evaluated a hypothetical future on-site resident, a construction 12.2.3 Reasonably Foreseeable Site Use - Hazard Index: Under reasonably foreseeable site

scenario is 3.9×10^{-6} which is less than the DEP ELCR risk limit of 1.0×10^{-5} . exposure to carcinogenic COC vapors in indoor air. The ELCR for the on-site worker 12.2.2 Current Site Use - Excess Lifetime Cancer Risk: Carcinogenic risks are based on

of 1.0. The Hazard Index for an on-site work scenario is 0.033, well below the DEP HI risk limit from COC migration from groundwater to indoor air was evaluated for an on-site worker. under current conditions. Potential current and future exposure to COC vapors resulting site use is not considered to result in human exposure to soil or groundwater at the site 12.2.1 Current Site Use - Hazard Index The Activity and Use Limitation along with current

12.2 Risk Characterization Results - Human Health

in Sections 10.1 and 10.2). occur because of the conservative factors used to calculate the toxicity values (as discussed of 1.0 or greater or an ELCR 1×10^{-5} does not mean that adverse effects will necessarily are identified by the MADEP as those greater than 1 in 100,000 (1×10^{-5}). A Hazard Index associated with daily living) due to the exposure of concern. Significant carcinogenic risks Risk (ELCR) (i.e. risks above the background carcinogenic risk from all other events

The risk characterization incorporates the hazard evaluation, exposure assessment and dose-response assessment to estimate total site risk. The uncertainties in the risk characterization are an accumulation of uncertainties in the entire risk assessment process (discussed in Sections 10.3 and 11.5). Where uncertainty exists, conservative parameter estimates are used. These conservative estimates combine to create a conservative estimate of the Hazard

12.5 Uncertainties in the Risk Characterization

The Hazard Index risk estimates calculated for the hypothetical exposed populations are orders of magnitude lower than the MCP risk limit of 1.0. The Excess Lifetime Cancer Risks calculated for the hypothetical exposed population are less than the MCP carcinogenic risk limit of 1×10^{-5} . The criteria for a conclusion of a condition of No Significant Risk has been satisfied for the site.

Exposure Scenario	Hazard Index	MCP Risk Limits
#1 - Future On-site Resident (Child)	7.3×10^{-4}	1.0×10^{-5}
#2 - Future On-site Resident (Adult)	1.6×10^{-4}	1.0×10^{-5}
#3 - Future Construction Worker	5.5×10^{-4}	1.0×10^{-5}
#4 - Future Utility Line Worker	4.9×10^{-5}	1.0×10^{-5}
#5 - Current/Future On-site Factory Worker	0.033	1.0×10^{-5}
ELCR		3.0×10^{-6}

TABLE 17 - HAZARD INDEX AND EXCESS LIFETIME CANCER RISK SUMMARY

This risk assessment estimated non-carcinogenic and carcinogenic risks associated with current and reasonably foreseeable site use. The risk estimates are summarized below.

12.4 Risk Assessment Conclusions

health standards, guidelines and policies that may be used to further characterize the site. Potentially applicable standards are compared against exposure point concentrations as another means of evaluating risk. For exposure to subsurface soils, there are currently no federal or state guidelines or suitably analogous standards for chemicals in soil. Contaminants in soil were compared against site specific and DEP derived background levels (summarized in Table 15). Groundwater at the site is not used as a source of drinking water and therefore, drinking water standards are not applicable. A discussion of the potential surface water impacts and associated environmental risk evaluation is discussed in Section 14.0.

Current or past visible evidence of OHM impacted sediments, surface water or wetlands from the disposal site have not occurred based on review of Waltham Board of Health and Conservation Commission files and environmental assessments conducted since 1987. Surface water samples (SW-1 and SW-2) were collected from Crams Cove in 1987 and 1988 by TWM Northeast/Normandeau Engineers, Inc (TWMNE). The surface water samples were analyzed for pH, specific conductance, priority pollutant metals and volatile organic compounds. A summary of the analytical data is presented in the Phase II report prepared by TWMNE. Surface water quality data presented in the TWMNE report indicate no impact to Crams Cove, and associated aquatic organisms, from environmental conditions at the site.

14.1.1 Evidence of Current or Potential Future Exposure

14.1 Potential Impacts to Aquatic Habitats and Organisms

A Stage I Environmental Screening, pursuant to 310 CMR 40.0095(3), was conducted for this location. As shown on Figure 2, the site is within 50 feet of the Charles River and abuts Crams Cove (an embayment of the Charles River). The Charles River is presently classified as a Class B river and has a designated use as a warm water fishery, and primary and secondary contact recreation. This portion of the Charles River is not designated for use as a municipal water supply. An evaluation of current and potential impacts to surrounding environmental receptors is presented below.

14.0 STAGE I ENVIRONMENTAL SCREENING

In addition to potential human health risks, the risks to safety and public welfare must be addressed at each site. Although extensive guidance is not presently available from the DEP, this section summarizes current and reasonably foreseeable conditions related to these considerations. Based on site conditions, the site does not appear to pose a safety hazard or a threat to public welfare. Current subsurface soil concentrations of OHM in soil and groundwater are lower than the Upper Concentration Limit (UCL) promulgated in the MCP. There are no open pits or lagoons, no rusting or deteriorating hazardous waste drums and no reports of odors emanating from the site.

13.0 SAFETY AND PUBLIC WELFARE RISK CHARACTERIZATION

Index and Excess Lifetime Cancer Risk that are likely to overestimate the actual risk associated with exposures to OHM at the site. Consequently, the results of the analysis should not be taken as a characterization of absolute risk, but should be used as a tool for evaluating potential risk associated with exposure to OHM at the site.

14.1.2 Potential Groundwater Migration

The apparent groundwater flow direction across the site is in a southwesterly direction. OHM impacted subsurface soil located in the saturated zone (below 8 feet) is approximately 100 feet upgradient of Crams Cove. The contaminants of potential environmental concern are polycyclic aromatic hydrocarbons, metals, VOCs and total petroleum hydrocarbons. The potential for leaching and subsequent migration of these OHM through groundwater was evaluated by determining the composition of the subsurface and the physical characteristics of the OHM. Total organic carbon concentrations were analyzed for two soil samples collected from SB-37 and SB-41. TOC concentrations ranged from 260,000 and 460,000 mg/kg. The physical properties of PAHs indicate very low water solubilities and high organic carbon partition coefficients (K_{oc}). Minimal concentrations of PAHs will dissolve in groundwater and the high K_{oc} values indicate strong sorption to organic carbon. These characteristics suggest negligible migration potential of PAHs to Crams Cove. TOC in soil is also expected to inhibit migration of VOCs from soil to groundwater. TPH at the site has been determined to consist primarily of heavy lubricating oils with some gasoline. The primary constituents of heavy lubricating oils are PAHs and long chain hydrocarbons. The physical characteristics of the TPH are expected to be similar to PAHs resulting in minimal migration potential. Metals are relatively insoluble and immobile from soil to groundwater. Current levels of OHM in groundwater near Crams Cove were evaluated by sampling monitoring well MW-4 On June 13, 1996. The groundwater sample was analyzed for PAHs and dissolved silver. Analytical results indicated non-detectable levels of both PAHs and silver. Based on information presented in this section, potential impacts to aquatic habitats and organisms through groundwater migration is considered minimal.

14.1.3 Potential Surface Runoff

OHM impacted soil is located at depths greater than three feet below grade in most areas of the site. The potential for runoff of sediment to Crams Cove is not a potential migration pathway due to the depth of OHM and the maintenance of vegetation as part of the Activity and Use Limitation (Section 6.0).

14.2 Potential Impacts to Terrestrial Organisms and Habitats

14.2.1 Potential Impacts to Surficial Soil

The depth of OHM impacted soil is greater than three feet deep in most areas on the site. In certain sections of Exposure Area #1, the OHM impacted soil was detected at depths of approximately 1.0 to 1.5 feet below grade. Soil borings where OHM was detected at shallow depths include GP-38, GP-39 and GP-40. Detected OHM included PAHs and TPH. The area in which GP-38, GP-39 and GP-40 are located is densely vegetated with trees, shrubs and bushes. The dense vegetation will inhibit erosion of the top one foot of protective cover. In addition, the MADEP GIS Map, attached as Appendix F, indicates that there are no Areas of Critical Environmental Concern near the site.

The Stage I Environmental Screening conclusions are summarized below:

1. There is no evidence of past or present releases to environmental receptors.
2. There is negligible groundwater migration potential of OHM to environmental receptors.
3. There is minimal potential for surface runoff of OHM to environmental receptors.
4. There is no visible evidence of stressed vegetation due to OHM at the site.
5. Environmental conditions at the site supports a conclusion that there is minimal potential for impacts to aquatic and terrestrial habitats and organisms.

Based on the Stage I Environmental Screening, a condition of No Significant Risk to environmental receptors has been met for this location.

14.4 Stage I Environmental Screening Conclusions

Wetlands, as defined by 310 CMR 10.00, are present along the banks of Crams Cove and the Charles River. There are no known impacts to wetlands habitats from environmental migration of OHM in groundwater to environmental receptors located within Crams Cove. In addition, the MADEP GIS Map indicates that there are no NHESP Estimated Habitats of Rare Wetlands Wildlife in the area of the site.

14.3 Potential Impacts to Wetlands Habitats

Potential impacts to vegetation at the site was evaluated during numerous site visits and there was no visible evidence of stressed vegetation.

14.2.2 Potential Impacts to Vegetation

15.0 CONCLUSIONS

The following conclusions were reached based on the Method 3 Risk Characterization of site conditions at 48 Woerd Avenue in Waltham, Massachusetts:

1. A Method 3 Human Health Risk Characterization determined that non-carcinogenic and carcinogenic risks for current and future site uses are less than the promulgated MCP risk criteria

2. The site does not pose a risk to safety and public welfare.

3. A Stage I Environmental Screening concluded that a condition of No Significant Risk to environmental receptors exists.

4. A Condition of No Significant Risk to human health and the environment exists.

RISK CHARACTERIZATION:

PARKER HANNIFIN CORPORATION, 48 WOERD AVENUE, WALTHAM, MA

RISK CHARACTERIZATION:

PARKER HANNIFIN CORPORATION, 48 WOERD AVENUE, WALTHAM, MA

16.0 REFERENCES

ASTM, "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, E 1739-95", American Society For Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428.

Das, Braja M., "Principles of Geotechnical Engineering, Second Edition", 1990, PWS-Kent Publishing Co., Boston, MA 02116.

Freeze, Allan R. and John A. Cherry, "Groundwater", 1979, Prentice-Hall, Inc., Englewood Cliffs, NJ 07632.

MADRP, Bureau of Waste Site Cleanup, The Massachusetts Contingency Plan, 310 CMR 40.0000, December 15, 1995.

MADRP, Bureau of Waste Site Cleanup and Office of Research and Standards, "Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan", BWSC/ORS-95-141, July 1995.

MADRP, Office of Research and Standards, "The Chemical Health Effects Assessment Methodology and the Method to Derive Allowable Ambient Limits", No. 90-1, Volumes I & II, May 1990.

MADRP, Bureau of Waste Site Cleanup and Office of Research and Standards, "Documentation for the Risk Assessment Shortform Residential Scenario", Policy #WSC/ORS-142-92, October 1992.

MADRP, Bureau of Waste Site Cleanup and Office of Research and Standards, "Background Documentation for the Development of the MCF Numerical Standards", April 1994.

U.S. EPA, Office of Health and Environmental Assessment, "Exposure Factors Handbook", EPA/600/8-89/043, March 1990.

U.S. EPA, Office of Solid Waste and Emergency Response, "Health Effects Assessment Summary Tables (HEAST)", OERR 9200.6-303 (95-1).

Appendix G

Pertinent Correspondence

CITY OF WALTHAM
MASSACHUSETTS

DEPARTMENT OF PUBLIC WORKS
25 LEXINGTON STREET
WALTHAM, MASSACHUSETTS 02154
EDWARD F. DELANEY, P.E.
DIRECTOR OF PUBLIC WORKS



August 13, 1970

Stanley T. Oley, Health Agent
Waltham Board of Health
25 Lexington Street
Waltham, Massachusetts 02154

Dear Mr. Oley:

Thank you for sending me a copy of Mr. Sawyer's letter of August 6 regarding the Wood Avenue dump.

As you know, we make arrangements on a regular basis to seal the exposed faces of rubbish with clean fill so as to minimize infiltration of rodents and vermin.

I have made arrangements for each filling to take place within a week.

Very truly yours,

Edward F. Delaney, P.E.
Director of Public Works

ERB:k

cc Edward J. Sawyer, H. D.
Com. of Health, Newton

State Dept. of Public Health
Public Works Director - Newton



Edward J. Sawyer, M.D.
COMMISSIONER OF HEALTH

City of Newton, Massachusetts
Incorporated 1873
CITY HALL
COMMONWEALTH AVENUE AND WALNUT STREET
NEWTON CENTRE 02159

August 6, 1970

Stanley T. Oley, Director
Waltham Health Department
25 Lexington Street
Waltham, Massachusetts 02154

Dear Mr. Oley:

Several complaints have been received by this department regarding the probability of roaches emanating from the Waltham City Dump, off of Moody Street.

Inspection revealed that this dumping ground is not being operated or maintained in a manner as to protect the public health. This dumping area facing the Newton Municipal In-cinerator is exposed and certainly is conducive to the breeding and harboring of rodents, flies, and other vermin.

Please take any necessary action so as to eliminate this health nuisance.

Very truly yours,

Edward J. Sawyer, M.D.
Edward J. Sawyer, M.D.
Acting Commissioner of Health

PJM:mh

cc: State Department of Public Health
Public Works Director - Newton

THE COMMONWEALTH OF MASSACHUSETTS

WATER RESOURCES COMMISSION

STATE OFFICE BUILDING, GOVERNMENT CENTER

100 CAMBRIDGE STREET, BOSTON 02202

October 28, 1970

Re: Charles River, Waltham
Pollution Caused by City
Dumping

Honorable Arthur J. Clark
Mayor of the City of Waltham
City Hall
Waltham, Massachusetts 02154

Dear Mayor Clark:

This Division has received numerous complaints concerning pollution of the Charles River being caused by the Waltham City Dump. This is a condition in contravention of the standards adopted by this Division under authority of the Massachusetts Clean Waters Act of 1966. Under authority of Chapter 70A of the Acts of 1970 which further amended Chapter 21 of the General Laws you are hereby ordered to have this condition corrected. A copy of the order is attached hereto.

I shall be pleased to have members of my staff discuss this problem with you and your consulting engineer when he has been engaged.

Very truly yours,

Thomas C. McMahon
Director

TCM:VAS:at
Board of Health, Waltham
Department of Public Health, 600 Washington Street, Boston

OFFICE OF THE DIRECTOR
BUREAU OF WATER
POLLS AND DAMS



NOV 2 1970

NOV 3 1970

James P. ...

CITY SOLICITOR

FEB 1971

To: Thomas G. McMahon, Director
Division of Water Pollution Control

From: William A. Stagle, Designated Hearing Officer

Date: January 28, 1971

FEB 1971

Subject: Adjudicatory Hearing - City of Waltham

On January 8, 1971 I (being duly designated by the Director) sat as presiding hearing officer in the matter of the Division of Water Pollution Control and the City of Waltham (hereinafter called the Respondent). Representing the Division were Elinor T. Johnson, General Counsel, who acted as counsel for the Division, and Messrs. Sabin H. Lord, Jr., M.S., Donald L. Corey, P.E., and Peter C. Molau, who testified as witnesses called by the Division. Representing the City of Waltham were Attorney William J. Bannan, Jr., City Solicitor; and Edward F. Delaney, Director of Public Works; and Alan H. McClennan, Planning Director, who testified as witnesses called by the said City.

Witnesses called by the Division outlined the scope of the alleged problem as it relates to the Waltham municipal dump and displayed charts and pictures purportedly illustrating the condition which the Division alleges in contravention of the Water Quality Standards adopted by the Division. Analyses of samples taken in 1967 and November 1970 were later submitted as evidence.

Counsel for the City of Waltham objected to submission as an exhibit of samples taken in 1967, submission of evidence taken subsequent to the date of the Order (October 28, 1970), and then moved for dismissal of the Order on the basis that there was insufficient evidence to substantiate the findings of fact.

I recommend that the objections to submission of evidence taken in 1967 and in November 1970 be overruled. In my opinion, the Division was demonstrating that this is a continuing violation and was, in fact, continuing even after the date of the Order. I pointed out to the respondent the language of Section 44 of Chapter 21 of the General Laws which states in part: "Whenever it appears to the director that there is a discharge... which is causing or contributing to or is likely to cause or contribute to a

condition in contravention of the standards of water quality. . . (emphasis added). I further recommend that the respondent's motion for dismissal be denied on the basis that the Division did, in my opinion, from other substantial evidence submitted tending to prove that oil wastes and solids were emanating from the Waltham municipal dump into Creams Cove, an extension to and part of the Charles River.

After due and full consideration of the arguments and evidence presented by both parties, it is my opinion that the Order dated October 28, 1970 and issued by you, as Director of the Division of Water Pollution Control, is proper and based upon substantial evidence submitted tending to prove that the said effluents tended to reduce the quality of the waters known as the Charles River at said location below the assigned classification. I, therefore, recommend no change in said Order.

I would point out to you that the first item in the Order requires the City to have engaged a consulting engineer by December 1, 1970. If you concur in my above findings and recommendations, you might consider February 15, 1971 as the date to set for the City of Waltham to engage a consulting engineer. No other changes in the original Order are recommended.

Respectfully submitted,

William A. Stagle, P.E.
Designated Hearing Officer

cc: Attorney William J. Bannan, Jr., Solicitor for the City of Waltham

(The Respondent is hereby notified that it has ten days from receipt of this preliminary findings and recommended order within which to file written objections pursuant to the Rules and Regulations of this Division pertaining to adjudicatory hearings.)

A True Copy Attest:

Henry D. Shanks
Henry D. Shanks, Clerk

The Commonwealth of Massachusetts

Water Resources Commission

Severett Salkovskall Building, Government Center

100 Cambridge Street, Boston 02202

April 5, 1971

Honorable Arthur J. Clark
Mayor
City Hall
Waltham, Massachusetts

RE: Waltham - Charles River -
Abatement Program
Memorandum of Agreement

Dear Mayor Clark:

This letter is to summarize the meeting held in this office on March 30, 1971 with Mr. Edward Delaney, Public Works Director of Waltham.

At this meeting, several aspects of a pollution abatement program for the Waltham Dump were discussed. The first topic, and the one most easily implemented would be the removal of the material which has been thrown or has fallen into Gram's Cove. This would include tires, shopping carts, boxes, appliances, etc. It was agreed that this project could be initiated and completed within 30 days.

The second subject to be discussed was the extension of the now existing storm drain (City of Newton's) up to the rear of the Eagle Signal Property. This drain would have to have tight joints to prevent leaching of material directly into the drain. Once this drain is in place and connected, clean fill material should encase this structure. A permit from the Department of Natural Resources, Division of Conservation Services would be required to fill the wetland area surrounding the drain.

The face of the dump on the Cove, extending from the New England Mica Co., to the rear of the Eagle Signal Company should be graded or sloped, covered with clean landfill or loam, and planted.

The following implementation agreement has been drawn up to further clarify the steps necessary to correct the situation at the dump site:

OFFICE OF THE DIRECTOR
DIVISION OF WATER
POLLUTION CONTROL



Honorable Arthur J. Clark
Mayor
April 5, 1971
Page 2.

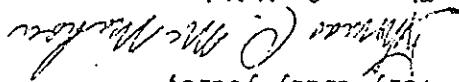
1. The requirement to hire a consulting engineer in the original order is hereby waived;
2. Removal of all debris from Gram's Cove to be completed by May 15, 1971;
3. Submission of final plans and specifications by May 15, 1971 for:
 - (a) facing the dump (including slope, cover material, extent of area to be covered,
 - (b) extension of the existing storm drain;
4. Completion of the following by August 15, 1971:
 - (a) storm drain extension,
 - (b) facing of the dump.

It is noted that the extension of the above mentioned storm drain is contingent upon the following:

1. Legal authority to extend this drain.
2. Proper application and licensing from the Division of Conservation Services,
3. Necessary easement rights.

Will you please acknowledge receipt of this letter, that this may be a memorandum of agreement and that you intend to comply with the implementation agreement as stated above.

Very truly yours,



Thomas C. McMahon

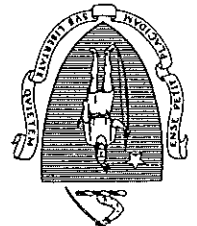
Director

TCM/SML/cf

The Commonwealth of Massachusetts
Department of Public Health

NORTHEASTERN REGIONAL OFFICE
 TEWKSBURY HOSPITAL
 TEWKSBURY 01876

TEL: 617-851-7261



March 14, 1972

Re: Waltham - Solid Waste
 Violation of Regulations
 Public Works Department
 Waltham, Massachusetts

Notice of Violation of
 the "Regulations for
 the disposal of Solid
 Wastes by Sanitary
 Landfill"

Inspection by the Department on March 8, 1972 of the solid
 waste disposal facility located off Woerd Street has established
 the following violations of the "Regulations for the Disposal of
 Solid Waste by Sanitary Landfill," as adopted under the provisions
 of Section 150A of Chapter 111 of the Massachusetts General Laws,
 as most recently amended by Chapter 839 of the Acts of 1970: (A
 copy of said Regulations is enclosed.)

Regulations Violated

- Reg. 3 - Submission of plans
- Reg. 6 - Cover material
- Reg. 10.1 - Access roads
- Reg. 10.3 - Signs
- Reg. 11.4 - Deposition of refuse
- Reg. 12.3 - Maintenance and general cleanliness
- Reg. 14 - Spreading and compacting of refuse
- Reg. 15 - Depths of cover; daily, intermediate, final
- Reg. 18.3 - Removal of salvaged materials
- Reg. 20.1 - Vector control
- Reg. 21.1 - Drainage of surface water

Re: Waltham - Solid Waste
Violation of Regulations

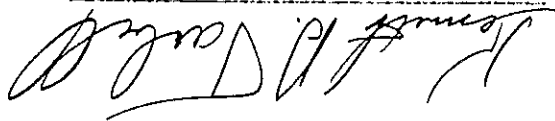
Requirements for Compliance

You are required to take such appropriate steps as may be necessary to abate the conditions which violate the aforementioned regulations.

It is further required that you inform the Department in writing, on or before March 31, 1972 of action you have taken or intend to take to stop violation of said regulations.

Failure to take action in this matter can cause the Department to take further legal steps.

Issued by



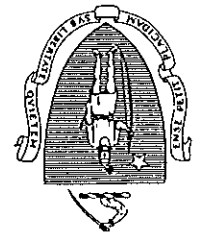
Kenneth A. Tarbell

Regional Sanitary Engineer

The Commonwealth of Massachusetts
Department of Public Health

NORTHEASTERN REGIONAL OFFICE
TEWKSBURY HOSPITAL
TEWKSBURY 01876

TEL: 617-851-7261



March 14, 1972

Public Works Department
City Hall
Waltham, Massachusetts

Re: Waltham - Solid Wastes - Violation
of the "Regulations for the Disposal
of Solid Wastes by Sanitary Landfill

Gentlemen:

An inspection by this Department of the refuse disposal site located off Woerd Street and operated by or under the control of your agency, has established that there exist violations of the "Regulations for the Disposal of Solid Wastes by Sanitary Landfill" as adopted under the provisions of Section 150A of Chapter 111 of the Massachusetts General Laws.

Accordingly, the Department issues the enclosed citation, which states the regulations violated and the Department's requirements for compliance with the above mentioned regulations.

Should you wish to discuss this matter further, please contact the Regional Health Office.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Kenneth A. Tarbell".

Kenneth A. Tarbell
Regional Engineer

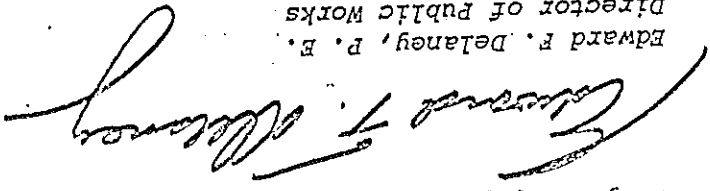
KAT/Ejac/mj

cc: Board of Health, Waltham, Mass.
Metropolitan Boston Air Pollution Control District, 600 Washington Street
Boston, Massachusetts

cc: City Councilors

EFD:k
Encl.

Edward F. Delaney, P. E.
Director of Public Works



Very truly yours,

I will be pleased to meet with you and the City Council tonight to discuss the matter in depth.

I am enclosing a statement which summarizes the various aspects of the solid waste problem which must be resolved in the near future.

Dear Mayor Clark:

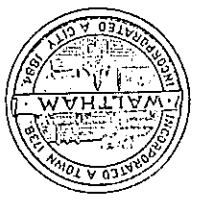
Honorable Arthur J. Clark
Mayor of the City of Waltham
City Hall
Waltham, Massachusetts

April 27, 1972

DEPARTMENT OF PUBLIC WORKS

EDWARD F. DELANEY, P.E.
DIRECTOR OF PUBLIC WORKS

CITY OF WALTHAM
MASSACHUSETTS



THE SOLID WASTE PROBLEM

It is no exaggeration to say that the solid waste problem has reached crisis proportions in Waltham. However, this fact has been alleged so many times in the past that skeptics tend to regard the present situation as just another minor nuisance that will soon pass. Nothing could be further from the truth. The purpose of this paper is to define the problem and outline possible solutions together with realistic cost figures. Let us consider the various elements of the problem.

The Incinerator

Waltham is under a state-wide order to abate air pollution by the installation of proper pollution control devices. As you know, our incinerator is 25 years old and has done yeoman service in the past. However, it has reached its maximum capacity and actually gone beyond its useful economic life. The cost of air pollution control devices is estimated at \$450,000 to \$500,000. In addition, another \$100,000 may be necessary for other improvements. There is no way that we can economically justify such expenditures.

The Woerd Avenue Dump

The dump has been an eyesore for as long as anyone can remember. In addition, we have been cited by the State Department of Public Health for failure to comply with a number of their provisions for sanitary landfills. A recent survey indicates a life expectancy of approximately one year at Woerd Avenue.

The only available area in Waltham with a reasonable capacity for the future is the Sawyer Road dump. There are approximately 25 acres with a life expectancy in excess of 10 years.

(b) Another Dump

without making extensive alterations. possible to gain permission from the state to operate at the reduced rate would recommend that our daily burn be held to 50 tons. It might then be about 8 men representing \$65,000 in salary. Under such conditions, I on a reduced tonnage basis. This would mean a reduction in personnel of daily. Of course, we would have to continue to operate our own incinerator year. We would still be responsible for handling 50 cubic yards of residue cost to Waltham this means somewhere between \$150,000 and \$200,000 per Mayor Mann that the price be increased to \$10.00 per ton. In terms of The present charge is \$6.00 per ton and Mr. Pratt has recommended to that he can safely handle only 100 tons per day of Waltham's rubbish. Incinerator to burn our rubbish. Public Works Director Pratt has stated We have been negotiating with Newton for the use of their

(a) The Incinerator

Alternatives

\$100,000. require approximately 45,000 cubic yards of fill at an estimated cost of cover for the active portion of the fill. In the next year, this will things, cover the entire completed portion of the dump and provide daily In order to comply with state regulations we must, among other

Summary
 If Waltham elects to use the Newton Incinerator and operate a new sanitary landfill, the capital costs will be approximately \$320,000 and the net increased annual operating costs will run between \$120,000 and \$170,000 per year.

The annual operating cost of the sanitary landfill will be approximately \$50,000 per year.

\$220,000

25,000

11,000

58,000

56,000

- (a) Front End Loader
- (b) Compactor
- (c) Truck
- (d) Garage with sanitary facilities

3) Purchase of Equipment

50,000

2) Preparation of site, clearing, excavation, etc.

\$20,000

1) Preparation of plans

The cost to Waltham would be as follows:
 To be approved by the state, the facility must meet all current standards.

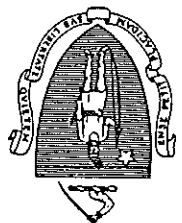
appealed.

An area selected as the site for a disposal facility must first be approved by the local Board of Health. Any aggrieved party, including the City, can appeal their decision to the state Department of Public Health. It is almost certain that any decision will be appealed.

The Commonwealth of Massachusetts
Water Resources Commission
Leveitt Saltonstall Building, Government Center
100 Cambridge Street, Boston 02202

May 10, 1973

OFFICE OF THE DIRECTOR
DIVISION OF WATER
POLLUTION CONTROL



Director of Public Works
City of Waltham
25 Lexington Street
Waltham, Massachusetts 02154
Re: Waltham - CHS
Waltham Dump
Docket #213

Dear Sir:

It is our understanding that your City has fully complied with our Division Order of April 27, 1971.
To complete our records, please confirm the above information by summarizing the measures that were taken. A reply letter within two weeks will be appreciated.

Very truly yours,

Thomas C. McMahon
Thomas C. McMahon
Director

TCM/JHP/lmw

CITY OF WALTHAM
MASSACHUSETTS

DEPARTMENT OF PUBLIC WORKS

EDWARD F. DELANEY, P.E.
DIRECTOR OF PUBLIC WORKS



May 16, 1973

Mr. Thomas C. McHaddon, Director
Water Resources Commission
100 Cambridge Street
Boston, Massachusetts 02202

Re: Waltham - CHS
Waltham Dump
Docket #213

The City of Waltham has fully complied with your order
of April 27, 1971.

As indicated on the plan previously sent to you, we ex-
tended an existing culvert several hundred feet and filled over
the culvert; we made a general cleanup of Cram's Cove removing the
accumulated debris of several decades; and we covered the south
slope of the Word Avenue dump to prevent possible leaching into
the cove.

You may be interested to learn that as of April 21, 1973
the gates of the Word Avenue dump were closed forever. The dump
has been completely covered with clean fill in accordance with the
requirements of the State Department of Public Health.

Very truly yours,

Edward F. Delaney, P. E.
Director of Public Works

EPD:k

Y
P
O
C

cc: Mayor
Auditor

RFD:00

Edward F. Delaney, P. E.
Director of Public Works

Very truly yours,

I respectfully request that the sum of forty thousand (\$40,000.) Dollars be appropriated to account RE 02 C 06, Collection and disposal of Rubbish.
This money is necessary to carry continuing expenses of rubbish disposal for the balance of the fiscal year. The funds will be used to pay Reclamation Systems, Inc., in Cambridge for rubbish disposal and Howard Disposal Division of SCA for disposal of incinerator residue.

Dear Mayor Clark:

Honorable Arthur J. Clark
Mayor of the City of Waltham
City Hall
Waltham, Mass. 02154

May 22, 1974

DEPARTMENT OF PUBLIC WORKS

EDWARD F. DELANEY, P.E.
DIRECTOR OF PUBLIC WORKS

CITY OF WALTHAM
MASSACHUSETTS



CITY OF WALTHAM

MASSACHUSETTS

November 11, 1974

MOTION

Motion... that Mayor Clark in conjunction with Mayor

Mann, of Newton, be requested to clearly

state the conditions of the refuse disposal

agreement between the two cities to allay

any misconceptions regarding this major step

of cooperation in such an important aspect

of City Government... that the information

be presented to the City Council at the Committee
of the whole meeting on Nov. 18, 1974.

Chairman Newton-Waltham

Regional Refuse Disposal Dist.

Councillor Ward 8

Commissioner

Councillor Ward 7

A TRUE COPY ATTEST:

Read and Adopted: November 11, 1974

CITY CLERK

Joseph S. Lombardi



This office has received information, data, and/or a report which indicates that oil and/or hazardous materials may have been released on property located at 48 Woerd Avenue, Waltham, Massachusetts; a parcel which directly abuts property owned by the City of Waltham. Further that the preliminary engineering report conducted for the 48 Woerd Avenue parcel makes various references to the parcel owned by the City of Waltham and indicates the existence of potential contaminants in groundwater monitoring wells located in proximity to the property line which separates the City owned parcel from the parcel located at 48 Woerd Avenue. While the City has no present knowledge that oil and/or hazardous materials exist or have been released at the location referenced above, it was the concern of this Office that the engineering report submitted for the 48 Woerd Avenue parcel may be deemed by your agency as constructive notice of potential environmental conditions on the property owned by the City, thus triggering the mandatory reporting requirements under G.L.M. c.21E, Section 7. This Office would request at this time guidance and/or a directive from your office on whether the duties and obligations under G.L.M. c.21E have been triggered by the circumstances set out above, and if so, what response your office would expect from the City.

Dear Mr. Fitzgerald:

RE: Waltham property
Woerd Avenue and Moody Street

John J. Fitzgerald, P.E.
Chief, Site Management Section
The Commonwealth of Massachusetts
Department of Environmental Protection
Metropolitan Boston - Northeast Region
5 Commonwealth Avenue
Woburn, MA 01801

July 31, 1990

STAFF ATTORNEYS
ROBERT M. HORACK
CHERYL L. LUDWIG
PATRICIA HARRIS TEICHER

ASSISTANT CITY SOLICITORS
JOHN B. GERVONE
ROBERT F. PILICY
PATRICIA A. AZADI

ROBERT J. BROPHY
CITY SOLICITOR

LAW DEPARTMENT

CITY OF WALTHAM
MASSACHUSETTS

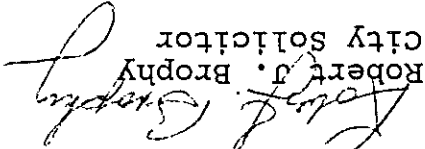


Waltham
3-3260

Fitzgerald
Page two

Any assistance you may provide this office is appreciated, and please feel free to contact this office if you require additional information regarding this matter.

Very truly yours,


Robert J. Brophy
City Solicitor

RJB/nk

cc: John J. Fitzgerald, P.E.

Chief, Site Management Branch, DEP

Madeline Snow

Dept. of Environmental Protection
BWSC, One Winter Street, Boston, MA

Hon. William F. Stanley
Mayor, City of Waltham

Edward F. Delaney, Director Public Works Department,
City of Waltham

Walter S. Sweder, Jr.
Director of Public Health, City of Waltham

TELEPHONE CONVERSATION NOTES
HASS DEQE/NERO/DSHM

SITE REFERENCE

WALTHAM PARKER HANNAH

DATE

9/20/90

SUBJECT

48 WARD 3-3260
AVERICE

TIME

3:57 PM

FROM IDA BARROUDI

REPRESENTING

NERO BLDG

TO ROBERT J BROPH

REPRESENTING

WALTHAM CITY

DISCUSSION

The implications made in a January 1990 TUM Northeast report that a certain amount found on the ^{48 WARD} property may be on a city owned site (former landfill).

appear to be inconclusive at this time. Unless in future further information is obtained, the City of Waltham need not take any further action with this record.

ACTION REQUIRED/REFERRED TO

City of Waltham,
Massachusetts

**Woerd Avenue Landfill
Comprehensive Site Assessment
Scope of Work**

May 1997

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Letter of Transmittal

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Section 1 Introduction

1.1 Purpose of Project

The Consultant retained by City of Waltham, Massachusetts (the "City" or "Waltham"), prepared this Scope of Work for the Comprehensive Site Assessment (CSA) at the Woerd Avenue Landfill (the "landfill"). The CSA is to be conducted in accordance with the Solid Waste Management Regulations (310 CMR 19.000), administered by the Massachusetts Department of Environmental Protection (DEP).

The purpose of a CSA is to obtain an understanding of the site geology and hydrogeology; evaluate air, soil, groundwater, surface water, and sediment quality in an effort to identify contamination associated with the landfill; and, based on this information, evaluate possible risks to human health and the environment. The data collected is used to ensure proper landfill monitoring, remediation, and closure. The CSA data will also provide basis for evaluation of landfill reuse alternatives such as construction of athletic fields on top of the closed landfill.

This submittal provides the scope of work for the CSA to be approved by DEP. This scope was prepared to meet the requirements outlined in 310 CMR 19.000 and DEP's Landfill Technical Guidance Manual (revised September 1993). The proposed CSA field program will not begin until DEP approval of this Scope of Work is attained. The approved sampling program will serve as the environmental monitoring program for the landfill during the duration of the CSA.

The approach to the CSA work is to collect adequate environmental monitoring data for the Woerd Avenue Landfill to determine the impacts of the landfill on human health, safety and the environment. This data will be analyzed and evaluated, and a qualitative risk assessment will be prepared. Based on the outcome of this risk assessment, closure plans to complete capping of the site will be prepared that address any significant impact and the requirements of 310 CMR 19.000. This CSA project consists of three primary parts as discussed in Section 1.3. Part 1 includes the development of this CSA scope of work; Part 2 includes the field investigations; and Part 3 includes the data analysis and report preparation.

For Part 2 of the CSA, the Consultant proposed to install several new groundwater monitoring wells, collect and analyze four rounds of water quality monitoring for groundwater and surface water, collect landfill gas samples for laboratory analysis, and determine the local geologic characteristics. During Part 3, the CSA report including summaries of the available environmental data including all four rounds of water quality testing, evaluate and analyze the data, and the qualitative baseline risk assessment will be prepared. This work will be presented in a Draft Final CSA report which will be submitted to DEP for review and approval.

1.2 Project Schedule

The Consultant proposes the following schedule for completion of the CSA for the landfill:

- Submit ISA and CSA Scope of Work May 1, 1997
- Receive DEP Approval of ISA and CSA Scope of Work July 1, 1997

*Section 1
Introduction*

- Commence Work on CSA August, 1997
- Complete Drilling Program September 1, 1997
- Quarterly Sampling Rounds
 - First Round September 1997
 - Second Round December 1997
 - Third Round March 1998
 - Fourth Round June 1998
- Submit Draft CSA Report September 1998

Section 2 Scope of Work

2.1 Introduction

This CSA Scope of Work has been developed with consideration of available site information and previous reports. Additionally, the Scope of Work has been developed to comply with DEP's Solid Waste Management Regulations (310 CMR 19.000). Specifically, the CSA Scope of Work tasks described herein follow the "Outline for Solid Waste Site Assessment" presented in DEP's "Landfill Technical Guidance Manual" (revised September 1993).

2.2 Task 1.0 - Initial Site Assessment Summary

Provided below is a brief summary of key issues concerning the landfill as summarized in the ISA:

- *Site Description.* The landfill site is approximately 8.69 acres in size. The abutting Moody Street playground consists of an additional 2.4 acres. The landfill portion of the site is wooded with several paths. The site is abutted by residential and industrial properties, the Moody Street playground and the inactive incinerator for the City of Newton.
- *Site Operational Status.* The landfill no longer receives any solid waste for disposal and has not been active since 1973. There was no evidence of ongoing illegal dumping at the landfill site.
- *Site History.* The landfill originally began operating for the disposal of coal ashes from home heating furnaces in about 1912. By 1935, an estimated 35,000 tons of ashes were dumped there annually. When the Waltham incinerator opened in 1946, the landfill began accepting incinerator residue and other non-combustible wastes. As other city dumps began to close in the 1950's, the landfill became the major disposal site for non-combustible items.

In the early 1970s, the City began to receive complaints about the conditions at the landfill. After correcting problems identified by the Department of Public Health the City closed the landfill on April 21, 1973. At that time, the landfill was reportedly covered with clean fill in accordance with the current regulations.

- *Previous Sampling and Analysis.* There has been no historic sampling of groundwater, surface water and sediments specifically at the landfill site. There has been a limited sampling program at the adjacent Parker Hannifan site under the requirements of the Massachusetts Contingency Plan (MCP, 310 CMR 40.000). The limited sampling and analysis program is summarized in the ISA.
- *Geologic and Hydrogeologic Setting.* There is no surficial geology map for the Waltham site from the United States Geologic Service (USGS). Mapping completed for the City of Newton in the area of the landfill determined that the site is underlain by glacial till which was defined as compact and generally impervious mixture of clay, silt, gravel, cobbles and boulders deposited by ice. The statewide mapping completed by Zen et al has the landfill located within an area of Cambridge Argillite.



Woerd Avenue Landfill
 Waltham, Massachusetts

Figure 2-1
Site Locus Plan

- *Site-2.* This is the sidegradient couplet which will be located between the landfill site and the Parker Hannifan site. This location will monitor any contamination moving between the landfill and the industrial site as well as provide a sidegradient monitoring location.
- *Site-3.* This site will be located along Cram's Cove adjacent to the water line. It is likely that since landfill operations extended into the Cove, that this well couplet will be screened below waste. However, it is the only location to monitor groundwater quality immediately before it discharges into the Cove.
- *Site-4.* This site is located along the southwestern corner of the landfill and will provide another downgradient monitoring location.

The Consultant will receive the appropriate approvals from the Waltham Conservation Commission for the installation of these monitoring wells.

The sampling program is summarized in Section 2.6 below and Appendix B to this document. All overburden wells will have a ten-foot screen length and be 2-inches in nominal diameter.

During the drilling program, the Engineer will collect visual samples with a split spoon sampler as part of the drilling program at five foot intervals on the deeper well locations. These samples will be classified and stored in drillers jars. The Engineer will also perform jar headspace analysis on these samples. It is not proposed to collect any soil samples for laboratory analysis as part of the drilling program.

In addition to the four monitoring well couplets, the Consultant will also install three landfill gas monitoring wells. The locations of the landfill gas monitoring wells is shown on Figure 2-2.

The Engineer will also collect four surface water samples from the vicinity of the site. Two of the samples, SW-1 and SW-2, will be collected from Cram's Cove. The other two samples will be from the swales which drain from the landfill behind the Newton incinerator as well as the swale which drains towards Cram's Cove. The Engineer will collect four sediment samples from approximately the same locations as the surface water samples.

2. Locus map indicating the proposed locations listed above.

All proposed well and surface water locations noted above are shown on Figure 2-2 attached.

Following installation of all monitoring wells, an elevation and location survey will be conducted. The survey will include all wells and other monitoring points, including surface water stations, leachate sample points, and air sampling stations. All locations will be added to the base map prepared for the CSA report.

3. Drilling methods and field procedures.

Drilling methods, well installation guidelines, and associated field procedures are presented in the work plan and guidance document (Appendix A).

In addition to the new monitoring wells at the site, the Consultant proposes to collect four surface water samples and four sediment samples in the vicinity of the landfill. The location of the surface water samples are shown on Figure 2-2. The locations were selected to provide a representative impact of the site on wetlands and surface water quality.

2.6.1 Groundwater and Surface Water Sampling

All monitoring wells and surface water sampling locations are to be sampled quarterly for four rounds. All groundwater and surface water samples will be analyzed for the following parameters:

- pH, specific conductance, temperature, and dissolved oxygen (field measured)
- Alkalinity
- Chemical Oxygen Demand (COD)
- Iron
- Barium
- "RCRA-8 Metals (arsenic, cadmium, chromium, copper, lead, mercury, selenium, and silver)
- Zinc
- Chlorides
- Sulfate
- Chlorides
- Nitrate nitrogen
- Total dissolved solids (TDS)
- Manganese
- Total cyanide
- Volatile Organic Compounds (VOC) using EPA Method 8260

Note that for the first round of sampling, water samples will be analyzed for total metals. If the results indicate the presence of metals above Maximum Contaminant Levels (MCLs), the subsequent round will be field filtered and analyzed for dissolved metals. If the analytical results of the second round are below the respective MCLs, total metal analysis will be conducted on subsequent sampling rounds.

During each sampling round, a water level elevation survey will be conducted to include all well and surface water stations. Water contour maps will be prepared for each round and included in the CSA report.

2.6.2 Sediment Sampling and Analysis

As discussed above, the Consultant proposes to collect one round of four sediment samples during the initial water quality round from the same locations as the surface water samples. The sample locations are indicated on the attached Figure 2-2.

Collected samples will be delivered to a DEP-approved laboratory for analysis of the following parameters:

- Total metals by appropriate EPA Methods;
- Pesticides and PCBs by EPA Method 8080;
- Volatile Organic Compounds by EPA Method 8260;

Appendix A

Work Plan and Guidance Document for
Boring and Monitoring Well Installations

Appendix A

Work Plan and Guidance Document for Boring and Monitoring Well Installations

1.0 Introduction

The following sections provide a discussion on the boring and monitoring well installation methods to be used in conducting this field investigation. Soil and groundwater sample collection procedures, and soil classification and logging guidelines are presented in Appendix B. The specific locations for monitoring well installations at the Woerd Avenue Landfill are as shown on Figure 2-2.

The purpose of this section is to provide guidance for conducting borings and installing monitoring wells. The procedures do not cover all variations that may occur during the collection of samples or installation of monitoring wells. The methodology selected for use during the field investigation has been based on available information for the specific area being investigated.

1.1 Mobilization

Prior to drilling at the site, several steps are to be taken in order to select the most appropriate boring method and associated field procedures. At a minimum, prior to implementation of a drilling program, the following issues are to be considered and key personnel made fully aware of the relationship of these issues to the site under investigation.

- Pertinent sections of the DEP Publication No. WSC-310-91 (Standard References for Monitoring Wells), other regulations governing how, where or when the hole is drilled (e.g., property rights, permits, utilities) and the use of certain equipment compatible with the site's conditions and needs of the investigation.
- Background research of available data on the site, including both surface and subsurface geological and hydrogeological data, physical and chemical characteristics and available information on utilities such as sources of electricity and water.
- Health and Safety Plan content; aspects related to the specific site area (e.g., emergency responses, chain of commands, alternative routes in and out of the site and information on chemicals/pollutants on site, personal protective clothing/gear and equipment that may be used on the site).
- Selection of field methodologies specified for all drilling and sampling activities and execution of the drilling contract.
- Details of field procedures for sample collection, the implementation and decontamination of field equipment, etc.
- The prevention of spreading contaminants, maintenance of sample integrity and the minimization of disruptions to existing conditions and long-term impacts are specific

considerations which are common to all drilling programs at or near a landfill. To ensure sampling results accurately describe the conditions present, all materials to be furnished in performing work must be new and all equipment to be used must be in good working order.

The following section provides general information on the selected drilling method.

1.2 Boring and Drilling Operations

1.2.1 Task Team

- Field Investigation Team
- Drilling Subcontractor and Crew

1.2.2 Equipment

The Consultant Field Investigation Team Equipment

1. A copy of the Guidance Documents and CSA Scope of Work
2. A copy of the Subcontractors Agreement (Contract)
3. Field log books
4. Personal protective equipment and clothing as required by Health and Safety Plan
5. Organic Vapor Analyzer (OVA) or photoionization detector (HNu)
6. Stainless steel sampling knife
7. Headspace analysis containers
8. Field decontamination supplies (alconox, deionized/distilled water, 10% nitric acid solution, acetone, paper towels, trash bags)
9. Aluminum foil
10. Stakes and marking flags
11. 100-foot steel tape
12. Soil sample containers, packaging as required by the laboratory Chain-of-Custody Records, Traffic Reports, sample tags, and other paperwork
13. Sample coolers
14. Scrub brushes
15. Camera and film
16. Squirt bottles
17. Galvanized or plastic tubs
18. Plastic pails/buckets
19. Vermiculite or equivalent packing material
20. Stainless steel pans or bowls
21. Scale big enough to weigh a 24-inch long, nominal 3-inch diameter split-spoon sampler.

Drilling Subcontractor's Equipment

All drilling equipment and auxiliary supplies will be supplied by the drilling subcontractor. The drilling rig, augers, and auxiliary equipment will be steam cleaned prior to being brought to the site, at designated areas prior to each boring and before leaving the site. Prior to initiating activities, the

subcontractor shall supply a list of equipment that he proposes to use along with a tentative work schedule which identifies equipment that will be provided at various times according to the needs of certain activities.

1.2.3 Drilling Hole Location

Procedure

1. The general location(s) of the proposed monitoring wells are as shown on Figure 2-2.
2. A visit to the site with the driller at, or prior to if possible, the initiation of activities to check specific drilling locations for acceptability. The following will be considered:
 - Access coordination with the Client or other property owners if necessary.
 - The site checked for drilling equipment accessibility.
 - The site area checked for water supply, space, absence of overhead utilities.
 - Normally, the drilling contractor will be responsible to check for physical evidence of underground utilities such as gas or waterlines, sewers, telephone or electrical cables. While no conflict with such utilities is expected at the proposed drilling sites, the drilling contractor is to make his own determination in this regard. The driller should obtain any permits required for drilling and the field representative should verify that permits have been obtained.
3. Even if no physical evidence of underground utilities is observed, all appropriate companies must be contacted to ensure that no utilities actually exist.
4. If any of the designated sites are not suitable, a relocated site must be checked to ensure that the new location will fulfill the original intent for the exploration. The relocation is preferably one which will not require obtaining another permit. DEP will be notified of any proposed change in monitoring well location.
5. The exact locations selected for drilling are to be staked with a clearly visible marker (i.e., fluorescent orange lath, flagging, etc.) and labeled with the proper drill hole number.
6. All holes are to be checked to ensure that they are properly located and labeled both on the final Site Plan and in the field.
7. Establish a tentative schedule to survey the location and elevations of new monitoring wells and other sampling points.
8. The drilling equipment is to be escorted to the site.

1.2.4 Hollow-Stem Augers (Helical Augers)

Description

Hollow-stem augers are a type of powered auger used primarily to advance the borehole when soil sampling is required. The hollow-stem auger consists of: (1) a section of seamless steel tube with a spiral flight to which are attached a finger-type cutter head at the bottom and an adapter cap at the top, and (2) a center drill stem composed of drill rods to which are attached a center plug with a drag bit at the bottom and an adapter at the top. The adapters at the top of the drill stem and auger flight are designed to allow the auger to advance with the plug in place. As the hole is drilled, additional lengths of hollow-stem flights and center stem are added. The center stem and plug may be removed at any time during the drilling to permit disturbed, undisturbed, or core sampling below the bottom of the cutter head by using the hollow-stem flights as casing. This process also permits the use of augering in loose deposits below the water table. Where this technique is used in unconsolidated material below the water table, fluids of known chemical quality may be needed to control groundwater inflow. Undisturbed samples taken in this manner may be more useful than those taken from a cased hole, since the disturbance caused by advancing the auger is much less than that caused by driving the casing. Augers of this type are available with hollow stems having inside diameters from 2-3/4 to 6 inches. An auger diameter of 4.25 inches is required for this drilling program.

Application

The use of hollow-stem augers is advantageous because drilling fluids are needed only under special circumstances when advancing a borehole. The augers also allow direct access for soil sampling through the hollow inner part of the auger stem.

The depths to which hollow-stem augers can bore are limited by the geologic formation and depth to groundwater. Hollow-stem augers are used primarily in formations that do not cave or have large boulders.

Upon reaching the desired depth, a small-diameter casing and screen can be set inside the hollow stem to produce a monitoring well. The augers are removed by section while the well screen and risers are held in place.

Typically, one 5-foot section of auger is removed at a time. In incompetent formations, the borehole surrounding the screen may be allowed to cave around the screen, or a clean sand or gravel pack may be installed as the augers are withdrawn. Once the screen is properly covered (usually to 2 feet above the top of the screen), a clay (bentonite) seal is installed. As a final step, grout or other impermeable material is tremied in place on top of the clay seal to ground level as the remaining auger sections are removed. Careful installation of clay and/or grout seals is essential, especially in areas where multiple aquifers are encountered.

Allowing the formation to collapse around the well may damage the screen and/or risers. Depending on formation material, sand or gravel pack may provide a better performing well.

1.2.5 Split-Spoon Samples

Description

A detailed discussion of split spoon sampling is included in Appendix B. As the actual collection of the samples is accomplished during the borehole advancement, a reference to the basic procedure to be followed is presented below.

1. Split-spoon samples will be collected in accordance with ASTM D1586-67 (1984), Method for Penetration Test and Split-Barrel Sampling of Soils. Split-spoon (nominal 2-inch diameter) samples will be collected at 5-foot intervals when drilling in overburden materials.
2. The locations at which geotechnical samples are to be collected will be as directed in the field. At locations where geotechnical samples are taken, split-spoon samplers (nominal 3-inch diameter) which appear to recover 24 inches of soil will be weighed before the spoons are opened. If a 24-inch soil recovery is confirmed, the bulk density of the soil will be computed based on the dimensions of the split-spoon (24 inches long, 3 inches in diameter) and the value noted in the field log book.
3. Formation samples will be described in accordance with Burmeister using the description definitions based on the modified Wentworth Scale.

1.2.6 Soil Logging

Soil logging includes keeping a detailed record of drilling (or excavating) and a geological description of materials on a prepared form. Geological logs are used for all types of drilling and exploratory excavations and include descriptions of both soil and rock. General guidance for logging soils and rock is provided below.

Methods

When drilling in soils or unconsolidated deposits, the log should be kept on a standard borehole log form (see Figure A-1).

The following basic information should be entered on the heading of each log sheet:

- Project name and number,
- Boring or well number,
- Location (approximate in relation to an identifiable landmark--will be surveyed),
- Elevation (approximate at the time--will be surveyed),
- Name of drilling contractor,
- Drilling method and equipment,
- Water level, and
- Start and finish (time and date).

			Boring no:
Client		Project no:	
Contractor		Date started	Completed
Method	Casing size	PID	Protect'n level
Ground el.	Soil drilled	Rock drilled	<input checked="" type="checkbox"/> Below grd
Logged by	Ch'd by	Date	Site

Depth (ft)	PID ambient air	Sample no. and type	Sample	Zn	Pb	Cu	Cd	PID sample (ppm)	Soil/rock description	Lithologic symbol	Well data	Blows/6-in. or RQD %						Elevation (ft)
												0	20	40	60	80	100	
0																		
1																		
2																		
3																		
4																		
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U = Thin wall tube S = Split spoon R = Rock

Figure A-1
Field Boring Log

The following technical information is recorded on the logs:

- Name of logger,
- Depth of sample below surface,
- Sample interval,
- Sample type and number,
- Length of sample recovered,
- Standard penetration test (ASTM D1586) results if applicable,
- Soil description and classification,
- Graphic soil symbols, and
- HNu/OVA readings.

In addition to the items listed above, all pertinent observations about drilling rate, equipment operation, or unusual conditions should be noted. Such information might include the following:

- Size of casing used and method of installation;
- Rig reactions such as chatter, rod drops, and bouncing;
- Drilling rate changes;
- Depth and percentage of fluid losses;
- Changes in fluid color or consistency;
- Material changes;
- Zones of caving or heaving; and/or
- Zones where circulation is lost or water production is observed.

Soil Description

The Burmeister system of soil description should be used to describe soils. Because the Burmeister system relies heavily on handling the soil, care should be taken in areas of significant soil contamination. For some purposes, an additional, or alternate description of soils (well logging) may be appropriate in accordance with the Unified Soil Classification System (USCS) as described in ASTM D2487-69 (1975): Test Method for Classification of Soils for Engineering Purposes. The approach and format should generally conform to ASTM D2488-69 (1975): Recommended Practice of Description of Soils (Visual-Manual Procedure).

1.2.7 General Rock Coring Guidelines

Introduction

It is anticipated there will be no rock coring during the project. However, if bedrock is encountered, the following procedures will be utilized. Rock coring techniques are used to obtain a continuous sample of rock at the project site for field logging and to provide samples of intact rock for laboratory testing should such subsequent testing be required. Additional information about the rock mass is available by careful observation of rig performance during drilling, drilling rate, bit wear, and loss of drilling fluid.

Procedure

1. Prior to commencing the field explorations, the site geologist should specify the following items:
 - Location of rock-coring explorations
 - Depth of rock-core penetration.
 - Length of core-run (usually 5 feet).
 - Specific rock-coring procedures.
2. The site geologist should identify the locations of rock-core explorations with survey stakes and flagging. Locations of the explorations should be approximately determined by the Field Geologist using pocket-transit and pace method and should be plotted on the site base map.
3. The site geologist should indicate the information to be recorded during the rock-coring operation. The recorded information should include but not necessarily be limited to the following:
 - Drill rate (minutes per foot),
 - Type and size of bit,
 - Core number,
 - Depth range,
 - Core recovery (inches), and
 - Rock Quality Designation (RQD in percent).
4. The rock core should be classified by the site geologist using a rock classification system established for the program.
5. There is no universal core barrel or drilling equipment for rock coring. The geologic and topographic conditions as well as the requirements of the project will, in most instances, control the type of equipment to be employed. The use of double-tube barrel, with a split inner tube would be required for most, if not all, rock coring on the project.

The following factors can result in good core production and should be observed during rock coring.

- 5.1 Prepare a level and stable drilling platform before commencing the boring.
- 5.2 Keep the drill stem as nearly vertical as possible. On deep core holes, true alignment of the casing is critical. The driller may elect to use a heavy drilling mud instead of casing to support the borehole walls; this procedure is not as desirable under some conditions, but acceptable if satisfactory information is obtained. In the present investigation, the hollow stem augers are expected to provide a satisfactory means for supporting the borehole wells.
- 5.3 Wash the casing out thoroughly before inserting the core barrel.

- 5.4 Inspect the selected core barrel and bit for wear, general cleanliness, and free movement of all parts. Reject any barrel or bit that appears unsatisfactory.
- 5.5 Pump recirculated drill fluid down the drill rods and observe a return flow before commencing drilling operations.
- 5.6 Carefully measure all lengths of rod, core barrel, and stick-up through all phases of drilling for accurate depth determination.
- 5.7 Drill with minimal vertical pressure and rotation. Most rigs are equipped with a selection of gear ratios and a variable hydraulically controlled feed mechanism. Driller expertise in selecting the correct combination of speed and feed rate is invaluable.
- 5.8 Water return should be no more than just sufficient to bring the borehole cuttings to the surface.
- 5.9 Place the core carefully in the core box from left to right, top to bottom.
- 5.10 If 100 percent recovery was not obtained, the borehole should be sounded to determine if the missing core still remains in the bottom of the borehole.

1.2.8 Core Logging

Note: The record of core logging is to be documented on the borehole log - See Figure A-1.

Procedure

1. Record the depth of the top and the bottom of the core run.
2. Record the core recovery (CR) of each run. The percentage of core recovered is:

$$\text{CR} = \frac{\text{Total length of core recovered}}{\text{Total length of core drilled}} \times 100$$

3. Designate areas of suspected core loss based on drill behavior and rock quality. Core loss is often indicated by: fragmented core, polishing, circular core ends, rounded edges on core pieces, or immediately beneath hard fragments in soft rock. Routinely placing core loss at the top or bottom of the core run can lead to significant errors during evaluation. Note the reason for core loss, i.e., soft rock - washed away hard rock ground up by drilling, or malfunction of equipment during drilling.
4. Often a length of core is left at the bottom of the hole and recovered during the next core run. Unless properly handled, this condition may lead to significant errors. The preferred method to correct this situation is to carefully inspect the upper part of the recovered core for marks made by the core catcher or drill bit during the previous run. If they are identified, break the core and insert the run marker at the proper location.

5. Log the core in as much detail as possible depending upon the local geology and project requirements. The description should include:
- Rock type;
 - Color;
 - Grain size;
 - Mineralogy;
 - Bedding thickness, dip and type (i.e., stylolitic or shale partings); and
 - Natural joints and fractures including frequency, dip, second, any coatings or fillings. A graphical representation of these features may also be desirable.

Additional data in sedimentary rocks include:

- Sorting,
- Cementation,
- Density or compaction, and
- Rounding.

6. Additional notes
- a. Log the core as quickly as possible after removal from the hole. Some materials may degrade rapidly upon exposure, resulting in apparently poor rock, which was not actually present in the subsurface.
 - b. Check each core end carefully, and try to determine if the fracture is natural or mechanical in origin. Mechanical fractures often can be identified by their orientation, the absence of secondary coatings or filling and slickensides, and its fit with the adjacent core piece. If doubt exists, consider it a natural fracture. If it is determined that the fracture is mechanical, ignore it and consider the two pieces of core as a single piece.

References

Law, J.W., 1951. Examination of Well Cuttings. Golden. Colorado Sch. of Mines.

1.2.9 Borings Not Completed as Wells

Borings that are not completed as wells shall be abandoned in accordance with DEP Publication No. WSC-310-91 (Standard Reference for Monitoring Wells).

1.3 Monitoring Well Installation

Monitoring wells are constructed to collect groundwater samples that, upon analysis, can be used to delineate a contaminant plume and track movement of specific chemical or biological constituents. A secondary consideration is the determination of the physical characteristics of the groundwater flow system to establish flow direction, transmissivity, quantity, etc. The spatial and vertical locations of monitoring wells are important. Of equal importance are the design and construction of

monitoring wells to yield reliable samples. An understanding of the chemistry of suspected pollutants and geological setting in which the monitoring well has been constructed plays a major role in determining the drilling technique and materials used.

1.3.1 Well Design

Well borings are to have an inside diameter of at least 2 inches larger than the outside diameter of the casing and screen to ensure that a tremie may be properly used. All wells at the landfill will be 2 inches in nominal diameter.

Procedure

1. Determine the exact screen interval and total depth of the monitoring well. Calculate the quantity of slotted casing or screen, blank casing, sealing materials, gravel pack and cement necessary to complete the well.
2. A cementing company handbook similar to the one published by either Halliburton or Dowell can be used to calculate the quantities of gravel pack, sealing materials and cement. If one of these is not available then figure the volume of the borehole ($\pi r^2 \times L$) minus the volume of the casing ($\pi r_c^2 \times L$) to yield volume per linear foot.

A cubic foot of silica sand weighs 100 pounds. Frequently silica sand is packaged in 100 pound sacks; however, it may be purchased and delivered in bulk quantities. A five-gallon bucket is equal to 0.67 cubic feet. Dividing the determined or calculated volume between the well bore and the outside of the casing(s) into 0.67 cubic feet per bucket will yield approximately the number of feet per bucket of silica sand. Dividing the total interval of the intended gravel pack by the number of feet per bucket of gravel pack will yield approximately how many buckets of gravel will be required. This same method can be used if the silica sand arrives in 1-cubic-foot sacks (100 lbs) except the final value is approximately the number of feet per sack of silica sand.

Cement usually comes in 94-pound sacks and can be mixed in the field to obtain volumes between 0.88 cubic feet per sack to 1.50 cubic foot per sack. The calculation to determine the amount of cement needed for seals, caps or plugs is governed by the volume of mixture per sack desired. This volume should be specified either in the project proposal or the drillers' contract. Determine the amount of cement in the same manner as the silica sand calculation for the gravel pack.

Clay seals are routinely placed above the gravel or filter pack and below the cement or grout cap or plug. The clay seals are generally a bentonite clay and before swelling (in the borehole) have the form of 1/4" to 1/2" tablets. A common type of bentonite tablets are American Colloid Volclay Tablets. The tablets generally come in plastic containers of 20 and 50 pounds but can also arrive in boxes or cloth sacks.

The volume of the bentonite tablets needed for a specific seal thickness is calculated in the same manner as was done for the gravel pack and cement requirements.

These methods of estimating the quantity of materials to be used in any specific well completion are crude at best. There may exist portions of the bore hole that are of a larger diameter, due to erosion during drilling, or sections of a somewhat smaller diameter due to swelling conditions; the estimated quantities may be either too little or too much. Measure all materials twice during the well construction. First, when estimating the quantity of supplies needed for well completion, second, during well construction.

3. Documentation is imperative. Drilling data is to be recorded on the Soil Boring Log Record. Daily activities of the drill crew and supervisor are essential for keeping within cost guidelines and to identify potential completion problems. Record daily field activities in the field book. A well completion diagram including the details of well installation is to be completed for each well (see Figure A-2).

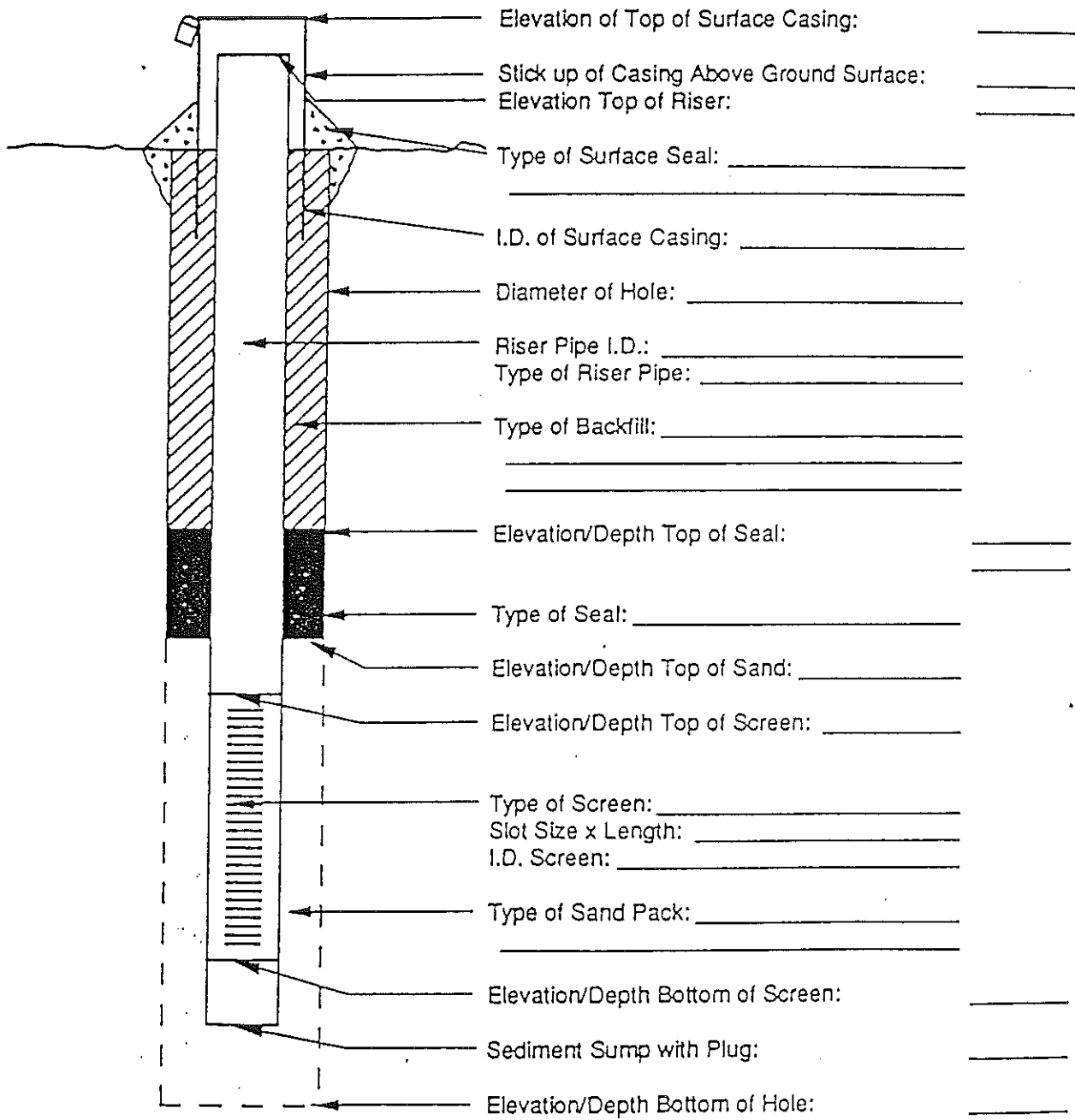
Record rig activities during the drilling of the well. Document:

- Start-up and shut-down time for the day;
- Problems encountered during the day, e.g. slow drilling, thunder storms, down time due to maintenance, waiting on water, injuries and important conversations, decisions made during the day, or any other item which slows or stops drilling;
- Visitors at the site;
- Problems with swelling clays or caving sand or gravel;
- Type of bit(s) and materials used (bentonite, foam, etc.) and quantity used during drilling; and
- Record of time spent by driller in other activities such as steam cleaning or authorized standby time.

Additional data listed below is to be included in the field book.

- Hole size,
- Type of drilling,
- Drilling fluid,
- Penetration rate,
- Circulation losses or gains,
- Drill behavior,
- Drillers observations, and
- Sampling intervals.

Project _____ Location _____ Driller _____
 Project No. _____ Boring _____ Drilling Method _____
 Elevation _____ Date _____ Development Method _____



The description of unconsolidated deposits is to be described on the boring log (see Figure A-1). If coring through rock is conducted, then record lithologic character versus depth data as completely and as accurately as possible as the material changes. Depending on rock type, these descriptions typically include:

- Lithology/rock type;
- Color;
- Mineralogy, including secondary mineralizations;
- Degree of cementation, density, and compaction;
- Any physical characteristics of the rock such as bedding or fractures;
- Percent recovery of the core; and
- The rock quality designation (RQD), which is the length of core pieces greater than 4 inches divided by the total length of the core recovered.

Additional notes:

1. Log the core or cuttings as quickly as possible after removal from the hole. Some materials may degrade rapidly upon exposure, resulting in apparently poor rock, which was not actually present in the subsurface.
2. Check each core carefully to determine if the fracture is natural or mechanical in origin. Mechanical fractures often can be identified by their orientation, the absence of secondary coatings or filling and slickensides, and its fit with the adjacent core piece. If doubt exists, consider it a natural fracture. If it is determined that the fracture is mechanical, ignore it and consider the two pieces of core as a single piece.
3. The total depth intended of the drill hole should be determined and conveyed to the driller as early as possible - preferably before drilling begins. However, this is not always the case and every effort should be made to determine borehole depth as soon as practicable.

1.3.2 Well Construction

Well Casing

Well casing and risers must be constructed of materials sufficient for the required monitoring period. Well casing shall be a minimum two-inch (2") ID, flush-joint, threaded riser. The casing should be provided in 5- or 10-foot lengths. For most purposes, Schedule 40 PVC is generally a suitable material. Solvents or glues should not be used during construction.

Well Screen

Well screens shall be two-inch (2") ID, flush-joint, threaded, Schedule 40 PVC for this specific program. In some instances, the selection of slot size for the screen depends on the geologic materials at the screened interval. For this drilling program, because of the expected high percentage of fines in the soil, the screen slot size will be 0.010-in (10-slot). The maximum length of the well screen shall be ten feet.

A bottom plug or cap will be fitted at the base of each well. If a high percentage of fines in soils is observed, a silt trap is recommended at the base of the screen.

Protective Casings

Each well casing shall be fitted with a threaded, vented cap.

All wells will be completed with a protective steel casing with a hinged, locking steel cover. A weep hole must be drilled at the base of the protective casing for drainage. A concrete surface well seal, designed to prevent freeze/thaw damage, must be constructed during installation of the protective casing. Wells should be marked with a number following installation. In addition to marking the exterior of the protective casing, the number shall be affixed to the interior of the cover by embossing with a metal die. The protective casing will be locked and a padlock with duplicate keys provided.

All wells completed on a paved or traveled area shall be completed with a roadbox cover. None are anticipated for this program.

Filter Pack

The filter pack surrounding the well screen must consist of clean inert, siliceous material of a suitable grain size for the screen slot size. All wells shall be completed with a uniform coarse-grained silica sand to be approved prior to use by the field representative.

The sand pack must be placed in the annular space around the well screen and would normally extend to no more than two feet above the top, and at least one foot below the bottom of the screen.

The sand pack must be checked frequently for proper placement. A finer grained sand pack material (100 percent passing the N. 30 sieve and less than two percent passing the N. 200 sieve), six inches thick, should be used as the top of the sand pack between the sand and the bentonite seal.

Bentonite Pellet Seal

Bentonite pellets, of 1/4-inch size, as manufactured by the Volclay Division of American Colloid Company, or approved equivalent, shall be used to seal the annulus above the filter pack in monitoring wells. Bentonite must be placed above the sand pack using the tremie method to form a seal at least one foot thick.

Cement/Bentonite Grout

The annulus above the bentonite seal in all wells shall be sealed with cement/bentonite grout. The cement/bentonite grout must be placed under pressure using a tremie or other approved method.

Procedure for Installation:

1. Final Design of Casing - Screen String(s). If there is any doubt about the final design of the casing string, based on data from an adjacent monitoring well or the individual drill holes scheduled for completion, verify the design with the field supervisor.

2. Installing Casing - Screen String(s)

- 2.1 Plastic or Polyvinyl chloride (PVC) Casing. Join all casing (blank and screen) by screwing male ends to female ends. After joining and screwing, the string is suspended and lowered into the borehole. Hold the string in tension until completion of the filter material placement, bentonite pellet installation and tremie grouting.

Seal the bottom of the casing-screen string with a cap, screwed permanently in place.

- 2.2 Casing Installation Record. A complete casing-screen string tally is kept by both the field geologist/engineer and the subcontractor.

3. Installing Filter Material (gravel pack)

- 3.1 Place the filter material downhole by pouring slowly. Check the height of the filter material periodically. If it is of suitable diameter and depth, use a tremie pipe to install filter materials. The length of tremie pipe should end no more than 20 feet above the bottom of the hole, or the bottom of the interval to receive the filter pack. Gradually lift the tremie pipe and remove sections, as the filter material being placed in the hole rises.

- 3.2 Place the filter material continuously at a rate which prevents bridging in the borehole.

- 3.3 The filter material shall be installed to levels pre-determined by the field geologist/engineer. The exact depth for each well is determined from the final well design. However, generally the top of the filter material will not be more than 2 feet above the top of the screened interval.

- 3.4 Following placement of the filter material "sound" or "tag" this depth to ensure it is at the prescribed level.

4. Installing Bentonite Pellet Seals (Blanket). Following installation of the filter material, place a bentonite pellet blanket seal on top of the filter material to prevent contamination of the filter pack by the grout.

- 4.1 The actual amount of the annulus which is filled with bentonite pellets may vary from completion to completion but, generally 2 feet (not less than 1 foot) and, if possible, approximately 3 feet of the annulus should be filled with bentonite by gravity feed from the surface.

- 4.2 Following placement of the bentonite pellets, the depth is tagged to ensure they are at the desired level.

- 4.3 For very shallow wells completed in an unconsolidated formation where a bentonite seal and grouting would serve no useful function, the sand pack around the screen may be extended to the concrete employed for setting the protective surface casing.

5. Grouting

- 5.1 The annular space above the bentonite pellets is grouted as directed by the field supervisor.
- 5.2 The grouted volume of annular space will vary from completion to completion. Generally, if the annular space exceeds approximately 20 feet then the grouting is done in more than one stage. Take care to ensure that the grout does not displace the bentonite seal or exceed (in weight) the collapse strength of the casing.
- 5.3 **Mixing Grout.** The methods of mixing grout in the field are numerous. The first concern is that the slurry mixture is fluid enough for placement and heavy enough to give the desired strength and sealing properties required. Reference to the table from Halliburton Cementing Tables (1979) or some other suitable source for the amount of water per sack, and then measure accurately into a large tub (water trough) or steel pit. Mix the correct number of bags of cement with the water at a rate which prevents, clotting or settling out of dry, unmixed cement. Usually this procedure is accomplished with a portable pump which sucks the water or cement mixture in and then expels it under pressure through a hose which is used in a jetting fashion at the opposite end of the tank, pit or trough.

Grout also can be mixed using a shovel or hoe. Generally, the grout is placed on the side of the tub, the bag is ruptured, and the cement is slowly added to the water. If the cement has hard spots place on a screen of approximately 1/4" mesh attached to some type of frame which is placed across the mixing tub. The cement is then "filtered" for the larger; hard pieces or blocks.

Calcium chloride reduces the curing time for the grout. If used, it should be added in a volume (near the end of the mixing stage) approximately 2 to 4 percent calcium chloride. Less than 2 percent is of little use and in excess of 4 percent will not decrease the curing time beyond an optimum period. However, an excess (greater than 4 percent) will not harm the system either.

Sometimes it is also desirable to mix approximately 2 percent bentonite with the cement. This percentage of bentonite offsets shrinkage in the grout when it hardens.

6. Monitoring Well Design.

Design details for overburden monitoring wells are as shown on Figure A-2.

1.3.3 Well Development

Introduction

All completed wells must be developed in order to facilitate unobstructed and continuous ground water flow into the well.

Well development is the process of cleaning the face of the borehole. During any drilling process, the side of the borehole becomes smeared with drilling mud, clays or other fines. This plugging action substantially reduces the permeability and retards the movement of water into the well screen. If these fines are not removed, especially in formations having low permeability, it then becomes difficult and time-consuming to remove sufficient water from the well before obtaining a fresh groundwater sample, because the water cannot flow easily into the well. The entire vertical screened interval must be developed.

Development is required for the following reasons:

- To restore the natural permeability of the formation adjacent to the borehole to permit the water to flow easily into the screened zone.
- To remove the clay, silt and other fines from the formation so that during subsequent sampling the water will not be turbid or contain suspended matter which can easily interfere with chemical analysis.

The development process is best accomplished for monitoring wells by causing the natural formation water inside the well screen to move vigorously in and out through the screen in order to agitate the clay and silt, and move these fines into the screen.

Generalized Procedure

1. *Surge Block* - A surge block is a round plunger with pliable edges such as belting that will not catch on the well screen. Moving the surge block forcefully up and down inside the well screen causes the water to surge in and out through the screen accomplishing the desired cleaning action.

Surge blocks are commonly used with cable-tool drilling rigs, but are not easily used by other types of drilling rigs.

2. *Bailer* - A bailer sufficiently heavy that it will sink rapidly through the water can be raised and lowered through the well screen. The resulting agitating action of the water is similar to that caused by a surge block. The bailer, however, has the added advantage of removing the fines each time it is brought to the surface and dumped. Bailers can be custom-made for small diameter wells, and can be hand-operated in shallow wells.
3. *Surging and Pumping* - Starting and stopping a pump so that the water is alternately pulled into the well through the screen and backflushed through the screen is an effective development method. Periodically pumping to the surface will remove the fines from the well and permit checking the progress to assure that development is complete. An adaptation of this method that the Consultant has successfully used is the employment of a Waterra pump combined with a surge disk. The pump consists of tubing to which a check valve is affixed to the bottom end. The pumping is achieved by alternately lowering and raising the tubing in the well. The surging action is achieved by a disk attached to the tubing just above the check valve.

4. *Compressed Air* - Compressed air pumped down a pipe inside the well casing can be used to blow water out of the monitoring well. If air is applied to the well intermittently and for short periods then the water is only raised inside the casing rather than blown out and will fall back down the casing causing the desired backwashing action. Also, blowing the water out will remove the fines brought into the screen by the agitating action.

Specific Procedure Proposed

At the Rumford Avenue Landfill, well development shall be performed by surging and pumping, using a Waterra pump.

References:

Johnson Division, UOP Inc. 1975. Ground water and wells. Minnesota. Johnson Division, UOP Inc.

Lohman, S.W. 1972. Ground water hydraulics. Professional paper 708. Washington. U.S. Geological Survey.

Massachusetts DEP, Revised September 1993. "Landfill Technical Guidance Manual."

U.S. Environmental Protection Agency. 1976. Manual of water well construction procedures. EPA-570/9-75-001. Washington. EPA.

1.3.4 Permeability Tests Overburden Soils

Rising head or falling head permeability tests (slug tests) can be performed in wells to determine the hydraulic characteristics of the soil materials. The Hvorslev technique can be used to determine the in situ hydraulic conductivity (K) of the unconfined materials.

Procedures

1. *Instantaneous Recharge*. The equations used to analyze a slug test assume an instantaneous recharge or discharge from the well. Therefore, the "slug" of water should be introduced into the well casing as rapidly as possible. Wells with water levels below 50 feet are better tested by methods described in paragraph 2. If an adequate depth of water is available to accommodate the installation of both a liquid level transducer and a water displacement object, the methods as described in paragraph 2 may also be employed with wells where water levels are closer to the surface than 50 ft.

Instantaneous recharge to the well is approximated by rapidly pouring into the casing the volume (V) of water calculated in paragraph 1. The drop in water level is then monitored closely by a transducer. If water cannot be poured into the casing without spilling, a funnel should be used to insure that the entire measured volume gets into the well. When all the water is in the casing, $t = 0$. Water level readings should be taken in intervals as short as possible (no more than 5 second intervals at the beginning) and gradually increased as the rate of drop decreases. Monitoring should continue until the water level has stabilized to 90

percent of the original head. Values for H (where H equals the head inside the well at time t after injection or removal of the "slug," above or below initial head) are calculated by subtracting each water level reading from the initial H₀ reading.

Instantaneous discharge from the well is approximated by bailing or pumping water from the well. The well can be pumped dry or to a known head by monitoring water level during evaluation. If satisfactory results are not obtained using this method, testing would be repeated using the alternate method described below. The water level in the well is monitored as the well recovers, until the water level has reached 90% of the initial head (prior to evacuation).

2. *Suspended Weight.* In wells where the static water level is deeper than 50 ft, the slug of water takes too long to travel down the casing for the recharge to even approximate instantaneous. These wells are better tested by introduction or withdrawal of a suspended weighted object to known volume. Water level changes are monitored as in paragraph 1. The suspended object should be large enough to displace sufficient water to cause an easily measurable change in head (H₀).

This method is also useful where the static water level is below the lift of a centrifugal pump and bailing does not achieve a significant lowering of the water level in the well being tested.

3. *Calculations.* Using the values of H recorded at repeated intervals, values for H/H₀ are computed and plotted on semilogarithmic paper. H/H₀ is plotted on the linear axis of the paper and time (t) in seconds, on the logarithmic scale. Any convenient scale is acceptable for plotting H/H₀ since this number is dimensionless. Plot the values, and then curve match, superimposing the field value plot on plate 2 (see Reference), to define a match line for a value of t at $Tt/rc^2 = 1.0$ (match point values of H/H₀ are not needed). Determine transmissivity (T) using:

$$T = 1.0 rc^2/t$$

In addition, the storativity, S, is calculated using:

$$S = rs^2/rc^2$$

Where: the value is determined through curve matching of the type curves (see Reference).

rs = radius of screen zone

Reference:

S.W. Lohman. 1972. Groundwater Hydraulics, Professional Paper 708. Washington, U.S. GPO.

1.3.5 Decontamination

Decontamination procedures for drilling and sampling equipment is as described in Appendix B.

2.0 Installation of Gas Monitoring Wells

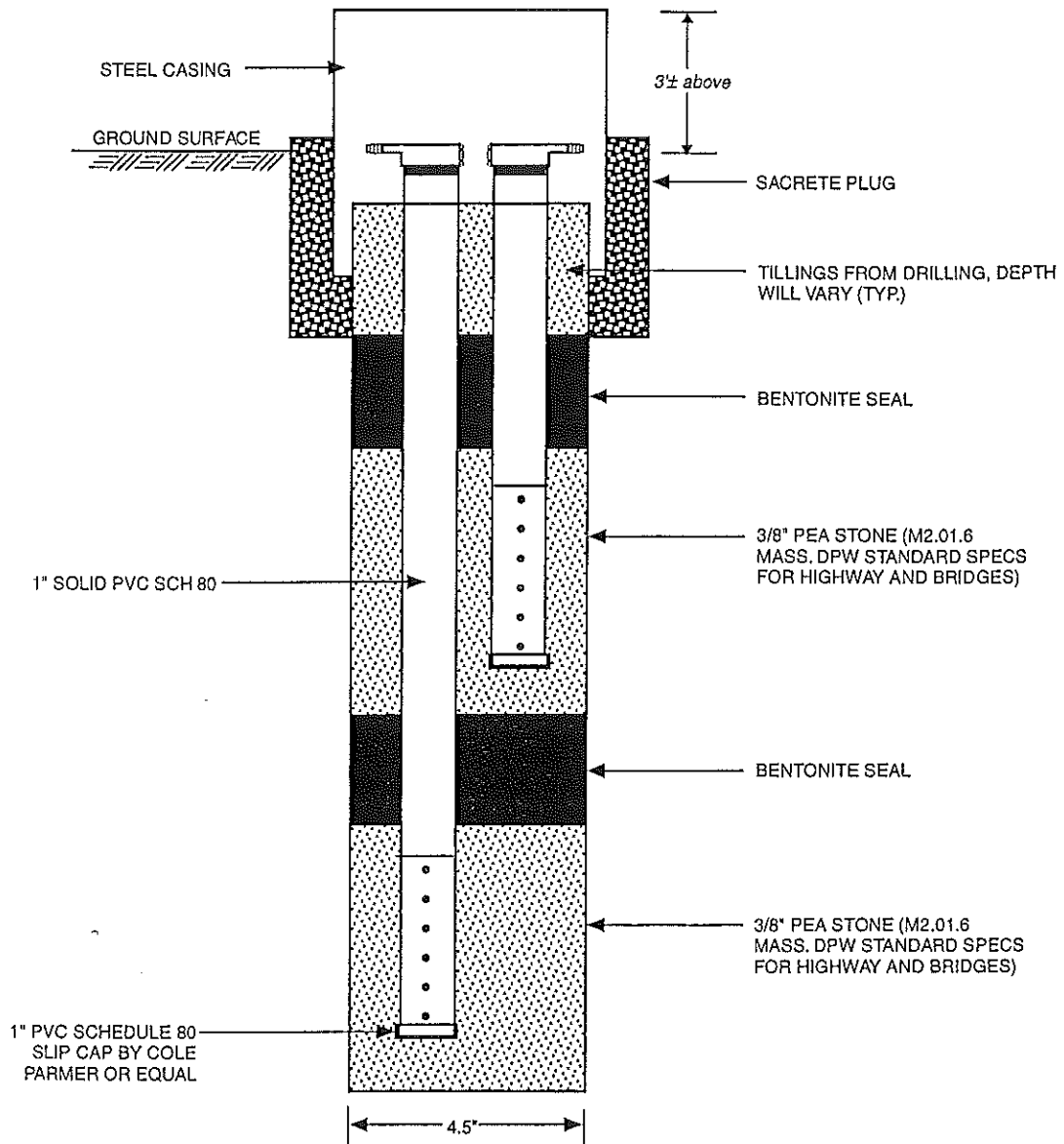
The gas monitoring wells will be installed in general accordance with the procedures outlined in Section 1.2 of Appendix A. A schematic well installation log for the landfill gas monitoring wells is shown on Figure A-3.

3.0 Field Log Book

3.1 Entries

The field log book entries will be as described below. Additional information to be recorded will be a daily detailed report which provides a complete description of all material encountered, number of feet drilled, number of hours on the job, shutdown due to breakdown, feet of casing set, and other pertinent data including:

- Date of entry,
- Names of all personnel at the site including times of entry and departures,
- Time of each entry,
- The reference point for all depth measurements,
- The depth at which each change of formation occurs,
- The total depth of the drilled borehole,
- Well yield during drilling and/or development with drawdown (if possible),
- Dates that field log book copies and borehole log forms are forwarded to the office and the name of the personnel receiving the package (A sample borehole log is shown on Figure A-1),
- The length and description of all casings used to construct the well,
- Types of materials (bentonite, cement, aluminum hydroxide) used to seal the annulus,
- A well construction diagram (Typical diagrams are as shown on Figures A-2 and A-3.), and
- Log entries for specific tasks during sampling procedures (as identified in Appendix B).
- At the completion of the day's activities, the record keeper is to sign the log and cross off the balance of the page; the following day's entries then starts on the following page.



City of Waltham, Massachusetts
 Woerd Avenue Landfill

Figure A-3
Gas Monitoring Well
Completion Logs

Appendix B

Work Plan and Guidance Document for Site Sampling

Appendix B

Work Plan and Guidance Document for Site Sampling

1.0 Introduction

The following sections provide a discussion of the equipment and procedures for field sampling in this investigation. Included are descriptions of equipment to be used, the methodology for decontamination of equipment, methodology of sampling and the parameters for which sampling is to be conducted.

The purpose of this section is to give the field sampling team an overall guidance of the sampling to take place, but it does not pretend to cover each and every problem that may be encountered during the actual conduct of sample collection and handling.

1.1 Mobilization

Prior to the start of field investigation activities, the following preparatory activities will be completed:

1. Key personnel are to review and discuss the Health and Safety Plan and the field procedures described in Appendix A - Work Plan and Guidance Documents for Boring and Monitoring Well Installations.
2. The Project Manager or his designee will ensure that all sample analyses have been scheduled through a DEP-certified laboratory.
3. The Project Manager or his designee will obtain sufficient sample containers and preservatives for the sample parameters identified. Additional sample bottles will be obtained and taken into the field as backup for potential bottle breakages.
4. The Project Manager or his designee will obtain laboratory prepared trip blanks and equipment blank water from the subcontracted analytical laboratory.
5. The Project Manager or his designee will schedule to have all required equipment available on site for field activities and make sure that all equipment has been properly calibrated, maintained, and decontaminated.
6. The Project Manager or his designee will obtain all materials required for personnel protection and equipment decontamination.
7. The Project Manager or his designee will insure that the field team is fully informed as to the laboratories to which field samples are to be delivered and procedures in connection with such delivery. If overnight delivery service is to be utilized, the Project Manager will ensure that every field team member is provided with written information that includes the direction to these offices, the hours of operation, and any special conditions required for sample shipment.

8. The Project Manager or his designee will make any other arrangements that may be required prior to field investigation activities, based on information that becomes available to him or the field team.

1.2 Soil Sampling

This section describes procedures to be followed in the collection and logging of soil samples during the course of the drilling program. It is not intended to submit any soil samples for chemical analyses; however, provisions will be made to have the necessary sampling equipment and bottles on-hand in case the need for soil chemical analysis is identified during the drilling program. If soil chemical analyses does become necessary, laboratory methods and parameters will be determined at that time.

1.2.1 Task Team

- Field Investigation Team
- Drilling Subcontractor and Crew

1.2.2 Equipment

The equipment necessary to carry out the investigation including most equipment necessary for sampling has been described in Appendix A. Additional items of equipment to complete the sampling program would include:

1. Appropriate sample bottles (obtained from laboratory),
2. Forms to accompany samples,
3. Ice (as appropriate for preservation of certain samples),
4. Sample coolers and/or appropriate containers for transport of samples to the laboratory.

1.2.3 Procedures

1. Soil borings will be advanced using the hollow stem auger or other appropriate method.
2. Split-spoon samples will be collected in accordance with ASTM D1586-67 (1984), Method for Penetration Test and Split-Barrel Sampling of Soils. Split-spoons (nominal 2-inch diameter) will be advanced continuously prior to obtaining soil samples.
3. The locations at which geotechnical samples are to be collected will be as directed in the field. At locations where geotechnical samples are taken, split-spoon samplers (nominal 3-inch diameter) which appear to recover 24 inches of soil will be weighed before the spoons are opened. If a 24-inch soil recovery is confirmed, the bulk density of the soil will be computed based on the dimensions of the split-spoon (24 inches long, 3 inches in diameter) and the value noted in the field log book.

4. Formation samples will be described in accordance with Burmeister using the description definitions based on the modified Wentworth Scale provided below:

<u>(mm)</u>	<u>Grade Limits Sieve Series</u>	<u>U.S. Standard Grade Name</u>
>2.26	>0.08	Gravel
1.00-2.36	0.04-0.08	Very Coarse Sand
0.500-1.00	0.02-0.04	Coarse Sand
0.250-0.500	0.01-0.02	Medium Sand
0.125-0.250x	0.005-0.01	Fine Sand
<0.075	<0.002	Silt

5. The most representative and least disturbed portion of the split-spoon sample shall be bisected with a decontaminated stainless steel knife.
6. The spoon will be quickly scanned with an HNu and/or OVA. Sample recovery shall be measured. All information will be entered in the field log book.
7. As described in Appendix A, all information pertaining to the borehole drilling and split spoon sampling will be recorded in a dedicated field log book, including, but not limited to, the date, time, weather, sample location identifier, blow counts, spoon advance and recovery. Geologic descriptions shall also be summarized on a test boring log. A sample boring log is presented in Appendix A.
8. Split-spoon samplers, sampling knives, and drilling equipment will be cleaned prior to and between uses as described in Section 2.0 herein.

1.3 Groundwater Sampling

1.3.1 Task Team

- Field Investigation Team

1.3.2 Equipment

1. Stainless steel measuring tape (100-foot)
2. Electric water level indicator
3. Metal or plastic buckets (5-gallon)
4. OVA or HNu
5. Field log books
6. Key to well locks
7. 2-inch and 4-inch submersible pump (3/4 HP)
8. 1/2-inch and 3/4-inch diameter ASTM "Drinking Water Grade" hose
9. 220-volt, 8-amp, 5000-watt generator

10. 1-1/2-inch-outside diameter teflon bailers with 5-foot teflon coated stainless steel leader, polypropylene (braided) rope
11. Plastic electrical line clamps (stay ties)
12. Drums or storage tank for purge water
13. Sample coolers
14. Vermiculite or equivalent packing material
15. Ice
16. Garbage can (plastic)
17. Utility knives
18. Scrub brushes
19. Polypropylene sheeting
20. Field decontamination supplies (alconox, deionized/distilled water, 10% nitric acid solution, acetone, paper towels, trash bags)
21. Sample containers, packaging as required by the laboratory, Chain-of-Custody Records, Traffic Reports, sample tags, and other paperwork
22. Pressure sprayer
23. Preservatives
24. pH paper
25. Personal protective equipment and clothing as required by Health and Safety Plan
26. Polypropylene rop
27. Field measurement instruments for pH, temperature, dissolved oxygen, conductivity, and turbidity of water (such as Horiba U-10 Water Quality Checker)
28. Paperwork
29. Camera and film

1.3.3 Procedures

1. Prior to initiating field activities, the field team will discuss the Health and Safety Plan and field procedures described herein. All monitoring and protective equipment shall be checked thoroughly at this time.
2. The bailers will be precleaned prior to entering the field.
3. Any pumps or tubing involved with these procedures shall be cleaned with tap water and non-phosphate, non-residual detergent and then rinsed with deionized/distilled water prior to pumping.
4. All water monitoring instrument probes will be rinsed with deionized/distilled water prior to their use at each monitoring well.
5. Upon arrival at each well, inspect the well for any damage, and condition of the well seal and locking device. Note any problems in the field notebook.

6. Air monitoring will be performed during the well opening, pumping, and sampling using a Photoionization Detector (11.7 ev lamp HNu) and Combustible Gas Indicator. Record readings and determine level of personnel protective equipment required by the Health and Safety Plan.
7. The static water level will be measured from the top of inner casing. The total depth of the well will also be measured.
8. The height and volume of the water in the well will be calculated. The volume of water to be purged (gallons) will be computed to equal three times the well volume.
9. Polypropylene sheeting will be placed on the ground around the monitoring well.
10. The sampler will change gloves prior to sampling at each monitoring well.
11. The sampler will avoid contact with all clean pumps, instrument probes, and sampling bailers and will not allow any equipment to touch the ground.
12. It is anticipated that at the landfill site, the wells are to be sampled with a bailer.
13. In the employment of a bailer for purging and/or sampling, a 5-foot teflon leader line will be attached to a dedicated polypropylene rope and fastened to the bailer. Enough line will be played out to submerge the bailer. The bailer line will not be allowed to contact the ground at any time.
14. Should a pump and an electrical generator be employed for purging prior to sampling, the generator shall be located downwind of the well to be sampled.
15. The temperature, pH, conductivity, turbidity, and dissolved oxygen of the pump discharge will be monitored. After three (3) casing volumes have been purged, evacuation will cease if these measurements have stabilized, such that these parameters vary less than 10 percent over the removal of two successive well volumes. Otherwise, purging will continue until these measurements stabilize or a maximum of 5 well volumes have been removed. If after five well volumes, the measurements have not stabilized within 10 percent, one additional well volume will be evacuated. All field monitoring equipment will be calibrated in the lab prior to using in the field.
16. The well shall be sampled within 3 hours of completion of the purging operation. If the well sits longer than 3 hours, it will be re-evacuated. If wells do not recharge sufficiently to collect all samples within 3 hours, then this requirement will not apply. All samples will be collected from a stainless steel bailer.
17. Sample bottle and preservation requirements are as provided in Table B-1.

Table B-1

18. The well will be locked before leaving the well location.
19. For each sample collected, Chain-of-Custody Records and Traffic Reports will be completed. Sample labels and tags will be attached to each sample container. Sample container lot and/or shipment numbers will be recorded in the field log book.
20. Ice and vermiculite will be added and the package will be sealed for delivery to the laboratory. The quantity of ice packed in the sample coolers containing samples requiring preservation to 4oC shall be sufficient to achieve and maintain the temperature of those samples at 4oC after collection and throughout transit.
21. For each shipment of samples, Chain-of-Custody Records and Traffic Reports will be grouped, packed in a waterproof bag, and included with the samples.
22. All samples to be shipped shall be done in accordance with DOT regulations specified for environmental samples. Two custody seals will be placed on the outside of each sample cooler.
23. All data obtained in the field, including sample location and number, date and time of sampling, well condition, depth to water, well depth, height of protective casing, amount of water bailed from the well, temperature, specific conductance, pH, dissolved oxygen, HNu and combustible gas indicator readings, number of samples collected and parameters to be analyzed, filtering techniques and any other observations made by the field personnel, shall be recorded in a field log book.
24. Each of the water quality sampling rounds will include the collection of 12 water samples (i.e., 8 groundwater samples and 4 surface water samples). QA/QC plans will include the following during each sampling round:
 - One trip blank to be provided by the laboratory for analysis of VOCs only,
 - One equipment blank to be analyzed for all water quality parameters, and
 - One duplicate sample to be analyzed for all water quality parameters and be submitted blind to the laboratory.

Sample Bottle Filling Procedures

Sample Bottle Filling for Volatile Organics

1. The cap will be removed from the two 40-ml glass vials. Care shall be taken to avoid contact with the inner surface of the caps.
2. The entire vial will be filled. The cap will be replaced making sure no air bubbles are present inside the vial. The sample shall be placed in the cooler on ice.

Sample Bottle Filling for Inorganics

1. Samples for total metals and cyanide analysis will be collected from each well. The sample for total metals will not be filtered during the first round but will be field filtered during the second round.
2. The sample bottles will be filled approximately 7/8 full and preserved.
3. The cap on each sample bottle shall be replaced and the bottle placed in the cooler on ice.
4. All appropriate data will be recorded in the field log book.

Sample Bottle Filling for Conventional Parameters

1. The cap will be removed from the container. Care shall be taken to avoid contact with the inner surface of the cap.
2. The entire container will be filled and the cap replaced. BOD, TDS, and fluoride sample containers shall be completely filled (no air space). All samples for laboratory analysis, except dissolved oxygen samples, shall be placed on ice in the cooler.

1.4 Surface Water Sampling

At locations where both surface water and sediment samples are collected, surface water samples will be collected first. In addition, downstream samples will be collected before upstream samples.

1.4.1 Task Team

- Field Investigation Team

1.4.2 Equipment

1. Sample containers, packaging as required by the laboratory, Chain-of-Custody Records, Traffic Reports, sample tags, and other paperwork
2. Sample coolers
3. Ice
4. Field log books
5. Vermiculite or equivalent packing material
6. Field measurement instruments for pH, temperature, dissolved oxygen, conductivity, and turbidity of water (such as Horiba U-10 Water Quality Checker)
7. HNu or OVA
8. Stainless steel tape measure and measuring rod
9. Preservatives
10. Personal protective clothing and equipment as required by the Health and Safety Plan and Procedures
11. Camera and film

12. Wooden stakes and flagging
13. Field decontamination supplies (alconox, deionized/distilled water 10% nitric acid solution, acetone, paper towels, trash bags)
14. Waders or hip boots

1.4.3 Procedures for Collecting Surface Water Samples

1. Prior to initiating any field activities, the field team will review and discuss, in detail, the Health and Safety Plan and procedures. All monitoring and protective equipment shall be checked thoroughly at this time.
2. Surface water samples will be taken at locations shown on Figure 2-2. Final sample locations will be determined in the field.
3. Surface water samples should not be collected within 48 hours after a precipitation event.
4. Prior to sampling at each location, the water monitoring equipment probes will be rinsed thoroughly with distilled/deionized water.
5. The following information will be recorded in the field log book:
 - Sample location, identification number, date, and time
 - Sample container log and/or shipment number
 - Water temperature, at the point and time of sampling
 - pH of water sampled (electrodes shall not be immersed in samples to be sent to laboratory; either duplicate samples may be obtained or on-site measurements may be taken)
 - Conductivity of water sample
 - Dissolved oxygen content of water sample
 - Wetted depth of stream
 - Description of flow rate, velocity, and other stream characteristics (fast-running verses stagnant)
 - Weather conditions
 - Precipitation information prior to sampling event (e.g., last rainfall date and total amount, if known)
 - Observable physical characteristics (odor, color, turbidity, multi-phase layering, precipitants)
 - Evidence of stressed or dead vegetation or dead animals
 - Photograph location, time, and frame number
6. The surface water samples shall be grab samples collected by submerging the sample containers below the surface of the water.
7. A wooden stake with colored flagging will be driven into the ground to the side of the sample location to mark each location.

8. Preparation of sample labels and tags, Chain-of-Custody Records, Traffic Records, shipping and handling, and sample bottle and preservation requirements are the same as those for groundwater samples.
9. QA/QC sample requirements are identified under the groundwater sampling section.

Sample Bottle Filling Procedures for Volatile Organics - Surface Water

1. The cap will be removed from the two 40-ml glass vials. Care shall be taken to avoid contact with the inner surface of the cap.
2. The entire vial will be immersed into the water just below the water surface, if possible, without disturbing the sediments, and the container will be completely filled. The cap on the sample bottle will be replaced making sure no air bubbles are present in the vial. The sample shall be placed in the cooler on ice.

Sample Bottle Filling Procedures for All Other Parameters - Surface Water

1. The cap will be removed from the bottle. Care shall be taken to avoid contact with the inner surface of the cap.
2. The container will be immersed in the stream so that the mouth of the bottle is just below the water surface.
3. The cap will be replaced on the sample bottle and the sample bottle placed in a cooler on ice.
4. The rest of the bottles will be filled by repeating steps 1 through 3.
5. All appropriate data will be recorded in a field logbook.

1.5 Sediment Sampling

1.5.1 Task Team

- Field Investigation Team

1.5.2 Equipment

1. Sample containers, packaging as required by the laboratory, Chain-of-Custody Records, Traffic Reports, sample tags, and other paperwork
2. Sample coolers
3. Ice
4. Field log books
5. Vermiculite or equivalent packing material
6. HNu or OVA
7. Stainless steel trowels, bowls, dredge, and spoons

8. Stainless steel tape measure and measuring rod
9. Preservatives
10. Personal protective clothing and equipment as required by the Health and Safety Plan and Procedures
11. Camera and film
12. Wooden stakes and flagging
13. Field decontamination supplies (alconox, deionized/distilled water 10% nitric acid solution, acetone, paper towels, trash bags)
14. Waders or hip boots

1.5.3 Procedures for Collecting Sediment Samples

1. Sediment samples will be obtained with a clean stainless steel trowel.
2. At each location, the sampling personnel will approach the designated sampling location from downstream.
3. The cap will be removed from the sample container. Care shall be taken to avoid contact with the inner surface of the cap.
4. The sample container will be scraped along the bottom of the stream (cross sectionally) to collect the sediment sample. If necessary a precleaned stainless steel trowel will be used to collect the sample.
5. Sediment samples collected for all analyses except volatile organic analysis shall be thoroughly mixed. Vegetative matter, rocks, twigs, and other debris shall be removed.
6. Native water on the top of the final sample shall not be removed. The bottle shall be sealed tightly.
7. The outside of the sample containers will be cleaned with tap water.
8. The samples will be placed in a cooler, on ice.
9. Each field duplicate and matrix spike/matrix spike duplicate sample shall be appropriately identified in the field log book as such and shall be labeled as such on the sample bottle labels, Chain-of-Custody Records, and Traffic Reports.
10. For each sample collected, sample labels and tags will be attached to each sample container. The Chain-of-Custody Records and Traffic Reports for each group of samples shipped to the laboratory will be completely filled out.

1.6 Leachate Sampling

1.6.1 Task Team

- Field Investigation Team

1.6.2 Equipment

Equipment necessary is identical to that listed in 1.4.2 for surface water sampling.

1.6.3 Procedures for Collecting Leachate Samples

The procedures for collecting leachate samples are identical to those in 1.4.3 for surface water sampling, except as noted below.

1. Leachate sample locations will be determined in the field, depending upon the presence of leachate seeps.
2. Leachate sampling will be conducted shortly after a precipitation event, when the leachate is flowing.
3. QA/QC plans for leachate sampling will be limited to the following:
 - One trip blank to be provided by the laboratory for analysis of VOCs by EPA Method 8260.

2.0 General Decontamination Procedures

Staging/decontamination areas will be set up at drainage areas as close to the monitoring wells as possible.

The following general decontamination procedures will be implemented during field investigation activities at the site:

1. Personal protective equipment: The required decontamination procedure for personal protective equipment is as follows:
 - Non-phosphate, non-residual detergent (alconox) rinse
 - Deionized/distilled water rinse
 - Air dry
2. Field monitoring equipment: Instruments shall be cleaned per manufacturer's instructions after each use. The pH meter and conductivity probes cannot be rinsed with solvents. These instruments will be rinsed after each use with deionized/distilled water only.

3. **Well evacuation equipment:** All tubing and evacuation equipment such as submersible pumps which are put into the borehole shall be rinsed with soapy (alconox) water and deionized/distilled water before use. All tubing must be dedicated to individual wells (i.e., tubing cannot be reused). If bailers are used to evacuate wells, they shall be decontaminated with the same procedure listed in item number 5, below.

4. **Drilling equipment, excavation equipment, and other large pieces of equipment:** All drilling (or excavation) and downhole equipment that comes in contact with the soil shall be steam cleaned before use, between and after each borehole (or test pit). This includes drill rods, bits and augers, dredges, backhoe, or any other large piece of equipment. Spent water from the steam cleaning of auger flights will be discharged to stormwater collection trenches through a screen and riprap system placed over the trenches. Sampling devices such as split-spoons shall be decontaminated between boreholes as per item 5, below. Within the same borehole, split-spoons will be decontaminated as per item 5, below.

5. **Sampling Apparatus:** All sampling apparatus shall be properly decontaminated prior to its use in the field to prevent cross-contamination. The required decontamination procedure for all sampling equipment is as follows:
 - Wash and scrub with non-phosphate detergent (alconox and water),
 - Deionized/distilled water rinse,
 - Methanol rinse,
 - Deionized/distilled water rinse,
 - Air dry, and
 - Wrap in aluminum foil (shiny side out) for transport. Bailer cord will be dedicated to individual wells.

Appendix C

Current Health and Safety Plan

PROJECT NAME _____ PROJECT # _____ REGION NNR _____

JOBSITE ADDRESS _____ CLIENT _____

CLIENT CONTACT _____ CLIENT CONTACT PHONE # _____

() AMENDMENT TO EXISTING APPROVED H&SP? _____

() H&SP AMENDMENT NUMBER? _____ () DATE EXISTING APPROVED H&SP _____

OBJECTIVES OF FIELD WORK:

TYPE: *Click as many as applicable*

Active	()	Landfill	()	Unknown	()
Inactive	()	Uncontrolled	()	Military	()
Secure	()	Industrial	()	Other (specify)	()
Unsecured	()	Recovery	()		
Enclosed space	()	Well Field	()		

All requirements described in the CDM Health and Safety Assurance Manual for Haz. Waste Operations are incorporated in this health and safety plan by reference.

DESCRIPTION AND FEATURES: *Include principal operations and unusual features (containers, buildings, dikes, power lines, hillslopes, rivers, etc.)*

SURROUNDING POPULATION: () Residential () Industrial () Rural () Urban OTHER:

ORIGINAL

HEALTH AND SAFETY PLAN FORM

CDM Health and Safety Program

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THIS PAGE RESERVED FOR MAP (Show Exclusion, Contamination Reduction, and Support Zones. Indicate evacuation and reassembly points.)

HISTORY: Summarize below. Include complaints from public, previous agency actions, known exposures or injuries, etc.

WASTE TYPES: () Liquid () Solid () Sludge () Gas () Unknown () Other, specify:

WASTE CHARACTERISTICS: Check as many as applicable.

- () Corrosive () Flammable () Radioactive
- () Toxic () Volatile () Reactive
- () Inert Gas () Unknown () Other, specify:

WORK ZONES: Describe the Exclusion, Contamination Reduction, and Support Zones in terms on-site personnel will recognize
 CDM will observe a 50-foot radius area around any intrusive activity as an Exclusion Zone. A 20-foot radius are around the Exclusion Zone will serve as the Contamination Reduction Zone. The Support Zone will be the remainder of the site.

HAZARDS OF CONCERN:

- () Heat Stress *attach guidelines*
- () Cold Stress *attach guidelines*
- () Explosive/Flammable
- () Oxygen Deficient
- () Radiological
- () Biological
- () Other - specify
- () Noise
- () Inorganic Chemicals
- () Organic Chemicals
- (X) Motorized Traffic
- (X) Heavy Machinery
- (X) Slips, Trips, & Falls

FACILITY'S DISPOSAL METHODS AND PRACTICES: Summarize below.

HAZARDOUS MATERIAL SUMMARY: Circle waste type and estimate amounts by category.					
CHEMICALS: Amount/Units:	SOLIDS: Amount/Units:	SLUDGES: Amount/Units:	SOLVENTS: Amount/Units:	OILS: Amount/Units:	OTHER: Amount/Units:
Acids	Flyash	Paints	Halogenated (chloro, bromo) Solvents	Oily Wastes	Laboratory
Pickling Liquors	Milling/Mine Tailing	Pigments	Hydrocarbons	Gasoline	Pharmaceutical
Caustics	Asbestos	Metals Sludges	Alcohols	Diesel Oil	Hospital
Pesticides	Ferrous Smelter	POTW Sludge	Ketones	Lubricants	Radiological
Dyes/Inks	Non-Ferrous Smelter	Aluminum	Esters	PCBs	Municipal
Cyanides	Metals	Distillation Bottoms	Ethers	Polynuclear Aromatics	Construction
Phenols	Other: specify:	Other: specify:	Other specify:	Other specify:	Munitions
Halogens					Other specify:
PCBs					
Metals					
Dioxins					
OVERALL HAZARD EVALUATION: () High () Medium () Low () Unknown					
JUSTIFICATION: Water quality testing has yet to detect significant Health and Safety hazards.					
FIRE/EXPLOSION POTENTIAL: () High () Medium () Low () Unknown					
BACKGROUND REVIEW: (X) Complete () Incomplete					

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KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (specify units and media)	PELTLY ppm or mg/m3 (specify)	IDLH ppm or mg/m3 (specify)	WARNING CONCENTRATION (in ppm)	SYMPTOMS/EFFECTS	PHOTO IONIZATION POTENTIAL
--------------------	---	-------------------------------------	-----------------------------------	-----------------------------------	------------------	----------------------------

--	--	--	--	--	--	--

NA = Not Available

NE = None Established

U = Unknown

S = Soil

SW = Surface Water

T = Tailings

W = Waste

TK = Tanks

SD = Sediment

A = Air

GW = Ground Water

SL = Sludge

D = Drums

L = Lagoons

OFF = Off-Site

HEALTH AND SAFETY PLAN FORM
 CDM Health and Safety Program

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TASK DESCRIPTION/SPECIFIC TECHNIQUE/SITE LOCATION
(attach additional sheets as necessary)

TASK DESCRIPTION/SPECIFIC TECHNIQUE/SITE LOCATION	Type	Primary	Contingency	HAZARD & SCHEDULE	
				Hi	Med Low
	Intrusive	A B C (D)	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		
	Intrusive	A B C (D)	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		
	Intrusive	A B C (D)	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		
	Intrusive	A B C (D)	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		
	Intrusive	A B C (D)	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		
	Intrusive	A B C D	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		
	Intrusive	A B C D	A B C D	Hi	Med Low
	Non-intrusive	Modified	Exit Area		

PERSONNEL AND RESPONSIBILITIES (include subcontractors)

NAME	FIRM/DIVISION	CLEARANCE	RESPONSIBILITIES	On Site?
	CDM/NNR	CDM HEALTH		
	CDM/NNR			
	CDM/NNR			
	CDM/NNR			

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PROTECTIVE EQUIPMENT: Specify by task. Indicate type and/or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.

BLOCK A

TASKS: 1-2-3-4-5-6-7-8-9-10
 LEVEL: A-B-C-D-Modified
 () Primary
 (X) Contingency

Respiratory: (X) Not needed
 () SCBA, Airline:
 () APR:
 () Cartridge:
 () Escape Mask:
 () Other:
 Head and Eye: () Not needed
 (X) Safety Glasses:
 () Face Shield:
 () Goggles:
 (X) Hard Hat:
 () Other:
 Boots: () Not needed
 (X) Steel-Toe (X) Steel Shank
 () Rubber (X) Leather
 () Overboots: Rubber / Latex

Prot. Clothing: () Not needed
 () Encapsulated Suit:
 () Splash Suit
 () Apron:
 (X) Tyvek Coverall or
 (X) Saranex Coverall or
 (X) Cloth Coverall: or
 (X) Other: pvc rainsuit

Gloves: () Not needed
 (X) Undergloves: PVC or
 (X) Gloves: cotton or
 (X) Overgloves: nitrile

Other: specify below

BLOCK B

TASKS: 1-2-3-4-5-6-7-8-9-10
 LEVEL: A-B-C-D-Modified
 () Primary
 (X) Contingency

Respiratory: (X) Not needed
 () SCBA, Airline:
 () APR:
 () Cartridge:
 () Escape Mask:
 () Other:
 Head and Eye: (X) Not needed
 () Safety Glasses:
 () Face Shield:
 () Goggles:
 () Hard Hat:
 () Other:
 Boots: (X) Not needed
 () Steel-Toe () Steel Shank
 () Rubber () Leather
 () Overboots: Rubber/Latex

Prot. Clothing: (X) Not needed
 () Encapsulated Suit:
 () Splash Suit
 () Apron:
 () Tyvek Coverall
 () Saranex Coverall
 () Cloth Coverall: or
 () Other: pvc rainsuit

Gloves: (X) Not needed
 () Undergloves: and
 () Gloves: cotton or
 () Overgloves:
 Other: specify below

EXIT SITE

BLOCK C

TASKS: 1-2-3-4-5-6-7-8-9-10
 LEVEL: A-B-C-D-Modified
 () Primary
 () Contingency

Respiratory: () Not needed
 () SCBA, Airline:
 () APR:
 () Cartridge:
 () Escape Mask:
 () Other:
 Head and Eye: () Not needed
 () Safety Glasses:
 () Face Shield:
 () Goggles:
 () Hard Hat:
 () Other:
 Boots: () Not needed
 () Steel-Toe () Steel Shank
 () Rubber () Leather
 () Overboots:

Prot. Clothing: () Not needed
 () Encapsulated Suit:
 () Splash Suit
 () Apron:
 () Tyvek Coverall
 () Saranex Coverall
 () Cloth Coverall:
 () Other:
 Gloves: () Not needed
 () Undergloves:
 () Gloves:
 () Overgloves:
 Other: specify below

BLOCK D

TASKS: 1-2-3-4-5-6-7-8-9-10
 LEVEL: A-B-C-D-Modified
 () Primary
 () Contingency

Respiratory: () Not needed
 () SCBA, Airline:
 () APR:
 () Cartridge:
 () Escape Mask:
 () Other:
 Head and Eye: () Not needed
 () Safety Glasses:
 () Face Shield:
 () Goggles:
 () Hard Hat:
 () Other:
 Boots: () Not needed
 () Steel-Toe () Steel Shank
 () Rubber () Leather
 () Overboots:

Prot. Clothing: () Not needed
 () Encapsulated Suit:
 () Splash Suit
 () Apron:
 () Tyvek Coverall
 () Saranex Coverall
 () Cloth Coverall:
 () Other:
 Gloves: () Not needed
 () Undergloves:
 () Gloves:
 () Overgloves:
 Other: specify below

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MONITORING EQUIPMENT Specify by task. Indicate type as necessary. Attach additional sheets if needed.				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS (When and how will you use the monitor?)
Combustible Gas Indicator	1-2-3-4-5-6-7-8	0-10% LEL 10-25% LEL >25% LEL 21.0% O2 <11.0% O2 <19.5% O2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	Team will continuously monitor while on-site.
Radiation Survey Meter	1-2-3-4-5-6-7-8			() Not Needed
Photoionization Detector 10.2 eV Lamp Type: OVM	1-2-3-4-5-6-7-8	Specify:		Team will continuously monitor while on-site.
Flame Ionization Detector Type:	1-2-3-4-5-6-7-8	Specify:		() Not Needed
Detector Tubes/ Monitox Type: Type:	1-2-3-4-5-6-7-8	Specify:		() Not Needed
Respirable Dust Monitor Type: Type:	1-2-3-4-5-6-7-8	Specify:		If team notices visible concentrations of dust in air or windy, dry conditions that produce dusts, they will leave the area.
Other Specify:	1-2-3-4-5-6-7-8	Specify: If team notices unusual odors or irritation of the eye or throat, they will exit the area and call DHSC.		Page 8 of 12

DECONTAMINATION PROCEDURES

ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO

<p>Personnel Decontamination <i>Summarize below or attach diagram;</i></p> <p>Team members will remove their protective clothing in the following order:</p> <ul style="list-style-type: none"> - equipment drop - boot cover (if worn) removal - outer glove removal (if worn) - hard hat removal - surgical glove removal - hand and face wash 	<p>Sampling Equipment Decontamination <i>Summarize below or attach diagram;</i></p> <p><u>Reusable Sampling Equipment</u> will be decontaminated by</p> <ul style="list-style-type: none"> - rinse with deionized distilled water - methanol rinse - final rinse with distilled water - air dry 	<p>Heavy Equipment Decontamination <i>Summarize below or attach diagram;</i></p> <p>CDM will require drillers to decontaminate their equipment before it leaves the site, per the bid specification or:</p> <ul style="list-style-type: none"> - wire brush to remove soil - clean with high pressure steam - water rinse - store in non-contaminated area
<p>Containment and Disposal Method</p> <p>Disposable protective equipment will be disposed of at the Town Transfer Station located on-site.</p>	<p>Containment and Disposal Method</p> <p>All disposable sampling equipment will be disposed of at the Town Transfer Station.</p>	<p>Containment and Disposal Method</p> <p>Disposable drilling equipment will be disposed of at the Town Transfer Station located on-site.</p>

() Not Needed
() Not Needed
() Not Needed

HEALTH AND SAFETY PLAN FORM

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EMERGENCY CONTACTS

Water Supply: _____
 Site Telephone: 1-800/424-8802
 EPA Release Report #: 1-800/SKY-PAGE 31821#
 CDM 24-Hour Emergency #: 1-800/424-9300
 Facility Management: _____
 Other (specify) _____
 CHEMTREC Emergency #: 1-800/424-9300

EMERGENCY CONTACTS

Health and Safety Manager Chris Marlowe (800) SKY PAGE
 Project Manager _____
 Site Safety Coordinator _____
 Client Contact _____
 Other (specify) _____
 Environmental Agency MA DEP (check) (508) 792-7653
 State Spill Number MA DEP (508) 820-2121
 Fire Department _____
 Police Department _____
 State Police _____
 Poison Control Center (800) 682-9211
 Occupational Physician 1-800/229-3674

CONTINGENCY PLANS: Summarize below

If work team observes hazards for which they have not prepared, they will withdraw from the area and call the health and safety manager. Employees will not enter or remain in the work area unless accompanied. CDM may rely on instruments operated by contractor personnel only upon HSM approval. Without regard to the instrument readings, personnel will leave site and upgrade their level of protection if they experience nausea or dizziness.

MEDICAL EMERGENCY

Hospital Name: _____
 Hospital Address: _____
 Name of Contact at Hospital: Emergency Room
 Name of 24-Hour Ambulance: Through 911 (check)
 Route to Hospital: _____

PHONE

HEALTH AND SAFETY PLAN APPROVALS

Prepared by Sherri Curria _____ Date _____
 DHSC Signature _____ Date _____
 HSM Signature _____ Date _____

Distance to Hospital _____

Attach map with route to hospital _____

HEALTH AND SAFETY PLAN FORM

CDM Health and Safety Program

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HEALTH AND SAFETY PLAN SIGNATURE FORM

CDM Health and Safety Program

All site personnel must sign this form indicating receipt of the H&SP. Keep this original on site. It becomes part of the permanent project files. Send a copy to the Health and Safety Manager (HSM).

SITE NAME/NUMBER: _____

DIVISION/LOCATION: _____

CERTIFICATION:

I understand, and agree to comply with, the provisions of the above referenced H&SP for work activities on this project. I agree to report any injuries, illnesses or exposure incidents to the site Health and Safety Coordinator (SHSC). I agree to inform the SHSC about any drugs (legal and illegal) that I take within three days of site work.

PRINTED NAME	SIGNATURE	DATE



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
METROPOLITAN BOSTON - NORTHEAST REGIONAL OFFICE

ARGEO PAUL CELLUCCI
Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

September 11, 1997

Mr. Ronald Vokey
Planning Director
City of Waltham
610 Main Street
Waltham, MA 02154

RE: WALTHAM - Solid Waste
Woerd Avenue Landfill
BWP SW 12 - ISA
Approval with Conditions
Transmittal No. 102380

Dear Mr. Vokey:

The Metropolitan Boston/Northeast Regional Office of the Department of Environmental Protection, Bureau of Waste Prevention, Solid Waste Section (the "Department"), has reviewed the City of Waltham's application for an Initial Site Assessment (BWP SW 12, Transmittal No. 102380) for the former Waltham landfill located off Woerd Avenue in Waltham (Woerd Avenue Landfill). The application includes two documents, entitled:

City of Waltham, Massachusetts
Initial Site Assessment
Woerd Avenue Landfill
May 1997

and

City of Waltham, Massachusetts
Woerd Avenue Landfill
Comprehensive Site Assessment
Scope of Work
May 1997

The documents present an Initial Site Assessment (ISA) and a Scope of Work for a Comprehensive Site Assessment (CSA Scope) for the Woerd Avenue Landfill. Both reports were prepared on behalf of the City of Waltham (the "City") by Camp Dresser & McKee Inc. (CDM) of Cambridge, MA.

The Woerd Avenue Landfill is located adjacent to the Waltham/Newton municipal boundary. According to the ISA, the landfill area is approximately 8.7 acres and abuts Cram's Cove off of the Charles River. Abutting property uses include: a playground and residential properties to the east; an industrial property (Parker Hannifin) to the north; and the former Newton solid waste incinerator to the south.

Reportedly, the landfill began operations in the early 1900s for the disposal of coal ash. When the Waltham incinerator began operations in 1946, the landfill accepted incinerator ash and non-combustible wastes. The landfill ceased operations in 1973, and was reportedly covered with clean fill. The landfill, reportedly, continued to receive brush and street sweepings until 1980.

Previous reports (TWM Northeast, 1990) indicate that landfill waste may be located under the parking lot at the eastern portion of the adjacent Parker Hannifin property. The report also indicates that the source of groundwater contamination at the Parker Hannifin property may be due to the landfill. To date, there has been no environmental monitoring of the landfill.

In summary, the CSA Scope proposes to: (1) install four groundwater monitoring well couplets; (2) install three landfill gas monitoring wells; (3) collect and analyze four quarterly rounds from the groundwater and gas monitoring wells and four surface water monitoring locations; (4) collect and analyze sediment samples; and (5) prepare and submit a CSA in accordance with the Department's guidance document; Landfill Technical Guideline Manual.

The Department has reviewed the information presented in the application pursuant to 310 CMR 19.150 (Solid Waste Management Facility Regulations, Landfill Assessment Requirements) and the established guidelines presented in Chapter 5, "Landfill Assessments," of the Landfill Technical Guideline Manual.

Based on this review, the Department, acting under the authority of the M.G.L. c. 111, s. 150A and 310 CMR 19.000, hereby approves the City of Waltham's application for an ISA (BWP SW 12, Transmittal No. 102380) for the Woerd Avenue Landfill with the following conditions:

CONDITIONS:

- (1) All work conducted at the landfill shall be performed in accordance with the Department's Landfill Technical Guidance Manual and Standard References for Monitoring Wells, DEP Publication #WSC-310-91.
- (2) **ISA Comments.** Responses to the following comments regarding the ISA should be addressed with the results of the first sampling round, as they may affect subsequent CSA monitoring locations.

- a. Information should be provided indicating abutting property ownership and usage. Appendix A of the ISA provides a list of abutting property owners, but does not provide reference to usage and where the properties are located.
 - b. The Department notes that figures presented in the Handex (1996) report indicate that Excavation Area #1 and sample locations GP-7, GP-8, GP-37, GP-38, GP-39, and GP-40 may have been on the landfill property. Other than the figure which indicates TPH concentrations, the analytical results for these samples were not provided in the Handex (1996) report. These results should be provided, if available.
- (3) **Waste Delineation.** The Department notes that the extent of the landfill may extend beyond the property boundaries for the parcel. The CSA must adequately determine the limit of waste at the landfill. The edge of waste should be physically confirmed through test pit excavation, borings, or other suitable method.
 - (4) **Property Line Survey.** The Department notes that the site plans provided indicate "Approximate Property Lines" as derived from Assessor's records. Please be advised that the property line survey must be certified by a Registered Land Surveyor.
 - (5) **Evaluation of Groundwater Flow.** An attempt should be made to incorporate groundwater elevation data in the existing monitoring wells on the Parker Hannifin property during sampling events, in order to better evaluate groundwater flow direction in the area.
 - (6) **Landfill Gas Characterization.** In addition to analyzing landfill gas characterization samples by EPA Method TO-14, the samples shall also be analyzed for total Non-Methane Organic Compounds (NMOCs) by EPA Method 25A, or equivalent.
 - (7) **Schedule.** Due to the Department's review time of the application, the schedule for the CSA, as outlined in CSA Scope Section 1.2, may be delayed 2 months.
 - (8) **Monitoring Results Submittal.** The results of each sampling round shall be submitted to the Department for review prior to collection of the subsequent sampling round. The results shall include any proposed modifications to the sampling plan, if warranted.

- (9) **CSA Report Submittal.** The Final CSA report shall be presented to the Department with an application BWP SW 23 - Comprehensive Site Assessment. The CSA shall be prepared in accordance with the Landfill Technical Guidance Manual; 310 CMR 19.150 Landfill Assessment Requirements; and the approved CSA Scope.
- (10) **Further CSA Study.** In accordance with 310 CMR 19.150 (5), the CSA shall include a scope for further study, if warranted.
- (11) **Alternative Cap.** If, in accordance with 310 CMR 19.113, an alternative cap is proposed for the landfill, then additional assessment of the existing cover material will be required.
- (12) **Post-Closure Use.** If an active post-closure use of the site is proposed, a quantitative risk assessment shall be prepared to comply with the Office of Research and Standards (ORS) Solid Waste Landfill Quantitative Risk Assessment Scope of Work Guidance document, dated January 1996.
- (13) **Continued Environmental Monitoring.** Following completion of sampling for the CSA, the City shall continue to conduct environmental monitoring at the landfill in accordance with 310 CMR 19.132. Sampling shall be performed in accordance with the approved CSA Scope until an alternate environmental monitoring plan, based on the findings of the CSA, is submitted and approved by the Department. However, groundwater and surface water sampling may be performed on a semi-annual schedule, instead of quarterly as approved in the CSA Scope.
- (14) The Department reserves the right to require additional assessment and investigation of the landfill site area based on a review of environmental monitoring results. It is the applicant's responsibility to comply with all other applicable federal, state, and local statutes and regulations as a prerequisite to conducting work at the Waltham Woerd Avenue Landfill.

NOTICE OF RIGHT TO APPEAL

The City of Waltham (the "City") is hereby notified that it may within twenty-one (21) days file a request that this decision be deemed a provisional decision under 310 CMR 19.037(4)(b), by submitting a written statement of the basis on which the City believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed

a provisional decision with an effective date twenty-one (21) days after the Department's receipt of the request. Such a request shall reopen the administrative record, and the Department may rescind, supplement, modify, or reaffirm its decision. Failure by the City to exercise the right provided in this section shall constitute a waiver of the City's right to appeal.

Appeal. Any person aggrieved by the issuance of this decision, except as provided for under 310 CMR 19.037(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the receipt of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to the Department of their intention to commence such action. Said notice of intention shall include the Department file number and shall identify with particularity the issues and reasons why it is believed the decision was not proper. Such notice shall be provided to the Office of General Counsel of the Department and the Regional Director for the regional office which processed the application. The appropriate addresses to which to send such notices are:

General Counsel
Department of Environmental Protection
One Winter Street - 3rd Floor
Boston, MA 02108

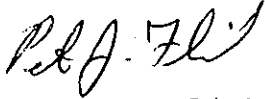
Regional Director
Department of Environmental Protection
10 Commerce Way
Woburn, MA 01801

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

Woerd Avenue Landfill
BWP SW 12, Transmittal No. 102380
Page 6

If you have any questions regarding this letter, or you need additional information, please contact Peter Flink at (617) 932-7663.

Sincerely,



Peter J. Flink
Environmental Analyst

Sincerely,



Edward H. MacDonald
Regional Engineer for
Waste Prevention

EHM/PJF

cc: Mr. Bruce Haskell, Camp Dresser & McKee Inc.
10 Cambridge Center, Cambridge, MA 02142
Waltham Board of Health

**Waltham, Massachusetts
Woerd Avenue Landfill**

**Groundwater and Surface Water
Quarterly Sampling Results**

May 1998 Sampling

TRANSMITTAL SHEET

*environmental engineers, scientists,
planners & management consultants*



Date: 7/16/98

Job: Quarterly Sampling Report

Groundwater, Surface Water and Gas Sampling

Woerd Avenue Landfill, Waltham, Massachusetts

To: Waltham Planning Department

610 Main Street

Waltham, MA 02154

Att: Mr. Ronald G. Vokey, Planning Director

We are sending

herewith
under separate cover.
by messenger.

2 print(s) each of the following: Quarterly Sampling Report for the Woerd Avenue Landfill

Which are

approved
approved as noted.
returned to you for correction and resubmittal
for your information & use
for your review

Two copies of this report have also been sent to Peter Flink at the DEP Northeast Regional Office.

Please call me if you have any questions.

Thank You..

CC: File

By James R. Laurila



Camp Dresser & McKee Inc.

consulting
engineering
construction
operations

Ten Cambridge Center
Cambridge, Massachusetts 02142
Tel: 617 252-8000 Fax: 617 621-2565

July 16, 1998

Mr. Peter Flink
Solid Waste Management Division
Department of Environmental Protection
Metropolitan Boston - Northeast Regional Office
205A Lowell Street
Wilmington, MA 01887

Subject: Groundwater, Surface Water and Gas Sampling
Woerd Avenue Landfill, Waltham, Massachusetts

Dear Mr. Flink:

Please find enclosed the following documents pertaining to the groundwater, surface water, and gas sampling event performed at the Woerd Avenue Landfill on May 18, 19 and 21, 1998.

- Written summary describing the sampling and analysis
- Landfill monitoring schematic depicting monitoring locations
- Summary tables presenting laboratory and field data for each monitoring point
- Laboratory data sheets and chain of custody forms

There was no exceedance of drinking water standards for volatile organics detected in this round of sampling. There were several exceedances of primary drinking water standards including exceedances of arsenic, barium, cadmium, chromium, copper, lead and mercury. In addition, there were several exceedances of secondary drinking water standards, including exceedances of iron and manganese; and exceedances of total dissolved solids and zinc. Many of the total metals concentrations may be due in large part to sediment in the water samples. Future samples will be filtered so that dissolved metals concentrations can be determined. The Massachusetts Department of Environmental Protection's (DEP) solid waste regulations (310 CMR 19.132) require that any exceedances of state or federal drinking water standards be reported to DEP, with resampling and analysis of the location with the exceedance to occur within 60 days of the prior sampling date. However, because routine quarterly sampling is occurring at this facility with the next sampling event scheduled for August, no additional sampling is planned prior to this next quarterly sampling round.

If there are any questions regarding this information please contact me at 617-252-8382 or Paul Taurasi at 617-252-8481.

Very truly yours,

CAMP DRESSER & MCKEE INC.

James R. Laurila, P.E.
Project Manager

cc: Mr. Ronald G. Vokey, Planning Department

SUMMARY OF QUARTERLY SAMPLING AND ANALYSIS
MAY 1998
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

Introduction

On May 18, 19 and 21, 1998, Camp Dresser & McKee's (CDM's) subconsultant CRB Geological & Environmental Services, Inc. collected groundwater and surface water samples in the vicinity of the Woerd Avenue Landfill. The sampling network at the landfill site currently consists of 8 groundwater monitoring wells and 3 landfill gas wells. The locations of the groundwater monitoring wells are identified as: CDM 1, CDM 1A, CDM 2, CDM 2A, CDM 3 (not sampled), CDM 3A, CDM 4 and CDM 4A. As noted above, monitoring well CDM 3 was not sampled because it was dry at the time of sampling. Monitoring wells CDM 1, CDM 2, CDM 3 and CDM 4 are shallow wells with 10-foot long screens with bottom of screen elevations ranging from 15 to 37-feet. Monitoring wells CDM 1A, CDM 2A, CDM 3A and CDM 4A are deeper wells with 10-foot long screens with bottom of screen depths ranging from 75 to 97-feet. Two surface water samples were also taken from Cram's Cove at locations identified as Cove 1 and Cove 2. Additional surface water samples were planned for two locations within the existing swale located at the southwestern area of the site, however the swale was dry at the time of sampling. Additionally, as part of the quarterly gas monitoring program, gas monitoring wells LFG 1, LFG 2, and LFG 3 were sampled for the presence of methane and hydrogen sulfide.

The above-referenced sampling locations are indicated on the attached Existing Conditions Plan. The sampling wells were located as close to the site property border as access would allow. However, the shallow overburden wells were installed in filled material in all locations. The deep overburden wells were installed in native soils. The fill material encountered was mainly ash. The installation of the wells and other site conditions will be reported in detail in the *Comprehensive Site Assessment Report*.

Groundwater and surface water samples were analyzed for volatile organic compounds (VOCs), dissolved metals, and several indicator parameters at the Camp Dresser & McKee Laboratory in Cambridge, Massachusetts. Both the laboratory reports for this sampling round and summary tables of the analytical results are included in this report.

Groundwater Quality

Indicator Parameters

As shown on the attached tables, the samples indicated no exceedance of Massachusetts Department of Environmental Protection (MDEP) or Environmental Protection Agency (EPA) Primary Standards (primary standards) for all the field parameters and conventional parameters measured. Concentrations of total dissolved solids (TDS) exceeded the Massachusetts Drinking Water Guidelines and EPA Secondary Maximum Contaminant Level (secondary standards) at CDM-1 (duplicate sample), CDM 2, CDM 4, and CDM 4A. Concentrations of TDS ranged from 700 mg/L to 1,400 mg/L for these samples. The secondary standard for pH was exceeded at CDM 2 with value of 8.86, above the standard's range of 6.5 to 8.5.

Metals

The metals concentrations reported were total metals since the samples were not filtered. Future sampling events will include the filtering of samples to determine dissolved metals concentrations.

There were several exceedances of the primary standards for metals detected in the groundwater samples. The primary standard for lead was exceeded by all samples, except at CDM 1A and CDM 3A. The largest concentrations of lead were detected at CDM 4 at 14,000 ug/L and at CDM 1 at 1,300 ug/L, well above the primary standard of 15 ug/L. The primary standards for arsenic, cadmium and chromium were exceeded at CDM 4 and CDM 2A at maximum concentrations of 210 ug/L, 150 ug/L and 2,000 ug/L, above the primary standards of 50 ug/L, 5 ug/L and 100 ug/L, respectively. The primary standards for barium, copper and mercury were exceeded at CDM 4 at concentrations of 5,400 ug/L, 17,000 ug/L and 3.3 ug/L, above the primary standards of 2,000 ug/L, 1,300 ug/L and 2 ug/L, respectively.

There were several exceedances of the secondary standards for metals detected in the groundwater samples. The secondary standard for iron was exceeded for all seven monitoring wells sampled with two concentrations as high as 5,100,000 ug/L at CDM 2A and 370,000 ug/L at CDM 4, considerably above the standard of 300 ug/L. The secondary standard for manganese was exceeded for all seven monitoring wells sampled with a concentration as high as 110,000 ug/L at CDM 2A, considerably above the standard of 50 ug/L.

Volatile Organic Compounds

No exceedances of primary or secondary standards were detected for any VOC's in this sampling round. Chlorobenzene, 1,2-Dichlorobenzene, cis 1,2-Dichloroethene were detected in monitoring well CDM 3A at low concentrations of 1.3 ug/L, 1.9 ug/L, and 19 ug/L, below the primary standards of 600 ug/L, 100 ug/L and 70 ug/L, respectively. Naphthalene, a compound not regulated by primary or secondary standards, was detected in monitoring well CDM 4 at a low concentration of 2.8 ug/L.

Surface Water Quality

This quarterly monitoring of Cram's Cove surface water quality with samples from locations Cove 1 and Cove 2 indicate low concentrations of several parameters. Additional surface water samples were planned for two locations within the existing swale located at the southwestern area of the site, however the swale was dry at the time of sampling

Indicator Parameters

No exceedances of primary or secondary standards were detected in either surface water sample, Cove 1 or Cove 2 for any of the indicator parameters. Nitrate-nitrogen, sulfate and chloride were detected at maximum levels of 0.36 ug/L, 43 ug/l and 60 ug/L for the two samples, below the standards of 10 ug/l, 250 ug/L and 250 ug/L, respectively.

Metals

Lead was the only metal detected in either surface water sample which exceeded the primary standard. Lead was detected at 18 ug/L in Cove 2, just above the primary standard for lead of 15 ug/L. There was exceedances of both iron and manganese for both Cove 1 and Cove 2 at maximum

levels of 5,100 ug/l and 190 ug/L, above the secondary standards of 300 ug/l and 50 ug/l, respectively. Barium, copper and zinc were detected but at levels considerably below the primary and secondary standards and generally below the concentrations detected at the groundwater monitoring wells.

Volatile Organic Compounds

No exceedances of primary or secondary standards for VOC's were detected in either surface water sample, Cove 1 or Cove 2. Methyl Tert-butyl Ether was the only VOC detected and was detected in both Cove 1 and Cove 2 samples at concentrations of 3.2 ug/L and 1.7 ug/L, both significantly below the secondary standard of 70 ug/L.

Quality Control

A trip blank was collected for each of the two days of groundwater sampling, May 18 and May 21, 1998. The only detection of volatile organic compounds was a concentration of 55 ug/L of acetone in the trip blank from May 21, 1998. There was no detection of acetone in any of the groundwater or surface water samples, therefore it appears that the detection was caused by a contamination only effecting that one sample and has no effect on the results of the other samples.

One duplicate sample was collected from CDM 1. The concentrations detected for the initial CDM 1 sample varied from the concentrations detected for the duplicate sample. However, they both had similar exceedances of primary and secondary standards and the concentrations of metals were generally in the same proportion between both samples. The discrepancy may be due to the sediment in the unfiltered samples.

Landfill Gas Monitoring

The concentrations of methane, hydrogen sulfide, carbon dioxide and oxygen gases were measured at gas monitoring wells LFG 1, LFG 2 and LFG 3. There was only one detection of methane at LFG 1 at a concentration of 0.3 percent (of methane by volume in air), considerably below the lower explosive limit of 5 percent. The detection of oxygen at an average of 11.0 percent and the absence of methane indicates that ash at this site is stable and is not anaerobically degrading. Gas migration does not appear to be a problem at this site.

Conclusions

The results of the laboratory analysis of the first round of quarterly sampling show exceedances of primary standards in certain metals but no exceedances in indicator parameters or VOCs. Five of the seven monitoring wells sampled contained concentrations of lead exceeding the primary standard. The sample from CDM 4 contained a lead concentration of over 900 times the primary standard. Also, the primary standards for arsenic, barium, cadmium, chromium, copper and mercury were all exceeded at one or two locations of groundwater sampling. The high levels of certain metals are likely due to the monitoring wells being located within the waste boundary and may not necessarily represent the quality of groundwater beyond the site boundaries. Also, the metals concentrations reported were total metals since the samples were not filtered. Future sampling events will include the filtering of samples to determine dissolved metals concentrations.

The surface water samples from Cram's Cove showed similar water quality to groundwater sampled within the site, however, at generally lower concentrations. Lead was the only contaminant detected in either surface water sample which exceeded the primary standard and was detected just above the regulated concentration.

The gas monitoring at the site showed no methane gas migration. The waste appears to be biologically stable and gas migration does not appear to be a problem.

Groundwater and surface water quality will continue to be evaluated quarterly as part of routine monitoring and as part of the preparation of the *Comprehensive Site Assessment Report*.

WATER QUALITY SAMPLING SUMMARY
MAY 1998 SAMPLING ROUND
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

SAMPLE NUMBER	DRINKING WATER REGULATIONS	98-04320	98-04321	98-04319	98-04322	98-04433	98-04434	98-04435	98-04436	98-04379	98-04380
SAMPLING DATE	UNITS	18-May-98	18-May-98	18-May-98	18-May-98	21-May-98	21-May-98	21-May-98	21-May-98	19-May-98	19-May-98
LOCATION ID		CDM 1	CDM 1 - Duplicate	CDM 2	CDM 4	CDM 1A	CDM 2A	CDM 3A	CDM 4A	Cove 1	Cove 2
FIELD PARAMETERS											
SPECIFIC CONDUCTANCE	umhos	382	382	1,285	1,852	196	165	389	1,217	--	--
DISSOLVED OXYGEN	mg/l	—	—	---	—	4.0	2.5	2.3	2.5	---	---
pH	Std	8.18	8.18	8.86	7.75	—	---	—	—	---	---
WATER LEVEL (MEAN SEA LEVEL)	ft.	40.44	40.44	39.16	37.41	43.78	39.73	37.70	37.46	---	---
TEMPERATURE	C	16.4	16.4	15.8	18.9	17.9	17.7	26.1	17.0	---	---
CONVENTIONAL PARAMETERS											
ALKALINITY	mg/l	140	130	660	900	74	79	150	300	180	160
TDS (TOT. DISSOLVED SOLIDS)	mg/l	240	730	760	1,400	140	140	<5.0	700	340	280
NITRATE-NITROGEN	mg/l	4	4	<0.050	0.58	<0.050	<0.050	<0.050	<0.050	0.36	0.22
CYANIDE, TOTAL	mg/l	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
SULFATE	mg/l	36	27	79	85	<10	<10	<10	<10	36	43
CHLORIDE	mg/l	3.6	3.8	22	66	11	4.1	27	200	60	50
COD (CHEMICAL OXYGEN DEMAND)	mg/l	20	31	120	140	48	66	7	16	57	140
METALS											
ARSENIC	ug/l	11	<5.0	9.5	120	<5.0	210	12	<5.0	5.2	<5.0
BARIUM	ug/l	260	110	590	5,400	24	570	120	160	260	230
CADMIUM	ug/l	4	1.3	2	83	<1.0	150	<1.0	1.7	<1.0	<1.0
CHROMIUM	ug/l	66	19	11	2,000	5.1	990	<5.0	19	<5.0	<5.0
COPPER	ug/l	740	220	70	17,000	8.2	680	<5.0	27	9.8	17
IRON	ug/l	47,000	11,000	27,000	370,000	10,000	5,100,000	990	12,000	5,100	5,800
LEAD	ug/l	1,300	380	430	14,000	<5.0	140	<5.0	22	8.4	18
MANGANESE	ug/l	1,500	1,300	540	1,800	190	110,000	380	3,300	190	140
MERCURY	ug/l	<0.20	0.26	0.22	3.3	<0.20	0.5	<0.20	<0.20	<0.20	<0.20
SELENIUM	ug/l	<10	<10	<10	28	<10	<10	<10	11	<10	<10
SILVER	ug/l	<5.0	<5.0	<5.0	55	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
ZINC	ug/l	380	120	470	13,000	34	3,600	<20	57	91	86

FOOTNOTES:

- HIGHLIGHTED AREA: CONCENTRATION EXCEEDS MASSACHUSETTS OR EPA DRINKING WATER STANDARDS
 - MASSACHUSETTS DRINKING WATER STANDARD
 - MASSACHUSETTS DRINKING WATER GUIDELINE OR SECONDARY MAXIMUM CONTAMINANT LEVEL
 - EPA PRIMARY DRINKING WATER STANDARD
 - EPA SECONDARY DRINKING WATER STANDARD
 - NO SAMPLE WAS TAKEN AT GROUNDWATER MONITORING WELL MW-3 BECAUSE GROUNDWATER WAS BELOW BOTTOM OF SCREEN.
 - SAMPLES WERE NOT FILTERED, THEREFORE TOTAL CONCENTRATIONS OF METALS INCLUDING DISSOLVED, SUSPENDED AND SETTLED METALS MAY HAVE BEEN PRESENT DURING ANALYSIS.
- <# NOT DETECTED TO THE LIMIT INDICATED
NL NO LIMIT
— THIS ANALYSIS WAS NOT PERFORMED.

WATER QUALITY SAMPLING SUMMARY
MAY 1998 SAMPLING ROUND - QA/QC
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

SAMPLE NUMBER	98-04321	98-04323	98-04437
SAMPLING DATE	18-May-98	18-May-98	21-May-98
LOCATION ID	CDM 1 - Duplicate	Trip Blank	Trip Blank
UNITS	DRINKING WATER REGULATIONS		
VOLATILE ORGANICS			
1,1,1,2-TETRACHLOROETHANE	NL	<1.0	<2.0
1,1,1-TRICHLOROETHANE	200 (2,4)	<1.0	<2.0
1,1,2,2-TETRACHLOROETHANE	NL	<1.0	<2.0
1,1,2-TRICHLOROETHANE	5 (2,4)	<1.0	<2.0
1,1-DICHLOROETHANE	70(3)	<1.0	<2.0
1,1-DICHLOROETHENE	7 (2,4)	<1.0	<2.0
1,1-DICHLOROPROPENE	NL	<1.0	<2.0
1,2,3- TRICHLOROBENZENE	NL	<1.0	<2.0
1,2,3-TRICHLOROPROPANE	NL	<1.0	<2.0
1,2,4-TRICHLOROBENZENE	70(2,4)	<1.0	<2.0
1,2,4-TRIMETHYLBENZENE	NL	<1.0	<2.0
1,2- DIBROMO- 3-CHLOROPROPANE	0.2(2)	<1.0	<2.0
1,2-DIBROMOETHANE	NL	<1.0	<2.0
1,2-DICHLOROBENZENE	600 (2,4)	<1.0	<2.0
1,2-DICHLOROETHANE	5(2,4)	<1.0	<2.0
1,2-DICHLOROPROPANE	5 (2,4)	<1.0	<2.0
1,3,5-TRIMETHYLBENZENE	NL	<1.0	<2.0
1,3-DICHLOROBENZENE	NL	<1.0	<2.0
1,3-DICHLOROPROPANE	NL	<1.0	<2.0
1,4-DICHLOROBENZENE	75(2,4)	<1.0	<2.0
2,2-DICHLOROPROPANE	NL	<1.0	<2.0
2-BUTANONE	NL	<20	<40
2-CHLOROTOLUENE	NL	<1.0	<2.0
2-HEXANONE	NL	<20	<40
4-CHLOROTOLUENE	NL	<1.0	<2.0
4-METHYL-2-PENTANONE	NL	<20	<40
ACETONE	3000 (3)	<20	55
BENZENE	5 (2,4)	<1.0	<2.0
BROMOBENZENE	NL	<1.0	<2.0
BROMOCHLOROMETHANE	NL	<1.0	<2.0
BROMODICHLOROMETHANE	NL	<1.0	<2.0
BROMOFORM	NL	<1.0	<2.0
BROMOMETHANE	10 (3)	<5.0	<10
CARBON TETRACHLORIDE	5 (2,4)	<1.0	<2.0
CHLOROBENZENE	100 (2)	<1.0	<2.0
CHLOROETHANE	NL	<5.0	<10
CHLOROFORM	5 (3)	<5.0	<10
CHLOROMETHANE	NL	<5.0	<10
cis 1,2-DICHLOROETHENE	70 (2,4)	<1.0	<2.0
cis 1,3-DICHLOROPROPENE	NL	<1.0	<2.0
DIBROMOCHLOROMETHANE	NL	<1.0	<2.0

GAS WELL SAMPLING RESULTS
MAY 1998 SAMPLING ROUND
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

Parameter	Meter	LFG 1	LFG 2	LFG 3
METHANE	LANDTEC	0.3	0.0	0.0
VOCs	---	---	---	---
HYDROGEN SULFIDE	BACHRACH	0.0	0.0	0.0
CARBON DIOXIDE	LANDTEC	8.9	8.5	5.5
OXYGEN	LANDTEC	9.2	10.3	13.4

Notes:

1. Values are expressed in percent by volume in air.
 2. LEL = Lower Explosive Limit. The lower explosive limit of methane in air is 5% methane by volume in air.
- This analysis was not performed.

Client: City of Waltham

Project: Waltham landfill

SDG: 980519-632

Date: 6/4/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980519-632
Client: City of Waltham
Project: Waltham landfill

Print Date: 6/4/98
Client Contact: *JIM LAURA*
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW:

James F. O'Neil

LABORATORY QA/QC REVIEW:

Letitia May - 1

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509,
NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Cove 1	05/19/98	05/19/98	98-04379	AQUEOUS
Cove 2	05/19/98	05/19/98	98-04380	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980519-632	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 1		
Lab Sample ID:	98-04379	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	91.14	86 - 115
Dibromofluoromethane	99.24	86 - 118
Toluene-d8	94.98	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980519-632
Client Sample ID: Cove 1
Lab Sample ID: 98-04379
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	260	
Iron	25	5100	
Manganese	5.0	190	
Zinc	20	91	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980519-632	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 2	Analytical Batch ID:	I980524/8260A_AQU/261
Lab Sample ID:	98-04380	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	1.7	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 2
 Lab Sample ID: 98-04380
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	110.40	86 - 115
Dibromofluoromethane	104.22	86 - 118
Toluene-d8	105.76	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980519-632
Client Sample ID: Cove 2
Lab Sample ID: 98-04380
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	230	
Iron	25	5800	
Manganese	5.0	140	
Zinc	20	86	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Preparation Batch: P980526/9012_AQ_P/22

Prep. Analyst: DEVLINHA

Component Name:	Cyanide, Total	EPA Method #:	EPA 9012	Matrix:	AQUEOUS
Analytical Batch:	I980526/9012_AQUE/22	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 5/26/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	0.015	<0.015	1	
Cove 2	98-04380	0.015	<0.015	1	

Component Name:	Nitrate	EPA Method #:	EPA 353.2	Matrix:	AQUEOUS
Analytical Batch:	I980521/353.2_AQU/65	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 5/26/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	0.050	0.36	1	
Cove 2	98-04380	0.050	0.22	1	

Component Name:	Total Dissolved Solids	EPA Method #:	SM 2540C	Matrix:	AQUEOUS
Analytical Batch:	I980529/2540C_AQU/41	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 5/29/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	5.0	340	1	
Cove 2	98-04380	5.0	280	1	

Component Name:	Alkalinity	EPA Method #:	SM 2320B	Matrix:	AQUEOUS
Analytical Batch:	I980601/2320B_AQU/36	Analyst:	NGUYENMH	Units:	mg/L CaCO3
Reviewed By - Date:	GOTTSHALLDL - 6/1/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	5.0	180	1	
Cove 2	98-04380	5.0	160	1	

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980603/8000_AQUE/35	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	5.0	57	1	
Cove 2	98-04380	5.0	140	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980603/9251_AQUE/15	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	1.0	60	1	
Cove 2	98-04380	1.0	50	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	I980604/9038_AQUE/15	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/4/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	10	36	1	
Cove 2	98-04380	10	43	1	

PREPARATION INFORMATION REPORT

SDG #: 980519-632

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Cove 2	98-04380	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/28/98
Cove 2	98-04380	05/19/98	05/19/98		05/28/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/26/98
Cove 2	98-04380	05/19/98	05/19/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/20/98
Cove 2	98-04380	05/19/98	05/19/98		05/20/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/29/98	06/01/98
Cove 2	98-04380	05/19/98	05/19/98	05/29/98	06/01/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/22/98	05/22/98
Cove 2	98-04380	05/19/98	05/19/98	05/22/98	05/22/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/21/98	05/21/98
Cove 2	98-04380	05/19/98	05/19/98	05/21/98	05/21/98

HOLDTIME SUMMARY

Analysis: 9038_AQUEOUS
Analysis Desc: Sulfate

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/03/98
Cove 2	98-04380	05/19/98	05/19/98		06/03/98

Analysis: 9251_AQUEOUS
Analysis Desc: Chloride

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

353.2_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: B98-03097 Prep Analyst: DEVLINHA
EPA Number: EPA 9012 Analytical Batch ID: I980526/9012_AQUE/22
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C Analytical Batch ID: I980529/2540C_AQU/41
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03282 Prep Analyst:
EPA Number: SM 2320B Analytical Batch ID: I980601/2320B_AQU/36
Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/1/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Barium	5.0	<5.0	
Iron	25	<25	
Manganese	5.0	<5.0	

6010A_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Zinc	20	<20	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03346 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03348 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03352 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03354 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03356 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03379 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03381 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: QCS98-03016 Prep. Analyst:
Units: mg/L
Matrix: AQUEOUS Analytical Batch ID: I980521/353.2_AQU/65
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	0.82	93.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: QCS98-03098 Prep. Analyst: DEVLINHA
Units: mg/L
Matrix: AQUEOUS Analytical Batch ID: I980526/9012_AQUE/22
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: QCS98-03209 Prep. Analyst:
Units: mg/L
Matrix: AQUEOUS Analytical Batch ID: I980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03283
Units: mg/L CaCO3
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980601/2320B_AQU/36
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	140	104.6	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03347
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	240	97.3	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03349
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	230	95.8	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03353
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	70	102.9	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03355
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	67	98.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03357
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	270	99.6	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	250	98.0	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	260	101.2	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980519-632
 Lab Sample ID: LFB98-03067
 EPA Method #: EPA 8260A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	106.9	109.9	2.73	61 - 145	0 - 14	
Benzene	1.0	50.00	108.3	109.7	1.36	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	104.4	107.5	2.93	75 - 130	0 - 13	
Toluene	1.0	50.00	105.6	100.6	4.79	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	105.6	104.8	0.72	71 - 120	0 - 14	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

SDG #: 980519-632
 Lab Sample ID: LFB98-03299
 EPA Method #: EPA 6010A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.0	1000.00	93.8			80 - 120		
Iron	25	200.00	103.5			80 - 120		
Manganese	5.0	100.00	88.4			80 - 120		
Zinc	20	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	P980526/9012_AQ_P/22
EPA Method #:	EPA 9012	Prep. Analyst:	DEVLINHA
Lab Sample ID:	98-04319	Analytical Batch ID:	I980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04319	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: SM 2320B Prep. Analyst:
 Lab Sample ID: 98-04353
 Units: mg/L CaCO3 Analytical Batch ID: I980601/2320B_AQU/36
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	<5.0	<5.0	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-04379
 Units: mg/L Analytical Batch ID: I980521/353.2_AQU/65
 Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-04401
 Units: mg/L Analytical Batch ID: I980604/9038_AQUE/15
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: SM 2540C Prep. Analyst:
 Lab Sample ID: 98-04404
 Units: mg/L Analytical Batch ID: I980529/2540C_AQU/41
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	55	42	26.804	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>5/29/98</u>				

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: HACH 8000 Prep. Analyst:
 Lab Sample ID: 98-04405
 Units: mg/L Analytical Batch ID: I980603/8000_AQUE/35
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	540	540	0.185	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/3/98</u>				

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
 EPA Method #: EPA 6010A Prep. Analyst: LESHINSKYA
 Lab Sample ID: 98-04435
 Units: ug/L Analytical Batch ID: I980602/6010A_AQU/95
 Matrix: AQUEOUS Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.0	120	130	4.672	0 - 20	
Iron	25	810	1100	27.144	0 - 20	
Manganese	5.0	380	400	4.779	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/3/98</u>				

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04444	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	15	16	3.279	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/1/98		

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	15	15	0.027	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/3/98		

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	16	17	6.061	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/4/98		

353.2_AQUEOUS MS/MSD RPD REPORT

SDG #: 980519-632
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: 1980521/353.2_AQU/65
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD					
Nitrate	99				80 - 120		
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>5/26/98</u>					

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Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
2320B_AQUEOUS	mg/L CaCO3	180	160
2540C_AQUEOUS	Total Dissolved Solids mg/L	340	280
353.2_AQUEOUS	Nitrate mg/L	0.36	0.22
6010A_AQUEOUS	Barium ug/L	260	230
	Iron ug/L	5100	5800
	Manganese ug/L	190	140
	Zinc ug/L	91	86
8000_AQUEOUS	COD mg/L	57	140
8260A_AQUEOUS	1,1,1,2-Tetrachloroet ug/L	<1.0	<1.0
	1,1,1-Trichloroethane ug/L	<1.0	<1.0
	1,1,2,2-Tetrachloroet ug/L	<1.0	<1.0
	1,1,2-Trichloroethane ug/L	<1.0	<1.0
	1,1-Dichloroethane ug/L	<1.0	<1.0
	1,1-Dichloroethene ug/L	<1.0	<1.0
	1,1-Dichloropropene ug/L	<1.0	<1.0
	1,2,3-Trichlorobenzen ug/L	<1.0	<1.0
	1,2,3-Trichloropropan ug/L	<1.0	<1.0

Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
8260A_AQUEOUS			
1,2,4-Trichlorobenze	ug/L	<1.0	<1.0
1,2,4-Trimethylbenze	ug/L	<1.0	<1.0
1,2-Dibromo-3-chloro	ug/L	<1.0	<1.0
1,2-Dibromoethane	ug/L	<1.0	<1.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0
1,3,5-Trimethylbenze	ug/L	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0
1,3-Dichloropropane	ug/L	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0
2,2-Dichloropropane	ug/L	<1.0	<1.0
2-Butanone	ug/L	<20	<20
2-Chlorotoluene	ug/L	<1.0	<1.0
2-Hexanone	ug/L	<20	<20
4-Chlorotoluene	ug/L	<1.0	<1.0
4-Methyl-2-pentanone	ug/L	<20	<20

Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
8260A_AQUEOUS	ug/L	<20	<20
Acetone	ug/L	<1.0	<1.0
Benzene	ug/L	<1.0	<1.0
Bromobenzene	ug/L	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0
Bromodichloromethan	ug/L	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0
Bromomethane	ug/L	<5.0	<5.0
Carbon tetrachloride	ug/L	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0
Chloroform	ug/L	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0
cis-1,2-Dichloroethen	ug/L	<1.0	<1.0
cis-1,3-Dichloroprope	ug/L	<1.0	<1.0
Dibromochloromethan	ug/L	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0
Dichlorodifluorometha	ug/L	<1.0	<1.0

Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
8260A_AQUEOUS	ug/L	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0
Hexachlorobutadiene	ug/L	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0
Isopropylmethylbenzene	ug/L	<1.0	<1.0
m- and p-Xylenes	ug/L	<1.0	<1.0
Methyl tert-butyl ethe	ug/L	3.2	1.7
Methylene chloride	ug/L	<5.0	<5.0
n-Butylbenzene	ug/L	<1.0	<1.0
n-Propylbenzene	ug/L	<1.0	<1.0
Naphthalene	ug/L	<1.0	<1.0
o-Xylene	ug/L	<1.0	<1.0
sec-Butylbenzene	ug/L	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0
tert-Butylbenzene	ug/L	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0

	Description	Id Text	Cove 1	Cove 2
Analysis Name	Name	Units	98-04379	98-04380
8260A_AQUEOUS	trans-1,3-Dichloropro	ug/L	<1.0	<1.0
	Trichloroethene	ug/L	<1.0	<1.0
	Trichlorofluoromethan	ug/L	<1.0	<1.0
	Vinyl chloride	ug/L	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	mg/L	<0.015	<0.015
9038_AQUEOUS	Sulfate	mg/L	36	43
9251_AQUEOUS	Chloride	mg/L	60	50

Chain of Custody

CDM Analytical Laboratory
 840 Memorial Drive
 Cambridge, MA 02139
 Phone: (617) 354-4448
 Fax: (617) 354-0764
 Field Log # **Q# 1447** Page **1** of **1**

Client: **City of Waltham**
 Project Name: **Waltham Landfill**
 Project #: _____
 Address: _____
 SDG#: **980519-632**
 TAT: **STD**
 TAT Approved by: **203**

Contact: **Sampled by CRB**
 Report to: **Jim Lavilla**
 Bill to: _____
 Phone: **250-8368 - Burns**
 Lab Acct #: _____
 VOA: _____
 SEMI VOA: _____
 MISC: _____
 METALS: _____
 OTHER: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC			METALS			OTHER							
						524.2	8260 624/8240	8260	Other	525	625/8270 A, B/N, AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13		RCRA 8	Other	Filtered (Y/N)				
Cove 1	5/19/88	11:30	Soil	6	98-04374	<input checked="" type="checkbox"/>																			
Cove 2	11:50		Soil	↓	98-04380	<input checked="" type="checkbox"/>																			
messy	3:15		Soil	↓	98-04381	<input checked="" type="checkbox"/>																			

CANCEL
 LARGE
 CRB

A - HCl D - NaOH P - Plastic
 B - HNO₃ E - NaThio G - Glass
 C - H₂SO₄ F - Other V - Vial
 Container Type:
 Preservative:
 Volume:

Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS
 Cooler Temperature? Chilled/properly preserved? In good condition? Evidence of tampering?

Method of Shipment: Courier UPS Fed-ex Hand
 Shipper/Airbill#: _____ Custody Seal#: _____

Comments:
 Chloride →
 Sulfate →
 Nitrate nitrogen
 TDS -
 Alkalinity
 Iron -
 Barium -
 Zinc -
 manganese -
 Total cyanide

NOTE: All samples submitted subject to Standard Terms & Conditions

Client: City of Waltham

Project: Waltham Landfill

SDG: 980518-620

Date: 6/5/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980518-620
Client: City of Waltham
Project: Waltham Landfill

Print Date: 6/5/98
Client Contact: *JIM LAURELL*
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

BATCH NOTES

TDS: I980529/2540C_AQU/41

Samples 98-04310, 98-04319, 98-04320, 98-04321, and 98-04322 were all analyzed one day beyond the EPA recommended maximum holding time due to intervening holiday and laboratory oversight.

RESULT NOTES

98-04319, 4320, 4322 (Iron) E qualifier = determined concentration exceeds system calibration linear range; samples were reanalyzed diluted and the additional results are reported in the single component report (p.18 of 39).

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW: *Lita May*

LABORATORY QA/QC REVIEW: *Jim F. O'Rourke*

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, RA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
CDM 2	05/18/98	05/18/98	98-04319	AQUEOUS
Duplicate	05/18/98	05/18/98	98-04321	AQUEOUS
CDM 1	05/18/98	05/18/98	98-04320	AQUEOUS
CDM 4	05/18/98	05/18/98	98-04322	AQUEOUS
Trip Blank	05/18/98	05/18/98	98-04323	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 2		
Lab Sample ID:	98-04319	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 2
Lab Sample ID: 98-04319
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	96.92	86 - 115
Dibromofluoromethane	100.32	86 - 118
Toluene-d8	99.58	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 2
Lab Sample ID: 98-04319
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	590	
Iron	25	26000	E
Manganese	5.0	540	
Zinc	20	470	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 1		
Lab Sample ID:	98-04320	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 1
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	87.58	86 - 115
Dibromofluoromethane	92.52	86 - 118
Toluene-d8	101.44	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 1
Lab Sample ID: 98-04320
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	260	
Iron	25	38000	E
Manganese	5.0	1500	
Zinc	20	380	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	89.62	86 - 115
Dibromofluoromethane	94.16	86 - 118
Toluene-d8	97.48	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	110	
Iron	25	11000	
Manganese	5.0	1300	
Zinc	20	120	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	2.8	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 4		
Lab Sample ID:	98-04322	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	104.72	86 - 115
Dibromofluoromethane	101.00	86 - 118
Toluene-d8	101.50	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	5400	
Iron	25	270000	E
Manganese	5.0	1800	
Zinc	20	13000	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Trip Blank
Lab Sample ID: 98-04323
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Trip Blank		
Lab Sample ID:	98-04323	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	114.36	86 - 115
Dibromofluoromethane	109.76	86 - 118
Toluene-d8	101.30	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Preparation Batch: P980526/9012_AQ_P/22	Prep. Analyst: DEVLINHA
Component Name: Cyanide, Total	EPA Method #: EPA 9012
Analytical Batch: I980526/9012_AQUE/22	Analyst: DEVLINHA
Reviewed By - Date: GOTTSALLDL - 5/26/98	Matrix: AQUEOUS Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.015	<0.015	1	
CDM 1	98-04320	0.015	<0.015	1	
Duplicate	98-04321	0.015	<0.015	1	
CDM 4	98-04322	0.015	<0.015	1	

Preparation Batch: P980601/3015/121	Prep. Analyst: LESHINSKYA
Component Name: Iron	EPA Method #: EPA 6010A
Analytical Batch: I980603/6010A_AQU/98	Analyst: LESHINSKYA
Reviewed By - Date: GOTTSALLDL - 6/4/98	Matrix: AQUEOUS Units: ug/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	50	27000	2	
CDM 1	98-04320	50	47000	2	
CDM 4	98-04322	500	370000	20	

Component Name: Alkalinity	EPA Method #: SM 2320B	Matrix: AQUEOUS
Analytical Batch: I980519/2320B_AQU/35	Analyst: DEVLINHA	Units: mg/L CaCO3
Reviewed By - Date: GOTTSALLDL - 5/19/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.0	660	1	
CDM 1	98-04320	5.0	140	1	
Duplicate	98-04321	5.0	130	1	
CDM 4	98-04322	5.0	900	1	

Component Name: Nitrate	EPA Method #: EPA 353.2	Matrix: AQUEOUS
Analytical Batch: I980521/353.2_AQU/65	Analyst: DEVLINHA	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 5/26/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.050	<0.050	1	
CDM 1	98-04320	0.50	4.0	10	
Duplicate	98-04321	0.50	4.0	10	
CDM 4	98-04322	0.050	0.58	1	

Component Name: Total Dissolved Solids	EPA Method #: SM 2540C	Matrix: AQUEOUS
Analytical Batch: I980529/2540C_AQU/41	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 5/29/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.0	760	1	
CDM 1	98-04320	5.0	240	1	
Duplicate	98-04321	5.0	730	1	
CDM 4	98-04322	5.0	1400	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980603/8000_AQUE/35	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.0	120	1	
CDM 1	98-04320	5.0	20	1	
Duplicate	98-04321	5.0	31	1	
CDM 4	98-04322	5.0	140	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980603/9251_AQUE/15	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	1.0	22	1	
CDM 1	98-04320	1.0	3.6	1	
Duplicate	98-04321	1.0	3.8	1	
CDM 4	98-04322	1.0	66	1	

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	I980604/9038_AQUE/15	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/4/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	10	79	1	
CDM 1	98-04320	10	36	1	
Duplicate	98-04321	10	27	1	
CDM 4	98-04322	10	85	1	

PREPARATION INFORMATION REPORT

SDG #: 980518-620

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 1	98-04320	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Duplicate	98-04321	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 4	98-04322	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Trip Blank	98-04323	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
		DUPLICATE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
		MATRIX_SPIKE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Duplicate	98-04321	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Duplicate	98-04321	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/19/98
CDM 1	98-04320	05/18/98	05/18/98		05/19/98
Duplicate	98-04321	05/18/98	05/18/98		05/19/98
CDM 4	98-04322	05/18/98	05/18/98		05/19/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/26/98
CDM 1	98-04320	05/18/98	05/18/98		05/26/98
Duplicate	98-04321	05/18/98	05/18/98		05/26/98
CDM 4	98-04322	05/18/98	05/18/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/20/98
CDM 1	98-04320	05/18/98	05/18/98		05/20/98
Duplicate	98-04321	05/18/98	05/18/98		05/20/98
CDM 4	98-04322	05/18/98	05/18/98		05/20/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/29/98	06/01/98
				05/29/98	06/04/98
CDM 1	98-04320	05/18/98	05/18/98	05/29/98	06/01/98
				05/29/98	06/04/98
Duplicate	98-04321	05/18/98	05/18/98	05/29/98	06/01/98
CDM 4	98-04322	05/18/98	05/18/98	05/29/98	06/01/98
				05/29/98	06/04/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

HOLDTIME SUMMARY

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/22/98	05/22/98
CDM 1	98-04320	05/18/98	05/18/98	05/22/98	05/22/98
Duplicate	98-04321	05/18/98	05/18/98	05/22/98	05/22/98
CDM 4	98-04322	05/18/98	05/18/98	05/22/98	05/22/98
Trip Blank	98-04323	05/18/98	05/18/98	05/22/98	05/22/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/21/98	05/21/98
CDM 1	98-04320	05/18/98	05/18/98	05/21/98	05/21/98
Duplicate	98-04321	05/18/98	05/18/98	05/21/98	05/21/98
CDM 4	98-04322	05/18/98	05/18/98	05/21/98	05/21/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/03/98
CDM 1	98-04320	05/18/98	05/18/98		06/03/98
Duplicate	98-04321	05/18/98	05/18/98		06/03/98
CDM 4	98-04322	05/18/98	05/18/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

2320B_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-02935	Prep Analyst:	
EPA Number:	SM 2320B	Analytical Batch ID:	I980519/2320B_AQU/35
Units:	mg/L CaCO ₃	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980524/5030/361
Lab Sample ID: B98-03066 Prep Analyst: MITCHELLMR
EPA Number: EPA 8260A Analytical Batch ID: I980524/8260A_AQU/261
Units: ug/L Analysis Analyst: MITCHELLMR
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: B98-03097 Prep Analyst: DEVLINHA
EPA Number: EPA 9012 Analytical Batch ID: I980526/9012_AQUE/22
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C Analytical Batch ID: I980529/2540C_AQU/41
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Barium	5.0	<5.0	
Iron	25	<25	
Manganese	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03346 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03348 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03352 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03354 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03356 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03379 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03381
EPA Number: EPA 9038
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: QCS98-02936 Prep. Analyst:
Units: mg/L CaCO3 Analytical Batch ID: I980519/2320B_AQU/35
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	130	99.2	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: QCS98-03016 Prep. Analyst:
Units: mg/L Analytical Batch ID: I980521/353.2_AQU/65
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	0.82	93.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: QCS98-03098 Prep. Analyst: DEVLINHA
Units: mg/L Analytical Batch ID: I980526/9012_AQUE/22
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03209
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	1200	101.8	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/29/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03347
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	240	97.3	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03349
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	230	95.8	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03353
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	70	102.9	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03355
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	67	98.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03357
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	270	99.6	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	250	98.0	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	260	101.2	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980518-620
 Lab Sample ID: LFB98-03067
 EPA Method #: EPA 8260A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
1,1-Dichloroethene	1.0	50.00	106.9	109.9	2.73	61 - 145	0 - 14		
Benzene	1.0	50.00	108.3	109.7	1.36	76 - 127	0 - 11		
Chlorobenzene	1.0	50.00	104.4	107.5	2.93	75 - 130	0 - 13		
Toluene	1.0	50.00	105.6	100.6	4.79	76 - 125	0 - 13		
Trichloroethene	1.0	50.00	105.6	104.8	0.72	71 - 120	0 - 14		
Batch Approved By: GOTTSHALLDL						Batch Approved Date: 5/26/98			

SDG #: 980518-620
 Lab Sample ID: LFB98-03299
 EPA Method #: EPA 6010A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
Barium	5.0	1000.00	93.8			80 - 120			
Iron	25	200.00	103.5			80 - 120			
Manganese	5.0	100.00	88.4			80 - 120			
Zinc	20	100.00	95.1			80 - 120			
Batch Approved By: GOTTSHALLDL						Batch Approved Date: 6/3/98			

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-02644	Analytical Batch ID:	I980519/2320B_AQU/35
Units:	mg/L CaCO3	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	24	24	0	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980526/9012_AQ_P/22
EPA Method #:	EPA 9012	Prep. Analyst:	DEVLINHA
Lab Sample ID:	98-04319	Analytical Batch ID:	I980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 EPA Method #: HACH 8000 Prep. Analyst:
 Lab Sample ID: 98-04319 Analytical Batch ID: 1980603/8000_AQUE/35
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	120	100	17.352	0 - 20	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-04379 Analytical Batch ID: 1980521/353.2_AQU/65
 Units: mg/L Analysis Analyst: DEVLINHA
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-04401 Analytical Batch ID: 1980604/9038_AQUE/15
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	34	33	2.985	0 - 20	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 EPA Method #: SM 2540C Prep. Analyst:
 Lab Sample ID: 98-04404 Analytical Batch ID: I980529/2540C_AQU/41
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 EPA Method #: HACH 8000 Prep. Analyst:
 Lab Sample ID: 98-04405 Analytical Batch ID: I980603/8000_AQUE/35
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID: P980601/3015/121
 EPA Method #: EPA 6010A Prep. Analyst: LESHINSKYA
 Lab Sample ID: 98-04435 Analytical Batch ID: I980602/6010A_AQU/95
 Units: ug/L Analysis Analyst: LESHINSKYA
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.0	120	130	4.672	0 - 20	
Iron	25	810	1100	27.144	0 - 20	
Manganese	5.0	380	400	4.779	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	1980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	1980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	112			61 - 145		
Benzene	111			76 - 127		
Chlorobenzene	104			75 - 130		
Toluene	99			76 - 125		
Trichloroethene	106			71 - 120		

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
 Prep. Analyst: DEVLINHA
 Analytical Batch ID: I980526/9012_AQUE/22
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Cyanide, Total	94			80 - 120		

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

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Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
2320B_AQUEOUS	mg/L CaCO3	140	660	900	130	
2540C_AQUEOUS	Total Dissolved Solids mg/L	240	760	1400	730	
353.2_AQUEOUS	Nitrate mg/L	4.0	<0.050	0.58	4.0	
6010A_AQUEOUS	Barium ug/L	260	590	5400	110	
	Iron ug/L	38000	27000	370000	11000	
	Manganese ug/L	1500	540	1800	1300	
	Zinc ug/L	380	470	13000	120	
8000_AQUEOUS	COD mg/L	20	120	140	31	
8260A_AQUEOUS	1,1,1,2-Tetrachloroethug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,1-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2,2-Tetrachloroethug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloropropene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichlorobenzen ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichloropropaneug/L	<1.0	<1.0	<1.0	<1.0	<1.0

Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
8260A_AQUEOUS						
1,2,4-Trichlorobenzene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone ug/L		<20	<20	<20	<20	<20
2-Chlorotoluene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
2-Hexanone ug/L		<20	<20	<20	<20	<20
4-Chlorotoluene ug/L		<1.0	<1.0	<1.0	<1.0	<1.0
4-Methyl-2-pentanone ug/L		<20	<20	<20	<20	<20

Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
8260A_AQUEOUS	ug/L	<20	<20	<20	<20	<20
Acetone	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0

Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylmethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
m- and p-Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
n-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/L	<1.0	<1.0	2.8	<1.0	<1.0
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
sec-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0

	Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Analysis Name	Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
3260A_AQUEOUS	trans-1,3-Dichloroprop	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	Trichlorofluoromethan	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	Vinyl chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	mg/L	<0.015	<0.015	<0.015	<0.015	
9038_AQUEOUS	Sulfate	mg/L	36	79	85	27	
9251_AQUEOUS	Chloride	mg/L	3.6	22	66	3.8	

	Description	Id Text	
Analysis Name	Name	Units	98-04675
5310C_AQUEOUS	TOC	mg/L	2.8

Chain of Custody

Client: City of North Andover SDG#: 980518-620
 Project Name: Walton Leadhill TAT: STD
 Project #: _____ TAT Approved by: _____
 Phone: 782-8368 E-BUEN Lab Acct. #: _____

Contact: Sampled by CBB Geological & Environmental
 Report to: Jim Lauricella Bill to: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC			METALS			OTHER		
						524.2	624/8240	8260	Other	525	625/8270 A, B/N, AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RORA 8 *	Other	Filtered (Y/N)
CDM 2	5/18/98	1:20	W	6	98-04319	✓														
CDM 1	5/18/98	2:30	W	6	98-04320	✓														
Duplicate	5/18/98	7:15	W	6	98-04321	✓														
CDM 4	5/18/98	3:00	W	6	98-04322	✓														
Trap Blank	5/18/98	3:10	W	1	98-04323	✓														

Method of Shipment: Courier Airborne UPS Fed-ex Hand Other

Shipper/Airbill#: _____ Custody Seal#: _____

Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS

Samples Received: Cooler Temperature: _____ °C yes no
 Chilled/property preserved? yes no
 In good condition? yes no
 Evidence of tampering? yes no

Comments:
 # Chlorides
 Sulfate
 Nitrate/nitrogen
 TDS
 Alkalinity
 Iron
 Barium
 Zinc
 Manganese
 Total Phosphate

NOTE: All samples submitted subject to Standard Terms & Conditions

Client: City of Waltham

Project: Waltham landfill

SDG: 980522-643

Date: 6/24/98

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Trip Blank	05/21/98	05/22/98	98-04437	AQUEOUS
CDM-1A	05/21/98	05/22/98	98-04433	AQUEOUS
CDM-2A	05/21/98	05/22/98	98-04434	AQUEOUS
CDM-4A	05/21/98	05/22/98	98-04436	AQUEOUS
CDM-3A	05/21/98	05/22/98	98-04435	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-1A		
Lab Sample ID:	98-04433	Analytical Batch ID:	I980528/8260A_AQU/264
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-1A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04433	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	97.54	86 - 115
Dibromofluoromethane	98.84	86 - 118
Toluene-d8	97.54	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980522-643
Client Sample ID: CDM-1A
Lab Sample ID: 98-04433
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	24	
Cadmium	1.0	<1.0	
Chromium	5.0	5.1	
Copper	5.0	8.2	
Iron	25	10000	
Lead	5.0	<5.0	
Manganese	5.0	190	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	34	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980522-643
Client Sample ID: CDM-2A
Lab Sample ID: 98-04434
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980528/8260A_AQU/264
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980522-643
Client Sample ID: CDM-2A
Lab Sample ID: 98-04434
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980528/8260A_AQU/264
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	102.30	86 - 115
Dibromofluoromethane	100.12	86 - 118
Toluene-d8	98.66	88 - 110

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980522-643
 Client Sample ID: CDM-2A
 Lab Sample ID: 98-04434
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	210	
Barium	5.0	570	
Cadmium	1.0	150	
Chromium	5.0	990	
Copper	5.0	680	
Iron	5000	5100000	
Lead	5.0	140	
Manganese	1000	110000	
Selenium	10	<10	
Silver	5.0	<5.0	M
Zinc	20	3600	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980522-643
 Client Sample ID: CDM-3A
 Lab Sample ID: 98-04435
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980528/8260A_AQU/264
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	1.9	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	1.3	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	19	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-3A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04435	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	102.62	86 - 115
Dibromofluoromethane	98.42	86 - 118
Toluene-d8	101.36	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980522-643
 Client Sample ID: CDM-3A
 Lab Sample ID: 98-04435
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	12	
Barium	5.0	120	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	990	
Lead	5.0	<5.0	
Manganese	5.0	380	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-4A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04436	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-4A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04436	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	99.40	86 - 115
Dibromofluoromethane	98.36	86 - 118
Toluene-d8	95.82	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980522-643
Client Sample ID: CDM-4A
Lab Sample ID: 98-04436
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	160	
Cadmium	1.0	1.7	
Chromium	5.0	19	
Copper	5.0	27	
Iron	25	12000	
Lead	5.0	22	
Manganese	5.0	3300	
Selenium	10	11	
Silver	5.0	<5.0	
Zinc	20	57	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980522-643
Client Sample ID: Trip Blank
Lab Sample ID: 98-04437
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 2

Preparation Batch ID: P980608/5030/370
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980608/8260A_AQU/265
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	2.0	<2.0	
Bromobenzene	2.0	<2.0	
Bromochloromethane	2.0	<2.0	
Bromodichloromethane	2.0	<2.0	
Bromoform	2.0	<2.0	
Bromomethane	10	<10	
2-Butanone	40	<40	
n-Butylbenzene	2.0	<2.0	
sec-Butylbenzene	2.0	<2.0	
tert-Butylbenzene	2.0	<2.0	
Carbon tetrachloride	2.0	<2.0	
Chlorobenzene	2.0	<2.0	
Chloroethane	10	<10	
Chloroform	10	<10	
Chloromethane	10	<10	
2-Chlorotoluene	2.0	<2.0	
4-Chlorotoluene	2.0	<2.0	
1,2-Dibromo-3-chloropropane	2.0	<2.0	
1,2-Dibromoethane	2.0	<2.0	
Dibromochloromethane	2.0	<2.0	
Dibromomethane	2.0	<2.0	
1,2-Dichlorobenzene	2.0	<2.0	
1,3-Dichlorobenzene	2.0	<2.0	
1,4-Dichlorobenzene	2.0	<2.0	
Dichlorodifluoromethane	2.0	<2.0	
1,1-Dichloroethane	2.0	<2.0	
1,2-Dichloroethane	2.0	<2.0	
cis-1,2-Dichloroethene	2.0	<2.0	
trans-1,2-Dichloroethene	2.0	<2.0	
1,2-Dichloropropane	2.0	<2.0	
1,3-Dichloropropane	2.0	<2.0	
2,2-Dichloropropane	2.0	<2.0	
1,1-Dichloropropene	2.0	<2.0	
cis-1,3-Dichloropropene	2.0	<2.0	
trans-1,3-Dichloropropene	2.0	<2.0	
Ethylbenzene	2.0	<2.0	
Hexachlorobutadiene	2.0	<2.0	
2-Hexanone	40	<40	
Isopropylbenzene	2.0	<2.0	
4-Methyl-2-pentanone	40	<40	
Methyl tert-butyl ether	2.0	<2.0	
Methylene chloride	10	<10	
Naphthalene	2.0	<2.0	
n-Propylbenzene	2.0	<2.0	
Styrene	2.0	<2.0	
1,1,1,2-Tetrachloroethane	2.0	<2.0	
1,1,2,2-Tetrachloroethane	2.0	<2.0	
Tetrachloroethene	2.0	<2.0	
Toluene	2.0	<2.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 06/08/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980608/5030/370
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Trip Blank	Analytical Batch ID:	I980608/8260A_AQU/265
Lab Sample ID:	98-04437	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	2		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	2.0	<2.0	
1,2,4-Trichlorobenzene	2.0	<2.0	
1,1,1-Trichloroethane	2.0	<2.0	
1,1,2-Trichloroethane	2.0	<2.0	
Trichloroethene	2.0	<2.0	
Trichlorofluoromethane	2.0	<2.0	
1,2,4-Trimethylbenzene	2.0	<2.0	
1,3,5-Trimethylbenzene	2.0	<2.0	
1,2,3-Trichloropropane	2.0	<2.0	
Vinyl chloride	2.0	<2.0	
m- and p-Xylenes	2.0	<2.0	
o-Xylene	2.0	<2.0	
1,1-Dichloroethene	2.0	<2.0	
Acetone	40	55	
Isopropylmethylbenzene	2.0	<2.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	90.02	86 - 115
Dibromofluoromethane	93.02	86 - 118
Toluene-d8	98.78	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/08/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980522-643

Preparation Batch: P980528/9012_AQ_P/23

Prep. Analyst: NGUYENMH

Component Name: Cyanide, Total

EPA Method #: EPA 9012

Matrix: AQUEOUS

Analytical Batch: I980528/9012_AQUE/23

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: GOTTSHALLDL - 5/28/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	0.015	<0.015	1	
CDM-2A	98-04434	0.015	<0.015	1	
CDM-3A	98-04435	0.015	<0.015	1	
CDM-4A	98-04436	0.015	<0.015	1	

Preparation Batch: P980619/7470A_PRE/78

Prep. Analyst: LESHINSKYA

Component Name: Mercury

EPA Method #: EPA 7470A

Matrix: AQUEOUS

Analytical Batch: I980619/7470A_AQU/63

Analyst: LESHINSKYA

Units: ug/L

Reviewed By - Date: GOTTSHALLDL - 6/19/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	0.20	<0.20	1	
CDM-2A	98-04434	0.20	0.50	1	
CDM-3A	98-04435	0.20	<0.20	1	
CDM-4A	98-04436	0.20	<0.20	1	

Component Name: Nitrate

EPA Method #: EPA 353.2

Matrix: AQUEOUS

Analytical Batch: I980526/353.2_AQU/66

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSHALLDL - 5/26/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	0.050	<0.050	1	
CDM-2A	98-04434	0.050	<0.050	1	
CDM-3A	98-04435	0.050	<0.050	1	
CDM-4A	98-04436	0.050	<0.050	1	

Component Name: Total Dissolved Solids

EPA Method #: SM 2540C

Matrix: AQUEOUS

Analytical Batch: I980529/2540C_AQU/41

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: GOTTSHALLDL - 5/29/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	5.0	140	1	
CDM-2A	98-04434	5.0	140	1	
CDM-3A	98-04435	5.0	<5.0	1	
CDM-4A	98-04436	5.0	700	1	

Component Name: Alkalinity

EPA Method #: SM 2320B

Matrix: AQUEOUS

Analytical Batch: I980601/2320B_AQU/36

Analyst: NGUYENMH

Units: mg/L CaCO3

Reviewed By - Date: GOTTSHALLDL - 6/1/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	5.0	74	1	
CDM-2A	98-04434	5.0	79	1	
CDM-3A	98-04435	5.0	150	1	
CDM-4A	98-04436	5.0	300	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980522-643

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980603/8000_AQUE/35	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	5.0	48	1	
CDM-2A	98-04434	5.0	66	1	
CDM-3A	98-04435	5.0	7.0	1	
CDM-4A	98-04436	5.0	16	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980603/9251_AQUE/15	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	1.0	11	1	
CDM-2A	98-04434	1.0	4.1	1	
CDM-3A	98-04435	1.0	27	1	
CDM-4A	98-04436	10	200	10	

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	I980604/9038_AQUE/15	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/4/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	10	<10	1	
CDM-2A	98-04434	10	<10	1	
CDM-3A	98-04435	10	<10	1	
CDM-4A	98-04436	10	<10	1	

PREPARATION INFORMATION REPORT

SDG #: 980522-643

Preparation Batch ID: P980528/5030/366
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM-2A	98-04434	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM-3A	98-04435	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM-4A	98-04436	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980528/9012_AQ_P/23
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM-2A	98-04434	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM-3A	98-04435	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM-4A	98-04436	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-2A	98-04434	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-3A	98-04435	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
		DUPLICATE	Final Volume	50	mL	
			Initial Volume	45	mL	
		MATRIX_SPIKE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-4A	98-04436	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980608/5030/370
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 6/8/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Trip Blank	98-04437	SAMPLE	Final Volume	25.0	ml	

PREPARATION INFORMATION REPORT

SDG #: 980522-643

Preparation Batch ID: P980608/5030/370
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 6/8/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
			Initial Volume	12.5	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980619/3015/136
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/23/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-2A	98-04434	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-3A	98-04435	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
		DUPLICATE	Final Volume	50	mL	
			Initial Volume	45	mL	
		MATRIX_SPIKE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-4A	98-04436	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/7470A_PRE/78
 Preparation ID: 7470A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 7470A
 Batch Approved On: 6/19/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM-2A	98-04434	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM-3A	98-04435	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM-4A	98-04436	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		05/28/98
CDM-2A	98-04434	05/21/98	05/22/98		05/28/98
CDM-3A	98-04435	05/21/98	05/22/98		05/28/98
CDM-4A	98-04436	05/21/98	05/22/98		05/28/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		05/26/98
CDM-2A	98-04434	05/21/98	05/22/98		05/26/98
CDM-3A	98-04435	05/21/98	05/22/98		05/26/98
CDM-4A	98-04436	05/21/98	05/22/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		05/22/98
CDM-2A	98-04434	05/21/98	05/22/98		05/22/98
CDM-3A	98-04435	05/21/98	05/22/98		05/22/98
CDM-4A	98-04436	05/21/98	05/22/98		05/22/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	05/28/98	06/01/98
CDM-2A	98-04434	05/21/98	05/22/98	05/28/98	06/01/98
CDM-3A	98-04435	05/21/98	05/22/98	05/28/98	06/01/98
CDM-4A	98-04436	05/21/98	05/22/98	05/28/98	06/01/98

Analysis: 7470A_AQUEOUS
 Analysis Desc: Mercury in Water

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	06/18/98	06/18/98
CDM-2A	98-04434	05/21/98	05/22/98	06/18/98	06/18/98
CDM-3A	98-04435	05/21/98	05/22/98	06/18/98	06/18/98
CDM-4A	98-04436	05/21/98	05/22/98	06/18/98	06/18/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		06/02/98

HOLDTIME SUMMARY

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-2A	98-04434	05/21/98	05/22/98		06/02/98
CDM-3A	98-04435	05/21/98	05/22/98		06/02/98
CDM-4A	98-04436	05/21/98	05/22/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	05/27/98	05/27/98
CDM-2A	98-04434	05/21/98	05/22/98	05/27/98	05/27/98
CDM-3A	98-04435	05/21/98	05/22/98	05/27/98	05/27/98
CDM-4A	98-04436	05/21/98	05/22/98	05/27/98	05/27/98
Trip Blank	98-04437	05/21/98	05/22/98	05/28/98	05/28/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	05/27/98	05/28/98
CDM-2A	98-04434	05/21/98	05/22/98	05/27/98	05/28/98
CDM-3A	98-04435	05/21/98	05/22/98	05/27/98	05/28/98
CDM-4A	98-04436	05/21/98	05/22/98	05/27/98	05/28/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		06/03/98
CDM-2A	98-04434	05/21/98	05/22/98		06/03/98
CDM-3A	98-04435	05/21/98	05/22/98		06/03/98
CDM-4A	98-04436	05/21/98	05/22/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		06/02/98
CDM-2A	98-04434	05/21/98	05/22/98		06/02/98
CDM-3A	98-04435	05/21/98	05/22/98		06/02/98
CDM-4A	98-04436	05/21/98	05/22/98		06/02/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: 98-04597
 EPA Number: EPA 353.2
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980526/353.2_AQU/66
 Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03191
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980528/5030/366
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980528/8260A_AQU/264
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03191
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980528/5030/366
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980528/8260A_AQU/264
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

9012_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
Lab Sample ID: B98-03199 Prep Analyst: NGUYENMH
EPA Number: EPA 9012 Analytical Batch ID: I980528/9012_AQUE/23
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/28/98

9012_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
Lab Sample ID: B98-03201 Prep Analyst: NGUYENMH
EPA Number: EPA 9012 Analytical Batch ID: I980528/9012_AQUE/23
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/28/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C Analytical Batch ID: I980529/2540C_AQU/41
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID:
Lab Sample ID: B98-03282 Prep Analyst:
EPA Number: SM 2320B Analytical Batch ID: I980601/2320B_AQU/36
Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/1/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03298
EPA Number: EPA 6010A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Barium	5.0	<5.0	
Iron	25	<25	
Manganese	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03346
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03348
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03352
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03354
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03356
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03379
EPA Number: EPA 9038
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #:	980522-643	Preparation Batch ID:	
Lab Sample ID:	B98-03381	Prep Analyst:	
EPA Number:	EPA 9038	Analytical Batch ID:	1980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980522-643	Preparation Batch ID:	P980608/5030/370
Lab Sample ID:	B98-03468	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	1980608/8260A_AQU/265
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03468
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980608/5030/370
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980608/8260A_AQU/265
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/8/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03772
EPA Number: EPA 6010A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/3015/136
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/23/98

7470A_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03779
EPA Number: EPA 7470A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Mercury	0.20	<0.20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/19/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03095
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980526/353.2_AQU/66
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	0.86	97.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03200
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID: P980528/9012_AQ_P/23
Prep. Analyst: NGUYENMH
Analytical Batch ID: I980528/9012_AQUE/23
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	94.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03202
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID: P980528/9012_AQ_P/23
Prep. Analyst: NGUYENMH
Analytical Batch ID: I980528/9012_AQUE/23
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.20	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
 Lab Sample ID: QCS98-03209 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: 1980529/2540C_AQU/41
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
 Lab Sample ID: QCS98-03283 Prep. Analyst:
 Units: mg/L CaCO3
 Matrix: AQUEOUS Analytical Batch ID: 1980601/2320B_AQU/36
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	140	104.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
 Lab Sample ID: QCS98-03347 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: 1980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
 Lab Sample ID: QCS98-03349
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
 Lab Sample ID: QCS98-03353
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
 Lab Sample ID: QCS98-03355
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03357
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980522-643	Preparation Batch ID:	P980528/5030/366
Lab Sample ID:	LFB98-03192	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980528/8260A_AQU/264
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	103.4	109.3	5.51	61 - 145	0 - 14	
Benzene	1.0	50.00	107.4	110.4	2.70	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	109.4	110.2	0.75	75 - 130	0 - 13	
Toluene	1.0	50.00	97.1	102.0	4.96	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	105.6	107.8	2.08	71 - 120	0 - 14	
Batch Approved By:		GOTTSHALLDL			Batch Approved Date:		5/28/98	

SDG #:	980522-643	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.0	1000.00	93.8			80 - 120		
Iron	25	200.00	103.5			80 - 120		
Manganese	5.0	100.00	88.4			80 - 120		
Zinc	20	100.00	95.1			80 - 120		
Batch Approved By:		GOTTSHALLDL			Batch Approved Date:		6/3/98	

SDG #:	980522-643	Preparation Batch ID:	P980608/5030/370
Lab Sample ID:	LFB98-03469	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980608/8260A_AQU/265
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	110.2	104.3	5.54	61 - 145	0 - 14	
Benzene	1.0	50.00	109.8	106.8	2.71	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	108.4	107.6	0.78	75 - 130	0 - 13	
Toluene	1.0	50.00	105.5	107.8	2.21	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	108.0	106.6	1.34	71 - 120	0 - 14	
Batch Approved By:		GOTTSHALLDL			Batch Approved Date:		6/8/98	

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980522-643 Preparation Batch ID: P980619/3015/136
 Lab Sample ID: LFB98-03773 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 6010A Analytical Batch ID: I980619/6010A_AQU/107
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.0	100.00	100.4			80 - 120		
Barium	5.0	1000.00	93.8			80 - 120		
Cadmium	1.0	50.00	89.4			80 - 120		
Chromium	5.0	100.00	91.8			80 - 120		
Copper	5.0	100.00	98.6			80 - 120		
Iron	25	200.00	103.3			80 - 120		
Lead	5.0	100.00	88.2			80 - 120		
Manganese	5.0	100.00	88.4			80 - 120		
Selenium	10	50.00	111.3			80 - 120		
Silver	5.0	100.00	106.3			80 - 120		
Zinc	20	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

SDG #: 980522-643 Preparation Batch ID: P980619/7470A_PRE/78
 Lab Sample ID: LFB98-03778 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7470A Analytical Batch ID: I980619/7470A_AQU/63
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.2	5.00	97.6			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	1980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	380	380	0.261	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>5/29/98</u>				

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980619/7470A_PRE/78
EPA Method #:	EPA 7470A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04319	Analytical Batch ID:	1980619/7470A_AQU/63
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	0.22	0.26	20.238	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/19/98</u>				

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04319	Analytical Batch ID:	1980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	120	100	17.352	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/3/98</u>				

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
EPA Method #: SM 2320B Prep. Analyst:
Lab Sample ID: 98-04353 Analytical Batch ID: I980601/2320B_AQU/36
Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	<5.0	<5.0	N/A	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/1/98		

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
EPA Method #: EPA 9012 Prep. Analyst: NGUYENMH
Lab Sample ID: 98-04398 Analytical Batch ID: I980528/9012_AQUE/23
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	5/28/98		

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
EPA Method #: EPA 9038 Prep. Analyst:
Lab Sample ID: 98-04401 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	34	33	2.985	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/4/98		

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-04402	Analytical Batch ID:	1980526/353.2_AQU/66
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	1.2	1.2	0.722	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>5/26/98</u>				

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04404	Analytical Batch ID:	1980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	55	42	26.804	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>5/29/98</u>				

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04405	Analytical Batch ID:	1980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	540	540	0.185	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/3/98</u>				

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	1980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.0	120	130	4.672	0 - 20	
Iron	25	810	1100	27.144	0 - 20	

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Manganese	5.0	380	400	4.779	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980619/3015/136
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.0	12	12	6.193	0 - 20	
Barium	5.0	120	130	4.672	0 - 20	
Cadmium	1.0	<1.0	<1.0	N/A	0 - 20	
Chromium	5.0	<5.0	<5.0	N/A	0 - 20	
Copper	5.0	<5.0	<5.0	N/A	0 - 20	
Iron	25	990	1100	7.863	0 - 20	
Lead	5.0	<5.0	<5.0	N/A	0 - 20	
Manganese	5.0	380	400	4.779	0 - 20	
Selenium	10	<10	<10	N/A	0 - 20	
Silver	5.0	<5.0	<5.0	N/A	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04444	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	15	16	3.279	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980528/9012_AQ_P/23
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-04452	Analytical Batch ID:	I980528/9012_AQUE/23
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980522-643
 Lab Sample ID: 98-04434
 Matrix: AQUEOUS

Preparation Batch ID: P980528/5030/366
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980528/8260A_AQU/264
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	115			61 - 145		
Benzene	110			76 - 127		
Chlorobenzene	109			75 - 130		
Toluene	102			76 - 125		
Trichloroethene	107			71 - 120		
Batch Approved By: <u>GOTTSHALLDL</u>	Batch Approved Date: <u>5/28/98</u>					

6010A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980522-643
 Lab Sample ID: 98-04435
 Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Barium	91			80 - 120		
Iron	228			80 - 120		N
Manganese	97			80 - 120		
Zinc	91			80 - 120		
Arsenic	98			80 - 120		
Barium	91			80 - 120		
Cadmium	86			80 - 120		
Chromium	88			80 - 120		
Copper	96			80 - 120		
Iron	149			80 - 120		N
Lead	89			80 - 120		
Manganese	97			80 - 120		
Selenium	111			80 - 120		
Silver	103			80 - 120		
Zinc	91			80 - 120		
Batch Approved By: <u>GOTTSHALLDL</u>	Batch Approved Date: <u>6/23/98</u>					

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Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
2320B_AQUEOUS	mg/L CaCO3	74	79	150	300	
2540C_AQUEOUS	Total Dissolved Solids mg/L	140	140	<5.0	700	
353.2_AQUEOUS	Nitrate mg/L	<0.050	<0.050	<0.050	<0.050	
6010A_AQUEOUS	Arsenic ug/L	<5.0	210	12	<5.0	
	Barium ug/L	24	570	120	160	
	Cadmium ug/L	<1.0	150	<1.0	1.7	
	Chromium ug/L	5.1	990	<5.0	19	
	Copper ug/L	8.2	680	<5.0	27	
	Iron ug/L	10000	5100000	990	12000	
	Lead ug/L	<5.0	140	<5.0	22	
	Manganese ug/L	190	110000	380	3300	
	Selenium ug/L	<10	<10	<10	11	
	Silver ug/L	<5.0	<5.0	<5.0	<5.0	
	Zinc ug/L	34	3600	<20	57	
7470A_AQUEOUS	Mercury ug/L	<0.20	0.50	<0.20	<0.20	
8000_AQUEOUS	COD mg/L	48	66	7.0	16	
8260A_AQUEOUS	1,1,1,2-Tetrachloroet ug/L	<1.0	<1.0	<1.0	<1.0	<2.0

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS						
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,1,2,2-Tetrachloroet	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,1-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,3-Trichlorobenzen	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,3-Trichloropropan	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,4-Trichlorobenzen	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,4-Trimethylbenze	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dibromo-3-chloro	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dibromoethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	1.3	<1.0	<2.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,3,5-Trimethylbenze	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0

Laboratory Summary Report

SDG: 980522-643

Client: City of Waltham

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
2-Butanone	ug/L	<20	<20	<20	<20	<40
2-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
2-Hexanone	ug/L	<20	<20	<20	<20	<40
4-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
4-Methyl-2-pentanone	ug/L	<20	<20	<20	<20	<40
Acetone	ug/L	<20	<20	<20	<20	55
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Chlorobenzene	ug/L	<1.0	<1.0	1.9	<1.0	<2.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10
cis-1,2-Dichloroethen	ug/L	<1.0	<1.0	19	<1.0	<2.0
cis-1,3-Dichloroprope	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Dibromochloromethan	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Dichlorodifluorometha	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Hexachlorobutadiene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Isopropylmethylbenze	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
m- and p-Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Methyl tert-butyl ethe	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Methylene chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<10
n-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
n-Propylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Naphthalene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
sec-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
tert-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
trans-1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Vinyl chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Cyanide, Total	mg/L	<0.015	<0.015	<0.015	<0.015	<0.015
9012_AQUEOUS	mg/L	<10	<10	<10	<10	<10
9038_AQUEOUS	mg/L	<10	<10	<10	<10	<10
9251_AQUEOUS	mg/L	11	4.1	27	200	200

Client: City of Waltham
 Project Name: Waltham (ad61)
 Address: _____
 Phone: 252-8368 Burns
 Project #: _____

Contact: Sampled by CRB Ecologic + Environment
 Report to: Jim Laurila Bill to: _____
 Phone: _____
 Fax #: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC			METALS			OTHER		
						524.2	624/8240	8260	Other	525	625/8270 A, B/N, AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	HCRA 8	Other	Filtered (Y/N)
<u>Tap blank</u>	<u>5/18/08</u>	<u>9:00</u>	<u>W</u>	<u>1</u>	<u>98-04437</u>	<input checked="" type="checkbox"/>														
<u>CDM 1A</u>	<u>1/10/08</u>			<u>6</u>	<u>98-04433</u>	<input checked="" type="checkbox"/>														
<u>CDM 2A</u>					<u>98-04434</u>	<input checked="" type="checkbox"/>														
<u>CDM 3A</u>		<u>2:30</u>			<u>98-04435</u>	<input checked="" type="checkbox"/>														
<u>CDM 4A</u>		<u>2:00</u>			<u>98-04436</u>	<input checked="" type="checkbox"/>														

Split samples for A-Hg

Lab Acct. #: _____
 Date: 5/21/08
 Received by: [Signature]
 Date: _____

Method of Shipment: Counter Airborne Fed-ex
 Shipper/Label #: _____
 Custody Seal #: _____
 Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS

Comments:
 Chlorides
 Sulfate
 Nitrate Nitrogen
 TDs
 Alkalinity
 Iron
 Barium
 Zinc
 Manganese
 Total Cyanide

Other: _____
 NOTE: All samples submitted subject to Standard Terms & Conditions

Client: City of Waltham
Project: Waltham landfill
SDG: 980519-632
Date: 6/24/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #:	980519-632	Print Date:	6/24/98
Client:	City of Waltham	Client Contact:	
Project:	Waltham landfill	Address:	Camp Dresser & McKee Ten Cambridge Center Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples. No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

Note that results for these samples were originally reported on 6/4/98. It was discovered that additional metals analyses were needed; the additional metals results plus all of the original results are included in this report.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge complete & accurate.

LABORATORY MANAGEMENT REVIEW: *James J. Orsholnik*

LABORATORY QA/QC REVIEW: *Patricia May - 1*

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Cove 1	05/19/98	05/19/98	98-04379	AQUEOUS
Cove 2	05/19/98	05/19/98	98-04380	AQUEOUS
MW-4	05/19/98	05/19/98	98-04381	AQUEOUS

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 1
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	3.2	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980519-632
Client Sample ID: Cove 1
Lab Sample ID: 98-04379
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	91.14	86 - 115
Dibromofluoromethane	99.24	86 - 118
Toluene-d8	94.98	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980519-632
Client Sample ID: Cove 1
Lab Sample ID: 98-04379
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	5.2	
Barium	5	260	
Cadmium	1	<1.0	
Chromium	5	<5.0	
Copper	5	9.8	
Iron	25	5100	
Lead	5	8.4	
Manganese	5	190	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	91	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980519-632
Client Sample ID: Cove 2
Lab Sample ID: 98-04380
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	1.7	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980519-632
Client Sample ID: Cove 2
Lab Sample ID: 98-04380
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	110.40	86 - 115
Dibromofluoromethane	104.22	86 - 118
Toluene-d8	105.76	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980519-632
 Client Sample ID: Cove 2
 Lab Sample ID: 98-04380
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	<5.0	
Barium	5	230	
Cadmium	1	<1.0	
Chromium	5	<5.0	
Copper	5	17	
Iron	25	5800	
Lead	5	18	
Manganese	5	140	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	86	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Preparation Batch: P980526/9012_AQ_P/22

Prep. Analyst: DEVLINHA

Component Name: Cyanide, Total

EPA Method #: EPA 9012

Matrix: AQUEOUS

Analytical Batch: I980526/9012_AQUE/22

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 5/26/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	0.015	<0.015	1	
Cove 2	98-04380	0.015	<0.015	1	

Preparation Batch: P980619/7470A_PRE/78

Prep. Analyst: LESHINSKYA

Component Name: Mercury

EPA Method #: EPA 7470A

Matrix: AQUEOUS

Analytical Batch: I980619/7470A_AQU/63

Analyst: LESHINSKYA

Units: ug/L

Reviewed By - Date: GOTTSALLDL - 6/19/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	0.200	<0.20	1	
Cove 2	98-04380	0.200	<0.20	1	

Component Name: Nitrate

EPA Method #: EPA 353.2

Matrix: AQUEOUS

Analytical Batch: I980521/353.2_AQU/65

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 5/26/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	0.050	0.36	1	
Cove 2	98-04380	0.050	0.22	1	

Component Name: Total Dissolved Solids

EPA Method #: SM 2540C

Matrix: AQUEOUS

Analytical Batch: I980529/2540C_AQU/41

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 5/29/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	5.000	340	1	
Cove 2	98-04380	5.000	280	1	

Component Name: Alkalinity

EPA Method #: SM 2320B

Matrix: AQUEOUS

Analytical Batch: I980601/2320B_AQU/36

Analyst: NGUYENMH

Units: mg/L CaCO₃

Reviewed By - Date: GOTTSALLDL - 6/1/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	5.000	180	1	
Cove 2	98-04380	5.000	160	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Component Name: COD	EPA Method #: HACH 8000	Matrix: AQUEOUS
Analytical Batch: I980603/8000_AQUE/35	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 6/3/98		

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	5.000	57	1	
Cove 2	98-04380	5.000	140	1	

Component Name: Chloride	EPA Method #: EPA 9251	Matrix: AQUEOUS
Analytical Batch: I980603/9251_AQUE/15	Analyst: DEVLINHA	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 6/3/98		

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	1.000	60	1	
Cove 2	98-04380	1.000	50	1	

Component Name: Sulfate	EPA Method #: EPA 9038	Matrix: AQUEOUS
Analytical Batch: I980604/9038_AQUE/15	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 6/4/98		

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	10.000	36	1	
Cove 2	98-04380	10.000	43	1	

PREPARATION INFORMATION REPORT

SDG #: 980519-632

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Cove 2	98-04380	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/3015/136
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/23/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/7470A_PRE/78
 Preparation ID: 7470A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 7470A
 Batch Approved On: 6/19/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Cove 2	98-04380	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS **Required Preparation Holdtime:** None
Analysis Desc: Total Alkalinity **Required Analytical Holdtime:** 14 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		05/28/98
Cove 2	98-04380	05/19/98	05/19/98		05/28/98

Analysis: 2540C_AQUEOUS **Required Preparation Holdtime:** None
Analysis Desc: Total Dissolved Solids (TDS) **Required Analytical Holdtime:** 7 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		05/26/98
Cove 2	98-04380	05/19/98	05/19/98		05/26/98

Analysis: 353.2_AQUEOUS **Required Preparation Holdtime:** None
Analysis Desc: Nitrate or Nitrite as Nitrogen **Required Analytical Holdtime:** 0 days 48 hrs

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		05/20/98
Cove 2	98-04380	05/19/98	05/19/98		05/20/98

Analysis: 6010A_AQUEOUS **Required Preparation Holdtime:** 180 days
Analysis Desc: ICP Metals **Required Analytical Holdtime:** 180 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98	05/28/98	06/01/98
Cove 2	98-04380	05/19/98	05/19/98	05/28/98	06/01/98

Analysis: 7470A_AQUEOUS **Required Preparation Holdtime:** 28 days
Analysis Desc: Mercury in Water **Required Analytical Holdtime:** 28 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98	06/18/98	06/18/98
Cove 2	98-04380	05/19/98	05/19/98	06/18/98	06/18/98

Analysis: 8000_AQUEOUS **Required Preparation Holdtime:** None
Analysis Desc: Chemical Oxygen Demand **Required Analytical Holdtime:** 28 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

Analysis: 8260A_AQUEOUS **Required Preparation Holdtime:** 14 days
Analysis Desc: Volatile Organics **Required Analytical Holdtime:** 14 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98	05/22/98	05/22/98
Cove 2	98-04380	05/19/98	05/19/98	05/22/98	05/22/98

HOLDTIME SUMMARY

Analysis: 9012_AQUEOUS
Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
Required Analytical Holdtime: 14 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98	05/21/98	05/21/98
Cove 2	98-04380	05/19/98	05/19/98	05/21/98	05/21/98

Analysis: 9038_AQUEOUS
Analysis Desc: Sulfate

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		06/03/98
Cove 2	98-04380	05/19/98	05/19/98		06/03/98

Analysis: 9251_AQUEOUS
Analysis Desc: Chloride

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

353.2 AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	1980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.05	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	1980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.00	<1.0	
1,1,1-Trichloroethane	1.00	<1.0	
1,1,2,2-Tetrachloroethane	1.00	<1.0	
1,1,2-Trichloroethane	1.00	<1.0	
1,1-Dichloroethane	1.00	<1.0	
1,1-Dichloroethene	1.00	<1.0	
1,1-Dichloropropene	1.00	<1.0	
1,2,3-Trichlorobenzene	1.00	<1.0	
1,2,3-Trichloropropane	1.00	<1.0	
1,2,4-Trichlorobenzene	1.00	<1.0	
1,2,4-Trimethylbenzene	1.00	<1.0	
1,2-Dibromo-3-chloropropane	1.00	<1.0	
1,2-Dibromoethane	1.00	<1.0	
1,2-Dichlorobenzene	1.00	<1.0	
1,2-Dichloroethane	1.00	<1.0	
1,2-Dichloropropane	1.00	<1.0	
1,3,5-Trimethylbenzene	1.00	<1.0	
1,3-Dichlorobenzene	1.00	<1.0	
1,3-Dichloropropane	1.00	<1.0	
1,4-Dichlorobenzene	1.00	<1.0	
2,2-Dichloropropane	1.00	<1.0	
2-Butanone	20.00	<20	
2-Chlorotoluene	1.00	<1.0	
2-Hexanone	20.00	<20	
4-Chlorotoluene	1.00	<1.0	
4-Methyl-2-pentanone	20.00	<20	
Acetone	20.00	<20	
Benzene	1.00	<1.0	

8260A AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromobenzene	1.00	<1.0	
Bromochloromethane	1.00	<1.0	
Bromodichloromethane	1.00	<1.0	
Bromoform	1.00	<1.0	
Bromomethane	5.00	<5.0	
Carbon tetrachloride	1.00	<1.0	
Chlorobenzene	1.00	<1.0	
Chloroethane	5.00	<5.0	
Chloroform	5.00	<5.0	
Chloromethane	5.00	<5.0	
Dibromochloromethane	1.00	<1.0	
Dibromomethane	1.00	<1.0	
Dichlorodifluoromethane	1.00	<1.0	
Ethylbenzene	1.00	<1.0	
Hexachlorobutadiene	1.00	<1.0	
Isopropylbenzene	1.00	<1.0	
Isopropylmethylbenzene	1.00	<1.0	
Methyl tert-butyl ether	1.00	<1.0	
Methylene chloride	5.00	<5.0	
Naphthalene	1.00	<1.0	
Styrene	1.00	<1.0	
Tetrachloroethene	1.00	<1.0	
Toluene	1.00	<1.0	
Trichloroethene	1.00	<1.0	
Trichlorofluoromethane	1.00	<1.0	
Vinyl chloride	1.00	<1.0	
cis-1,2-Dichloroethene	1.00	<1.0	
cis-1,3-Dichloropropene	1.00	<1.0	
m- and p-Xylenes	1.00	<1.0	
n-Butylbenzene	1.00	<1.0	
n-Propylbenzene	1.00	<1.0	
o-Xylene	1.00	<1.0	
sec-Butylbenzene	1.00	<1.0	
tert-Butylbenzene	1.00	<1.0	
trans-1,2-Dichloroethene	1.00	<1.0	
trans-1,3-Dichloropropene	1.00	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012 AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: B98-03097 Prep Analyst: DEVLINHA
EPA Number: EPA 9012 Analytical Batch ID: I980526/9012_AQUE/22
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.02	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C Analytical Batch ID: I980529/2540C_AQU/41
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03282 Prep Analyst:
EPA Number: SM 2320B Analytical Batch ID: I980601/2320B_AQU/36
Units: mg/L CaCO₃ Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

6010A AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Barium	5.00	<5.0	
Iron	25.00	<25	

6010A AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03298
EPA Number: EPA 6010A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analysis Analyst: LESHINSKYA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Manganese	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03346
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03348
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03352
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03354
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03356
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038 AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03379
 EPA Number: EPA 9038
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038 AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03381
 EPA Number: EPA 9038
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

6010A AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03772
 EPA Number: EPA 6010A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980619/3015/136
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Arsenic	5.00	<5.0	
Barium	5.00	<5.0	
Cadmium	1.00	<1.0	
Chromium	5.00	<5.0	
Copper	5.00	<5.0	
Iron	25.00	<25	
Lead	5.00	<5.0	
Manganese	5.00	<5.0	
Selenium	10.00	<10	
Silver	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03779
EPA Number: EPA 7470A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Mercury	0.20	<0.20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

353.2 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03016
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980521/353.2_AQU/65
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.05	0.88	0.82	93.5	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03098
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
 Prep. Analyst: DEVLINHA
 Analytical Batch ID: 1980526/9012_AQUE/22
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.02	0.20	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

2540C AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03209
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980529/2540C_AQU/41
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	1200.00	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/29/98

2320B AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03283
 Units: mg/L CaCO₃
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980601/2320B_AQU/36
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.00	131.00	140	104.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03347
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03349
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03353
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03355
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03357
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	272.00	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	254.00	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	254.00	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	LFB98-03067	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.00	50.00	106.9	109.9	2.73	61 - 145	0 - 14	
Benzene	1.00	50.00	108.3	109.7	1.36	76 - 127	0 - 11	
Chlorobenzene	1.00	50.00	104.4	107.5	2.93	75 - 130	0 - 13	
Toluene	1.00	50.00	105.6	100.6	4.79	76 - 125	0 - 13	
Trichloroethene	1.00	50.00	105.6	104.8	0.72	71 - 120	0 - 14	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

6010A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.00	1000.00	93.8			80 - 120		
Iron	25.00	200.00	103.5			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.00	100.00	100.4			80 - 120		
Barium	5.00	1000.00	93.8			80 - 120		
Cadmium	1.00	50.00	89.4			80 - 120		
Chromium	5.00	100.00	91.8			80 - 120		
Copper	5.00	100.00	98.6			80 - 120		

6010A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Iron	25.00	200.00	103.3			80 - 120		
Lead	5.00	100.00	88.2			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Selenium	10.00	50.00	111.3			80 - 120		
Silver	5.00	100.00	106.3			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/7470A_PRE/78
Lab Sample ID:	LFB98-03778	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 7470A	Analytical Batch ID:	I980619/7470A_AQU/63
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.20	5.00	97.6			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

2540C AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: SM 2540C
Lab Sample ID: 98-04310
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: EPA 9012
Lab Sample ID: 98-04319
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
Prep. Analyst: DEVLINHA
Analytical Batch ID: I980526/9012_AQUE/22
Analysis Analyst: DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.02	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

7470A AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: EPA 7470A
Lab Sample ID: 98-04319
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	0.22	0.26	20.238	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

8000 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: HACH 8000
Lab Sample ID: 98-04319
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

2320B AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: SM 2320B
Lab Sample ID: 98-04353
Units: mg/L CaCO₃
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980601/2320B_AQU/36
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	<5.0	<5.0	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

353.2 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: EPA 353.2
Lab Sample ID: 98-04379
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980521/353.2_AQU/65
Analysis Analyst: DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.05	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9038 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: EPA 9038
Lab Sample ID: 98-04401
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2540C AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: SM 2540C
Lab Sample ID: 98-04404
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
EPA Method #: HACH 8000
Lab Sample ID: 98-04405
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-04435
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.00	120	130	4.672	0 - 20	
Iron	25.00	810	1100	27.144	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-04435
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.00	12	12	6.193	0 - 20	
Barium	5.00	120	130	4.672	0 - 20	
Cadmium	1.00	<1.0	<1.0	N/A	0 - 20	
Chromium	5.00	<5.0	<5.0	N/A	0 - 20	
Copper	5.00	<5.0	<5.0	N/A	0 - 20	
Iron	25.00	990	1100	7.863	0 - 20	
Lead	5.00	<5.0	<5.0	N/A	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Selenium	10.00	<10	<10	N/A	0 - 20	
Silver	5.00	<5.0	<5.0	N/A	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

2320B AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: SM 2320B
 Lab Sample ID: 98-04444
 Units: mg/L CaCO₃
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980601/2320B_AQU/36
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	15	16	3.279	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 9251
 Lab Sample ID: 98-04450
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.00	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 9038
 Lab Sample ID: 98-04450
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

353.2 AQUEOUS MS/MSD RPD REPORT

SDG #: 980519-632
Lab Sample ID: 98-04379
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:

Analytical Batch ID: 1980521/353.2_AQU/65
Analyst: DEVLINHA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Nitrate	99			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

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Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
2320B_AQUEOUS	Lab ID	98-04379	98-04380
2540C_AQUEOUS	Alkalinity	180	160
353.2_AQUEOUS	Total Dissolved Solids	340	280
6010A_AQUEOUS	Nitrate	0.36	0.22
	Arsenic	5.2	<5.0
	Barium	260	230
	Cadmium	<1.0	<1.0
	Chromium	<5.0	<5.0
	Copper	9.8	17
	Iron	5100	5800
	Lead	8.4	18
	Manganese	190	140
	Selenium	<10	<10
	Silver	<5.0	<5.0
	Zinc	91	86
7470A_AQUEOUS	Mercury	<0.20	<0.20
8000_AQUEOUS	COD	57	140
8260A_AQUEOUS	1,1,1,2-Tetrachloroeth	<1.0	<1.0
	1,1,1-Trichloroethane	<1.0	<1.0
	1,1,2,2-Tetrachloroeth	<1.0	<1.0
	1,1,2-Trichloroethane	<1.0	<1.0
	1,1-Dichloroethane	<1.0	<1.0
	1,1-Dichloroethene	<1.0	<1.0
	1,1-Dichloropropene	<1.0	<1.0
	1,2,3-Trichlorobenzene	<1.0	<1.0
	1,2,3-Trichloropropan	<1.0	<1.0
	1,2,4-Trichlorobenzene	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
8260A_AQUEOUS	Lab ID	98-04379	98-04380
	1,2,4-Trimethylbenzer	<1.0	<1.0
	1,2-Dibromo-3-chloro	<1.0	<1.0
	1,2-Dibromoethane	<1.0	<1.0
	1,2-Dichlorobenzene	<1.0	<1.0
	1,2-Dichloroethane	<1.0	<1.0
	1,2-Dichloropropane	<1.0	<1.0
	1,3,5-Trimethylbenzer	<1.0	<1.0
	1,3-Dichlorobenzene	<1.0	<1.0
	1,3-Dichloropropane	<1.0	<1.0
	1,4-Dichlorobenzene	<1.0	<1.0
	2,2-Dichloropropane	<1.0	<1.0
	2-Butanone	<20	<20
	2-Chloroluene	<1.0	<1.0
	2-Hexanone	<20	<20
	4-Chloroluene	<1.0	<1.0
	4-Methyl-2-pentanon	<20	<20
	Acetone	<20	<20
	Benzene	<1.0	<1.0
	Bromobenzene	<1.0	<1.0
	Bromochloromethane	<1.0	<1.0
	Bromodichlorometha	<1.0	<1.0
	Bromoform	<1.0	<1.0
	Bromomethane	<5.0	<5.0
	Carbon tetrachloride	<1.0	<1.0
	Chlorobenzene	<1.0	<1.0
	Chloroethane	<5.0	<5.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
8260A_AQUEOUS	Lab ID	98-04379	98-04380
Chloroform		<5.0	<5.0
Chloromethane		<5.0	<5.0
cis-1,2-Dichloroethen		<1.0	<1.0
cis-1,3-Dichloropropene		<1.0	<1.0
Dibromochloromethane		<1.0	<1.0
Dibromomethane		<1.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0
Ethylbenzene		<1.0	<1.0
Hexachlorobutadiene		<1.0	<1.0
Isopropylbenzene		<1.0	<1.0
Isopropylmethylbenzene		<1.0	<1.0
m- and p-Xylenes		<1.0	<1.0
Methyl tert-butyl ether		3.2	1.7
Methylene chloride		<5.0	<5.0
n-Butylbenzene		<1.0	<1.0
n-Propylbenzene		<1.0	<1.0
Naphthalene		<1.0	<1.0
o-Xylene		<1.0	<1.0
sec-Butylbenzene		<1.0	<1.0
Styrene		<1.0	<1.0
tert-Butylbenzene		<1.0	<1.0
Tetrachloroethene		<1.0	<1.0
Toluene		<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0
Trichloroethene		<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
	Lab ID	98-04379	98-04380
8260A_AQUEOUS	Trichlorofluoromethan	<1.0	<1.0
	Vinyl chloride	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	<0.015	<0.015
9038_AQUEOUS	Sulfate	36	43
9251_AQUEOUS	Chloride	60	50

Chain of Custody

CDM Analytical Laboratory
 870 WASHINGTON DRIVE
 Cambridge, MA 02139
 Fax: (617) 354-0764
 Field Log # U 1117 Page 1 of 1

Client: City of Lowell Address: _____
 Project Name: Callithron Leadkill Address: _____

Project #: _____ Phone: 950-8368 - Burns TAT: SFD
 TAT Approved by: 203

Contact: Sampled by CRB Fax #: _____ Lab Acct. #: _____
 Report to: Jim Lawler Bill to: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA	SEMI VOA	MISC	METALS	OTHER		
Core 1	5/17/81	1:30	W	6	98-04379	524.2	525	TPH 418.1	PP13			
Core 2	5/17/81	1:50	W	6	98-04380	624/8240	625/8270 A, B/N, AB/N	PET ID	RCRA 8	✓		
Mossy	5/15	8:15	W	6	98-04381	8260	PAH	PET ID	Other	✓		
						Other	Other		Filtered (Y/N)	✓		
<p>CHANGES MADE BY CRB</p> <p>CHANGES MADE BY CRB</p> <p>CHANGES MADE BY CRB</p>												
A - HCl	D - NaOH	P - Plastic	Container Type:			Sampled & Relinquished by:		Date	Time	Received by:	Date	Time
B - HNO ₃	E - NaOH	G - Glass	Preservative:			Relinquished by:		Date	Time	Received by:	Date	Time
C - H ₂ SO ₄	F - Other	V - Vial	Volume:			Relinquished by:		Date	Time	Received by:	Date	Time

- Samples Received:**
- Cooler Temperature: yes no
 - Chilled/properly preserved? yes no
 - In good condition? yes no
 - Evidence of tampering? yes no

- Instructions:**
- Fax Results
 - State Forms
 - SMART Report
 - Disk Deliverable
 - TICS

Shipper/Atch#: _____ Custody Seal#: _____ Method of Shipment: Counter Airborne Fed-ex UPS Hand Other

Comments: Chloride Self-test Aspirate begins Alkalinity Iron manganese Total cyanide

NOTE: All samples submitted subject to Standard Terms & Conditions

Client: City of Waltham
Project: Waltham Landfill
SDG: 980518-620
Date: 6/24/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #:	980518-620	Print Date:	6/24/98
Client:	City of Waltham	Client Contact:	
Project:	Waltham Landfill	Address:	Camp Dresser & McKee Ten Cambridge Center Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples. No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

NOTES

SDG 980518-620: Results for this sample group were originally reported on 6/5/98; after which, it was discovered that the trace metals target list was incomplete. Additional testing was conducted on these samples and this report contains the results reported on 6/5/98 as well as any additional metals results needed.

TDS: I980529/2540C_AQU/41; Samples , 98-04319, 98-04320, 98-04321, and 98-04322 were all analyzed one day beyond the EPA recommended maximum holding time due to intervening holiday and laboratory oversight.

RESULT NOTES

Metals: It should be noted that the analysis of these samples for trace metals was complicated by the large amounts of sediment found in the preserved samples. The sediment contributed to matrix interferences both as non-target and target chemicals requiring dilution.

98-04322 (Silver) M qualifier = Sample matrix interference is suspected, which may have biased results for this analyte. Sample result should be considered an estimate.
I980619/6010A_AQU/107: All samples were reanalyzed for silver on 6/19/98. The concentrations of samples 98-04322 (potential high bias) and 98-04434 (potential low bias) were confirmed. Sample matrix interference is suspected due to very high levels of aluminum and iron.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge complete & accurate.

LABORATORY MANAGEMENT REVIEW:

James F. Onofri

LABORATORY QA/QC REVIEW:

Patricia May - 1

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
CDM 2	05/18/98	05/18/98	98-04319	AQUEOUS
Duplicate	05/18/98	05/18/98	98-04321	AQUEOUS
CDM 1	05/18/98	05/18/98	98-04320	AQUEOUS
CDM 4	05/18/98	05/18/98	98-04322	AQUEOUS
Trip Blank	05/18/98	05/18/98	98-04323	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 2
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 2	Analytical Batch ID:	I980524/8260A_AQU/261
Lab Sample ID:	98-04319	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	96.92	86 - 115
Dibromofluoromethane	100.32	86 - 118
Toluene-d8	99.58	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 2
Lab Sample ID: 98-04319
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	9.5	
Barium	5	590	
Cadmium	1	2.0	
Chromium	5	11	
Copper	5	70	
Iron	50	27000	
Lead	5	430	
Manganese	5	540	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	470	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 1
Lab Sample ID: 98-04320
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 1
Lab Sample ID: 98-04320
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	87.58	86 - 115
Dibromofluoromethane	92.52	86 - 118
Toluene-d8	101.44	88 - 110

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980518-620
 Client Sample ID: CDM 1
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	11	
Barium	5	260	
Cadmium	1	4.0	
Chromium	5	66	
Copper	5	740	
Iron	50	47000	
Lead	5	1300	
Manganese	5	1500	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	380	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	89.62	86 - 115
Dibromofluoromethane	94.16	86 - 118
Toluene-d8	97.48	88 - 110

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	<5.0	
Barium	5	110	
Cadmium	1	1.3	
Chromium	5	19	
Copper	5	220	
Iron	25	11000	
Lead	5	380	
Manganese	5	1300	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	120	

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	2.8	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	104.72	86 - 115
Dibromofluoromethane	101.00	86 - 118
Toluene-d8	101.50	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	120	
Barium	5	5400	
Cadmium	1	83	
Chromium	5	2000	
Copper	5	17000	
Iron	500	370000	
Lead	5	14000	
Manganese	5	1800	
Selenium	10	28	
Silver	5	55	M
Zinc	20	13000	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Trip Blank
Lab Sample ID: 98-04323
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Trip Blank
Lab Sample ID: 98-04323
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	114.36	86 - 115
Dibromofluoromethane	109.76	86 - 118
Toluene-d8	101.30	88 - 110

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Preparation Batch: P980526/9012_AQ_P/22

Prep. Analyst: DEVLINHA

Component Name: Cyanide, Total EPA Method #: EPA 9012 Matrix: AQUEOUS
 Analytical Batch: I980526/9012_AQUE/22 Analyst: DEVLINHA Units: mg/L
 Reviewed By - Date: GOTTSHALLDL - 5/26/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.015	<0.015	1	
CDM 1	98-04320	0.015	<0.015	1	
Duplicate	98-04321	0.015	<0.015	1	
CDM 4	98-04322	0.015	<0.015	1	

Preparation Batch: P980619/7470A_PRE/78

Prep. Analyst: LESHINSKYA

Component Name: Mercury EPA Method #: EPA 7470A Matrix: AQUEOUS
 Analytical Batch: I980619/7470A_AQU/63 Analyst: LESHINSKYA Units: ug/L
 Reviewed By - Date: GOTTSHALLDL - 6/19/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.200	0.22	1	
CDM 1	98-04320	0.200	<0.20	1	
Duplicate	98-04321	0.200	0.26	1	
CDM 4	98-04322	0.200	3.3	1	

Component Name: Alkalinity EPA Method #: SM 2320B Matrix: AQUEOUS
 Analytical Batch: I980519/2320B_AQU/35 Analyst: DEVLINHA Units: mg/L CaCO3
 Reviewed By - Date: GOTTSHALLDL - 5/19/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.000	660	1	
CDM 1	98-04320	5.000	140	1	
Duplicate	98-04321	5.000	130	1	
CDM 4	98-04322	5.000	900	1	

Component Name: Nitrate EPA Method #: EPA 353.2 Matrix: AQUEOUS
 Analytical Batch: I980521/353.2_AQU/65 Analyst: DEVLINHA Units: mg/L
 Reviewed By - Date: GOTTSHALLDL - 5/26/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.050	<0.050	1	
CDM 1	98-04320	0.500	4.0	10	
Duplicate	98-04321	0.500	4.0	10	
CDM 4	98-04322	0.050	0.58	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Component Name: Total Dissolved Solids **EPA Method #:** SM 2540C **Matrix:** AQUEOUS
Analytical Batch: I980529/2540C_AQU/41 **Analyst:** NGUYENMH **Units:** mg/L
Reviewed By - Date: GOTTSALLDL - 5/29/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	5.000	760	1	
CDM 1	98-04320	5.000	240	1	
Duplicate	98-04321	5.000	730	1	
CDM 4	98-04322	5.000	1400	1	

Component Name: COD **EPA Method #:** HACH 8000 **Matrix:** AQUEOUS
Analytical Batch: I980603/8000_AQUE/35 **Analyst:** NGUYENMH **Units:** mg/L
Reviewed By - Date: GOTTSALLDL - 6/3/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	5.000	120	1	
CDM 1	98-04320	5.000	20	1	
Duplicate	98-04321	5.000	31	1	
CDM 4	98-04322	5.000	140	1	

Component Name: Chloride **EPA Method #:** EPA 9251 **Matrix:** AQUEOUS
Analytical Batch: I980603/9251_AQUE/15 **Analyst:** DEVLINHA **Units:** mg/L
Reviewed By - Date: GOTTSALLDL - 6/3/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	1.000	22	1	
CDM 1	98-04320	1.000	3.6	1	
Duplicate	98-04321	1.000	3.8	1	
CDM 4	98-04322	1.000	66	1	

Component Name: Sulfate **EPA Method #:** EPA 9038 **Matrix:** AQUEOUS
Analytical Batch: I980604/9038_AQUE/15 **Analyst:** NGUYENMH **Units:** mg/L
Reviewed By - Date: GOTTSALLDL - 6/4/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	10.000	79	1	
CDM 1	98-04320	10.000	36	1	
Duplicate	98-04321	10.000	27	1	
CDM 4	98-04322	10.000	85	1	

PREPARATION INFORMATION REPORT

SDG #: 980518-620

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 1	98-04320	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Duplicate	98-04321	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 4	98-04322	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Trip Blank	98-04323	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments	
CDM 2	98-04319	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		
			Final Volume	50.0	mL		
		DUPLICATE	Initial Volume	50.0	mL		
			MATRIX_SPIKE	Final Volume	50.0	mL	
				Initial Volume	50.0	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		
Duplicate	98-04321	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		
CDM 4	98-04322	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

PREPARATION INFORMATION REPORT

SDG #: 980518-620

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Duplicate	98-04321	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/3015/136
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/23/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Duplicate	98-04321	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/7470A_PRE/78
 Preparation ID: 7470A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 7470A
 Batch Approved On: 6/19/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		DUPLICATE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		MATRIX_SPIKE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 1	98-04320	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Duplicate	98-04321	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 4	98-04322	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Alkalinity

Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/19/98
CDM 1	98-04320	05/18/98	05/18/98		05/19/98
Duplicate	98-04321	05/18/98	05/18/98		05/19/98
CDM 4	98-04322	05/18/98	05/18/98		05/19/98

Analysis: 2540C_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Dissolved Solids (TDS)

Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/26/98
CDM 1	98-04320	05/18/98	05/18/98		05/26/98
Duplicate	98-04321	05/18/98	05/18/98		05/26/98
CDM 4	98-04322	05/18/98	05/18/98		05/26/98

Analysis: 353.2_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/20/98
CDM 1	98-04320	05/18/98	05/18/98		05/20/98
Duplicate	98-04321	05/18/98	05/18/98		05/20/98
CDM 4	98-04322	05/18/98	05/18/98		05/20/98

Analysis: 6010A_AQUEOUS

Required Preparation Holdtime: 180 days

Analysis Desc: ICP Metals

Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/28/98	06/01/98
CDM 1	98-04320	05/18/98	05/18/98	05/28/98	06/01/98
Duplicate	98-04321	05/18/98	05/18/98	05/28/98	06/01/98
CDM 4	98-04322	05/18/98	05/18/98	05/28/98	06/01/98

Analysis: 7470A_AQUEOUS

Required Preparation Holdtime: 28 days

Analysis Desc: Mercury in Water

Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	06/18/98	06/18/98
CDM 1	98-04320	05/18/98	05/18/98	06/18/98	06/18/98
Duplicate	98-04321	05/18/98	05/18/98	06/18/98	06/18/98
CDM 4	98-04322	05/18/98	05/18/98	06/18/98	06/18/98

Analysis: 8000_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Chemical Oxygen Demand

Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98

HOLDTIME SUMMARY

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/22/98	05/22/98
CDM 1	98-04320	05/18/98	05/18/98	05/22/98	05/22/98
Duplicate	98-04321	05/18/98	05/18/98	05/22/98	05/22/98
CDM 4	98-04322	05/18/98	05/18/98	05/22/98	05/22/98
Trip Blank	98-04323	05/18/98	05/18/98	05/22/98	05/22/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/21/98	05/21/98
CDM 1	98-04320	05/18/98	05/18/98	05/21/98	05/21/98
Duplicate	98-04321	05/18/98	05/18/98	05/21/98	05/21/98
CDM 4	98-04322	05/18/98	05/18/98	05/21/98	05/21/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/03/98
CDM 1	98-04320	05/18/98	05/18/98		06/03/98
Duplicate	98-04321	05/18/98	05/18/98		06/03/98
CDM 4	98-04322	05/18/98	05/18/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

2320B_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-02935 Prep Analyst:
EPA Number: SM 2320B Analytical Batch ID: I980519/2320B_AQU/35
Units: mg/L CaCO3 Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: 98-04415 Prep Analyst:
EPA Number: EPA 353.2 Analytical Batch ID: I980521/353.2_AQU/65
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.05	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980524/5030/361
Lab Sample ID: B98-03066 Prep Analyst: MITCHELLMR
EPA Number: EPA 8260A Analytical Batch ID: I980524/8260A_AQU/261
Units: ug/L Analysis Analyst: MITCHELLMR
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.00	<1.0	
1,1,1-Trichloroethane	1.00	<1.0	
1,1,2,2-Tetrachloroethane	1.00	<1.0	
1,1,2-Trichloroethane	1.00	<1.0	
1,1-Dichloroethane	1.00	<1.0	
1,1-Dichloroethene	1.00	<1.0	
1,1-Dichloropropene	1.00	<1.0	
1,2,3-Trichlorobenzene	1.00	<1.0	
1,2,3-Trichloropropane	1.00	<1.0	
1,2,4-Trichlorobenzene	1.00	<1.0	
1,2,4-Trimethylbenzene	1.00	<1.0	
1,2-Dibromo-3-chloropropane	1.00	<1.0	
1,2-Dibromoethane	1.00	<1.0	
1,2-Dichlorobenzene	1.00	<1.0	
1,2-Dichloroethane	1.00	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,2-Dichloropropane	1.00	<1.0	
1,3,5-Trimethylbenzene	1.00	<1.0	
1,3-Dichlorobenzene	1.00	<1.0	
1,3-Dichloropropane	1.00	<1.0	
1,4-Dichlorobenzene	1.00	<1.0	
2,2-Dichloropropane	1.00	<1.0	
2-Butanone	20.00	<20	
2-Chlorotoluene	1.00	<1.0	
2-Hexanone	20.00	<20	
4-Chlorotoluene	1.00	<1.0	
4-Methyl-2-pentanone	20.00	<20	
Acetone	20.00	<20	
Benzene	1.00	<1.0	
Bromobenzene	1.00	<1.0	
Bromochloromethane	1.00	<1.0	
Bromodichloromethane	1.00	<1.0	
Bromoform	1.00	<1.0	
Bromomethane	5.00	<5.0	
Carbon tetrachloride	1.00	<1.0	
Chlorobenzene	1.00	<1.0	
Chloroethane	5.00	<5.0	
Chloroform	5.00	<5.0	
Chloromethane	5.00	<5.0	
Dibromochloromethane	1.00	<1.0	
Dibromomethane	1.00	<1.0	
Dichlorodifluoromethane	1.00	<1.0	
Ethylbenzene	1.00	<1.0	
Hexachlorobutadiene	1.00	<1.0	
Isopropylbenzene	1.00	<1.0	
Isopropylmethylbenzene	1.00	<1.0	
Methyl tert-butyl ether	1.00	<1.0	
Methylene chloride	5.00	<5.0	
Naphthalene	1.00	<1.0	
Styrene	1.00	<1.0	
Tetrachloroethene	1.00	<1.0	
Toluene	1.00	<1.0	
Trichloroethene	1.00	<1.0	
Trichlorofluoromethane	1.00	<1.0	
Vinyl chloride	1.00	<1.0	
cis-1,2-Dichloroethene	1.00	<1.0	
cis-1,3-Dichloropropene	1.00	<1.0	
m- and p-Xylenes	1.00	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980524/5030/361
Lab Sample ID: B98-03066 Prep Analyst: MITCHELLMR
EPA Number: EPA 8260A
Units: ug/L Analytical Batch ID: I980524/8260A_AQU/261
Matrix: AQUEOUS Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
n-Butylbenzene	1.00	<1.0	
n-Propylbenzene	1.00	<1.0	
o-Xylene	1.00	<1.0	
sec-Butylbenzene	1.00	<1.0	
tert-Butylbenzene	1.00	<1.0	
trans-1,2-Dichloroethene	1.00	<1.0	
trans-1,3-Dichloropropene	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: B98-03097 Prep Analyst: DEVLINHA
EPA Number: EPA 9012
Units: mg/L Analytical Batch ID: I980526/9012_AQUE/22
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.02	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C
Units: mg/L Analytical Batch ID: I980529/2540C_AQU/41
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03298
EPA Number: EPA 6010A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Barium	5.00	<5.0	
Iron	25.00	<25	
Manganese	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03346
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03348
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03352
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03354
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03356
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-03379	Prep Analyst:	
EPA Number:	EPA 9038	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-03381	Prep Analyst:	
EPA Number:	EPA 9038	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

6010A_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	B98-03772	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Arsenic	5.00	<5.0	
Barium	5.00	<5.0	
Cadmium	1.00	<1.0	
Chromium	5.00	<5.0	
Copper	5.00	<5.0	
Iron	25.00	<25	
Lead	5.00	<5.0	
Manganese	5.00	<5.0	
Selenium	10.00	<10	
Silver	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03779
EPA Number: EPA 7470A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Mercury	0.20	<0.20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/19/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	QCS98-02936	Prep. Analyst:	
Units:	mg/L CaCO3		
Matrix:	AQUEOUS	Analytical Batch ID:	I980519/2320B_AQU/35
		Analysis Analyst:	DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.00	131.00	130	99.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	QCS98-03016	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980521/353.2_AQU/65
		Analysis Analyst:	DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.05	0.88	0.82	93.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980526/9012_AQ_P/22
Lab Sample ID:	QCS98-03098	Prep. Analyst:	DEVLINHA
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980526/9012_AQUE/22
		Analysis Analyst:	DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.02	0.20	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03209
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	1200.00	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/29/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03347
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03349
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03353
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03355
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03357
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	272.00	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	254.00	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	254.00	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	LFB98-03067	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.00	50.00	106.9	109.9	2.73	61 - 145	0 - 14	
Benzene	1.00	50.00	108.3	109.7	1.36	76 - 127	0 - 11	
Chlorobenzene	1.00	50.00	104.4	107.5	2.93	75 - 130	0 - 13	
Toluene	1.00	50.00	105.6	100.6	4.79	76 - 125	0 - 13	
Trichloroethene	1.00	50.00	105.6	104.8	0.72	71 - 120	0 - 14	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.00	1000.00	93.8			80 - 120		
Iron	25.00	200.00	103.5			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.00	100.00	100.4			80 - 120		
Barium	5.00	1000.00	93.8			80 - 120		
Cadmium	1.00	50.00	89.4			80 - 120		
Chromium	5.00	100.00	91.8			80 - 120		
Copper	5.00	100.00	98.6			80 - 120		

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Iron	25.00	200.00	103.3			80 - 120		
Lead	5.00	100.00	88.2			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Selenium	10.00	50.00	111.3			80 - 120		
Silver	5.00	100.00	106.3			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/7470A_PRE/78
Lab Sample ID:	LFB98-03778	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 7470A	Analytical Batch ID:	I980619/7470A_AQU/63
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.20	5.00	97.6			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
EPA Method #: SM 2320B Prep. Analyst:
Lab Sample ID: 98-02644 Analytical Batch ID: I980519/2320B_AQU/35
Units: mg/L CaCO3 Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	24	24	0	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
EPA Method #: SM 2540C Prep. Analyst:
Lab Sample ID: 98-04310 Analytical Batch ID: I980529/2540C_AQU/41
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID: P980526/9012_AQ_P/22
EPA Method #: EPA 9012 Prep. Analyst: DEVLINHA
Lab Sample ID: 98-04319 Analytical Batch ID: I980526/9012_AQUE/22
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.02	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
EPA Method #: EPA 7470A
Lab Sample ID: 98-04319
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	0.22	0.26	20.238	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
EPA Method #: HACH 8000
Lab Sample ID: 98-04319
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
EPA Method #: EPA 353.2
Lab Sample ID: 98-04379
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980521/353.2_AQU/65
Analysis Analyst: DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.05	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
 EPA Method #: EPA 9038
 Lab Sample ID: 98-04401
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
 EPA Method #: SM 2540C
 Lab Sample ID: 98-04404
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980529/2540C_AQU/41
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
 EPA Method #: HACH 8000
 Lab Sample ID: 98-04405
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.00	120	130	4.672	0 - 20	
Iron	25.00	810	1100	27.144	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/3015/136
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.00	12	12	6.193	0 - 20	
Barium	5.00	120	130	4.672	0 - 20	
Cadmium	1.00	<1.0	<1.0	N/A	0 - 20	
Chromium	5.00	<5.0	<5.0	N/A	0 - 20	
Copper	5.00	<5.0	<5.0	N/A	0 - 20	
Iron	25.00	990	1100	7.863	0 - 20	
Lead	5.00	<5.0	<5.0	N/A	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Selenium	10.00	<10	<10	N/A	0 - 20	
Silver	5.00	<5.0	<5.0	N/A	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
EPA Method #: EPA 9251
Lab Sample ID: 98-04450
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.00	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
EPA Method #: EPA 9038
Lab Sample ID: 98-04450
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	112			61 - 145		
Benzene	111			76 - 127		
Chlorobenzene	104			75 - 130		
Toluene	99			76 - 125		
Trichloroethene	106			71 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
 Prep. Analyst: DEVLINHA

Analytical Batch ID: I980526/9012_AQUE/22
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Cyanide, Total	94			80 - 120		
Mercury	95			80 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/19/98

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Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
2320B_AQUEOUS	Alkalinity	140	660	900	130	
2540C_AQUEOUS	Total Dissolved Solid	240	760	1400	730	
353.2_AQUEOUS	Nitrate	4.0	<0.050	0.58	4.0	
6010A_AQUEOUS	Arsenic	11	9.5	120	<5.0	
	Barium	260	590	5400	110	
	Cadmium	4.0	2.0	83	1.3	
	Chromium	66	11	2000	19	
	Copper	740	70	17000	220	
	Iron	47000	27000	370000	11000	
	Lead	1300	430	14000	380	
	Manganese	1500	540	1800	1300	
	Selenium	<10	<10	28	<10	
	Silver	<5.0	<5.0	55	<5.0	
	Zinc	380	470	13000	120	
7470A_AQUEOUS	Mercury	<0.20	0.22	3.3	0.26	
8000_AQUEOUS	COD	20	120	140	31	
8260A_AQUEOUS	1,1,1,2-Tetrachloroet	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,1-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2,2-Tetrachloroet	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloropropene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichlorobenzen	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichloropropan	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,4-Trichlorobenzen	<1.0	<1.0	<1.0	<1.0	<1.0

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
8260A_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
	1,2,4-Trimethylbenze	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dibromo-3-chloro	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dibromoethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3,5-Trimethylbenze	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,4-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	2,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
	2-Butanone	<20	<20	<20	<20	<20
	2-Chlorotoluene	<1.0	<1.0	<1.0	<1.0	<1.0
	2-Hexanone	<20	<20	<20	<20	<20
	4-Chlorotoluene	<1.0	<1.0	<1.0	<1.0	<1.0
	4-Methyl-2-pentanone	<20	<20	<20	<20	<20
	Acetone	<20	<20	<20	<20	<20
	Benzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromochloromethan	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromodichlorometha	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromoform	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromomethane	<5.0	<5.0	<5.0	<5.0	<5.0
	Carbon tetrachloride	<1.0	<1.0	<1.0	<1.0	<1.0
	Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Chloroethane	<5.0	<5.0	<5.0	<5.0	<5.0

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
8260A_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
	Chloroform	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloromethane	<5.0	<5.0	<5.0	<5.0	<5.0
	cis-1,2-Dichloroethen	<1.0	<1.0	<1.0	<1.0	<1.0
	cis-1,3-Dichloroprope	<1.0	<1.0	<1.0	<1.0	<1.0
	Dibromochlorometha	<1.0	<1.0	<1.0	<1.0	<1.0
	Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0
	Dichlorodifluorometh	<1.0	<1.0	<1.0	<1.0	<1.0
	Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Hexachlorobutadiene	<1.0	<1.0	<1.0	<1.0	<1.0
	Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Isopropylmethylbenz	<1.0	<1.0	<1.0	<1.0	<1.0
	m- and p-Xylenes	<1.0	<1.0	<1.0	<1.0	<1.0
	Methyl tert-butyl ethe	<1.0	<1.0	<1.0	<1.0	<1.0
	Methylene chloride	<5.0	<5.0	<5.0	<5.0	<5.0
	n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Naphthalene	<1.0	<1.0	2.8	<1.0	<1.0
	o-Xylene	<1.0	<1.0	<1.0	<1.0	<1.0
	sec-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Styrene	<1.0	<1.0	<1.0	<1.0	<1.0
	tert-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Tetrachloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
	Toluene	<1.0	<1.0	<1.0	<1.0	<1.0
	trans-1,2-Dichloroeth	<1.0	<1.0	<1.0	<1.0	<1.0
	trans-1,3-Dichloropro	<1.0	<1.0	<1.0	<1.0	<1.0
	Trichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
8260A_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
	Trichlorofluorometha	<1.0	<1.0	<1.0	<1.0	<1.0
	Vinyl chloride	<1.0	<1.0	<1.0	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	<0.015	<0.015	<0.015	<0.015	
9038_AQUEOUS	Sulfate	36	79	85	27	
9251_AQUEOUS	Chloride	3.6	22	66	3.8	

Client: CITY OF CAMBRIDGE
Project Name: Walton Landfill
Project #: _____

Address: _____
SDG#: 980518-620
TAT: STD
TAT Approved by: _____

Phone: 782-8368-2200
Lab Acct. #: _____

Contact: Sampled by CEB Biological - Environmental
Report to: Jim Landfill

CLIENT SAMPLE ID	DATE	TIME	MATRIX	# OF CONT	CDM SAMPLE ID	VOA			SEMI VOA			MISC			METALS			OTHER		
						524.2	8260	Other	625/8270 AB/N	525	PAH	Other	PEST/PCB	TPH 418.1	PET ID	PP13	Other	RCRA 8	Other	Filtered (Y/N)
CDM 2	5/18/02	1:20	W	6	98-04319	✓														
CDM 1	5/18/02	2:30	W	6	98-04320	✓														
Duplicate	5/18/02	7:05	W	6	98-04321	✓														
CDM 4	5/18/02	3:00	W	6	98-04322	✓														
Trip Blank	5/18/02	3:15	W	1	98-04323	✓														
A - HCl	D - NaOH	P - Plastic	Container Type:																	
B - HNO ₃	E - NaOH	G - Glass	Preservative:																	
C - H ₂ SO ₄	F - Other	V - Vial	Volume:																	

Samples Received: Fax Results
 Cooler Temperature State Forms
 Chilled/properly preserved? SMART Report
 In good condition? Disk Deliverable
 Evidence of tampering? TICS

Shipper/Airbill #: _____
 Method of Shipment: Courier UPS Fed-ex Hand Other
 Relinquished by: _____
 Relinquished by: _____
 Relinquished by: _____

Comments:
 * Chlorides
 Sulfate
 Nitrate nitroxy
 TDS

Alkalinity
 Iron
 Barium
 Zinc

Manganese
 Total Petroleum

NOTE: All samples submitted subject to Standard Terms & Conditions

Received by: _____
 Date: 5/18/02
 Time: 1:40

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 Date: _____
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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
METROPOLITAN BOSTON - NORTHEAST REGIONAL OFFICE

ARGEO PAUL CELLUCCI
Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

December 3, 1998

Mr. Ronald Vokey
Planning Director
City of Waltham
610 Main Street
Waltham, MA 02154

RE: WALTHAM - Solid Waste
Woerd Avenue Landfill
FMF # 39834
Response to 11NOV98 Report

Dear Mr. Vokey:

The Metropolitan Boston/Northeast Regional Office of the Department of Environmental Protection, Bureau of Waste Prevention, Solid Waste Section (the "Department"), is in receipt of the report, dated November 11, 1998, entitled:

Waltham, Massachusetts
Woerd Avenue Landfill
Groundwater, Surface Water, Gas and Sediment
Quarterly Sampling Results
August 1998 Sampling
(received November 16, 1998)

The report presents the results of the second quarterly round of sampling for the former Waltham landfill located off Woerd Avenue in Waltham (Woerd Avenue Landfill). The report was prepared on behalf of the City of Waltham (the "City") by Camp Dresser & McKee Inc. (CDM) of Cambridge, MA. CDM previously submitted results from the first sampling round conducted in May 1998.

Based on the CSA findings to date, CDM is planning on collecting an additional sediment sample from Cram's Cove to confirm the concentration of lead detected in one sample (Cove 2), and proposes to prepare the CSA based on the sampling data already gathered. Based on the data, the City will continue with closure and post-closure plans for the site.

Based on a review of the data from the first two CSA sampling rounds, the Department has determined the following:

1. The Department concurs that additional sediment sampling is warranted to confirm the results found in sediment sample Cove 2.

Woerd Avenue Landfill

Page 2

2. The Department does not concur that sufficient data has been gathered in order to complete the CSA, at this time. Based on the data provided:
 - a. Additional investigation of the sediments adjacent to the landfill is warranted. The Department notes that the concentration of heavy metals and SVOCs in the sediments in Cram's Cove and the stream on the south side of the landfill. Additional sediment samples should be collected to help determine if the landfill is the primary source of contamination of sediments in the cove.
 - b. Due to the variability of the results from the two sampling rounds (the first being analyzed for total metals and the second being analyzed for dissolved metals), the Department will require that at least one additional round be collected and analyzed for dissolved metals, and indicator parameters.

Please be advised that the Department reserves the right to require additional assessment and investigation of the landfill site area based on a review of environmental monitoring results.

If you have any questions regarding this letter, or you need additional information, please contact Peter Flink at (978) 661-7663.

Sincerely,



Peter J. Flink
Environmental Analyst

Sincerely,



Edward H. MacDonald
Regional Engineer for
Waste Prevention

EHM/PJF

cc: Mr. Bruce Haskell, Camp Dresser & McKee Inc.
10 Cambridge Center, Cambridge, MA 02142
Waltham Board of Health

**Waltham, Massachusetts
Woerd Avenue Landfill**

**Groundwater, Surface Water, Gas and Sediment
Quarterly Sampling Results**

November 1998 Sampling



Camp Dresser & McKee Inc.

consulting
engineering
construction
operations

Ten Cambridge Center
Cambridge, Massachusetts 02142
Tel: 617 252-8000 Fax: 617 621-2565

January 26, 1999

Mr. Edward MacDonald
Department of Environmental Protection
Metropolitan Boston - Northeast Regional Office
205A Lowell Street
Wilmington, Massachusetts 01887

Subject: Groundwater, Surface Water, Sediment and Landfill Gas Sampling
Woerd Avenue Landfill — Waltham, Massachusetts
November 1998

Dear Mr. MacDonald:

Attached are the following documents pertaining to the groundwater, surface water, landfill gas and sediment sampling event performed at the Woerd Avenue Landfill on December 9, 10 and 11, 1998:

- Written summary describing the sampling and analysis. (*Attachment A*)
- Landfill monitoring site plan showing sampling locations. (*Attachment B*)
- Summary tables presenting analytical results and field data for each monitoring point. (*Attachment C*)
- Laboratory data sheets and chain of custody forms. (*Attachment D*)

The groundwater and surface water sampling results for the third round of sampling showed no exceedances of any primary standards for indicator parameters or metals. The samples were filtered prior to laboratory analysis and show similar yet lower concentrations than the second quarter sampling which were also filtered. Comparably, these results show considerably lower concentrations than the first quarter sampling which were not filtered. Groundwater and surface water samples were not tested for volatile organic carbons (VOCs) this round because of the low concentrations of VOCs found in the previous two sampling rounds.

A confirmatory sample of sediment was taken at Cove 2 due to excessively high lead concentration found in the sediment sample during the second round of sampling. Three samples were obtained at locations 5-feet apart and combined at the laboratory prior to analysis. The composite sample showed two exceedances of NOAA ER-Median concentrations of lead and zinc. The lead concentration of 490 mg/kg exceeded the ER-Median value of 300 mg/kg; however, it is significantly lower than the 110,000 mg/kg found in the second sampling round.

Mr. Edward MacDonald
January 26, 1999
Page 2

The landfill gas results correlate with the findings of the first two sampling rounds that the waste is biologically stable and methane does not appear to be a problem at the site.

As previously agreed, this third sampling round completes the sampling requirements as part of the CSA. The City is now concentrating on proceeding forward with landfill closure and post-closure reuse plans and will be completing the CSA based on the existing data. The recommendations for future site monitoring will be made as part of the CSA.

If there are any questions regarding this information, please contact me at (617) 252-8367 or Bruce Haskell at (617) 252-8371.

Very truly yours,

CAMP DRESSER & McKEE INC.



Renata P. Nagrant



Bruce W. Haskell, P.E.

RPN/BWH:dmd

Attachments

cc: Ronald G. Vokey, Waltham Planning Department

Attachment A

Summary of Quarterly Sampling and Analysis November 1998 Woerd Avenue Landfill Waltham, Massachusetts

Introduction

On December 9 and 10, 1998, Camp Dresser & McKee's (CDM's) subconsultant CRB Geological & Environmental Services, Inc. collected groundwater, surface water, sediment, and gas samples in the vicinity of the Woerd Avenue Landfill. The monitoring network at the landfill site currently consists of 8 groundwater monitoring wells and 3 landfill gas wells. The locations of the groundwater monitoring wells are identified as: CDM 1, CDM 1A, CDM 2, CDM 2A, CDM 3, CDM 3A, CDM 4 and CDM 4A. Monitoring well CDM 3 was not sampled because it was dry at the time of sampling. Monitoring wells CDM 1, CDM 2, CDM 3 and CDM 4 are shallow wells with 10-foot screens with bottom of screen depths ranging from 15 to 37-feet. Monitoring wells CDM 1A, CDM 2A, CDM 3A and CDM 4A are deeper wells with 10-foot screens with bottom of screen depths ranging from 75 to 97-feet. A total of three surface water samples were collected: Cove 1, Cove 2, and Stream 1. Cove 1 and Cove 2 were taken from Cram's Cove. Stream 1 was collected from the stream along the southern border of the site in Newton. Three sediment samples were also taken at the Cove 2 location at 5-foot increments and were combined at the laboratory into one composite sample before laboratory analysis was performed. In addition, landfill gas parameters were measured from landfill gas wells LFG 1, LFG 2, and LFG 3. No leachate seeps were observed in the field. The above-referenced sampling locations are indicated on the attached Existing Conditions Plan in Attachment B.

Groundwater and surface water samples were analyzed on-site for field parameters. All water samples were forwarded to the CDM Laboratory in Cambridge, Massachusetts who managed the laboratory testing performed by the CDM affiliate Alpha Analytical Laboratories in Westborough, Massachusetts. The water samples were analyzed for the following parameters: "RCRA 8" - metals plus iron, manganese, zinc by EPA Method 6010A; total cyanide; and indicator parameters. All water samples analyzed for metals were filtered in the laboratory prior to analysis. Samples were not tested for volatile organic carbons (VOCs) since there was no exceedance of primary or secondary standards for VOCs in prior sampling rounds.

The composite sediment sample obtained at Cove 2 was analyzed at the CDM Laboratory for metals by EPA Method 6010A, pesticides and polychlorinated biphenyls (PCBs) by EPA Method 8081, VOCs by EPA Method 8260A, and polyaromatic hydrocarbons (PAHs) by EPA Method 8270B.

The landfill gas wells were screened in the field for methane, hydrogen sulfide, oxygen, carbon dioxide, and VOCs. Both the laboratory reports for this sampling round and summary tables of the analytical results are included in this report.

Quality Control

A duplicate sample was obtained for the groundwater well CDM 1. The concentrations of all metals found for CDM 1 Duplicate are comparable to the concentrations found in CDM 1. No blank samples were obtained in the field because these samples are used to test the accuracy of VOC analysis which was not performed for this sample round.

Evaluation of Results

The results of the water quality sampling are summarized in Table 1 in Attachment C. The sampling results are compared to the Massachusetts Department of Environmental Protection (MDEP) or Environmental Protection Agency (EPA) Primary Drinking Water Standards (primary standards) and to MDEP Drinking Water Guidelines or EPA Secondary Maximum Contaminant Level (secondary standards).

Groundwater Quality

There are no exceedances of primary standards for any of the field and conventional parameters measured for any of the groundwater locations. The pH exceeded the secondary standard for pH at CDM 1 with a slightly acidic value of 6.2, below the minimum standard of 6.5. Concentrations of total dissolved solids (TDS) exceeded the secondary standard of 500 mg/L at CDM 2, CDM 4 and CDM 4A. Concentrations of TDS ranged from 690 mg/L to 940 mg/L for these samples.

The metals concentrations reported are dissolved metals concentrations since all samples were filtered at the laboratory before analysis. There were no exceedances of the primary standards for metals for any of the groundwater samples.

There were several exceedances of the secondary standards for metals detected in the groundwater samples. Iron was detected at a level of 9,800 ug/L at CDM 2 and 1,700 ug/L, at CDM 4 both above the secondary standard of 300 ug/L. The secondary standard for manganese of 50 ug/L was exceeded for all seven monitoring wells sampled with levels as high as 3,200 ug/L at CDM 4A and 1,200 ug/L at CDM 1.

Surface Water Quality

Surface water samples were obtained from Cram's Cove, at locations Cove 1 and Cove 2 and from the stream bordering the landfill to the south on the Waltham/Newton town line at the location Stream 1.

The surface water samples indicated no exceedances of primary standards. Concentrations of total dissolved solids (TDS) exceeded the secondary standard of 500 mg/L at Cove 1 and Stream 1 with concentrations of 780 mg/L and 820 mg/L, respectively.

As explained previously, the metals concentrations reported are the dissolved metals concentrations because the samples were filtered at the laboratory before analysis. There were no exceedances of the primary standards for metals for any of the surface water samples.

There were several exceedances of the secondary standards for metals detected in the surface water samples. The secondary standard for iron of 300 ug/L was exceeded for all three surface water samples with levels as high as 19,000 ug/L at Cove 1 and 1,100 ug/L at Stream 1. The secondary standard for manganese of 50 ug/L was also exceeded for all three surface water samples with levels as high as 500 ug/L at Cove 1 and 370 ug/L at Stream 1.

Sediment Sample

The National Oceanic and Atmospheric Administration (NOAA) has developed sediment effect levels as part of the National Status and Trends Program (NS&T). A number of approaches were used to determine the different effect ranges (ERs). ER-L is the effects Range-Low, which is based on histograms where 10 percent of the data shows that the organisms in a more sensitive life stage are biologically affected. For ER-M, or Effects Range-Median, 50 percent of the data shows effects on all life stages. Although not listed by NOAA, the concentration of iron was found at a high concentration of 34,000 mg/kg.

The results of the laboratory analysis of the composite sediment sample obtained at Cove 2 is presented in Table 2 of Attachment C. These results are compared to the NOAA Effects Range-Low (ER-Low) and Effects Range-Median (ER-Median). Exceedances of the ER-Low range were noted for all metals except mercury and silver. Exceedances of the ER-Median range were noted in two of the eight metals, namely lead and zinc. Lead was found at a concentration of 490 mg/kg, exceeding the ER-Median concentration of 300 mg/kg. Zinc was found at a concentration of 840 mg/kg, exceeding the ER-Median concentration of 410 mg/kg. There are no NOAA ER detection limits established for VOCs and PCBs/pesticides (with an exception of 4-4'-DDE) in sediment. However, there are ER-Low and ER-Median values established for selective PAHs which are significantly lower than the laboratory detection limits. Consequently, no comparison of the sediment results with NOAA limits can be made.

Landfill Gas Monitoring

The concentrations of methane, total volatile organic compounds (VOCs), hydrogen sulfide, carbon dioxide and oxygen were field measured on December 9, 1998 at gas monitoring well LFG 2 and on December 11, 1998 at gas monitoring wells LFG 1 and LFG 3. The summary table of these results is shown as Table 4 in Attachment C. Background levels were established in the ambient air, off landfill limits, before proceeding with well sampling. Upon arrival at the well, the end of the tubing attached to the sampling instrument was connected to the well's sampling port then the sampling valve was opened and initial readings were recorded. After taking the initial readings, the well was purged for ten minutes in order to obtain a representative air sample from the soil surrounding the monitoring well screen. Once purging was complete, the gas meters were reconnected to the sampling port to record final readings.

Methane was detected above the background levels at LFG 1 and LFG 3, however, at levels below the lower explosive limit of 5 percent (methane by volume in air). Total VOCs were not detected in any of the three gas wells. Hydrogen sulfide was measured below background levels at LFG 2 and LFG 3 and at the low level of 1 ppm at LFG 1. Carbon dioxide was detected at LFG 1, LFG 2 and LFG 3 at concentration of 16.5, 14.1 and 1.2 percent by volume in air, none of which indicate a high level of biological activity. Oxygen was found at 19.9 percent by volume in LFG 3, which is similar

to ambient conditions, and at lower concentrations of 0.7 and 7.8 percent at LFG 1 and LFG 2, respectively.

Conclusions

The groundwater and surface water sampling results for the third quarter showed no exceedances of any primary standard in indicator parameters or metals. The results for indicator parameters are similar to both the first and second quarter sampling results. The results for metals are significantly lower in concentration than the results of non-filtered samples of the first sampling round in May 1998. However, the results from this round are similar to the results from the filtered samples of the second round which showed a total of three exceedances of primary standards; two exceedances of cadmium in groundwater samples and one exceedance of lead in a surface water sample.

The composite sediment sample at Cove 2 showed two exceedances of NOAA ER-Median concentrations for lead and zinc and four other exceedances of ER-Low concentrations for arsenic, cadmium, chromium and copper. There were no exceedances for NOAA effects concentrations for any of the PCBs/pesticides and VOCs. PAHs exceedances for NOAA limits could not be established because the minimum detection limits for PAHs were higher than ER values.

The gas monitoring at the site indicates a low presence of methane on the site, similar to the findings of the first and second sampling rounds that found virtually no presence of methane on-site.

This is the final of three rounds of water quality sediment and landfill gas sampling to be evaluated as part of the *Comprehensive Site Assessment Report*.

Attachment
C

TABLE 1
 WATER QUALITY SAMPLING SUMMARY
 NOVEMBER 1998 SAMPLING ROUND
 WOERD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS

TYPE OF SAMPLE SAMPLING DATE LOCATION ID	UNITS	DRINKING WATER REGULATIONS	GROUNDWATER SAMPLES						SURFACE WATER SAMPLES								
			9-DEC-98		9-DEC-98		9-DEC-98		10-DEC-98		10-DEC-98						
			CDM 1	CDM 1 Duplicate	CDM 2	CDM 4	CDM 1A	CDM 2A	CDM 3A	CDM 4A	COVE 1	COVE 2	STREAM 1				
FIELD PARAMETERS																	
SPECIFIC CONDUCTANCE	us/cm	NL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
DISSOLVED OXYGEN	mg/l	NL	1.7	1.7	1.0	0.4	4.2	1.5	2.1	3.1	2.3	6.6	8.1	—	—	—	—
Ph	Std	6.5-8.5 (3,5)	6.2	6.8	6.6	35.5	7.0	7.5	7.4	6.8	6.5	7.2	7.6	—	—	—	—
WATER LEVEL (MEAN SEA LEVEL)	ft.	NL	40.8	40.8	36.4	10.0	38.0	36.3	35.3	36.2	—	—	—	—	—	—	—
TEMPERATURE	C	NL	11.0	11.0	14.2	10.8	10.8	12.2	17.7	12.5	10.8	7.9	4.2	—	—	—	—
CONVENTIONAL PARAMETERS																	
ALKALINITY	mg/l	NL	120	120	650	900	120	69	230	310	500	400	510	—	—	—	—
TDS (TOT. DISSOLVED SOLIDS)	mg/l	500 (3,5)	190	200	690	940	190	120	320	710	780	470	820	—	—	—	—
NITRATE-NITROGEN	mg/l	10 (2,4)	2.7	2.7	<0.1	<0.1	0.8	<0.1	<0.1	<0.1	0.46	0.16	<0.1	—	—	—	—
CYANIDE, TOTAL	mg/l	0.2(4)	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	—	—	—	—
SULFATE	mg/l	250(3,5)	26	26	<10	<10	20	<10	13	<10	<10	<10	<10	—	—	—	—
CHLORIDE	mg/l	250(5)	4.3	4.2	66	58	8.4	4	32	240	150	40	220	—	—	—	—
COD (CHEMICAL OXYGEN DEMAND)	mg/l	NL	130	120	620	710	<20	<20	41	51	46	110	150	—	—	—	—
METALS																	
ARSENIC	ug/l	50(2,4)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	—	—	—	—
BARIUM	ug/l	2000 (2,4)	40	40	1,400	870	<10	<10,0	160	120	960	340	200	—	—	—	—
CADMIUM	ug/l	5 (2,4)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	—	—	—	—
CHROMIUM	ug/l	100(2,4)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	—	—	—	—
COPPER	ug/l	1300 (2,4)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	—	—	—	—
IRON	ug/l	300 (3,5)	260	180	9,800	1,700	100	<50	50	350	19,000	480	1,100	—	—	—	—
LEAD	ug/l	15 (2,4)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	—	—	—	—
MANGANESE	ug/l	50 (3,5)	1,200	1,200	130	170	460	180	560	3,200	500	190	370	—	—	—	—
MERCURY	ug/l	2 (2,4)	<5	<5	<5	<5	<5	<5	6	7	<5	9	<5	—	—	—	—
SELENIUM	ug/l	50 (2,4)	<5	<5	25	25	<5	<5	<5	<5	16	9	<5	—	—	—	—
SILVER	ug/l	100 (3,5)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	—	—	—	—
ZINC	ug/l	5000 (3,5)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	—	—	—	—

FOOTNOTES:

- (1) HIGHLIGHTED AREA: CONCENTRATION EXCEEDS MASSACHUSETTS OR EPA DRINKING WATER STANDARDS
 - (2) MASSACHUSETTS DRINKING WATER STANDARD
 - (3) MASSACHUSETTS DRINKING WATER GUIDELINE OR SECONDARY MAXIMUM CONTAMINANT LEVEL
 - (4) EPA PRIMARY DRINKING WATER STANDARD
 - (5) EPA SECONDARY DRINKING WATER STANDARD
 - (6) NO SAMPLE WAS TAKEN AT GROUNDWATER MONITORING WELL CDM 3 BECAUSE THE WELL WAS DRY
 - (7) ALL SAMPLES WERE FILTERED IN THE LABORATORY
 - (8) SURFACE WATER SAMPLE WAS NOT TAKEN AT THE LOCATION - SWALE 1 BECAUSE THE SWALE WAS DRY
- <## NOT DETECTED TO THE LIMIT INDICATED
 NL NO LIMIT
 — THIS ANALYSIS WAS NOT PERFORMED.

TABLE 2
 SEDIMENT ANALYSIS SUMMARY
 NOVEMBER 1998 SAMPLING ROUND
 WOERD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS

SAMPLING DATE	NOAA EFFECTS RANGE CONCENTRATIONS		UNITS	10-Dec-98 Composite of Cove 2
	ER-Low (mg/kg)	ER-Median (mg/kg)		
EPA 6010A - Metals				
Arsenic	8.2	70	mg/Kg dry	17
Barium	NL	NL	mg/Kg dry	530
Cadmium	1.2	9.6	mg/Kg dry	6.4
Chromium	8.1	370	mg/Kg dry	63
Copper	34	270	mg/Kg dry	210
Iron	NL	NL	mg/Kg dry	34000
Lead	218	300	mg/Kg dry	490
Manganese	NL	NL	mg/Kg dry	270
Mercury	0.15	0.71	mg/Kg dry	<1.4
Selenium	NL	NL	mg/Kg dry	<2.2
Silver	1	3.7	mg/Kg dry	<2.2
Zinc	150	410	mg/Kg dry	840
EPA 8081				
Aldrin	NL	NL	mg/Kg dry	<0.278
Aroclor 1221	NL	NL	mg/Kg dry	<1.390
Aroclor 1232	NL	NL	mg/Kg dry	<1.390
Aroclor 1248	NL	NL	mg/Kg dry	<1.390
Aroclor 1254	NL	NL	mg/Kg dry	<1.390
Aroclor 1260	NL	NL	mg/Kg dry	<1.390
alpha-BHC	NL	NL	mg/Kg dry	<0.278
beta-BHC	NL	NL	mg/Kg dry	<0.278
Chlordane (Technical)	NL	NL	mg/Kg dry	<1.110
4,4'-DDD	NL	NL	mg/Kg dry	<0.278
4,4'-DDE	0.0022	0.027	mg/Kg dry	<0.278
4,4'-DDT	NL	NL	mg/Kg dry	<0.278
Dieldrin	NL	NL	mg/Kg dry	<0.278
Endosulfan I	NL	NL	mg/Kg dry	<0.278
Endosulfan II	NL	NL	mg/Kg dry	<0.278
Endosulfan sulfate	NL	NL	mg/Kg dry	<0.278
Endrin	NL	NL	mg/Kg dry	<0.278
Endrin aldehyde	NL	NL	mg/Kg dry	<0.278
Heptachlor	NL	NL	mg/Kg dry	<0.278
Heptachlor epoxide	NL	NL	mg/Kg dry	<0.278
Methoxychlor	NL	NL	mg/Kg dry	<0.278
Toxaphene	NL	NL	mg/Kg dry	<0.278
delta-BHC	NL	NL	mg/Kg dry	<1.110
Aroclor 1242/1016	NL	NL	mg/Kg dry	<0.278
EPA 8260A				
Benzene	NL	NL	ug/Kg dry	<110

TABLE 2 (cont.)
 SEDIMENT ANALYSIS SUMMARY
 NOVEMBER 1988 SAMPLING ROUND
 WOERD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS

SAMPLING DATE	NOAA EFFECTS RANGE CONCENTRATIONS		UNITS	10-Dec-98 Composite of Cove 2
	ER-Low (mg/kg)	ER-Median (mg/kg)		
Bromobenzene	NL	NL	ug/Kg dry	<560
Bromochloromethane	NL	NL	ug/Kg dry	<560
Bromodichloromethane	NL	NL	ug/Kg dry	<1,100
Bromoform	NL	NL	ug/Kg dry	<110
Bromomethane	NL	NL	ug/Kg dry	<220
2-Butanone	NL	NL	ug/Kg dry	<1,100
n-Butylbenzene	NL	NL	ug/Kg dry	<560
sec-Butylbenzene	NL	NL	ug/Kg dry	<560
tert-Butylbenzene	NL	NL	ug/Kg dry	<560
Carbon tetrachloride	NL	NL	ug/Kg dry	<110
Chlorobenzene	NL	NL	ug/Kg dry	<390
Chloroethane	NL	NL	ug/Kg dry	<220
Chloroform	NL	NL	ug/Kg dry	<170
Chloromethane	NL	NL	ug/Kg dry	<1,100
1,2-Dibromo-3-chloropropane	NL	NL	ug/Kg dry	<560
1,2-Dibromoethane	NL	NL	ug/Kg dry	<560
Dibromochloromethane	NL	NL	ug/Kg dry	<110
Dibromomethane	NL	NL	ug/Kg dry	<1,100
1,2-Dichlorobenzene	NL	NL	ug/Kg dry	<1,100
1,3-Dichlorobenzene	NL	NL	ug/Kg dry	<1,100
1,4-Dichlorobenzene	NL	NL	ug/Kg dry	<1,100
Dichlorodifluoromethane	NL	NL	ug/Kg dry	<1,100
1,1-Dichloroethane	NL	NL	ug/Kg dry	<170
1,2-Dichloroethane	NL	NL	ug/Kg dry	<170
cis-1,2-Dichloroethene	NL	NL	ug/Kg dry	<110
trans-1,2-Dichloroethene	NL	NL	ug/Kg dry	<170
1,2-Dichloropropane	NL	NL	ug/Kg dry	<390
1,3-Dichloropropane	NL	NL	ug/Kg dry	<560
2,2-Dichloropropane	NL	NL	ug/Kg dry	<560
1,1-Dichloropropene	NL	NL	ug/Kg dry	<2,800
cis-1,3-Dichloropropene	NL	NL	ug/Kg dry	<110
trans-1,3-Dichloropropene	NL	NL	ug/Kg dry	<110
Ethylbenzene	NL	NL	ug/Kg dry	<110
Hexachlorobutadiene	NL	NL	ug/Kg dry	<560
2-Hexanone	NL	NL	ug/Kg dry	<1,100
Isopropylbenzene	NL	NL	ug/Kg dry	<560
4-Methyl-2-pentanone	NL	NL	ug/Kg dry	<560
Methylene chloride	NL	NL	ug/Kg dry	660
Naphthalene	NL	NL	ug/Kg dry	<560
n-Propylbenzene	NL	NL	ug/Kg dry	<110
Styrene	NL	NL	ug/Kg dry	<560
1,1,1,2-Tetrachloroethane	NL	NL	ug/Kg dry	<110
1,1,2,2-Tetrachloroethane	NL	NL	ug/Kg dry	<560
Tetrachloroethene	NL	NL	ug/Kg dry	<170
Toluene	NL	NL	ug/Kg dry	<170

TABLE 2 (cont.)
 SEDIMENT ANALYSIS SUMMARY
 NOVEMBER 1998 SAMPLING ROUND
 WOERD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS

SAMPLING DATE	NOAA EFFECTS RANGE CONCENTRATIONS		UNITS	10-Dec-98 Composite of Cove 2
	ER-Low (mg/kg)	ER-Median (mg/kg)		
1,2,3-Trichlorobenzene	NL	NL	ug/Kg dry	<560
1,2,4-Trichlorobenzene	NL	NL	ug/Kg dry	<560
1,1,1-Trichloroethane	NL	NL	ug/Kg dry	<560
1,1,2-Trichloroethane	NL	NL	ug/Kg dry	<110
Trichloroethene	NL	NL	ug/Kg dry	<560
Trichlorofluoromethane	NL	NL	ug/Kg dry	<560
1,2,4-Trimethylbenzene	NL	NL	ug/Kg dry	<560
1,3,5-Trimethylbenzene	NL	NL	ug/Kg dry	<1,100
1,2,3-Trichloropropane	NL	NL	ug/Kg dry	<220
Vinyl chloride	NL	NL	ug/Kg dry	<110
m- and p-Xylenes	NL	NL	ug/Kg dry	<110
o-Xylene	NL	NL	ug/Kg dry	<170
1,1-Dichloroethene	NL	NL	ug/Kg dry	2100
Acetone	NL	NL	ug/Kg dry	<560
Isopropylmethylbenzene	NL	NL	ug/Kg dry	<1,100
Methyl tert-butyl ether	NL	NL	ug/Kg dry	
EPA 8270B				
Acenaphthene	16	500	ug/Kg dry	<14,000
Acenaphthylene	44	640	ug/Kg dry	<14,000
Anthracene	85.3	1100	ug/Kg dry	<14,000
Benzo (a) anthracene	261	1600	ug/Kg dry	<14,000
Benzo(b)fluoranthene	NL	NL	ug/Kg dry	<14,000
Benzo(k)fluoranthene	NL	NL	ug/Kg dry	<14,000
Benzo(g,h,i)perylene	NL	NL	ug/Kg dry	<14,000
Benzo(a)pyrene	430	1600	ug/Kg dry	<14,000
Chrysene	384	2800	ug/Kg dry	<14,000
Dibenz(a,h)anthracene	63.4	260	ug/Kg dry	<14,000
Fluoranthene	600	5100	ug/Kg dry	<14,000
Fluorene	19	540	ug/Kg dry	<14,000
Indeno(1,2,3-cd)pyrene	NL	NL	ug/Kg dry	<14,000
2-Methylnaphthalene	70	670	ug/Kg dry	<14,000
Naphthalene	160	2100	ug/Kg dry	<14,000
Phenanthrene	240	1500	ug/Kg dry	<14,000
Pyrene	885	2600	ug/Kg dry	<14,000

FOOTNOTES:

Bolded, outlined values indicate an exceedance of the ER-L values.

Bolded, outlined, shaded values indicate an exceedance of both ER-L and ER-M values.

NL: No value was provided by NOAA.

* National Oceanic and Atmospheric

Administration (NOAA) 1993. The

<#:# Not detected to the limit indicated.

TABLE 3
GAS WELL - FIELD MEASURED SUMMARY
NOVEMBER 1998 SAMPLING ROUND
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

Parameter	Meter	Units	LFG 1 - Field Measured			LFG 2 - Field Measured			LFG 3 - Field Measured		
			Background	Initial	Final	Background	Initial	Final	Background	Initial	Final
METHANE	LANDTEC	%*	0.0	0.0	2.7	0.1	0.1	0.1	0.0	0.0	0.1
CARBON DIOXIDE	LANDTEC	%	0.2	2.0	16.5	0.0	0.9	14.1	0.0	0.0	1.2
OXYGEN	LANDTEC	%	20.9	20.9	0.7	20.3	16.5	7.8	20.9	21.0	19.1
VOCs	PID	ppm	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROGEN SULFIDE	BACHRACH	ppm	0	0	1	5	5	3	5	2	3

Notes:

1. LEL = Lower Explosive Limit. The lower explosive limit of methane in air is 5% methane by volume in air.
 2. Gas well field measurements for LFG 2 were performed on December 9, 1998 at 3:15 PM. LFG 1 and LFG 3 were measured on December 11, 1998 at 8:30 AM and 9:00 AM respectively
- * Values are expressed in percent by volume in air.
 — This analysis was not performed.

Hourly Surface Observations

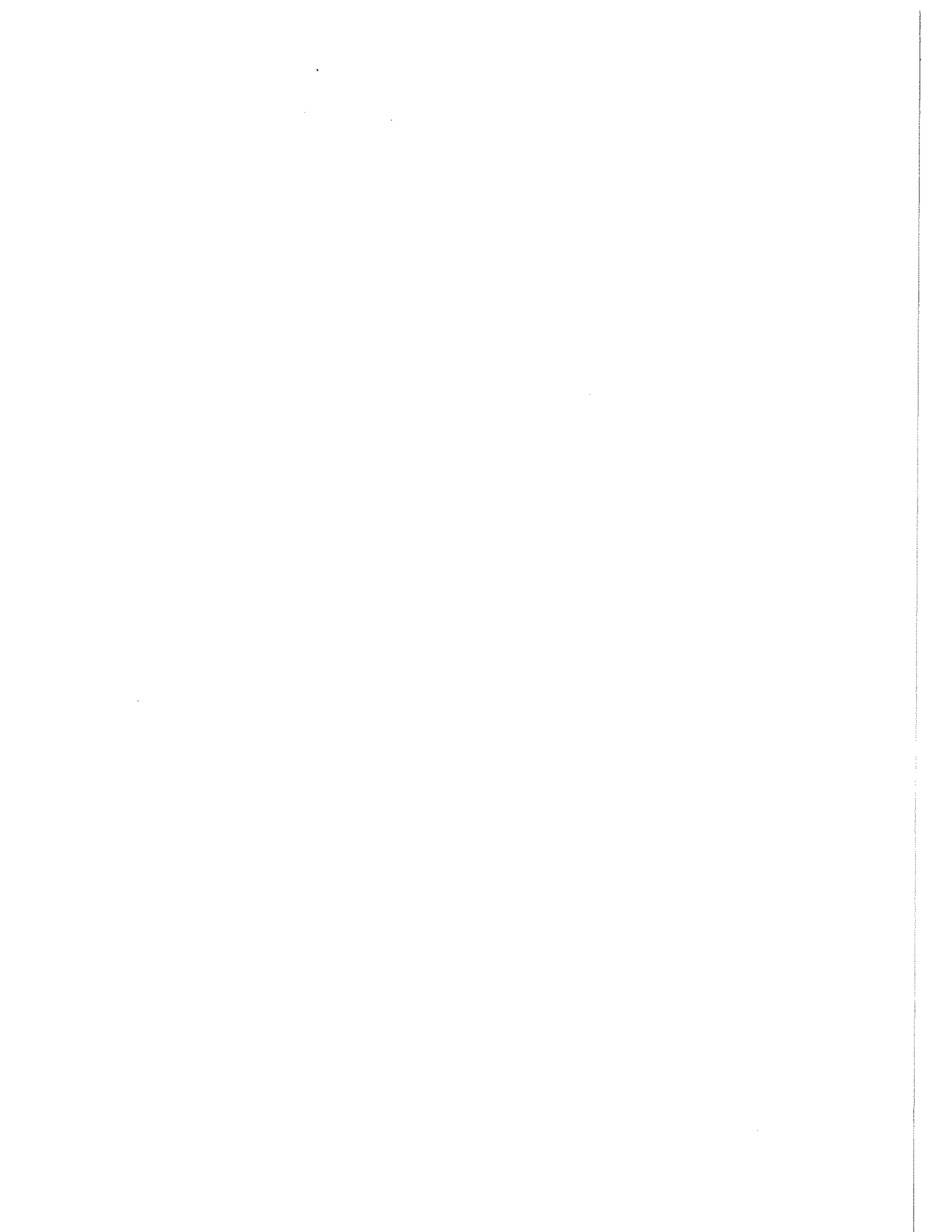
Station: BOSTON WSFO AP, MA, Year: 1998

mm/dd/yyyy hh	Temperature	Dewpoint	Wind Speed	Wind Direction	Wind Gusts	Peak Wind Speed	Peak Wind Direction	Station Pressure	Visibility	Weather Conditions	Hourly Precipitation
	degF	degF	miles/hour	compass	miles/hour	miles/hour	compass	inch Hg	miles	text	inch
12/08/1998 00	45	28	12.7	NNW	-	-	-	30.15	10.00		0.00
12/08/1998 01	44	29	10.4	NNW	-	-	-	30.16	10.00		0.00
12/08/1998 02	42	29	6.9	NNW	-	-	-	30.19	10.00		0.00
12/08/1998 03	41	27	10.4	N	-	-	-	30.19	10.00		0.00
12/08/1998 04	40	28	8.1	N	-	-	-	30.20	10.00		0.00
12/08/1998 05	39	27	9.2	N	-	-	-	30.21	10.00		0.00
12/08/1998 06	37	28	5.8	NNE	-	-	-	30.22	10.00		0.00
12/08/1998 07	37	27	8.1	N	-	-	-	30.24	10.00		0.00
12/08/1998 08	38	27	6.9	N	-	-	-	30.24	10.00		0.00
12/08/1998 09	42	33	13.8	E	-	-	-	30.22	10.00		0.00
12/08/1998 10	43	36	11.5	E	-	-	-	30.24	10.00		0.00
12/08/1998 11	43	39	13.8	E	-	-	-	30.20	10.00		0.00
12/08/1998 12	43	38	16.1	ESE	-	-	-	30.15	10.00		0.00
12/08/1998 13	43	37	16.1	ESE	-	-	-	30.13	10.00	light rain	0.00
12/08/1998 14	40	39	17.3	ESE	-	-	-	30.10	4.00	moderate rain, fog/mist	0.02
12/08/1998 15	40	40	12.7	ESE	-	-	-	30.09	3.00	light rain	0.12
12/08/1998 16	41	41	15.0	E	-	-	-	30.06	3.00	light rain	0.02
12/08/1998 17	41	41	15.0	E	-	-	-	30.03	3.00	light rain, fog/mist	0.07
12/08/1998 18	42	42	10.4	NE	-	-	-	30.04	10.00	light rain	0.03
12/08/1998 19	40	42	11.5	NNE	-	-	-	30.01	2.00	light rain, fog/mist	0.03
12/08/1998 20	40	40	12.7	N	-	-	-	30.02	2.00	light rain, fog/mist	0.07
12/08/1998 21	40	40	10.4	NNE	-	-	-	30.01	4.00	light rain, fog/mist	0.04
12/08/1998 22	40	40	8.1	N	-	-	-	30.00	2.00	light rain, fog/mist	0.00
12/08/1998 23	40	40	8.1	NNW	-	-	-	30.00	5.00	moderate drizzle, fog/mist	0.00
12/09/1998 00	37	37	9.2	NNW	-	-	-	30.01	3.00	moderate drizzle, fog/mist	0.00
12/09/1998 01	36	36	8.1	NNW	-	-	-	30.01	3.00	fog/mist	0.00
12/09/1998 02	35	35	9.2	NNW	-	-	-	30.03	3.00	fog/mist	0.00
12/09/1998 03	36	36	8.1	NNW	-	-	-	30.05	1.50	fog/mist	0.00

12/09/1998	04	35	9.2	NNW	-	-	-	30.05	10.00	0.00
12/09/1998	05	34	9.2	NW	-	-	-	30.07	10.00	0.00
12/09/1998	06	33	9.2	NW	-	-	-	30.09	10.00	0.00
12/09/1998	07	32	9.2	NNW	-	-	-	30.11	10.00	0.00
12/09/1998	08	31	11.5	NW	-	-	-	30.15	10.00	0.00
12/09/1998	09	31	13.8	NNW	-	-	-	30.17	10.00	0.00
12/09/1998	10	29	18.4	NNW	23.0	-	-	30.17	10.00	0.00
12/09/1998	11	29	13.8	NW	19.6	-	-	30.18	10.00	0.00
12/09/1998	12	28	10.4	NW	18.4	-	-	30.17	10.00	0.00
12/09/1998	13	28	13.8	WNW	-	-	-	30.16	10.00	0.00
12/09/1998	14	28	10.4	NW	23.0	-	-	30.16	10.00	0.00
12/09/1998	15	29	12.7	WNW	-	-	-	30.17	10.00	0.00
12/09/1998	16	30	18.4	WNW	-	-	-	30.20	10.00	0.00
12/09/1998	17	30	12.7	WNW	-	-	-	30.22	10.00	0.00
12/09/1998	18	41	11.5	WNW	-	-	-	30.23	10.00	0.00
12/09/1998	19	41	9.2	W	-	-	-	30.24	10.00	0.00
12/09/1998	20	41	11.5	W	-	-	-	30.26	10.00	0.00
12/09/1998	21	41	13.8	W	-	-	-	30.26	10.00	0.00
12/09/1998	22	40	13.8	W	-	-	-	30.27	10.00	0.00
12/09/1998	23	40	11.5	W	-	-	-	30.28	10.00	0.00
12/10/1998	00	38	8.1	WNW	-	-	-	30.29	10.00	0.00
12/10/1998	01	37	9.2	W	-	-	-	30.30	10.00	0.00
12/10/1998	02	37	8.1	WNW	-	-	-	30.30	10.00	0.00
12/10/1998	03	-	-	-	-	-	-	-	-	-
12/10/1998	04	37	9.2	W	-	-	-	30.30	10.00	0.00
12/10/1998	05	36	9.2	WNW	-	-	-	30.30	10.00	0.00
12/10/1998	06	36	5.8	W	-	-	-	30.31	10.00	0.00
12/10/1998	07	36	5.8	W	-	-	-	30.31	10.00	0.00
12/10/1998	08	38	10.4	W	-	-	-	30.30	10.00	0.00
12/10/1998	09	40	9.2	W	-	-	-	30.31	10.00	0.00
12/10/1998	10	41	8.1	SW	-	-	-	30.30	10.00	0.00
12/10/1998	11	44	8.1	W	-	-	-	30.30	10.00	0.00
12/10/1998	12	45	8.1	W	-	-	-	30.27	10.00	0.00
12/10/1998	13	46	10.4	W	-	-	-	30.23	10.00	0.00
12/10/1998	14	47	6.9	W	-	-	-	30.21	10.00	0.00
12/10/1998	15	47	10.4	W	-	-	-	30.18	10.00	0.00
12/10/1998	16	45	12.7	WSW	-	-	-	30.16	10.00	0.00
12/10/1998	17	44	5.8	W	-	-	-	30.13	10.00	0.00
12/10/1998	18	44	8.1	WSW	-	-	-	30.13	10.00	0.00
12/10/1998	19	43	8.1	SW	-	-	-	30.14	10.00	0.00
12/10/1998	20	43	10.4	WSW	-	-	-	30.14	10.00	0.00
12/10/1998	21	42	10.4	WSW	-	-	-	30.13	10.00	0.00

12/10/1998	22	43	31	13.8	WSW	-	-	-	30.11	10.00	0.00
12/10/1998	23	42	32	12.7	WSW	-	-	-	30.10	10.00	0.00
12/11/1998	00	43	31	11.5	W	-	-	-	30.08	10.00	0.00
12/11/1998	01	43	31	11.5	W	-	-	-	30.06	10.00	0.00
12/11/1998	02	43	31	15.0	W	-	-	-	30.06	10.00	0.00
12/11/1998	03	42	31	13.8	W	-	-	-	30.05	10.00	0.00
12/11/1998	04	42	31	15.0	WSW	-	-	-	30.03	10.00	0.00
12/11/1998	05	41	31	15.0	W	24.2	-	-	30.03	10.00	0.00
12/11/1998	06	40	31	12.7	W	19.6	-	-	30.04	10.00	0.00
12/11/1998	07	40	32	16.1	W	23.0	-	-	30.05	10.00	0.00
12/11/1998	08	41	32	12.7	W	23.0	-	-	30.06	10.00	0.00
12/11/1998	09	42	33	11.5	W	-	-	-	30.08	10.00	0.00
12/11/1998	10	43	32	16.1	WNW	21.9	-	-	30.09	10.00	0.00
12/11/1998	11	43	30	18.4	NW	25.3	-	-	30.08	10.00	0.00
12/11/1998	12	43	28	17.3	NW	23.0	29.9	WNW	30.08	10.00	0.00
12/11/1998	13	43	28	17.3	NW	27.6	29.9	WNW	30.08	10.00	0.00
12/11/1998	14	43	30	16.1	WNW	26.5	-	-	30.11	10.00	0.00
12/11/1998	15	44	28	20.7	WNW	25.3	34.5	NW	30.13	10.00	0.00
12/11/1998	16	42	26	16.1	NW	24.2	31.1	NW	30.16	10.00	0.00
12/11/1998	17	40	26	18.4	WNW	24.2	-	-	30.19	10.00	0.00
12/11/1998	18	39	26	19.6	NW	27.6	-	-	30.23	10.00	0.00
12/11/1998	19	38	27	12.7	NW	20.7	-	-	30.26	10.00	0.00
12/11/1998	20	37	28	10.4	NW	-	-	-	30.28	10.00	0.00
12/11/1998	21	35	28	8.1	NW	-	-	-	30.30	10.00	0.00
12/11/1998	22	35	28	11.5	WNW	-	-	-	30.31	10.00	0.00
12/11/1998	23	34	26	9.2	NW	-	-	-	30.32	10.00	0.00

Attachment
D



Client: Town of Waltham
Project: Waltham Landfill
SDG: 981209-1664
Date: December 23, 1998

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617)-354-4448 - fax (617)-354-0764

Laboratory Report

Client: Town of Waltham

Client Contact: Paul Taurasi

Project: Waltham Landfill

Address: Camp Dresser & McKee
Ten Cambridge Center

Project Narrative

The following report contains the analytical results for samples submitted to CDM Laboratory Services on December 9, 1998. The samples were received into the laboratory in accordance with documented sample acceptance procedures. All sample identification agreed with accompanying Chain of Custody documentation. Please refer to the Sample Description Information sheet for the list of samples included within this report.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples.

Note: Analytical testing was conducted by Alpha Analytical Laboratories under subcontract to CDM. The report is attached.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete and accurate.

LABORATORY MANAGEMENT REVIEW: _____

LABORATORY QA/QC REVIEW: _____

AZ DOH # AZ0553, CO DPHE (RECIPROCITY), CT DPH # 0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES#2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

ALPHA ANALYTICAL LABORATORIES

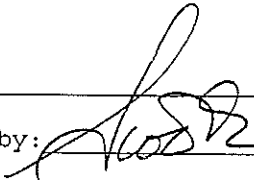
Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Camp Dresser & McKee, Inc. Laboratory Job Number: L9809864
Address: 840 Memorial Drive Invoice Number: 21745
Riverside Technology Center
Cambridge, MA 02139 Date Received: 10-DEC-98
Attn: Paul Taurasi Date Reported: 23-DEC-98
Project Number: 0519-22913-RT.SHMP Delivery Method: Alpha
Site: TOWN OF WALTHAM

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9809864-01	CDM 1	WALTHAM LANDFILL
L9809864-02	CDM 1A	WALTHAM LANDFILL
L9809864-03	CDM DUP	WALTHAM LANDFILL
L9809864-04	CDM 2	WALTHAM LANDFILL
L9809864-05	CDM 2A	WALTHAM LANDFILL

Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-01
 CDM 1
 Sample Matrix: WATER
 Condition of Sample: Satisfactory
 Number & Type of Containers: 4-Plastic
 Date Collected: 09-DEC-1998
 Date Received : 10-DEC-98
 Date Reported : 23-DEC-98
 Field Prep: Field Filtered

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Alkalinity, Total	120	mg CaCO3/L2.0		30	2320B	14-Dec	K
Solids, Total Dissolved	190	mg/l	5.0	30	2540C	18-Dec	D
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Chloride	4.3	mg/l	1.0	1	9251	11-Dec	E
Nitrogen, Nitrate	2.7	mg/l	0.10	30	4500NO3-F	11-Dec	E
Sulfate	26.	mg/l	10.	1	9038	15-Dec	K
Chemical Oxygen Demand	130	mg/l	20.	30	5220D	18-Dec	D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Barium, Dissolved	0.04	mg/l	0.01	1	6010B	22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Iron, Dissolved	0.26	mg/l	0.05	1	6010B	22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Manganese, Dissolved	1.2	mg/l	0.01	1	6010B	22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	M
Selenium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-02
 Sample Matrix: CDM 1A WATER
 Condition of Sample: Satisfactory
 Number & Type of Containers: 4-Plastic

Date Collected: 09-DEC-1998
 Date Received : 10-DEC-98
 Date Reported : 23-DEC-98
 Field Prep: Field Filtered

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Alkalinity, Total	120	mg CaCO3/L2.0		30	2320B	14-Dec	K
Solids, Total Dissolved	190	mg/l	5.0	30	2540C	18-Dec	I
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Chloride	8.4	mg/l	1.0	1	9251	11-Dec	E
Nitrogen, Nitrate	0.80	mg/l	0.10	30	4500NO3-F	11-Dec	E
Sulfate	20.	mg/l	10.	1	9038	15-Dec	K
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Barium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Iron, Dissolved	0.10	mg/l	0.05	1	6010B	22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Manganese, Dissolved	0.46	mg/l	0.01	1	6010B	22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec 23-Dec	D
Selenium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-03
 Date Collected: 09-DEC-1998
 CDM DUP
 Date Received : 10-DEC-98
 Sample Matrix: WATER
 Date Reported : 23-DEC-98
 Condition of Sample: Satisfactory
 Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES		II
						PREP	ANALYSIS	
Alkalinity, Total	120	mg CaCO3/L2.0		30	2320B		14-Dec	KI
Solids, Total Dissolved	200	mg/l	5.0	30	2540C		18-Dec	DI
Cyanide, Total	ND	mg/l	0.005	1	9010B		15-Dec	AI
Chloride	4.2	mg/l	1.0	1	9251		11-Dec	EI
Nitrogen, Nitrate	2.7	mg/l	0.10	30	4500NO3-F		11-Dec	EI
Sulfate	26.	mg/l	10.	1	9038		15-Dec	KI
Chemical Oxygen Demand	120	mg/l	20.	30	5220D		18-Dec	DI
Dissolved Metals								
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	MC
Barium, Dissolved	0.04	mg/l	0.01	1	6010B		22-Dec	MC
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	MC
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MC
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MC
Iron, Dissolved	0.18	mg/l	0.05	1	6010B		22-Dec	MC
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MC
Manganese, Dissolved	1.2	mg/l	0.01	1	6010B		22-Dec	MC
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec	DI
Selenium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	MC
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MC
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec	MC

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-04
 Date Collected: 09-DEC-1998
 CDM 2
 Date Received : 10-DEC-98
 Sample Matrix: WATER
 Date Reported : 23-DEC-98
 Condition of Sample: Satisfactory
 Field Prep: None
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	II
Alkalinity, Total	650	mg CaCO3/L2.0		30	2320B	14-Dec	KI
Solids, Total Dissolved	690	mg/l	5.0	30	2540C	18-Dec	DI
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AI
Chloride	66.	mg/l	1.0	1	9251	11-Dec	EI
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	EI
Sulfate	ND	mg/l	10.	1	9038	15-Dec	KI
Chemical Oxygen Demand	620	mg/l	20.	30	5220D	18-Dec	DI
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B	22-Dec	MC
Barium, Dissolved	1.4	mg/l	0.01	1	6010B	22-Dec	MC
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MC
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MC
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MC
Iron, Dissolved	9.8	mg/l	0.05	1	6010B	22-Dec	MC
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MC
Manganese, Dissolved	0.13	mg/l	0.01	1	6010B	22-Dec	MC
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	DI
Selenium, Dissolved	0.025	mg/l	0.005	1	6010B	22-Dec	MC
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MC
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	MC

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-05
 CDM 2A
 Sample Matrix: WATER
 Condition of Sample: Satisfactory
 Number & Type of Containers: 4-Plastic

Date Collected: 09-DEC-1998
 Date Received : 10-DEC-98
 Date Reported : 23-DEC-98
 Field Prep: Field Filtered

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES		I
						PREP	ANALYSIS	
Alkalinity, Total	69.	mg CaCO3/L2.0		30	2320B		14-Dec	K
Solids, Total Dissolved	120	mg/l	5.0	30	2540C		18-Dec	D
Cyanide, Total	ND	mg/l	0.005	1	9010B		17-Dec	A
Chloride	4.0	mg/l	1.0	1	9251		11-Dec	E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F		11-Dec	E
Sulfate	ND	mg/l	10.	1	9038		15-Dec	K
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D		18-Dec	D
Dissolved Metals								
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	M
Barium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Iron, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Manganese, Dissolved	0.18	mg/l	0.01	1	6010B		22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec	D
Selenium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L9809864

Parameter	Value 1	Value 2	RPD	Units
Alkalinity, Total for sample(s) 01-05				
Alkalinity, Total	69.	69.	0	mg CaCO3/L
Chloride for sample(s) 01-05				
Chloride	6.5	6.1	6	mg/l
Nitrogen, Nitrate for sample(s) 01-05				
Nitrogen, Nitrate	0.76	0.76	0	mg/l
Sulfate for sample(s) 01-05				
Sulfate	20.	20.	0	mg/l
Dissolved Metals for sample(s) 01-05				
Arsenic, Dissolved	ND	ND	NC	mg/l
Barium, Dissolved	0.04	0.04	0	mg/l
Cadmium, Dissolved	ND	ND	NC	mg/l
Chromium, Dissolved	ND	ND	NC	mg/l
Copper, Dissolved	ND	ND	NC	mg/l
Iron, Dissolved	0.26	0.27	4	mg/l
Lead, Dissolved	ND	ND	NC	mg/l
Manganese, Dissolved	1.2	1.2	0	mg/l
Selenium, Dissolved	ND	0.005	NC	mg/l
Silver, Dissolved	ND	ND	NC	mg/l
Zinc, Dissolved	ND	ND	NC	mg/l
Dissolved Metals for sample(s) 01-05				
Mercury, Dissolved	ND	ND	NC	mg/l

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809864

Parameter	% Recovery
Alkalinity, Total	100
Cyanide, Total	76
Cyanide, Total	103
Chloride	98
Nitrogen, Nitrate	94
Sulfate	95
Chemical Oxygen Demand	96
Chemical Oxygen Demand	100
Mercury, Dissolved	108
Alkalinity, Total	100
Cyanide, Total	87
Chloride	100
Nitrogen, Nitrate	78
Sulfate	93
Chemical Oxygen Demand	120
Arsenic, Dissolved	104
Barium, Dissolved	100
Cadmium, Dissolved	105

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809864

Continued

Parameter	% Recovery
Dissolved Metals SPIKE for sample(s) 01-05	
Chromium, Dissolved	100
Copper, Dissolved	100
Iron, Dissolved	100
Lead, Dissolved	100
Manganese, Dissolved	98
Selenium, Dissolved	127
Silver, Dissolved	84
Zinc, Dissolved	100

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809864

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I:
Blank Analysis for sample(s) 01-05							
Alkalinity, Total	ND	mg CaCO3/L2.0		30	2320B	14-Dec	K
Blank Analysis for sample(s) 01-05							
Solids, Total Dissolved	ND	mg/l	5.0	30	2540C	18-Dec	D
Blank Analysis for sample(s) 05							
Cyanide, Total	ND	mg/l	0.005	1	9010B	17-Dec	A
Blank Analysis for sample(s) 01-04							
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Blank Analysis for sample(s) 01-05							
Chloride	ND	mg/l	1.0	1	9251	11-Dec	E
Blank Analysis for sample(s) 01-05							
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	E
Blank Analysis for sample(s) 01-05							
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Blank Analysis for sample(s) 01-05							
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	D

ALPHA ANALYTICAL LABORATORIES
ADDENDUM I

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Update III, 1997.
30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

CDM Analytical Laboratory

840 Memorial Drive
Cambridge, MA 02139
Phone: (617) 354-4448
Fax: (617) 354-0764

Client: Town of Waltham Address: _____

Project Name: Waltham Controll

Project #: 0519-22913-R1-SAMP

Contact: Paul Tarnasi - CDM

SDG#: 981209-16649H 2553

TAT: st. sandal

TAT Approved by: _____

Phone: 617 252 8481

Fax #: _____

Report to: Paul Tarnasi Bill to: _____

Lab Acct. #: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA		SEMI VOA		MISC		METALS		OTHER				
						524.2	8260	Other	525	A. B/N. AB/N	PAH	Other	TPH 418.1	PET ID	PP13	Other	Filtered (Y/N)	PP13
CDM 1	12/15/98	10:20	W	4	98-08752	524.2	8260	Other	525	PAH	Other	TPH 418.1	PET ID	PP13	Other	Filtered (Y/N)	PP13	Other
CDM 1A	12/15/98	10:30	W	4	98-08753	524.2	8260	Other	525	PAH	Other	TPH 418.1	PET ID	PP13	Other	Filtered (Y/N)	PP13	Other
CDM Dup	12/15/98	10:40	W	4	98-08754	524.2	8260	Other	525	PAH	Other	TPH 418.1	PET ID	PP13	Other	Filtered (Y/N)	PP13	Other
CDM 2	12/15/98	2:30	W	4	98-08755	524.2	8260	Other	525	PAH	Other	TPH 418.1	PET ID	PP13	Other	Filtered (Y/N)	PP13	Other
CDM 2A	12/15/98	2:30	W	4	98-08756	524.2	8260	Other	525	PAH	Other	TPH 418.1	PET ID	PP13	Other	Filtered (Y/N)	PP13	Other

Samples Received: Cooler Temperature: _____ °C

Chilled/properly preserved? yes no

In good condition? yes no

Evidence of tampering? yes no

Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS

Container Type: _____
Preservative: _____
Volume: _____

Shipper/Airbill #: _____ Custody Seal #: _____

Method of Shipment: Counter UPS Fed-ex Hand Other

Comments:
EPA 9038 sulfate
EPA 808 6010A 10 metals
EPA 7470A mercury
* Please filter + preserve sample CDM-2 / 98-08755
Please filter metals

Requested by: [Signature] Date: 12/16/98 Time: 14:00

Requested by: [Signature] Date: 12/16/98 Time: 16:30

Requested by: [Signature] Date: 12/16/98 Time: 16:30

Requested by: [Signature] Date: 12/16/98 Time: 16:30

NOTE: All samples submitted subject to Standard Terms & Conditions

Chain of Custody

Waltham - CDM - DIA

CDM Analytical Laboratory

840 Memorial Drive
Cambridge, MA 02139

Phone: (617) 354-4448
Fax: (617) 354-0764

Field Log # _____

Page 1 of 1

Client: Town of Waltham
 Project Name: Waltham Cond111
 Project #: 0519-22913-RT-SHMP
 Contact: Paul Tarnasi - CDG
 Address: SDG#: 981209-16649H 2553
TAT: st southeast
 TAT Approved by: _____

Report to: Paul Tarnasi Bill to: _____
 Lab Acct. #: _____
 Phone: 617 252 8348
 Fax #: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA		MISC			METALS		OTHER													
						524.2	624/8240	8260	Other	525	625/8270 A, B/N, AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	HACH 8202	SM 2540C	SM 23208	Alkalinity	EPH 3532	EPH 9012	EPH 1251 Chloride		
CDM1	12/18/98	10:20	W	4	98-08752	524.2	624/8240	8260	Other	525	625/8270 A, B/N, AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	HACH 8202	SM 2540C	SM 23208	Alkalinity	EPH 3532	EPH 9012	EPH 1251 Chloride		
CDM1A	12/18/98	10:30	W	4	98-08753																								
CDM Dup	12/18/98	10:40	W	4	98-08754																								
CDM2	12/18/98	2:30	W	4	98-08755A																								
CDM2A	12/18/98	2:30	W	4	98-08756																								
A - HCl	D - NaOH	P - Plastic	Container Type:			Sampled & Relinquished by: _____			Date: 12/18/98	Time: 1400	Received by: _____	Date: 12/18/98	Time: 1400				Date: 12/18/98	Time: 1630	Received by: _____	Date: 12/18/98	Time: 1630				Date: 12/18/98	Time: 1630	Received by: _____	Date: 12/18/98	Time: 1630
B - HNO3	E - NaThio	G - Glass	Preservative:			Relinquished by: _____			Date: 12/18/98	Time: 1630	Relinquished by: _____	Date: 12/18/98	Time: 1630				Date: 12/18/98	Time: 1630	Relinquished by: _____	Date: 12/18/98	Time: 1630				Date: 12/18/98	Time: 1630	Relinquished by: _____	Date: 12/18/98	Time: 1630
C - H2SO4	F - Other	V - Vial	Volume:			Relinquished by: _____			Date: 12/18/98	Time: 1630	Relinquished by: _____	Date: 12/18/98	Time: 1630				Date: 12/18/98	Time: 1630	Relinquished by: _____	Date: 12/18/98	Time: 1630				Date: 12/18/98	Time: 1630	Relinquished by: _____	Date: 12/18/98	Time: 1630
Samples Received:						Instructions:						Method of Shipment:						NOTE: All samples submitted subject to Standard Terms & Conditions											
• Cooler Temperature: _____ °C						• Fax Results						• Courier						• Standard Terms & Conditions											
• Chilled/property preserved? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no						• State Forms						• Airborne						• Standard Terms & Conditions											
• In good condition? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no						• SMART Report						• Fed-ex						• Standard Terms & Conditions											
• Evidence of tampering? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no						• Disk Deliverable						• UPS						• Standard Terms & Conditions											
						• TICS						• Hand						• Standard Terms & Conditions											

Comments: EPA 9036 Sulfate * Please filter + preserve sample CDM-2 / 98-08755
 EPA 9010A IC.P. metals Please filter metals
 EPA 7170A Mercury Waltham-CDM-012

Chain of Custody

Client: Town of Waltham
Address: _____
Project Name: Waltham Council
Project #: 0519-22913-RT-SAMP
Phone: 617 252 8481
Fax #: _____
Contact: Paul Tamasi - CDM
Report to: Paul Tamasi
Bill to: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA		SEMI VOA		MISC			METALS		OTHER																
						5242	624/8240	8260	Other	525	625/8270	AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	Other									
CDM 1	12/18/98	10:20	W	4	98-08752	5242	624/8240	8260	Other	525	625/8270	AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	Other	HACH 8202	sm 2540c	sm 2320g	Alkalinity	EPN 35322	EPN 35323	EPN 9012	EPN 4251	SELECT
CDM 1A	12/18/98	10:30	W	4	98-08753	5242	624/8240	8260	Other	525	625/8270	AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	Other	HACH 8202	sm 2540c	sm 2320g	Alkalinity	EPN 35322	EPN 35323	EPN 9012	EPN 4251	SELECT
CDM Dup	12/18/98	10:40	W	4	98-08754	5242	624/8240	8260	Other	525	625/8270	AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	Other	HACH 8202	sm 2540c	sm 2320g	Alkalinity	EPN 35322	EPN 35323	EPN 9012	EPN 4251	SELECT
CDM 2	12/18/98	2:30	W	4	98-08755*	5242	624/8240	8260	Other	525	625/8270	AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	Other	HACH 8202	sm 2540c	sm 2320g	Alkalinity	EPN 35322	EPN 35323	EPN 9012	EPN 4251	SELECT
CDM 2A	12/18/98	2:30	W	4	98-08756	5242	624/8240	8260	Other	525	625/8270	AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	Other	HACH 8202	sm 2540c	sm 2320g	Alkalinity	EPN 35322	EPN 35323	EPN 9012	EPN 4251	SELECT

A - HCl D - NaOH P - Plastic Container Type:
B - HNO₃ E - NaThio G - Glass Preservative:
C - H₂SO₄ F - Other V - Vial Volume:
Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS

Samples Received: Cooler Temperature: _____ °C
Chilled/properly preserved? yes no
In good condition? yes no
Evidence of tampering? yes no
Shipper/Airbill #: _____ Custody Seal: _____

Comments: EPA 9038 sulfate
EPA 9096010A IC P-metals * Please filter + preserve sample CDM-2 / 98-08755
EPA 7170A mercury
Waltham - CDM-012





Client: Town of Waltham
Project: Waltham Landfill
SDG: 981210-1671
Date: December 24, 1998

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617)-354-4448 - fax (617)-354-0764

Laboratory Report

Client: Town of Waltham

Client Contact: Paul Taurasi

Project: Waltham Landfill

Address: Camp Dresser & McKee
Ten Cambridge Center

Project Narrative

The following report contains the analytical results for samples submitted to CDM Laboratory Services on December 10, 1998. The samples were received into the laboratory in accordance with documented sample acceptance procedures. All sample identification agreed with accompanying Chain of Custody documentation. Please refer to the Sample Description Information sheet for the list of samples included within this report.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples.

Note: Analytical testing was conducted by Alpha Analytical Laboratories under subcontract to CDM. The report is attached.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete and accurate.

LABORATORY MANAGEMENT REVIEW:

LABORATORY QA/QC REVIEW:

AZ DOH # AZ0553, CO DPHE (RECIPROCITY), CT DPH # 0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES#2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

ALPHA ANALYTICAL LABORATORIES

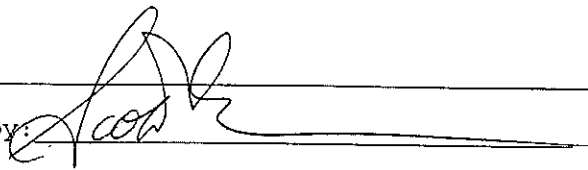
Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Camp Dresser & McKee, Inc. Laboratory Job Number: L9809865
Address: 840 Memorial Drive Invoice Number: 21787
Riverside Technology Center Date Received: 10-DEC-98
Cambridge, MA 02139 Date Reported: 24-DEC-98
Attn: Paul Taurasi Delivery Method: Alpha
Project Number:
Site: TOWN OF WALTHAM

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9809865-01	CDM 4	WALTHAM LANDFILL
L9809865-02	CDM 4A	WALTHAM LANDFILL
L9809865-03	STREAM 1	WALTHAM LANDFILL
L9809865-04	CDM 3A	WALTHAM LANDFILL
L9809865-05	COVE 1	WALTHAM LANDFILL
L9809865-06	COVE 2	WALTHAM LANDFILL
L9809865-07	COMPOSITE OF SED 1 - SED 3	WALTHAM LANDFILL

Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-01 Date Collected: 10-DEC-1998
 CDM 4 Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES		I
						PREP	ANALYSIS	
Alkalinity, Total	900	mg CaCO3/L2.0		30	2320B		14-Dec	K
Solids, Total Dissolved	940	mg/l	5.0	30	2540C		18-Dec	D
Cyanide, Total	ND	mg/l	0.025	1	9010B		22-Dec	A
Chloride	58.	mg/l	1.0	1	9251		11-Dec	E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F		11-Dec	E
Sulfate	ND	mg/l	10.	1	9038		15-Dec	K
Chemical Oxygen Demand	710	mg/l	20.	30	5220D		18-Dec	D
Dissolved Metals								
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B		22-Dec	M
Barium, Dissolved	0.87	mg/l	0.01	1	6010B		22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Iron, Dissolved	1.7	mg/l	0.05	1	6010B		22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Manganese, Dissolved	0.17	mg/l	0.01	1	6010B		22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec	D
Selenium, Dissolved	0.025	mg/l	0.005	1	6010B		22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-02 Date Collected: 10-DEC-1998
 CDM 4A Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: None
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	
						PREP	ANALYSIS
Alkalinity, Total	310	mg CaCO3/L2.0		30	2320B		14-Dec K
Solids, Total Dissolved	710	mg/l	5.0	30	2540C		18-Dec D
Cyanide, Total	ND	mg/l	0.005	1	9010B		15-Dec A
Chloride	240	mg/l	10.	1	9251		11-Dec E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F		11-Dec E
Sulfate	ND	mg/l	10.	1	9038		15-Dec K
Chemical Oxygen Demand	51.	mg/l	20.	30	5220D		18-Dec D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec M
Barium, Dissolved	0.12	mg/l	0.01	1	6010B		22-Dec M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Iron, Dissolved	0.35	mg/l	0.05	1	6010B		22-Dec M
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Manganese, Dissolved	3.2	mg/l	0.01	1	6010B		22-Dec M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec D
Selenium, Dissolved	0.007	mg/l	0.005	1	6010B		22-Dec M
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-04 Date Collected: 10-DEC-1998
 CDM 3A Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: None
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES		I
						PREP	ANALYSIS	
Alkalinity, Total	230	mg CaCO3/L2.0		30	2320B		14-Dec	K
Solids, Total Dissolved	320	mg/l	5.0	30	2540C		18-Dec	D
Cyanide, Total	ND	mg/l	0.005	1	9010B		15-Dec	A
Chloride	32.	mg/l	1.0	1	9251		11-Dec	E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F		11-Dec	E
Sulfate	13.	mg/l	10.	1	9038		15-Dec	K
Chemical Oxygen Demand	41.	mg/l	20.	30	5220D		18-Dec	D
Dissolved Metals								
Arsenic, Dissolved	0.008	mg/l	0.005	1	6010B		22-Dec	M
Barium, Dissolved	0.16	mg/l	0.01	1	6010B		22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Iron, Dissolved	0.05	mg/l	0.05	1	6010B		22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Manganese, Dissolved	0.56	mg/l	0.01	1	6010B		22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec	D
Selenium, Dissolved	0.006	mg/l	0.005	1	6010B		22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-06 Date Collected: 10-DEC-1998
 COVE 2 Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Alkalinity, Total	400	mg CaCO3/L2.0		30	2320B	14-Dec	K
Solids, Total Dissolved	470	mg/l	5.0	30	2540C	18-Dec	D
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Chloride	40.	mg/l	1.0	1	9251	11-Dec	E
Nitrogen, Nitrate	0.16	mg/l	0.10	30	4500NO3-F	11-Dec	E
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Chemical Oxygen Demand	110	mg/l	20.	30	5220D	18-Dec	D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B	22-Dec	M
Barium, Dissolved	0.34	mg/l	0.01	1	6010B	22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Iron, Dissolved	0.49	mg/l	0.05	1	6010B	22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Manganese, Dissolved	0.19	mg/l	0.01	1	6010B	22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	D
Selenium, Dissolved	0.009	mg/l	0.005	1	6010B	22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	II
Volatile Organics by GC/MS 8260 continued				1	8260B	24-Dec B	
Bromoform	ND	ug/kg	110				
1,1,2,2-Tetrachloroethane	ND	ug/kg	110				
Benzene	ND	ug/kg	110				
Toluene	ND	ug/kg	170				
Ethylbenzene	ND	ug/kg	110				
Chloromethane	ND	ug/kg	1100				
Bromomethane	ND	ug/kg	220				
Vinyl chloride	ND	ug/kg	220				
Chloroethane	ND	ug/kg	220				
1,1-Dichloroethene	ND	ug/kg	170				
trans-1,2-Dichloroethene	ND	ug/kg	170				
Trichloroethene	ND	ug/kg	110				
1,2-Dichlorobenzene	ND	ug/kg	1100				
1,3-Dichlorobenzene	ND	ug/kg	1100				
1,4-Dichlorobenzene	ND	ug/kg	1100				
Methyl tert butyl ether	ND	ug/kg	1100				
p/m-Xylene	ND	ug/kg	110				
o-Xylene	ND	ug/kg	110				
cis-1,2-Dichloroethene	ND	ug/kg	110				
Dibromomethane	ND	ug/kg	1100				
1,2,3-Trichloropropane	ND	ug/kg	1100				
Styrene	ND	ug/kg	110				
Dichlorodifluoromethane	ND	ug/kg	1100				
Acetone	2100	ug/kg	1100				
2-Butanone	ND	ug/kg	1100				
4-Methyl-2-pentanone	ND	ug/kg	1100				
2-Hexanone	ND	ug/kg	1100				
Bromochloromethane	ND	ug/kg	560				
2,2-Dichloropropane	ND	ug/kg	560				
1,2-Dibromoethane	ND	ug/kg	560				
1,3-Dichloropropane	ND	ug/kg	560				
1,1,1,2-Tetrachloroethane	ND	ug/kg	560				
Bromobenzene	ND	ug/kg	560				
n-Butylbenzene	ND	ug/kg	560				
sec-Butylbenzene	ND	ug/kg	560				
tert-Butylbenzene	ND	ug/kg	560				
o-Chlorotoluene	ND	ug/kg	560				
p-Chlorotoluene	ND	ug/kg	560				
1,2-Dibromo-3-chloropropane	ND	ug/kg	560				
Hexachlorobutadiene	ND	ug/kg	560				
Isopropylbenzene	ND	ug/kg	560				
p-Isopropyltoluene	ND	ug/kg	560				
Naphthalene	ND	ug/kg	560				
n-Propylbenzene	ND	ug/kg	560				
1,2,3-Trichlorobenzene	ND	ug/kg	560				
1,2,4-Trichlorobenzene	ND	ug/kg	560				
1,3,5-Trimethylbenzene	ND	ug/kg	560				
1,2,4-Trimethylbenzene	ND	ug/kg	560				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Volatile Organics by GC/MS 8260 continued				1	8260B	24-Dec	B
Surrogate Recovery							
1,2-Dichloroethane-d4	94.0	%					
Toluene-d8	96.0	%					
4-Bromofluorobenzene	87.0	%					
Dibromofluoromethane	92.0	%					
SVOC's by GC/MS 8270				1	8270C	11-Dec 14-Dec	M
Acenaphthene	ND	ug/kg	14000				
Benzidine	ND	ug/kg	140000				
1,2,4-Trichlorobenzene	ND	ug/kg	14000				
Hexachlorobenzene	ND	ug/kg	14000				
Bis(2-chloroethyl) ether	ND	ug/kg	14000				
1-Chloronaphthalene	ND	ug/kg	14000				
2-Chloronaphthalene	ND	ug/kg	14000				
1,2-Dichlorobenzene	ND	ug/kg	14000				
1,3-Dichlorobenzene	ND	ug/kg	14000				
1,4-Dichlorobenzene	ND	ug/kg	14000				
3,3'-Dichlorobenzidine	ND	ug/kg	140000				
2,4-Dinitrotoluene	ND	ug/kg	14000				
2,6-Dinitrotoluene	ND	ug/kg	14000				
Azobenzene	ND	ug/kg	14000				
Fluoranthene	ND	ug/kg	14000				
4-Chlorophenyl phenyl ether	ND	ug/kg	14000				
4-Bromophenyl phenyl ether	ND	ug/kg	14000				
Bis(2-chloroisopropyl) ether	ND	ug/kg	14000				
Bis(2-chloroethoxy) methane	ND	ug/kg	14000				
Hexachlorobutadiene	ND	ug/kg	28000				
Hexachlorocyclopentadiene	ND	ug/kg	28000				
Hexachloroethane	ND	ug/kg	14000				
Isophorone	ND	ug/kg	14000				
Naphthalene	ND	ug/kg	14000				
Nitrobenzene	ND	ug/kg	14000				
NDPA/DPA	ND	ug/kg	14000				
n-Nitrosodi-n-propylamine	ND	ug/kg	14000				
Bis(2-ethylhexyl) phthalate	ND	ug/kg	28000				
Butyl benzyl phthalate	ND	ug/kg	14000				
Di-n-butylphthalate	ND	ug/kg	14000				
Di-n-octylphthalate	ND	ug/kg	14000				
Diethyl phthalate	ND	ug/kg	14000				
Dimethyl phthalate	ND	ug/kg	14000				
Benzo(a)anthracene	ND	ug/kg	14000				
Benzo(a)pyrene	ND	ug/kg	14000				
Benzo(b)fluoranthene	ND	ug/kg	14000				
Benzo(k)fluoranthene	ND	ug/kg	14000				
Chrysene	ND	ug/kg	14000				
Acenaphthylene	ND	ug/kg	14000				
Anthracene	ND	ug/kg	14000				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
 COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	I
						PREP ANALYSIS	
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	M
Benzo (ghi) perylene	ND	ug/kg	14000				
Fluorene	ND	ug/kg	14000				
Phenanthrene	ND	ug/kg	14000				
Dibenzo (a, h) anthracene	ND	ug/kg	14000				
Indeno (1, 2, 3- cd) pyrene	ND	ug/kg	14000				
Pyrene	ND	ug/kg	14000				
Aniline	ND	ug/kg	28000				
4-Chloroaniline	ND	ug/kg	14000				
1-Methylnaphthalene	ND	ug/kg	14000				
2-Nitroaniline	ND	ug/kg	14000				
3-Nitroaniline	ND	ug/kg	14000				
4-Nitroaniline	ND	ug/kg	14000				
Dibenzofuran	ND	ug/kg	14000				
a, a-Dimethylphenethylamine	ND	ug/kg	140000				
Hexachloropropene	ND	ug/kg	140000				
Nitrosodi-n-butylamine	ND	ug/kg	28000				
2-Methylnaphthalene	ND	ug/kg	14000				
1, 2, 4, 5-Tetrachlorobenzene	ND	ug/kg	56000				
Pentachlorobenzene	ND	ug/kg	56000				
a-Naphthylamine	ND	ug/kg	56000				
b-Naphthylamine	ND	ug/kg	56000				
Phenacetin	ND	ug/kg	28000				
Dimethoate	ND	ug/kg	56000				
4-Aminobiphenyl	ND	ug/kg	28000				
Pentachloronitrobenzene	ND	ug/kg	28000				
Isodrin	ND	ug/kg	28000				
p-Dimethylaminoazobenzene	ND	ug/kg	28000				
Chlorobenzilate	ND	ug/kg	56000				
3-Methylcholanthrene	ND	ug/kg	56000				
Ethyl Methanesulfonate	ND	ug/kg	42000				
Acetophenone	ND	ug/kg	56000				
Nitrosodipiperidine	ND	ug/kg	56000				
7, 12-Dimethylbenz (a) anthracene	ND	ug/kg	28000				
n-Nitrosodimethylamine	ND	ug/kg	140000				
2, 4, 6-Trichlorophenol	ND	ug/kg	14000				
p-Chloro-m-cresol	ND	ug/kg	14000				
2-Chlorophenol	ND	ug/kg	14000				
2, 4-Dichlorophenol	ND	ug/kg	28000				
2, 4-Dimethylphenol	ND	ug/kg	28000				
2-Nitrophenol	ND	ug/kg	28000				
4-Nitrophenol	ND	ug/kg	28000				
2, 4-Dinitrophenol	ND	ug/kg	56000				
4, 6-Dinitro-o-cresol	ND	ug/kg	56000				
Pentachlorophenol	ND	ug/kg	56000				
Phenol	ND	ug/kg	14000				
2-Methylphenol	ND	ug/kg	14000				
3-Methylphenol/4-Methylphenol	ND	ug/kg	14000				
2, 4, 5-Trichlorophenol	ND	ug/kg	14000				
2, 6-Dichlorophenol	ND	ug/kg	28000				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	II
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MI
Benzoic Acid	ND	ug/kg	140000				
Benzyl Alcohol	ND	ug/kg	28000				
Carbazole	ND	ug/kg	14000				
Pyridine	ND	ug/kg	140000				
2-Picoline	ND	ug/kg	56000				
Pronamide	ND	ug/kg	56000				
Methyl methanesulfonate	ND	ug/kg	56000				
Surrogate Recovery							
2-Fluorophenol	43.0	%					
Phenol-d6	48.0	%					
Nitrobenzene-d5	75.0	%					
2-Fluorobiphenyl	72.0	%					
2,4,6-Tribromophenol	61.0	%					
4-Terphenyl-d14	83.0	%					
PCB/Pesticides				1	8082/8081	11-Dec 16-Dec	PI
Delta-BHC	ND	ug/kg	278.				
Lindane	ND	ug/kg	278.				
Alpha-BHC	ND	ug/kg	278.				
Beta-BHC	ND	ug/kg	278.				
Heptachlor	ND	ug/kg	278.				
Aldrin	ND	ug/kg	278.				
Heptachlor epoxide	ND	ug/kg	278.				
Endrin	ND	ug/kg	278.				
Endrin aldehyde	ND	ug/kg	278.				
Endrin ketone	ND	ug/kg	278.				
Dieldrin	ND	ug/kg	278.				
4,4'-DDE	ND	ug/kg	278.				
4,4'-DDD	ND	ug/kg	278.				
4,4'-DDT	ND	ug/kg	278.				
Endosulfan I	ND	ug/kg	278.				
Endosulfan II	ND	ug/kg	278.				
Endosulfan sulfate	ND	ug/kg	278.				
Methoxychlor	ND	ug/kg	278.				
Toxaphene	ND	ug/kg	1110				
Chlordane	ND	ug/kg	1110				
cis-Chlordane	ND	ug/kg	278.				
trans-Chlordane	ND	ug/kg	278.				
Aroclor 1221	ND	ug/kg	1390				
Aroclor 1232	ND	ug/kg	1390				
Aroclor 1242/1016	ND	ug/kg	1390				
Aroclor 1248	ND	ug/kg	1390				
Aroclor 1254	ND	ug/kg	1390				
Aroclor 1260	ND	ug/kg	1390				

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
 COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	II
PCB/Pesticides continued Surrogate Recovery				1	8082/8081	11-Dec 16-Dec	PI
2,4,5,6-Tetrachloro-m-xylene	58.0	%					
Decachlorobiphenyl	42.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L9809865

Parameter	Value 1	Value 2	RPD	Units
Alkalinity, Total for sample(s) 01-06				
Alkalinity, Total	69.	69.	0	mg CaCO3/L
Chloride for sample(s) 01-06				
Chloride	6.5	6.1	6	mg/l
Nitrogen, Nitrate for sample(s) 01-06				
Nitrogen, Nitrate	0.76	0.76	0	mg/l
Sulfate for sample(s) 01-06				
Sulfate	20.	20.	0	mg/l
Total Metals for sample(s) 07				
Arsenic, Total	17.	21.	21	mg/kg
Barium, Total	530	610	14	mg/kg
Cadmium, Total	6.4	6.6	3	mg/kg
Chromium, Total	63.	70.	11	mg/kg
Copper, Total	210	220	5	mg/kg
Iron, Total	34000	43000	23	mg/kg
Lead, Total	490	510	4	mg/kg
Manganese, Total	270	320	17	mg/kg
Selenium, Total	ND	ND	NC	mg/kg
Silver, Total	ND	ND	NC	mg/kg
Zinc, Total	840	880	5	mg/kg
Dissolved Metals for sample(s) 01-06				
Arsenic, Dissolved	ND	ND	NC	mg/l
Barium, Dissolved	0.04	0.04	0	mg/l
Cadmium, Dissolved	ND	ND	NC	mg/l
Chromium, Dissolved	ND	ND	NC	mg/l
Copper, Dissolved	ND	ND	NC	mg/l
Iron, Dissolved	0.26	0.27	4	mg/l
Lead, Dissolved	ND	ND	NC	mg/l
Manganese, Dissolved	1.2	1.2	0	mg/l
Selenium, Dissolved	ND	0.005	NC	mg/l
Silver, Dissolved	ND	ND	NC	mg/l
Zinc, Dissolved	ND	ND	NC	mg/l
Dissolved Metals for sample(s) 01-06				
Mercury, Dissolved	ND	ND	NC	mg/l

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Parameter	% Recovery
Alkalinity, Total LCS for sample(s) 01-06	
Alkalinity, Total	100
Cyanide, Total LCS for sample(s) 01-06	
Cyanide, Total	100
Cyanide, Total LCS for sample(s) 02-06	
Cyanide, Total	103
Chloride LCS for sample(s) 01-06	
Chloride	98
Nitrogen, Nitrate LCS for sample(s) 01-06	
Nitrogen, Nitrate	94
Sulfate LCS for sample(s) 01-06	
Sulfate	95
Chemical Oxygen Demand LCS for sample(s) 01-06	
Chemical Oxygen Demand	96
Chemical Oxygen Demand LCS for sample(s) 01-06	
Chemical Oxygen Demand	100
Hydrocarbons, Total (IR) LCS for sample(s) 07	
Hydrocarbons, Total (IR)	115
Total Metals LCS for sample(s) 07	
Arsenic, Total	89
Barium, Total	95
Cadmium, Total	92
Chromium, Total	93
Copper, Total	97
Lead, Total	95
Manganese, Total	110
Selenium, Total	84
Silver, Total	91
Zinc, Total	95
Total Metals LCS for sample(s) 07	
Mercury, Total	103
Dissolved Metals LCS for sample(s) 01-06	
Mercury, Dissolved	108
SVOC's by GC/MS 8270 LCS for sample(s) 07	
Acenaphthene	120
1,2,4-Trichlorobenzene	110
1,4-Dichlorobenzene	80

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Continued

Parameter	% Recovery
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SVOC's by GC/MS 8270 LCS for sample(s) 07

2,4-Dinitrotoluene	120
n-Nitrosodi-n-propylamine	89
Pyrene	110
p-Chloro-m-cresol	95
2-Chlorophenol	67
4-Nitrophenol	84
Pentachlorophenol	110
Phenol	44

PCB/Pesticides LCS for sample(s) 07

Lindane	79
Heptachlor	73
Aldrin	105
Endrin	84
Dieldrin	56
4,4' -DDT	76

Alkalinity, Total SPIKE for sample(s) 01-06

Alkalinity, Total	100
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Cyanide, Total SPIKE for sample(s) 01

Cyanide, Total	61
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Chloride SPIKE for sample(s) 01-06

Chloride	100
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Nitrogen, Nitrate SPIKE for sample(s) 01-06

Nitrogen, Nitrate	78
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Sulfate SPIKE for sample(s) 01-06

Sulfate	93
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Chemical Oxygen Demand SPIKE for sample(s) 01-06

Chemical Oxygen Demand	120
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Total Metals SPIKE for sample(s) 07

Arsenic, Total	100
Barium, Total	98
Cadmium, Total	86
Chromium, Total	85
Copper, Total	110
Lead, Total	90
Manganese, Total	120
Selenium, Total	100
Silver, Total	100
Zinc, Total	64

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Continued

Parameter	% Recovery
Total Metals SPIKE for sample(s) 07	
Mercury, Total	146
Dissolved Metals SPIKE for sample(s) 01-06	
Arsenic, Dissolved	104
Barium, Dissolved	100
Cadmium, Dissolved	105
Chromium, Dissolved	100
Copper, Dissolved	100
Iron, Dissolved	100
Lead, Dissolved	100
Manganese, Dissolved	98
Selenium, Dissolved	127
Silver, Dissolved	84
Zinc, Dissolved	100

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH MS/MSD ANALYSIS

Laboratory Job Number: L9809865

Parameter	MS %	MSD %	RPD
Volatile Organics by GC/MS 8260 for sample(s) 07			
Chlorobenzene	83	81	2
Benzene	83	88	6
Toluene	83	88	6
1,1-Dichloroethene	97	95	2
Trichloroethene	83	81	2
SVOC's by GC/MS 8270 for sample(s) 07			
Acenaphthene	130	140	7
1,2,4-Trichlorobenzene	130	130	0
1,4-Dichlorobenzene	100	100	0
2,4-Dinitrotoluene	160	180	12
n-Nitrosodi-n-propylamine	110	110	0
Pyrene	120	130	8
p-Chloro-m-cresol	110	110	0
2-Chlorophenol	84	84	0
4-Nitrophenol	60	92	42
Pentachlorophenol	100	130	26
Phenol	72	60	18
PCB/Pesticides for sample(s) 07			
Lindane	71	72	1
Heptachlor	65	66	1
Aldrin	67	70	4
Endrin	76	78	3
Dieldrin	52	54	4
4,4'-DDT	68	70	3

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Blank Analysis for sample(s) 01-06							
Alkalinity, Total	ND	mg CaCO3/L2.0		30	2320B	14-Dec	K
Blank Analysis for sample(s) 01-06							
Solids, Total Dissolved	ND	mg/l	5.0	30	2540C	18-Dec	D
Blank Analysis for sample(s) 01							
Cyanide, Total	ND	mg/l	0.005	1	9010B	22-Dec	A
Blank Analysis for sample(s) 02-06							
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Blank Analysis for sample(s) 01-06							
Chloride	ND	mg/l	1.0	1	9251	11-Dec	E
Blank Analysis for sample(s) 01-06							
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	E
Blank Analysis for sample(s) 01-06							
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Blank Analysis for sample(s) 01-06							
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	D
Blank Analysis for sample(s) 07							
Hydrocarbons, Total (IR)	ND	mg/kg	40.	4	418.1	21-Dec 23-Dec	S
Blank Analysis for sample(s) 07							
Total Metals				1	3051		
Arsenic, Total	ND	mg/kg	0.20	1	6010B	15-Dec 16-Dec	M
Barium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	M
Cadmium, Total	ND	mg/kg	0.20	1	6010B	15-Dec 16-Dec	M
Chromium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	M
Copper, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	M
Iron, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	M
Lead, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	M
Manganese, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	M
Selenium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	M
Silver, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	M

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Blank Analysis for sample(s) 07							
Total Metals				1	3051		
Zinc, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	M
Blank Analysis for sample(s) 07							
Volatile Organics by GC/MS 8260				1	8260B	24-Dec	E
Methylene chloride	ND	ug/kg	25.				
1,1-Dichloroethane	ND	ug/kg	7.5				
Chloroform	ND	ug/kg	7.5				
Carbon tetrachloride	ND	ug/kg	5.0				
1,2-Dichloropropane	ND	ug/kg	18.				
Dibromochloromethane	ND	ug/kg	5.0				
1,1,2-Trichloroethane	ND	ug/kg	7.5				
2-Chloroethylvinyl ether	ND	ug/kg	50.				
Tetrachloroethene	ND	ug/kg	7.5				
Chlorobenzene	ND	ug/kg	18.				
Trichlorofluoromethane	ND	ug/kg	25.				
1,2-Dichloroethane	ND	ug/kg	7.5				
1,1,1-Trichloroethane	ND	ug/kg	5.0				
Bromodichloromethane	ND	ug/kg	5.0				
trans-1,3-Dichloropropene	ND	ug/kg	5.0				
cis-1,3-Dichloropropene	ND	ug/kg	5.0				
1,1-Dichloropropene	ND	ug/kg	120				
Bromoform	ND	ug/kg	5.0				
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0				
Benzene	ND	ug/kg	5.0				
Toluene	ND	ug/kg	7.5				
Ethylbenzene	ND	ug/kg	5.0				
Chloromethane	ND	ug/kg	50.				
Bromomethane	ND	ug/kg	10.				
Vinyl chloride	ND	ug/kg	10.				
Chloroethane	ND	ug/kg	10.				
1,1-Dichloroethene	ND	ug/kg	7.5				
trans-1,2-Dichloroethene	ND	ug/kg	7.5				
Trichloroethene	ND	ug/kg	5.0				
1,2-Dichlorobenzene	ND	ug/kg	50.				
1,3-Dichlorobenzene	ND	ug/kg	50.				
1,4-Dichlorobenzene	ND	ug/kg	50.				
Methyl tert butyl ether	ND	ug/kg	50.				
p/m-Xylene	ND	ug/kg	5.0				
o-Xylene	ND	ug/kg	5.0				
cis-1,2-Dichloroethene	ND	ug/kg	5.0				
Dibromomethane	ND	ug/kg	50.				
1,4-Dichlorobutane	ND	ug/kg	50.				
Iodomethane	ND	ug/kg	50.				
1,2,3-Trichloropropane	ND	ug/kg	50.				
Styrene	ND	ug/kg	5.0				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	I
						PREP ANALYSIS	

Blank Analysis for sample(s) 07

Volatile Organics by GC/MS 8260 continued	1	8260E		24-Dec B
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Dichlorodifluoromethane	ND	ug/kg	50.
Acetone	ND	ug/kg	50.
Carbon disulfide	ND	ug/kg	50.
2-Butanone	ND	ug/kg	50.
Vinyl acetate	ND	ug/kg	50.
4-Methyl-2-pentanone	ND	ug/kg	50.
2-Hexanone	ND	ug/kg	50.
Ethyl methacrylate	ND	ug/kg	50.
Acrolein	ND	ug/kg	120
Acrylonitrile	ND	ug/kg	50.
Bromochloromethane	ND	ug/kg	25.
Tetrahydrofuran	ND	ug/kg	250
2,2-Dichloropropane	ND	ug/kg	25.
1,2-Dibromoethane	ND	ug/kg	25.
1,3-Dichloropropane	ND	ug/kg	25.
1,1,1,2-Tetrachloroethane	ND	ug/kg	25.
Bromobenzene	ND	ug/kg	25.
n-Butylbenzene	ND	ug/kg	25.
sec-Butylbenzene	ND	ug/kg	25.
tert-Butylbenzene	ND	ug/kg	25.
o-Chlorotoluene	ND	ug/kg	25.
p-Chlorotoluene	ND	ug/kg	25.
1,2-Dibromo-3-chloropropane	ND	ug/kg	25.
Hexachlorobutadiene	ND	ug/kg	25.
Isopropylbenzene	ND	ug/kg	25.
p-Isopropyltoluene	ND	ug/kg	25.
Naphthalene	ND	ug/kg	25.
n-Propylbenzene	ND	ug/kg	25.
1,2,3-Trichlorobenzene	ND	ug/kg	25.
1,2,4-Trichlorobenzene	ND	ug/kg	25.
1,3,5-Trimethylbenzene	ND	ug/kg	25.
1,2,4-Trimethylbenzene	ND	ug/kg	25.
trans-1,4-Dichloro-2-butene	ND	ug/kg	25.
Ethyl ether	ND	ug/kg	120

Surrogate Recovery

1,2-Dichloroethane-d4	98.0	%
Toluene-d8	98.0	%
4-Bromofluorobenzene	95.0	%
Dibromofluoromethane	94.0	%

Blank Analysis for sample(s) 07

SVOC's by GC/MS 8270	1	8270C		11-Dec 14-Dec M
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Acenaphthene	ND	ug/kg	500
Benzidine	ND	ug/kg	5000

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	II
						PREP ANALYSIS	
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec M	
1,2,4-Trichlorobenzene	ND	ug/kg	500				
Hexachlorobenzene	ND	ug/kg	500				
Bis(2-chloroethyl) ether	ND	ug/kg	500				
1-Chloronaphthalene	ND	ug/kg	500				
2-Chloronaphthalene	ND	ug/kg	500				
1,2-Dichlorobenzene	ND	ug/kg	500				
1,3-Dichlorobenzene	ND	ug/kg	500				
1,4-Dichlorobenzene	ND	ug/kg	500				
3,3'-Dichlorobenzidine	ND	ug/kg	5000				
2,4-Dinitrotoluene	ND	ug/kg	500				
2,6-Dinitrotoluene	ND	ug/kg	500				
Azobenzene	ND	ug/kg	500				
Fluoranthene	ND	ug/kg	500				
4-Chlorophenyl phenyl ether	ND	ug/kg	500				
4-Bromophenyl phenyl ether	ND	ug/kg	500				
Bis(2-chloroisopropyl) ether	ND	ug/kg	500				
Bis(2-chloroethoxy) methane	ND	ug/kg	500				
Hexachlorobutadiene	ND	ug/kg	1000				
Hexachlorocyclopentadiene	ND	ug/kg	1000				
Hexachloroethane	ND	ug/kg	500				
Isophorone	ND	ug/kg	500				
Naphthalene	ND	ug/kg	500				
Nitrobenzene	ND	ug/kg	500				
NDPA/DPA	ND	ug/kg	500				
n-Nitrosodi-n-propylamine	ND	ug/kg	500				
Bis(2-ethylhexyl) phthalate	ND	ug/kg	1000				
Butyl benzyl phthalate	ND	ug/kg	500				
Di-n-butylphthalate	ND	ug/kg	500				
Di-n-octylphthalate	ND	ug/kg	500				
Diethyl phthalate	ND	ug/kg	500				
Dimethyl phthalate	ND	ug/kg	500				
Benzo(a)anthracene	ND	ug/kg	500				
Benzo(a)pyrene	ND	ug/kg	500				
Benzo(b)fluoranthene	ND	ug/kg	500				
Benzo(k)fluoranthene	ND	ug/kg	500				
Chrysene	ND	ug/kg	500				
Acenaphthylene	ND	ug/kg	500				
Anthracene	ND	ug/kg	500				
Benzo(ghi)perylene	ND	ug/kg	500				
Fluorene	ND	ug/kg	500				
Phenanthrene	ND	ug/kg	500				
Dibenzo(a,h)anthracene	ND	ug/kg	500				
Indeno(1,2,3-cd)pyrene	ND	ug/kg	500				
Pyrene	ND	ug/kg	500				
Aniline	ND	ug/kg	1000				
4-Chloroaniline	ND	ug/kg	500				
1-Methylnaphthalene	ND	ug/kg	500				

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	II
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec M	
2-Nitroaniline	ND	ug/kg	500				
3-Nitroaniline	ND	ug/kg	500				
4-Nitroaniline	ND	ug/kg	500				
Dibenzofuran	ND	ug/kg	500				
a,a-Dimethylphenethylamine	ND	ug/kg	5000				
Hexachloropropene	ND	ug/kg	5000				
Nitrosodi-n-butylamine	ND	ug/kg	1000				
2-Methylnaphthalene	ND	ug/kg	500				
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	2000				
Pentachlorobenzene	ND	ug/kg	2000				
a-Naphthylamine	ND	ug/kg	2000				
b-Naphthylamine	ND	ug/kg	2000				
Phenacetin	ND	ug/kg	1000				
Dimethoate	ND	ug/kg	2000				
4-Aminobiphenyl	ND	ug/kg	1000				
Pentachloronitrobenzene	ND	ug/kg	1000				
Isodrin	ND	ug/kg	1000				
p-Dimethylaminoazobenzene	ND	ug/kg	1000				
Chlorobenzilate	ND	ug/kg	2000				
3-Methylcholanthrene	ND	ug/kg	2000				
Ethyl Methanesulfonate	ND	ug/kg	1500				
Acetophenone	ND	ug/kg	2000				
Nitrosodipiperidine	ND	ug/kg	2000				
7,12-Dimethylbenz (a) anthracene	ND	ug/kg	1000				
n-Nitrosodimethylamine	ND	ug/kg	5000				
2,4,6-Trichlorophenol	ND	ug/kg	500				
p-Chloro-m-cresol	ND	ug/kg	500				
2-Chlorophenol	ND	ug/kg	500				
2,4-Dichlorophenol	ND	ug/kg	1000				
2,4-Dimethylphenol	ND	ug/kg	1000				
2-Nitrophenol	ND	ug/kg	1000				
4-Nitrophenol	ND	ug/kg	1000				
2,4-Dinitrophenol	ND	ug/kg	2000				
4,6-Dinitro-o-cresol	ND	ug/kg	2000				
Pentachlorophenol	ND	ug/kg	2000				
Phenol	ND	ug/kg	500				
2-Methylphenol	ND	ug/kg	500				
3-Methylphenol/4-Methylphenol	ND	ug/kg	500				
2,4,5-Trichlorophenol	ND	ug/kg	500				
2,6-Dichlorophenol	ND	ug/kg	1000				
Benzoic Acid	ND	ug/kg	5000				
Benzyl Alcohol	ND	ug/kg	1000				
Carbazole	ND	ug/kg	500				
Pyridine	ND	ug/kg	5000				
2-Picoline	ND	ug/kg	2000				
Pronamide	ND	ug/kg	2000				
Methyl methanesulfonate	ND	ug/kg	2000				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	IN
						PREP ANALYSIS	
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	M
Surrogate Recovery							
2-Fluorophenol	48.0	%					
Phenol-d6	59.0	%					
Nitrobenzene-d5	92.0	%					
2-Fluorobiphenyl	98.0	%					
2,4,6-Tribromophenol	83.0	%					
4-Terphenyl-d14	126.	%					
Blank Analysis for sample(s) 07							
PCB/Pesticides				1	8082/8081	11-Dec 16-Dec	P
Delta-BHC	ND	ug/kg	5.00				
Lindane	ND	ug/kg	5.00				
Alpha-BHC	ND	ug/kg	5.00				
Beta-BHC	ND	ug/kg	5.00				
Heptachlor	ND	ug/kg	5.00				
Aldrin	ND	ug/kg	5.00				
Heptachlor epoxide	ND	ug/kg	5.00				
Endrin	ND	ug/kg	5.00				
Endrin aldehyde	ND	ug/kg	5.00				
Endrin ketone	ND	ug/kg	5.00				
Dieldrin	ND	ug/kg	5.00				
4,4'-DDE	ND	ug/kg	5.00				
4,4'-DDD	ND	ug/kg	5.00				
4,4'-DDT	ND	ug/kg	5.00				
Endosulfan I	ND	ug/kg	5.00				
Endosulfan II	ND	ug/kg	5.00				
Endosulfan sulfate	ND	ug/kg	5.00				
Methoxychlor	ND	ug/kg	5.00				
Toxaphene	ND	ug/kg	20.0				
Chlordane	ND	ug/kg	20.0				
cis-Chlordane	ND	ug/kg	5.00				
trans-Chlordane	ND	ug/kg	5.00				
Aroclor 1221	ND	ug/kg	25.0				
Aroclor 1232	ND	ug/kg	25.0				
Aroclor 1242/1016	ND	ug/kg	25.0				
Aroclor 1248	ND	ug/kg	25.0				
Aroclor 1254	ND	ug/kg	25.0				
Aroclor 1260	ND	ug/kg	25.0				
Surrogate Recovery							
2,4,5,6-Tetrachloro-m-xylene	48.0	%					
Decachlorobiphenyl	57.0	%					

ALPHA ANALYTICAL LABORATORIES
ADDENDUM I

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Update III, 1997.
4. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-82-055. 1982.
30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

Client: Town of Waltham Address: Ward Ave Waltham, MA SDG# 98210-1671 g#28560
 Project Name: Waltham Leachfill TAT: Stratford
 Project #: _____ Phone: 617-252-8481 TAT Approved by: _____
 Contact: Paul Tawansi - CDM Lab Accl. #: _____
 Report to: Paul Tawansi Bill to: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC			METALS			OTHER					
						524.2	8260	Other	625/8270 ABN	PAH	Other	PEST/PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other		Filtered (Y/N)				
CDM4	12/10/03	10:30	W	4	98-08777	524.2	8260	Other	625/8270 ABN	PAH	Other	PEST/PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)					
CDM4A	11:00		W	4	98-08778																		
Strison 1	10:15		W	4	98-08779																		
CDM3A	11:45		W	4	98-08780																		
COVE 1	11:15		W	4	98-08781																		
COVE 2	12:15		W	4	98-08782																		
Sed 1	12:30		S	2	98-08783																		
Sed 2	12:35		S	2																			
Sed 3	12:40		S	2																			
* CDM-3A	4				CDM-4A																		
A - HCl	D - NaOH	P - Plastic	Instructions:		Container Type:	Sampled & Relinquished by:		Date		Time		Received by:		Date		Time		Date		Time			
B - HNO ₃	E - NaThio	G - Glass	• Cooler Temperature: _____ °C	• Chilled/property preserved? <input type="checkbox"/> yes <input type="checkbox"/> no	Preservative:	For the Lab	12/10/03	ASD	12/10/03	12/10/03	10:30	ASD	12/10/03	10:30	12/10/03	10:30	12/10/03	10:30	12/10/03	10:30	12/10/03		
C - H ₂ SO ₄	F - Other	V - Vial	• In good condition? <input type="checkbox"/> yes <input type="checkbox"/> no	• Evidence of tampering? <input type="checkbox"/> yes <input type="checkbox"/> no	Volume:	R. Kelly	12/10/03	10:30	12/10/03	10:30	10:30	10:30	10:30	10:30	10:30	10:30	10:30	10:30	10:30	10:30	10:30		
Shipper/Airbill:			Custody Seal:			Method of Shipment:			Carrier			Shipper/Airbill:			Custody Seal:			Method of Shipment:			Carrier		

Comments: Soils - Please composite 3 samples and run composite sample for Total metals, 8260, 8270, and 418.1 (TPH).
 G.W. - Run all water samples for HACH 8000 (COD) EPA 353.2 (Nitrate) EPA 9012 (Cyanide) SM 2320B (Alkalinity) EPA 9257 (Chloride) EPA 7470A (Mercury)
 Sediment Soils - Sub to Alptec
 Willmann - CDM-013
 EPA 9038 (Sulfate)
 EPA 6010.A (Lead/Chromium)
 EPA 7470.A (Mercury)

CDM Analytical Laboratory

840 Memorial Drive
Cambridge, MA 02139
Phone: (617) 354-4448
Fax: (617) 354-0764

Client: Town of Waltham
 Project Name: Waltham Leadhill
 Address: Ward Ave Waltham, MA
 SDG #: 981210-1071 9142500
 TAT: Standard
 TAT Approved by: _____
 Project #: _____
 Phone: 617-252-8481

Contact: Paul Tanasei - CDM
 Report to: Paul Tanasei

Bill to: _____

Lab Accl. #: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle ID's	VOA			SEMI VOA			MISC			METALS			OTHER	
						524.2	8260	624/8240	Other	525	625/8270 A/B/N, AB/N	PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13		RCRA 8
CDM4	12/10/98	10:30	W	4	98-08777	524.2				625/8270 A/B/N, AB/N				Other					
CDM4A	11:00		W	4	98-08778														
Striso 1	10:15		W	4	98-08779														
CDM3A	11:45		W	4	98-08780														
COVE 1	11:15		W	4	98-08781														
COVE 2	12:15		W	4	98-08782														
Sed 1	12:30		S	2	98-08783														
Sed 2	12:35		S	2															
Sed 3	12:40		S	2															
* CDM-3A			* CDM-4A		are not filed														
A - HCl	D - NaOH			P - Plastic			Container Type:												
B - HNO ₃	E - NaThio			G - Glass			Preservative:												
C - H ₂ SO ₄	F - Other			V - Vial			Volume:												

Samples Received: _____

Cooler Temperature: _____ °C

Chilled/properly preserved? yes no

In good condition? yes no

Evidence of tampering? yes no

Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS

Method of Shipment: Courier Airborne Fed-ex UPS Hand Other

Shipper/Airbill #: _____ Custody Seal #: _____

Comments: Soils - Please composite 3 samples and run composite sample for Total metals, 8260, 8270, and 418.1 (TPH)
GW - Run all water samples for HACH 8000 (CO₂)
Run composite sample for EPA 353.2 (volatile), EPA 9012 (cyanide), EPA 9010A (chlorine), EPA 9010A (mercury)
Soils Sub to Alpha

Waltham, Massachusetts

**Comprehensive Site Assessment
Waltham Landfill**

Volume II: Appendices F Through N

October 1999

Appendix F
Water Quality Analytical Data, Round 1



Client: City of Waltham

Project: Waltham landfill

SDG: 980519-632

Date: 6/4/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980519-632
Client: City of Waltham
Project: Waltham landfill

Print Date: 6/4/98
Client Contact: *JIM LAUREA*
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW:

James F. Carlucci

LABORATORY QA/QC REVIEW:

John T. Meyer - 1

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Cove 1	05/19/98	05/19/98	98-04379	AQUEOUS
Cove 2	05/19/98	05/19/98	98-04380	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 1
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	3.2	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 1
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	91.14	86 - 115
Dibromofluoromethane	99.24	86 - 118
Toluene-d8	94.98	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980519-632
Client Sample ID: Cove 1
Lab Sample ID: 98-04379
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	260	
Iron	25	5100	
Manganese	5.0	190	
Zinc	20	91	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 2
 Lab Sample ID: 98-04380
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	1.7	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 2
 Lab Sample ID: 98-04380
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	110.40	86 - 115
Dibromofluoromethane	104.22	86 - 118
Toluene-d8	105.76	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980519-632
Client Sample ID: Cove 2
Lab Sample ID: 98-04380
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	230	
Iron	25	5800	
Manganese	5.0	140	
Zinc	20	86	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Preparation Batch:	P980526/9012_AQ_P/22	Prep. Analyst:	DEVLINHA
Component Name:	Cyanide, Total	EPA Method #:	EPA 9012
Analytical Batch:	I980526/9012_AQUE/22	Analyst:	DEVLINHA
Reviewed By - Date:	GOTTSHALLDL - 5/26/98	Matrix:	AQUEOUS
		Units:	mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	0.015	<0.015	1	
Cove 2	98-04380	0.015	<0.015	1	

Component Name:	Nitrate	EPA Method #:	EPA 353.2	Matrix:	AQUEOUS
Analytical Batch:	I980521/353.2_AQU/65	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 5/26/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	0.050	0.36	1	
Cove 2	98-04380	0.050	0.22	1	

Component Name:	Total Dissolved Solids	EPA Method #:	SM 2540C	Matrix:	AQUEOUS
Analytical Batch:	I980529/2540C_AQU/41	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 5/29/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	5.0	340	1	
Cove 2	98-04380	5.0	280	1	

Component Name:	Alkalinity	EPA Method #:	SM 2320B	Matrix:	AQUEOUS
Analytical Batch:	I980601/2320B_AQU/36	Analyst:	NGUYENMH	Units:	mg/L CaCO3
Reviewed By - Date:	GOTTSHALLDL - 6/1/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	5.0	180	1	
Cove 2	98-04380	5.0	160	1	

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980603/8000_AQUE/35	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	5.0	57	1	
Cove 2	98-04380	5.0	140	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980603/9251_AQUE/15	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	1.0	60	1	
Cove 2	98-04380	1.0	50	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	1980604/9038_AQUE/15	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/4/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-04379	10	36	1	
Cove 2	98-04380	10	43	1	

PREPARATION INFORMATION REPORT

SDG #: 980519-632

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Cove 2	98-04380	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/28/98
Cove 2	98-04380	05/19/98	05/19/98		05/28/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/26/98
Cove 2	98-04380	05/19/98	05/19/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/20/98
Cove 2	98-04380	05/19/98	05/19/98		05/20/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/29/98	06/01/98
Cove 2	98-04380	05/19/98	05/19/98	05/29/98	06/01/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/22/98	05/22/98
Cove 2	98-04380	05/19/98	05/19/98	05/22/98	05/22/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/21/98	05/21/98
Cove 2	98-04380	05/19/98	05/19/98	05/21/98	05/21/98

HOLDTIME SUMMARY

Analysis: 9038_AQUEOUS
Analysis Desc: Sulfate

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/03/98
Cove 2	98-04380	05/19/98	05/19/98		06/03/98

Analysis: 9251_AQUEOUS
Analysis Desc: Chloride

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

353.2_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980526/9012_AQ_P/22
Lab Sample ID:	B98-03097	Prep Analyst:	DEVLINHA
EPA Number:	EPA 9012	Analytical Batch ID:	I980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	B98-03208	Prep Analyst:	
EPA Number:	SM 2540C	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	B98-03282	Prep Analyst:	
EPA Number:	SM 2320B	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

6010A_AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	B98-03298	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Barium	5.0	<5.0	
Iron	25	<25	
Manganese	5.0	<5.0	

6010A_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Zinc	20	<20	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03346 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03348 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03352 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03354 Prep Analyst:
EPA Number: HACH 8000
Units: mg/L Analytical Batch ID: I980603/8000_AQUE/35
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03356 Prep Analyst:
EPA Number: HACH 8000
Units: mg/L Analytical Batch ID: I980603/8000_AQUE/35
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03379 Prep Analyst:
EPA Number: EPA 9038
Units: mg/L Analytical Batch ID: I980604/9038_AQUE/15
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03381 Prep Analyst:
EPA Number: EPA 9038
Units: mg/L Analytical Batch ID: I980604/9038_AQUE/15
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	QCS98-03016	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	I980521/353.2_AQU/65
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	0.82	93.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	P980526/9012_AQ_P/22
Lab Sample ID:	QCS98-03098	Prep. Analyst:	DEVLINHA
Units:	mg/L	Analytical Batch ID:	I980526/9012_AQUE/22
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	QCS98-03209	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	I980529/2540C_AQU/41
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	QCS98-03283	Prep. Analyst:	
Units:	mg/L CaCO3	Analytical Batch ID:	I980601/2320B_AQU/36
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	140	104.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	QCS98-03347	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	I980603/9251_AQUE/15
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	QCS98-03349	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	I980603/9251_AQUE/15
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: QCS98-03353 Prep. Analyst:
Units: mg/L
Matrix: AQUEOUS Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: QCS98-03353 Prep. Analyst:
Units: mg/L
Matrix: AQUEOUS Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: QCS98-03357 Prep. Analyst:
Units: mg/L
Matrix: AQUEOUS Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03380
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03384
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	LFB98-03067	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
1,1-Dichloroethene	1.0	50.00	106.9	109.9	2.73	61 - 145	0 - 14		
Benzene	1.0	50.00	108.3	109.7	1.36	76 - 127	0 - 11		
Chlorobenzene	1.0	50.00	104.4	107.5	2.93	75 - 130	0 - 13		
Toluene	1.0	50.00	105.6	100.6	4.79	76 - 125	0 - 13		
Trichloroethene	1.0	50.00	105.6	104.8	0.72	71 - 120	0 - 14		
Batch Approved By: <u>GOTTSHALLDL</u>						Batch Approved Date: <u>5/26/98</u>			

SDG #:	980519-632	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980602/6010A_AQU/95
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
Barium	5.0	1000.00	93.8			80 - 120			
Iron	25	200.00	103.5			80 - 120			
Manganese	5.0	100.00	88.4			80 - 120			
Zinc	20	100.00	95.1			80 - 120			
Batch Approved By: <u>GOTTSHALLDL</u>						Batch Approved Date: <u>6/3/98</u>			

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	P980526/9012_AQ_P/22
EPA Method #:	EPA 9012	Prep. Analyst:	DEVLINHA
Lab Sample ID:	98-04319	Analytical Batch ID:	I980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04319	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04353	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	<5.0	<5.0	N/A	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/1/98</u>				

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-04379	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	0.36	0.38	4.324	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>5/26/98</u>				

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04401	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	34	33	2.985	0 - 20	
Batch Approved By: <u>GOTTSHALLDL</u>		Batch Approved Date: <u>6/4/98</u>				

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04404	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04405	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.0	120	130	4.672	0 - 20	
Iron	25	810	1100	27.144	0 - 20	
Manganese	5.0	380	400	4.779	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04444	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	15	16	3.279	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

353.2_AQUEOUS MS/MSD RPD REPORT

SDG #: 980519-632
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: I980521/353.2_AQU/65
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD				
Nitrate	99				80 - 120		
Batch Approved By:	GOTTSHALLDL			Batch Approved Date:	5/26/98		

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Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
2320B_AQUEOUS	mg/L CaCO3	180	160
2540C_AQUEOUS	Total Dissolved Solids mg/L	340	280
353.2_AQUEOUS	Nitrate mg/L	0.36	0.22
6010A_AQUEOUS	Barium ug/L	260	230
	Iron ug/L	5100	5800
	Manganese ug/L	190	140
	Zinc ug/L	91	86
8000_AQUEOUS	COD mg/L	57	140
8260A_AQUEOUS	1,1,1,2-Tetrachloroet ug/L	<1.0	<1.0
	1,1,1-Trichloroethane ug/L	<1.0	<1.0
	1,1,2,2-Tetrachloroet ug/L	<1.0	<1.0
	1,1,2-Trichloroethane ug/L	<1.0	<1.0
	1,1-Dichloroethane ug/L	<1.0	<1.0
	1,1-Dichloroethene ug/L	<1.0	<1.0
	1,1-Dichloropropene ug/L	<1.0	<1.0
	1,2,3-Trichlorobenzen ug/L	<1.0	<1.0
	1,2,3-Trichloropropan ug/L	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
3260A_AQUEOUS			
1,2,4-Trichlorobenze ug/L		<1.0	<1.0
1,2,4-Trimethylbenze ug/L		<1.0	<1.0
1,2-Dibromo-3-chloro ug/L		<1.0	<1.0
1,2-Dibromoethane ug/L		<1.0	<1.0
1,2-Dichlorobenzene ug/L		<1.0	<1.0
1,2-Dichloroethane ug/L		<1.0	<1.0
1,2-Dichloropropane ug/L		<1.0	<1.0
1,3,5-Trimethylbenze ug/L		<1.0	<1.0
1,3-Dichlorobenzene ug/L		<1.0	<1.0
1,3-Dichloropropane ug/L		<1.0	<1.0
1,4-Dichlorobenzene ug/L		<1.0	<1.0
2,2-Dichloropropane ug/L		<1.0	<1.0
2-Butanone ug/L		<20	<20
2-Chlorotoluene ug/L		<1.0	<1.0
2-Hexanone ug/L		<20	<20
4-Chlorotoluene ug/L		<1.0	<1.0
4-Methyl-2-pentanone ug/L		<20	<20

Description	Id Text	Cove 1	Cove 2
Name	Units	98-04379	98-04380
Acetone	ug/L	<20	<20
Benzene	ug/L	<1.0	<1.0
Bromobenzene	ug/L	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0
Bromomethane	ug/L	<5.0	<5.0
Carbon tetrachloride	ug/L	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0
Chloroform	ug/L	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0
cis-1,2-Dichloroethen	ug/L	<1.0	<1.0
cis-1,3-Dichloroprope	ug/L	<1.0	<1.0
Dibromochloromethan	ug/L	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0
Dichlorodifluorometha	ug/L	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Description	Id Text	Cove 1	Cove 2
Analysis Name	Units	98-04379	98-04380
8260A_AQUEOUS	ug/L	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0
Hexachlorobutadiene	ug/L	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0
Isopropylmethylbenzene	ug/L	<1.0	<1.0
m- and p-Xylenes	ug/L	<1.0	<1.0
Methyl tert-butyl ethe	ug/L	3.2	1.7
Methylene chloride	ug/L	<5.0	<5.0
n-Butylbenzene	ug/L	<1.0	<1.0
n-Propylbenzene	ug/L	<1.0	<1.0
Naphthalene	ug/L	<1.0	<1.0
o-Xylene	ug/L	<1.0	<1.0
sec-Butylbenzene	ug/L	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0
tert-Butylbenzene	ug/L	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0

	Description	Id Text		
Analysis Name	Name	Units	98-04379	Cove 1
8260A_AQUEOUS	trans-1,3-Dichloropro	ug/L	<1.0	Cove 2 98-04380
	Trichloroethene	ug/L	<1.0	<1.0
	Trichlorofluoromethan	ug/L	<1.0	<1.0
	Vinyl chloride	ug/L	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	mg/L	<0.015	<0.015
9038_AQUEOUS	Sulfate	mg/L	36	43
9251_AQUEOUS	Chloride	mg/L	60	50

Client: City of Walworth

Project Name: Walworth Landfill

Project #: _____

SDG#: 980519-632

TAT: STD

TAT Approved by: 205

Contact: Sampled by CRB

Report to: Jim Lawilla

Bill to: _____

Phone: 250-8368 - Burns

Fax #: _____

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC			METALS			OTHER							
						524.2	624/8240	8260	Other	525	625/8270 A. B/N, ABN	PAH	Other	PEST / PCB	TFH 418.1	PET ID	PP13	RCRA8	Other	Filtered (Y/N)	Other				
Cave 1	5/17/88	11:30	W	6	98-04379																				
Cave 2	1:50	↓			98-04380																				
Messy		3:15	↓		98-04381																				
A - HCl	D - NaOH	P - Plastic	Container Type:																						
B - HNO ₃	E - NaThio	G - Glass	Preservative:																						
C - H ₂ SO ₄	F - Other	V - Vial	Volume:																						
Samples Received:		Instructions:										Sampled & Relinquished by:		Date		Time		Received by:		Date		Time			
• Cooler Temperature: <u>no</u>		• Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>										Relinquished by:		Date		Time		Received by:		Date		Time			
• Chilled/property preserved? <u>no</u>		• Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>										Relinquished by:		Date		Time		Received by:		Date		Time			
• In good condition? <u>no</u>		• Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>										Relinquished by:		Date		Time		Received by:		Date		Time			
• Evidence of tampering? <u>no</u>		() TICS										Relinquished by:		Date		Time		Received by:		Date		Time			
Shipper/Airbill#:		Method of Shipment:										Fed. ex		UPS		Airborne		Courier		Hand		Other			
Custody Seal#:		Comments:										NOTE: All samples submitted subject to Standard Terms & Conditions													

Chain of Custody

Alkalinity - manganese - Total cyanide

Iron - Barium - Zinc -

Chloride - Sulfate - Nitrate - Nitrogen - TSS -

Cancelled MW4 PCB

LARGE WEBSITE OF SPECIES AD

Received by: [Signature]

Date: 5/17/88

Time: 1600

Client: City of Waltham
Project: Waltham Landfill
SDG: 980518-620
Date: 6/5/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980518-620
Client: City of Waltham
Project: Waltham Landfill

Print Date: 6/5/98
Client Contact: *JIM LAURELLA*
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

BATCH NOTES

TDS: I980529/2540C_AQU/41

Samples 98-04310, 98-04319, 98-04320, 98-04321, and 98-04322 were all analyzed one day beyond the EPA recommended maximum holding time due to intervening holiday and laboratory oversight.

RESULT NOTES

98-04319, 4320, 4322 (Iron) E qualifier = determined concentration exceeds system calibration linear range; samples were reanalyzed diluted and the additional results are reported in the single component report (p.18 of 39).

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW: *Lita May*

LABORATORY QA/QC REVIEW: *Jim F. Okuniewicz*

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, RA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
CDM 2	05/18/98	05/18/98	98-04319	AQUEOUS
Duplicate	05/18/98	05/18/98	98-04321	AQUEOUS
CDM 1	05/18/98	05/18/98	98-04320	AQUEOUS
CDM 4	05/18/98	05/18/98	98-04322	AQUEOUS
Trip Blank	05/18/98	05/18/98	98-04323	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 2		
Lab Sample ID:	98-04319	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 2
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	96.92	86 - 115
Dibromofluoromethane	100.32	86 - 118
Toluene-d8	99.58	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980601/3015/121
SDG #:	980518-620	Prep. Analyst:	LESHINSKYA
Client Sample ID:	CDM 2	Analytical Batch ID:	I980602/6010A_AQU/95
Lab Sample ID:	98-04319	Analyst:	LESHINSKYA
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Barium	5.0	590	
Iron	25	26000	E
Manganese	5.0	540	
Zinc	20	470	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 1
Lab Sample ID: 98-04320
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 1		
Lab Sample ID:	98-04320	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	87.58	86 - 115
Dibromofluoromethane	92.52	86 - 118
Toluene-d8	101.44	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980518-620
 Client Sample ID: CDM 1
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	260	
Iron	25	38000	E
Manganese	5.0	1500	
Zinc	20	380	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Duplicate		
Lab Sample ID:	98-04321	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	89.62	86 - 115
Dibromofluoromethane	94.16	86 - 118
Toluene-d8	97.48	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980601/3015/121
SDG #:	980518-620	Prep. Analyst:	LESHINSKYA
Client Sample ID:	Duplicate		
Lab Sample ID:	98-04321	Analytical Batch ID:	I980602/6010A_AQU/95
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Barium	5.0	110	
Iron	25	11000	
Manganese	5.0	1300	
Zinc	20	120	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	2.8	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 4	Analytical Batch ID:	I980524/8260A_AQU/261
Lab Sample ID:	98-04322	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	104.72	86 - 115
Dibromofluoromethane	101.00	86 - 118
Toluene-d8	101.50	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 4
Lab Sample ID: 98-04322
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980601/3015/121
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980602/6010A_AQU/95
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Barium	5.0	5400	
Iron	25	270000	E
Manganese	5.0	1800	
Zinc	20	13000	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/03/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Trip Blank		
Lab Sample ID:	98-04323	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Trip Blank
Lab Sample ID: 98-04323
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Toluene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	114.36	86 - 115
Dibromofluoromethane	109.76	86 - 118
Toluene-d8	101.30	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Preparation Batch: P980526/9012_AQ_P/22

Prep. Analyst: DEVLINHA

Component Name: Cyanide, Total

EPA Method #: EPA 9012

Matrix: AQUEOUS

Analytical Batch: I980526/9012_AQUE/22

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 5/26/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.015	<0.015	1	
CDM 1	98-04320	0.015	<0.015	1	
Duplicate	98-04321	0.015	<0.015	1	
CDM 4	98-04322	0.015	<0.015	1	

Preparation Batch: P980601/3015/121

Prep. Analyst: LESHINSKYA

Component Name: Iron

EPA Method #: EPA 6010A

Matrix: AQUEOUS

Analytical Batch: I980603/6010A_AQU/98

Analyst: LESHINSKYA

Units: ug/L

Reviewed By - Date: GOTTSALLDL - 6/4/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	50	27000	2	
CDM 1	98-04320	50	47000	2	
CDM 4	98-04322	500	370000	20	

Component Name: Alkalinity

EPA Method #: SM 2320B

Matrix: AQUEOUS

Analytical Batch: I980519/2320B_AQU/35

Analyst: DEVLINHA

Units: mg/L CaCO3

Reviewed By - Date: GOTTSALLDL - 5/19/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.0	660	1	
CDM 1	98-04320	5.0	140	1	
Duplicate	98-04321	5.0	130	1	
CDM 4	98-04322	5.0	900	1	

Component Name: Nitrate

EPA Method #: EPA 353.2

Matrix: AQUEOUS

Analytical Batch: I980521/353.2_AQU/65

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 5/26/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.050	<0.050	1	
CDM 1	98-04320	0.50	4.0	10	
Duplicate	98-04321	0.50	4.0	10	
CDM 4	98-04322	0.050	0.58	1	

Component Name: Total Dissolved Solids

EPA Method #: SM 2540C

Matrix: AQUEOUS

Analytical Batch: I980529/2540C_AQU/41

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 5/29/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.0	760	1	
CDM 1	98-04320	5.0	240	1	
Duplicate	98-04321	5.0	730	1	
CDM 4	98-04322	5.0	1400	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980603/8000_AQUE/35	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.0	120	1	
CDM 1	98-04320	5.0	20	1	
Duplicate	98-04321	5.0	31	1	
CDM 4	98-04322	5.0	140	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980603/9251_AQUE/15	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	1.0	22	1	
CDM 1	98-04320	1.0	3.6	1	
Duplicate	98-04321	1.0	3.8	1	
CDM 4	98-04322	1.0	66	1	

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	I980604/9038_AQUE/15	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/4/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	10	79	1	
CDM 1	98-04320	10	36	1	
Duplicate	98-04321	10	27	1	
CDM 4	98-04322	10	85	1	

PREPARATION INFORMATION REPORT

SDG #: 980518-620

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSHALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 1	98-04320	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Duplicate	98-04321	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 4	98-04322	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Trip Blank	98-04323	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSHALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
			DUPLICATE	Final Volume	50.0	mL
		MATRIX_SPIKE	Initial Volume	50.0	mL	
			Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Duplicate	98-04321	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSHALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Duplicate	98-04321	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/19/98
CDM 1	98-04320	05/18/98	05/18/98		05/19/98
Duplicate	98-04321	05/18/98	05/18/98		05/19/98
CDM 4	98-04322	05/18/98	05/18/98		05/19/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/26/98
CDM 1	98-04320	05/18/98	05/18/98		05/26/98
Duplicate	98-04321	05/18/98	05/18/98		05/26/98
CDM 4	98-04322	05/18/98	05/18/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/20/98
CDM 1	98-04320	05/18/98	05/18/98		05/20/98
Duplicate	98-04321	05/18/98	05/18/98		05/20/98
CDM 4	98-04322	05/18/98	05/18/98		05/20/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/29/98	06/01/98
				05/29/98	06/04/98
CDM 1	98-04320	05/18/98	05/18/98	05/29/98	06/01/98
				05/29/98	06/04/98
Duplicate	98-04321	05/18/98	05/18/98	05/29/98	06/01/98
CDM 4	98-04322	05/18/98	05/18/98	05/29/98	06/01/98
				05/29/98	06/04/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

HOLDTIME SUMMARY

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/22/98	05/22/98
CDM 1	98-04320	05/18/98	05/18/98	05/22/98	05/22/98
Duplicate	98-04321	05/18/98	05/18/98	05/22/98	05/22/98
CDM 4	98-04322	05/18/98	05/18/98	05/22/98	05/22/98
Trip Blank	98-04323	05/18/98	05/18/98	05/22/98	05/22/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/21/98	05/21/98
CDM 1	98-04320	05/18/98	05/18/98	05/21/98	05/21/98
Duplicate	98-04321	05/18/98	05/18/98	05/21/98	05/21/98
CDM 4	98-04322	05/18/98	05/18/98	05/21/98	05/21/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/03/98
CDM 1	98-04320	05/18/98	05/18/98		06/03/98
Duplicate	98-04321	05/18/98	05/18/98		06/03/98
CDM 4	98-04322	05/18/98	05/18/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

2320B_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-02935	Prep Analyst:	
EPA Number:	SM 2320B	Analytical Batch ID:	I980519/2320B_AQU/35
Units:	mg/L CaCO3	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980526/9012_AQ_P/22
Lab Sample ID:	B98-03097	Prep Analyst:	DEVLINHA
EPA Number:	EPA 9012	Analytical Batch ID:	I980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-03208	Prep Analyst:	
EPA Number:	SM 2540C	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

6010A_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	B98-03298	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Barium	5.0	<5.0	
Iron	25	<25	
Manganese	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-03346	Prep Analyst:	
EPA Number:	EPA 9251	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-03348	Prep Analyst:	
EPA Number:	EPA 9251	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03352 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03354 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03356 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980603/8000_AQUE/35
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03379 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03381
EPA Number: EPA 9038
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/4/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 Lab Sample ID: QCS98-02936 Prep. Analyst:
 Units: mg/L CaCO3 Analytical Batch ID: I980519/2320B_AQU/35
 Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	130	99.2	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 Lab Sample ID: QCS98-03016 Prep. Analyst:
 Units: mg/L Analytical Batch ID: I980521/353.2_AQU/65
 Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	0.82	93.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID: P980526/9012_AQ_P/22
 Lab Sample ID: QCS98-03098 Prep. Analyst: DEVLINHA
 Units: mg/L Analytical Batch ID: I980526/9012_AQUE/22
 Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	QCS98-03209	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980529/2540C_AQU/41
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	QCS98-03349	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980603/9251_AQUE/15
		Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	QCS98-03349	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980603/9251_AQUE/15
		Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 Lab Sample ID: QCS98-03353 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	70	102.9	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 Lab Sample ID: QCS98-03353 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	67	98.5	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620 Preparation Batch ID:
 Lab Sample ID: QCS98-03357 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	270	99.6	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03380
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03384
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	LFB98-03067	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	106.9	109.9	2.73	61 - 145	0 - 14	
Benzene	1.0	50.00	108.3	109.7	1.36	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	104.4	107.5	2.93	75 - 130	0 - 13	
Toluene	1.0	50.00	105.6	100.6	4.79	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	105.6	104.8	0.72	71 - 120	0 - 14	
Batch Approved By:		GOTTSHALLDL			Batch Approved Date:		5/26/98	

SDG #:	980518-620	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980602/6010A_AQU/95
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.0	1000.00	93.8			80 - 120		
Iron	25	200.00	103.5			80 - 120		
Manganese	5.0	100.00	88.4			80 - 120		
Zinc	20	100.00	95.1			80 - 120		
Batch Approved By:		GOTTSHALLDL			Batch Approved Date:		6/3/98	

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-02644	Analytical Batch ID:	1980519/2320B_AQU/35
Units:	mg/L CaCO ₃	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	24	24	0	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	1980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980526/9012_AQ_P/22
EPA Method #:	EPA 9012	Prep. Analyst:	DEVLINHA
Lab Sample ID:	98-04319	Analytical Batch ID:	1980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04319	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-04379	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04401	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04404	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	55	42	26.804	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	5/29/98		

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04405	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	540	540	0.185	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/3/98		

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.0	120	130	4.672	0 - 20	
Iron	25	810	1100	27.144	0 - 20	
Manganese	5.0	380	400	4.779	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	
Batch Approved By:	GOTTSHALLDL		Batch Approved Date:	6/3/98		

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	1980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	1980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: 1980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	112			61 - 145		
Benzene	111			76 - 127		
Chlorobenzene	104			75 - 130		
Toluene	99			76 - 125		
Trichloroethene	106			71 - 120		
Batch Approved By: <u>GOTTSHALLDL</u>				Batch Approved Date: <u>5/26/98</u>		

9012_AQUEOUS MS/MSD RPD REPORT

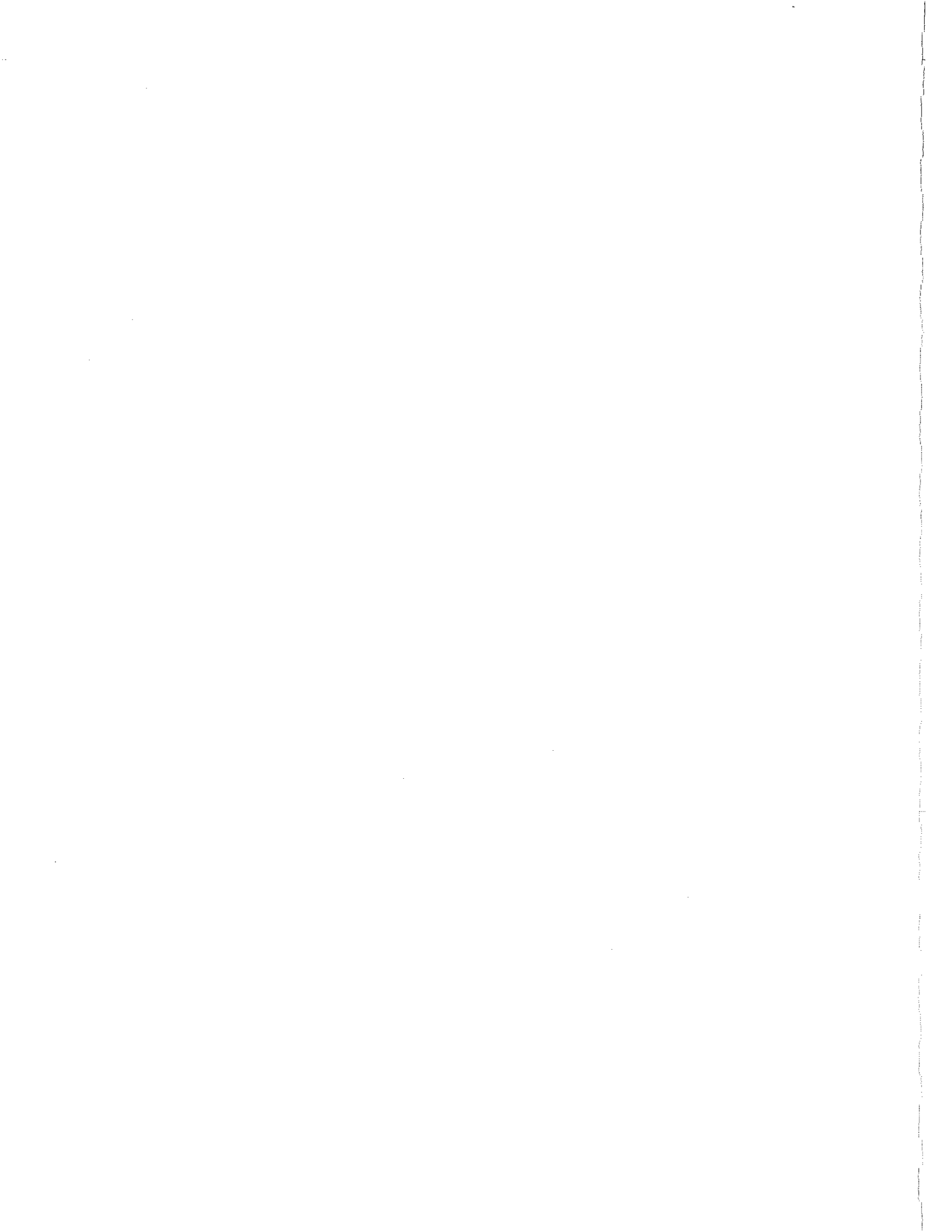
SDG #: 980518-620
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
 Prep. Analyst: DEVLINHA

Analytical Batch ID: 1980526/9012_AQUE/22
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Cyanide, Total	94			80 - 120		
Batch Approved By: <u>GOTTSHALLDL</u>				Batch Approved Date: <u>5/26/98</u>		

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Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Analysis Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
2320B_AQUEOUS	mg/L CaCO3	140	660	900	130	
2540C_AQUEOUS	Total Dissolved Solids mg/L	240	760	1400	730	
353.2_AQUEOUS	Nitrate mg/L	4.0	<0.050	0.58	4.0	
6010A_AQUEOUS	Barium ug/L	260	590	5400	110	
	Iron ug/L	38000	27000	370000	11000	
	Manganese ug/L	1500	540	1800	1300	
	Zinc ug/L	380	470	13000	120	
8000_AQUEOUS	COD mg/L	20	120	140	31	
8260A_AQUEOUS	1,1,1,2-Tetrachloroethug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,1-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2,2-Tetrachloroethug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloropropene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichlorobenzen ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichloropropaneug/L	<1.0	<1.0	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Analysis Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzen	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzen	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chlorop	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzen	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone	ug/L	<20	<20	<20	<20	<20
2-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Hexanone	ug/L	<20	<20	<20	<20	<20
4-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Methyl-2-pentanone	ug/L	<20	<20	<20	<20	<20

Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
3260A_AQUEOUS	ug/L	<20	<20	<20	<20	<20
Acetone	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropen	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethan	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluorometha	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

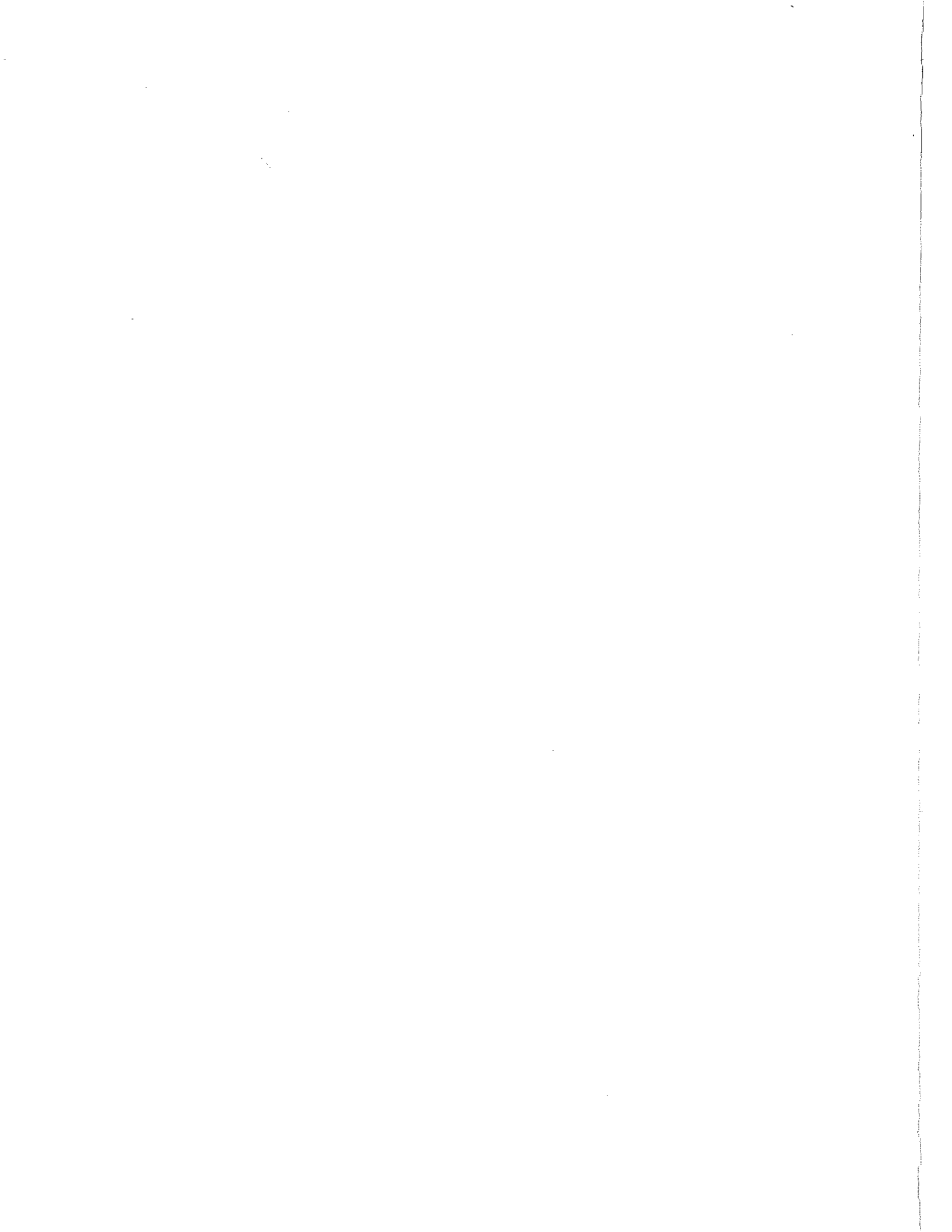
Description	Id Text	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
Analysis Name	Units	98-04320	98-04319	98-04322	98-04321	98-04323
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylmethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
m- and p-Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
n-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/L	<1.0	<1.0	2.8	<1.0	<1.0
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
sec-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Description		Id Text		CDM 1		CDM 2		CDM 4		Duplicate		Trip Blank	
Name	Units	98-04320	98-04319	98-04322	98-04321								
8260A_AQUEOUS	trans-1,3-Dichloroprop ug/L	<1.0	<1.0	<1.0	<1.0								
	Trichloroethene ug/L	<1.0	<1.0	<1.0	<1.0								
	Trichlorofluoromethan ug/L	<1.0	<1.0	<1.0	<1.0								
	Vinyl chloride ug/L	<1.0	<1.0	<1.0	<1.0								
9012_AQUEOUS	Cyanide, Total mg/L	<0.015	<0.015	<0.015	<0.015								
9038_AQUEOUS	Sulfate mg/L	36	79	85	27								
9251_AQUEOUS	Chloride mg/L	3.6	22	66	3.8								



Laboratory Summary Report

Client: Dallas Water Utilities

SDG: 980527-692

Description	Id Text
Analysis Name	BAICR-1014
5310C_AQUEOUS	98-04675
TOC	mg/L
	2.8

Client: City of Wakefield SDG#: 980518-620
 Project Name: Walton Landfill TAT: STD
 Address: 722-8368 Z-BUMS TAT Approved by: [Signature]
 Phone: 722-8368 Z-BUMS Lab Acct #: [blank]

Contact: Sampled by CBB Geological & Environmental
 Report to: Jim Lauricella Bill to: [blank]

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle ID's	Lab Acct #:					Date	Time			
						VOA	SEMI VOA	MISC	METALS	OTHER					
CDM 2	5/18/98	1:20	W	6	98-04319	524.2	625/8270 A, B/N, AB/N	525	PEST / PCB	TPH 418.1	PET ID	PP13	R/CRA 8 *	Filtered (Y/N)	COB Wet Chem
CDM 1	5/18/98	2:30	W	6	98-04320										
Duplicate	5/18/98	2:15	W	6	98-04321										
CDM 4	5/18/98	3:00	W	6	98-04322										
Trip Blank	5/18/98	3:10	W	11	98-04323										

<p>A - HCl</p> <p>B - HNO₃</p> <p>C - H₂SO₄</p> <p>Samples Received: Cooler Temperature: _____ °C Chilled/property preserved? <input type="checkbox"/> yes <input type="checkbox"/> no In good condition? <input type="checkbox"/> yes <input type="checkbox"/> no Evidence of tampering? <input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>D - NaOH</p> <p>E - NaThio</p> <p>F - Other</p> <p>Instructions: Fax Results <input type="checkbox"/> State Forms <input type="checkbox"/> SMART Report <input type="checkbox"/> Disk Deliverable <input type="checkbox"/> TICS <input type="checkbox"/></p>	<p>Container Type:</p> <p>Preservative:</p> <p>Volume:</p>	<p>VOA: 8260, 624/8240 SEMI VOA: 625/8270 A, B/N, AB/N, 525, Other MISC: PEST / PCB, TPH 418.1, PET ID METALS: PP13, R/CRA 8 *, Filtered (Y/N) OTHER: COB, Wet Chem</p>	<p>Received by: [Signature]</p> <p>Date: 5/20/98 Time: 4:40</p>	<p>Received by: [Signature]</p> <p>Date: 5/28 Date: 4:40</p>
---	--	--	---	---	--

Shipper/Airbill#: _____ Custody Seal#: _____
 Method of Shipment: Courier Airborne Fed-ex UPS Hand Other
 NOTE: All samples submitted subject to Standard Terms & Conditions

Comments:
 * Chlorides
 Sulfate
 Nitrate nitroxyes
 TDS
 Alkalinity
 Iron
 Barium
 Zinc
 Manganese
 Total Cyanide

Chain of Custody

Client: City of Waltham

Project: Waltham landfill

SDG: 980522-643

Date: 6/24/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980522-643
Client: City of Waltham
Project: Waltham landfill

Print Date: 6/24/98
Client Contact:
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

BATCH NOTES

VOA: I980608/8260A_AQU/265; Trip blank was analyzed twice to confirm Acetone hit. Second analysis was taken from same vial as original run. Only one vial was submitted. Acetone was not detected in any of the associated samples.

RESULT NOTES

Metals: Samples originally submitted for Fe, Ba, Zn, Mn analyses; additional testing (RCRA8 + Fe, Mn, Cu, Zn) was required and is included in this report. Note sample 98-04434 contained appreciable amount of sediment in the sample. Sample matrix interference (high levels of target and non-target analytes) hindered analysis of some constituents; Silver: M qualifier. Iron recovery of Matrix Spike (MS) was hindered due to high sample concentration relative to spike amount (N qualifier).

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW:

James F. Occasini

LABORATORY QA/QC REVIEW:

Robert T. May

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Trip Blank	05/21/98	05/22/98	98-04437	AQUEOUS
CDM-1A	05/21/98	05/22/98	98-04433	AQUEOUS
CDM-2A	05/21/98	05/22/98	98-04434	AQUEOUS
CDM-4A	05/21/98	05/22/98	98-04436	AQUEOUS
CDM-3A	05/21/98	05/22/98	98-04435	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-1A		
Lab Sample ID:	98-04433	Analytical Batch ID:	I980528/8260A_AQU/264
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-1A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04433	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	97.54	86 - 115
Dibromofluoromethane	98.84	86 - 118
Toluene-d8	97.54	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980522-643
 Client Sample ID: CDM-1A
 Lab Sample ID: 98-04433
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	24	
Cadmium	1.0	<1.0	
Chromium	5.0	5.1	
Copper	5.0	8.2	
Iron	25	10000	
Lead	5.0	<5.0	
Manganese	5.0	190	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	34	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-2A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04434	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980528/5030/366
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM-2A	Analytical Batch ID:	I980528/8260A_AQU/264
Lab Sample ID:	98-04434	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	102.30	86 - 115
Dibromofluoromethane	100.12	86 - 118
Toluene-d8	98.66	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980522-643
 Client Sample ID: CDM-2A
 Lab Sample ID: 98-04434
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	210	
Barium	5.0	570	
Cadmium	1.0	150	
Chromium	5.0	990	
Copper	5.0	680	
Iron	5000	5100000	
Lead	5.0	140	
Manganese	1000	110000	
Selenium	10	<10	
Silver	5.0	<5.0	M
Zinc	20	3600	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980522-643
Client Sample ID: CDM-3A
Lab Sample ID: 98-04435
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980528/8260A_AQU/264
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	1.9	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	1.3	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	19	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980522-643
Client Sample ID: CDM-3A
Lab Sample ID: 98-04435
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980528/8260A_AQU/264
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	102.62	86 - 115
Dibromofluoromethane	98.42	86 - 118
Toluene-d8	101.36	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980522-643
Client Sample ID: CDM-3A
Lab Sample ID: 98-04435
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	12	
Barium	5.0	120	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	990	
Lead	5.0	<5.0	
Manganese	5.0	380	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980522-643
 Client Sample ID: CDM-4A
 Lab Sample ID: 98-04436
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: 1980528/8260A_AQU/264
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/28/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980522-643
Client Sample ID: CDM-4A
Lab Sample ID: 98-04436
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980528/5030/366
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980528/8260A_AQU/264
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	99.40	86 - 115
Dibromofluoromethane	98.36	86 - 118
Toluene-d8	95.82	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/28/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980522-643
Client Sample ID: CDM-4A
Lab Sample ID: 98-04436
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	160	
Cadmium	1.0	1.7	
Chromium	5.0	19	
Copper	5.0	27	
Iron	25	12000	
Lead	5.0	22	
Manganese	5.0	3300	
Selenium	10	11	
Silver	5.0	<5.0	
Zinc	20	57	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980608/5030/370
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Trip Blank		
Lab Sample ID:	98-04437	Analytical Batch ID:	I980608/8260A_AQU/265
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	2		

Component Name	MRL	Result	Qualifiers
Benzene	2.0	<2.0	
Bromobenzene	2.0	<2.0	
Bromochloromethane	2.0	<2.0	
Bromodichloromethane	2.0	<2.0	
Bromoform	2.0	<2.0	
Bromomethane	10	<10	
2-Butanone	40	<40	
n-Butylbenzene	2.0	<2.0	
sec-Butylbenzene	2.0	<2.0	
tert-Butylbenzene	2.0	<2.0	
Carbon tetrachloride	2.0	<2.0	
Chlorobenzene	2.0	<2.0	
Chloroethane	10	<10	
Chloroform	10	<10	
Chloromethane	10	<10	
2-Chlorotoluene	2.0	<2.0	
4-Chlorotoluene	2.0	<2.0	
1,2-Dibromo-3-chloropropane	2.0	<2.0	
1,2-Dibromoethane	2.0	<2.0	
Dibromochloromethane	2.0	<2.0	
Dibromomethane	2.0	<2.0	
1,2-Dichlorobenzene	2.0	<2.0	
1,3-Dichlorobenzene	2.0	<2.0	
1,4-Dichlorobenzene	2.0	<2.0	
Dichlorodifluoromethane	2.0	<2.0	
1,1-Dichloroethane	2.0	<2.0	
1,2-Dichloroethane	2.0	<2.0	
cis-1,2-Dichloroethene	2.0	<2.0	
trans-1,2-Dichloroethene	2.0	<2.0	
1,2-Dichloropropane	2.0	<2.0	
1,3-Dichloropropane	2.0	<2.0	
2,2-Dichloropropane	2.0	<2.0	
1,1-Dichloropropene	2.0	<2.0	
cis-1,3-Dichloropropene	2.0	<2.0	
trans-1,3-Dichloropropene	2.0	<2.0	
Ethylbenzene	2.0	<2.0	
Hexachlorobutadiene	2.0	<2.0	
2-Hexanone	40	<40	
Isopropylbenzene	2.0	<2.0	
4-Methyl-2-pentanone	40	<40	
Methyl tert-butyl ether	2.0	<2.0	
Methylene chloride	10	<10	
Naphthalene	2.0	<2.0	
n-Propylbenzene	2.0	<2.0	
Styrene	2.0	<2.0	
1,1,1,2-Tetrachloroethane	2.0	<2.0	
1,1,2,2-Tetrachloroethane	2.0	<2.0	
Tetrachloroethene	2.0	<2.0	
Toluene	2.0	<2.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/08/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980608/5030/370
SDG #:	980522-643	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Trip Blank	Analytical Batch ID:	I980608/8260A_AQU/265
Lab Sample ID:	98-04437	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	2		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	2.0	<2.0	
1,2,4-Trichlorobenzene	2.0	<2.0	
1,1,1-Trichloroethane	2.0	<2.0	
1,1,2-Trichloroethane	2.0	<2.0	
Trichloroethene	2.0	<2.0	
Trichlorofluoromethane	2.0	<2.0	
1,2,4-Trimethylbenzene	2.0	<2.0	
1,3,5-Trimethylbenzene	2.0	<2.0	
1,2,3-Trichloropropane	2.0	<2.0	
Vinyl chloride	2.0	<2.0	
m- and p-Xylenes	2.0	<2.0	
o-Xylene	2.0	<2.0	
1,1-Dichloroethene	2.0	<2.0	
Acetone	40	55	
Isopropylmethylbenzene	2.0	<2.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	90.02	86 - 115
Dibromofluoromethane	93.02	86 - 118
Toluene-d8	98.78	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/08/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980522-643

Preparation Batch: P980528/9012_AQ_P/23		Prep. Analyst: NGUYENMH
Component Name: Cyanide, Total	EPA Method #: EPA 9012	Matrix: AQUEOUS
Analytical Batch: I980528/9012_AQUE/23	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 5/28/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	0.015	<0.015	1	
CDM-2A	98-04434	0.015	<0.015	1	
CDM-3A	98-04435	0.015	<0.015	1	
CDM-4A	98-04436	0.015	<0.015	1	

Preparation Batch: P980619/7470A_PRE/78		Prep. Analyst: LESHINSKYA
Component Name: Mercury	EPA Method #: EPA 7470A	Matrix: AQUEOUS
Analytical Batch: I980619/7470A_AQU/63	Analyst: LESHINSKYA	Units: ug/L
Reviewed By - Date: GOTTSALLDL - 6/19/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	0.20	<0.20	1	
CDM-2A	98-04434	0.20	0.50	1	
CDM-3A	98-04435	0.20	<0.20	1	
CDM-4A	98-04436	0.20	<0.20	1	

Component Name: Nitrate		EPA Method #: EPA 353.2	Matrix: AQUEOUS
Analytical Batch: I980526/353.2_AQU/66	Analyst: DEVLINHA	Units: mg/L	
Reviewed By - Date: GOTTSALLDL - 5/26/98			

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	0.050	<0.050	1	
CDM-2A	98-04434	0.050	<0.050	1	
CDM-3A	98-04435	0.050	<0.050	1	
CDM-4A	98-04436	0.050	<0.050	1	

Component Name: Total Dissolved Solids		EPA Method #: SM 2540C	Matrix: AQUEOUS
Analytical Batch: I980529/2540C_AQU/41	Analyst: NGUYENMH	Units: mg/L	
Reviewed By - Date: GOTTSALLDL - 5/29/98			

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	5.0	140	1	
CDM-2A	98-04434	5.0	140	1	
CDM-3A	98-04435	5.0	<5.0	1	
CDM-4A	98-04436	5.0	700	1	

Component Name: Alkalinity		EPA Method #: SM 2320B	Matrix: AQUEOUS
Analytical Batch: I980601/2320B_AQU/36	Analyst: NGUYENMH	Units: mg/L CaCO3	
Reviewed By - Date: GOTTSALLDL - 6/1/98			

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	5.0	74	1	
CDM-2A	98-04434	5.0	79	1	
CDM-3A	98-04435	5.0	150	1	
CDM-4A	98-04436	5.0	300	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980522-643

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980603/8000_AQUE/35	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	5.0	48	1	
CDM-2A	98-04434	5.0	66	1	
CDM-3A	98-04435	5.0	7.0	1	
CDM-4A	98-04436	5.0	16	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980603/9251_AQUE/15	Analyst:	DEVLINHA	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/3/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	1.0	11	1	
CDM-2A	98-04434	1.0	4.1	1	
CDM-3A	98-04435	1.0	27	1	
CDM-4A	98-04436	10	200	10	

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	I980604/9038_AQUE/15	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 6/4/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM-1A	98-04433	10	<10	1	
CDM-2A	98-04434	10	<10	1	
CDM-3A	98-04435	10	<10	1	
CDM-4A	98-04436	10	<10	1	

PREPARATION INFORMATION REPORT

SDG #: 980522-643

Preparation Batch ID: P980528/5030/366
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM-2A	98-04434	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM-3A	98-04435	SAMPLE	MATRIX_SPIKE	Final Volume	25.0	ml
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM-4A	98-04436	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980528/9012_AQ_P/23
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM-2A	98-04434	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM-3A	98-04435	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM-4A	98-04436	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-2A	98-04434	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-3A	98-04435	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
			DUPLICATE	Final Volume	50	mL
CDM-4A	98-04436	SAMPLE	MATRIX_SPIKE	Final Volume	50	mL
			Initial Volume	45	mL	
			Final Volume	50	mL	
CDM-4A	98-04436	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980608/5030/370
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 6/8/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Trip Blank	98-04437	SAMPLE	Final Volume	25.0	ml	

PREPARATION INFORMATION REPORT

SDG #: 980522-643

Preparation Batch ID: P980608/5030/370
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 6/8/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
			Initial Volume	12.5	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980619/3015/136
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/23/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-2A	98-04434	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-3A	98-04435	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
		DUPLICATE	Final Volume	50	mL	
			Initial Volume	45	mL	
		MATRIX_SPIKE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM-4A	98-04436	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/7470A_PRE/78
 Preparation ID: 7470A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 7470A
 Batch Approved On: 6/19/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM-1A	98-04433	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM-2A	98-04434	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM-3A	98-04435	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM-4A	98-04436	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		05/28/98
CDM-2A	98-04434	05/21/98	05/22/98		05/28/98
CDM-3A	98-04435	05/21/98	05/22/98		05/28/98
CDM-4A	98-04436	05/21/98	05/22/98		05/28/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		05/26/98
CDM-2A	98-04434	05/21/98	05/22/98		05/26/98
CDM-3A	98-04435	05/21/98	05/22/98		05/26/98
CDM-4A	98-04436	05/21/98	05/22/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		05/22/98
CDM-2A	98-04434	05/21/98	05/22/98		05/22/98
CDM-3A	98-04435	05/21/98	05/22/98		05/22/98
CDM-4A	98-04436	05/21/98	05/22/98		05/22/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	05/28/98	06/01/98
CDM-2A	98-04434	05/21/98	05/22/98	05/28/98	06/01/98
CDM-3A	98-04435	05/21/98	05/22/98	05/28/98	06/01/98
CDM-4A	98-04436	05/21/98	05/22/98	05/28/98	06/01/98

Analysis: 7470A_AQUEOUS
 Analysis Desc: Mercury in Water

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	06/18/98	06/18/98
CDM-2A	98-04434	05/21/98	05/22/98	06/18/98	06/18/98
CDM-3A	98-04435	05/21/98	05/22/98	06/18/98	06/18/98
CDM-4A	98-04436	05/21/98	05/22/98	06/18/98	06/18/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		06/02/98

HOLDTIME SUMMARY

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-2A	98-04434	05/21/98	05/22/98		06/02/98
CDM-3A	98-04435	05/21/98	05/22/98		06/02/98
CDM-4A	98-04436	05/21/98	05/22/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	05/27/98	05/27/98
CDM-2A	98-04434	05/21/98	05/22/98	05/27/98	05/27/98
CDM-3A	98-04435	05/21/98	05/22/98	05/27/98	05/27/98
CDM-4A	98-04436	05/21/98	05/22/98	05/27/98	05/27/98
Trip Blank	98-04437	05/21/98	05/22/98	05/28/98	05/28/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98	05/27/98	05/28/98
CDM-2A	98-04434	05/21/98	05/22/98	05/27/98	05/28/98
CDM-3A	98-04435	05/21/98	05/22/98	05/27/98	05/28/98
CDM-4A	98-04436	05/21/98	05/22/98	05/27/98	05/28/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		06/03/98
CDM-2A	98-04434	05/21/98	05/22/98		06/03/98
CDM-3A	98-04435	05/21/98	05/22/98		06/03/98
CDM-4A	98-04436	05/21/98	05/22/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM-1A	98-04433	05/21/98	05/22/98		06/02/98
CDM-2A	98-04434	05/21/98	05/22/98		06/02/98
CDM-3A	98-04435	05/21/98	05/22/98		06/02/98
CDM-4A	98-04436	05/21/98	05/22/98		06/02/98

353.2_AQUEOUS BLANK REPORT

SDG #:	980522-643	Preparation Batch ID:	
Lab Sample ID:	98-04597	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	I980526/353.2_AQU/66
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980522-643	Preparation Batch ID:	P980528/5030/366
Lab Sample ID:	B98-03191	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980528/8260A_AQU/264
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03191
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980528/5030/366
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980528/8260A_AQU/264
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/28/98

9012_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
Lab Sample ID: B98-03199 Prep Analyst: NGUYENMH
EPA Number: EPA 9012 Analytical Batch ID: I980528/9012_AQUE/23
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/28/98

9012_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
Lab Sample ID: B98-03201 Prep Analyst: NGUYENMH
EPA Number: EPA 9012 Analytical Batch ID: I980528/9012_AQUE/23
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/28/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C Analytical Batch ID: I980529/2540C_AQU/41
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID:
Lab Sample ID: B98-03282 Prep Analyst:
EPA Number: SM 2320B Analytical Batch ID: I980601/2320B_AQU/36
Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/1/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Barium	5.0	<5.0	
Iron	25	<25	
Manganese	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID:
Lab Sample ID: B98-03346 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980522-643 Preparation Batch ID:
Lab Sample ID: B98-03348 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03352
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03354
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03356
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980522-643
Lab Sample ID: B98-03379
EPA Number: EPA 9038
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03381
 EPA Number: EPA 9038
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03468
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980608/5030/370
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980608/8260A_AQU/265
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980522-643
 Lab Sample ID: B98-03468
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980608/5030/370
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980608/8260A_AQU/265
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/8/98

6010A_AQUEOUS BLANK REPORT

SDG #:	980522-643	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	B98-03772	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A_AQUEOUS BLANK REPORT

SDG #:	980522-643	Preparation Batch ID:	P980619/7470A_PRE/78
Lab Sample ID:	B98-03779	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 7470A	Analytical Batch ID:	I980619/7470A_AQU/63
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Mercury	0.20	<0.20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
 Lab Sample ID: QCS98-03095 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980526/353.2_AQU/66
 Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	0.86	97.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
 Lab Sample ID: QCS98-03202 Prep. Analyst: NGUYENMH
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980528/9012_AQUE/23
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	94.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
 Lab Sample ID: QCS98-03202 Prep. Analyst: NGUYENMH
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980528/9012_AQUE/23
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.20	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03209
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03283
Units: mg/L CaCO3
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980601/2320B_AQU/36
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	140	104.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
Lab Sample ID: QCS98-03347
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
Lab Sample ID:	QCS98-03349	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	1980603/9251_AQUE/15
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
Lab Sample ID:	QCS98-03353	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	1980603/8000_AQUE/35
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
Lab Sample ID:	QCS98-03355	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	1980603/8000_AQUE/35
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
 Lab Sample ID: QCS98-03357
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
 Lab Sample ID: QCS98-03380
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980522-643
 Lab Sample ID: QCS98-03384
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980522-643
 Lab Sample ID: LFB98-03192
 EPA Method #: EPA 8260A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980528/5030/366
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980528/8260A_AQU/264
 Analyst: MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
1,1-Dichloroethene	1.0	50.00	103.4	109.3	5.51	61 - 145	0 - 14		
Benzene	1.0	50.00	107.4	110.4	2.70	76 - 127	0 - 11		
Chlorobenzene	1.0	50.00	109.4	110.2	0.75	75 - 130	0 - 13		
Toluene	1.0	50.00	97.1	102.0	4.96	76 - 125	0 - 13		
Trichloroethene	1.0	50.00	105.6	107.8	2.08	71 - 120	0 - 14		
Batch Approved By: GOTTSHALLDL		Batch Approved Date: 5/28/98							

SDG #: 980522-643
 Lab Sample ID: LFB98-03299
 EPA Method #: EPA 6010A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
Barium	5.0	1000.00	93.8			80 - 120			
Iron	25	200.00	103.5			80 - 120			
Manganese	5.0	100.00	88.4			80 - 120			
Zinc	20	100.00	95.1			80 - 120			
Batch Approved By: GOTTSHALLDL		Batch Approved Date: 6/3/98							

SDG #: 980522-643
 Lab Sample ID: LFB98-03469
 EPA Method #: EPA 8260A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980608/5030/370
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980608/8260A_AQU/265
 Analyst: MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
1,1-Dichloroethene	1.0	50.00	110.2	104.3	5.54	61 - 145	0 - 14		
Benzene	1.0	50.00	109.8	106.8	2.71	76 - 127	0 - 11		
Chlorobenzene	1.0	50.00	108.4	107.6	0.78	75 - 130	0 - 13		
Toluene	1.0	50.00	105.5	107.8	2.21	76 - 125	0 - 13		
Trichloroethene	1.0	50.00	108.0	106.6	1.34	71 - 120	0 - 14		
Batch Approved By: GOTTSHALLDL		Batch Approved Date: 6/8/98							

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980522-643 Preparation Batch ID: P980619/3015/136
 Lab Sample ID: LFB98-03773 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 6010A Analytical Batch ID: I980619/6010A_AQU/107
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.0	100.00	100.4			80 - 120		
Barium	5.0	1000.00	93.8			80 - 120		
Cadmium	1.0	50.00	89.4			80 - 120		
Chromium	5.0	100.00	91.8			80 - 120		
Copper	5.0	100.00	98.6			80 - 120		
Iron	25	200.00	103.3			80 - 120		
Lead	5.0	100.00	88.2			80 - 120		
Manganese	5.0	100.00	88.4			80 - 120		
Selenium	10	50.00	111.3			80 - 120		
Silver	5.0	100.00	106.3			80 - 120		
Zinc	20	100.00	95.1			80 - 120		

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/23/98

SDG #: 980522-643 Preparation Batch ID: P980619/7470A_PRE/78
 Lab Sample ID: LFB98-03778 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7470A Analytical Batch ID: I980619/7470A_AQU/63
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.2	5.00	97.6			80 - 120		

Batch Approved By: GOTTSALLDL Batch Approved Date: 6/19/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980619/7470A_PRE/78
EPA Method #:	EPA 7470A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04319	Analytical Batch ID:	I980619/7470A_AQU/63
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	0.22	0.26	20.238	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04319	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04353	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	<5.0	<5.0	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980528/9012_AQ_P/23
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-04398	Analytical Batch ID:	I980528/9012_AQUE/23
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04401	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-04402	Analytical Batch ID:	I980526/353.2_AQU/66
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	1.2	1.2	0.722	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04404	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04405	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.0	120	130	4.672	0 - 20	
Iron	25	810	1100	27.144	0 - 20	

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980601/3015/121
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Manganese	5.0	380	400	4.779	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	P980619/3015/136
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04435	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.0	12	12	6.193	0 - 20	
Barium	5.0	120	130	4.672	0 - 20	
Cadmium	1.0	<1.0	<1.0	N/A	0 - 20	
Chromium	5.0	<5.0	<5.0	N/A	0 - 20	
Copper	5.0	<5.0	<5.0	N/A	0 - 20	
Iron	25	990	1100	7.863	0 - 20	
Lead	5.0	<5.0	<5.0	N/A	0 - 20	
Manganese	5.0	380	400	4.779	0 - 20	
Selenium	10	<10	<10	N/A	0 - 20	
Silver	5.0	<5.0	<5.0	N/A	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980522-643	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04444	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	15	16	3.279	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
 EPA Method #: EPA 9251 Prep. Analyst:
 Lab Sample ID: 98-04450 Analytical Batch ID: I980603/9251_AQUE/15
 Units: mg/L Analysis Analyst: DEVLINHA
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-04450 Analytical Batch ID: I980604/9038_AQUE/15
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980522-643 Preparation Batch ID: P980528/9012_AQ_P/23
 EPA Method #: EPA 9012 Prep. Analyst: NGUYENMH
 Lab Sample ID: 98-04452 Analytical Batch ID: I980528/9012_AQUE/23
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/28/98

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980522-643
 Lab Sample ID: 98-04434
 Matrix: AQUEOUS

Preparation Batch ID: P980528/5030/366
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980528/8260A_AQU/264
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	115			61 - 145		
Benzene	110			76 - 127		
Chlorobenzene	109			75 - 130		
Toluene	102			76 - 125		
Trichloroethene	107			71 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/28/98

6010A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980522-643
 Lab Sample ID: 98-04435
 Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980602/6010A_AQU/95
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Barium	91			80 - 120		
Iron	228			80 - 120		N
Manganese	97			80 - 120		
Zinc	91			80 - 120		
Arsenic	98			80 - 120		
Barium	91			80 - 120		
Cadmium	86			80 - 120		
Chromium	88			80 - 120		
Copper	96			80 - 120		
Iron	149			80 - 120		N
Lead	89			80 - 120		
Manganese	97			80 - 120		
Selenium	111			80 - 120		
Silver	103			80 - 120		
Zinc	91			80 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/23/98

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Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

	Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
2320B_AQUEOUS	Alkalinity	mg/L CaCO3	74	79	150	300	
2540C_AQUEOUS	Total Dissolved Solids	mg/L	140	140	<5.0	700	
353.2_AQUEOUS	Nitrate	mg/L	<0.050	<0.050	<0.050	<0.050	
6010A_AQUEOUS	Arsenic	ug/L	<5.0	210	12	<5.0	
	Barium	ug/L	24	570	120	160	
	Cadmium	ug/L	<1.0	150	<1.0	1.7	
	Chromium	ug/L	5.1	990	<5.0	19	
	Copper	ug/L	8.2	680	<5.0	27	
	Iron	ug/L	10000	5100000	990	12000	
	Lead	ug/L	<5.0	140	<5.0	22	
	Manganese	ug/L	190	110000	380	3300	
	Selenium	ug/L	<10	<10	<10	11	
	Silver	ug/L	<5.0	<5.0	<5.0	<5.0	
	Zinc	ug/L	34	3600	<20	57	
7470A_AQUEOUS	Mercury	ug/L	<0.20	0.50	<0.20	<0.20	
8000_AQUEOUS	COD	mg/L	48	66	7.0	16	
8260A_AQUEOUS	1,1,1,2-Tetrachloroet	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	1,1,1-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,1,2,2-Tetrachloroet ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,1,2-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,1-Dichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,1-Dichloroethene ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,1-Dichloropropene ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2,3-Trichlorobenzen ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2,3-Trichloropropan ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2,4-Trichlorobenzen ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2,4-Trimethylbenze ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2-Dibromo-3-chloro ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2-Dibromoethane ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2-Dichlorobenzene ug/L	<1.0	<1.0	1.3	<1.0	<2.0
	1,2-Dichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,2-Dichloropropane ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,3,5-Trimethylbenze ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
	1,3-Dichlorobenzene ug/L	<1.0	<1.0	<1.0	<1.0	<2.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
2-Butanone	ug/L	<20	<20	<20	<20	<40
2-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
2-Hexanone	ug/L	<20	<20	<20	<20	<40
4-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
4-Methyl-2-pentanone	ug/L	<20	<20	<20	<20	<40
Acetone	ug/L	<20	<20	<20	<20	55
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Chlorobenzene	ug/L	<1.0	<1.0	1.9	<1.0	<2.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0	<10
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<10
cis-1,2-Dichloroethen	ug/L	<1.0	<1.0	19	<1.0	<2.0
cis-1,3-Dichloroprope	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Dibromochloromethan	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Dichlorodifluorometha	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Hexachlorobutadiene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Isopropylmethylbenze	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
m- and p-Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Methyl tert-butyl ethe	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Methylene chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<10
n-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
n-Propylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980522-643

Description	Id Text	CDM-1A	CDM-2A	CDM-3A	CDM-4A	Trip Blank
Analysis Name	Units	98-04433	98-04434	98-04435	98-04436	98-04437
8260A_AQUEOUS	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Naphthalene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
sec-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
tert-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
trans-1,3-Dichloropro	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Trichlorofluoromethan	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Vinyl chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<2.0
Cyanide, Total	mg/L	<0.015	<0.015	<0.015	<0.015	<0.015
9012_AQUEOUS	mg/L	<10	<10	<10	<10	<10
9038_AQUEOUS	mg/L	11	4.1	27	200	
9251_AQUEOUS	mg/L					

CDM Analytical Laboratory

840 Memorial Drive
Cambridge, MA 02139

Phone: (617) 354-4448
Fax: (617) 354-0764

Field Log # **CA 1459**

Page **1** of **1**

Client: City of Waltham
Project Name: Waltham (ad61)

SDG#: **980522-643**

TAT: **STD**

TAT Approved by:

Address: **252-8368 Burns**

Phone: **252-8368 Burns**

Contact: Sampled by CRB Geoscientific + Environmental

Report to: Jim Laurita Bill to:

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC		METALS			OTHER		
						5242	624/8240	8260	525	625/8270 AB/N	PAH	Other	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)	CO2
Trip blank	5/11/98	9:00	W	1	98-04437	<input checked="" type="checkbox"/>													
CDM 1A	5/11/98	10:50	W	6	98-04433	<input checked="" type="checkbox"/>													
CDM 2A	5/11/98	11:30	W	1	98-04434	<input checked="" type="checkbox"/>													
CDM 3A	5/11/98	2:30	W	1	98-04435	<input checked="" type="checkbox"/>													
CDM 4A	5/11/98	2:00	W	1	98-04436	<input checked="" type="checkbox"/>													

*Spl + sample for
A-Hg*

Collected by: Diya Patel
Received by: Diya Patel
Date: 5/11/98
Time: 1:57

Method of Shipment: Courier Airborne Fed-ex

Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS

Comments:
Chlorides
Sulfate
Nitrate Nitrogen
TD5

Alkalinity
Iron
Barium
Zinc

Manganese
Total Cyanide

Chain of Custody

NOTE: All samples submitted subject to Standard Terms & Conditions

Client: City of Waltham

Project: Waltham landfill

SDG: 980519-632

Date: 6/24/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980519-632
Client: City of Waltham
Project: Waltham landfill

Print Date: 6/24/98
Client Contact:
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples. No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

Note that results for these samples were originally reported on 6/4/98. It was discovered that additional metals analyses were needed; the additional metals results plus all of the original results are included in this report.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge complete & accurate.

LABORATORY MANAGEMENT REVIEW: James J. Onkili

LABORATORY QA/QC REVIEW: Patricia May - 1

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Cove 1	05/19/98	05/19/98	98-04379	AQUEOUS
Cove 2	05/19/98	05/19/98	98-04380	AQUEOUS
MW-4	05/19/98	05/19/98	98-04381	AQUEOUS

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 1
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	3.2	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSHALLDLBatch Approval Date: 05/26/98

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980519-632
Client Sample ID: Cove 1
Lab Sample ID: 98-04379
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	91.14	86 - 115
Dibromofluoromethane	99.24	86 - 118
Toluene-d8	94.98	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980519-632
 Client Sample ID: Cove 1
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: 1980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	5.2	
Barium	5	260	
Cadmium	1	<1.0	
Chromium	5	<5.0	
Copper	5	9.8	
Iron	25	5100	
Lead	5	8.4	
Manganese	5	190	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	91	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980519-632
 Client Sample ID: Cove 2
 Lab Sample ID: 98-04380
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	1.7	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980519-632
Client Sample ID: Cove 2
Lab Sample ID: 98-04380
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	110.40	86 - 115
Dibromofluoromethane	104.22	86 - 118
Toluene-d8	105.76	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980519-632
Client Sample ID: Cove 2
Lab Sample ID: 98-04380
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	<5.0	
Barium	5	230	
Cadmium	1	<1.0	
Chromium	5	<5.0	
Copper	5	17	
Iron	25	5800	
Lead	5	18	
Manganese	5	140	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	86	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Preparation Batch: P980526/9012_AQ_P/22

Prep. Analyst: DEVLINHA

Component Name: Cyanide, Total

EPA Method #: EPA 9012

Matrix: AQUEOUS

Analytical Batch: I980526/9012_AQUE/22

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSHALLDL - 5/26/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	0.015	<0.015	1	
Cove 2	98-04380	0.015	<0.015	1	

Preparation Batch: P980619/7470A_PRE/78

Prep. Analyst: LESHINSKYA

Component Name: Mercury

EPA Method #: EPA 7470A

Matrix: AQUEOUS

Analytical Batch: I980619/7470A_AQU/63

Analyst: LESHINSKYA

Units: ug/L

Reviewed By - Date: GOTTSHALLDL - 6/19/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	0.200	<0.20	1	
Cove 2	98-04380	0.200	<0.20	1	

Component Name: Nitrate

EPA Method #: EPA 353.2

Matrix: AQUEOUS

Analytical Batch: I980521/353.2_AQU/65

Analyst: DEVLINHA

Units: mg/L

Reviewed By - Date: GOTTSHALLDL - 5/26/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	0.050	0.36	1	
Cove 2	98-04380	0.050	0.22	1	

Component Name: Total Dissolved Solids

EPA Method #: SM 2540C

Matrix: AQUEOUS

Analytical Batch: I980529/2540C_AQU/41

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: GOTTSHALLDL - 5/29/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	5.000	340	1	
Cove 2	98-04380	5.000	280	1	

Component Name: Alkalinity

EPA Method #: SM 2320B

Matrix: AQUEOUS

Analytical Batch: I980601/2320B_AQU/36

Analyst: NGUYENMH

Units: mg/L CaCO3

Reviewed By - Date: GOTTSHALLDL - 6/1/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	5.000	180	1	
Cove 2	98-04380	5.000	160	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980519-632

Component Name: COD	EPA Method #: HACH 8000	Matrix: AQUEOUS
Analytical Batch: 1980603/8000_AQUE/35	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 6/3/98		

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	5.000	57	1	
Cove 2	98-04380	5.000	140	1	

Component Name: Chloride	EPA Method #: EPA 9251	Matrix: AQUEOUS
Analytical Batch: 1980603/9251_AQUE/15	Analyst: DEVLINHA	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 6/3/98		

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	1.000	60	1	
Cove 2	98-04380	1.000	50	1	

Component Name: Sulfate	EPA Method #: EPA 9038	Matrix: AQUEOUS
Analytical Batch: 1980604/9038_AQUE/15	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 6/4/98		

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
Cove 1	98-04379	10.000	36	1	
Cove 2	98-04380	10.000	43	1	

PREPARATION INFORMATION REPORT

SDG #: 980519-632

Preparation Batch ID: P980524/5030/361
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Cove 2	98-04380	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/3015/136
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/23/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-04380	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/7470A_PRE/78
 Preparation ID: 7470A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 7470A
 Batch Approved On: 6/19/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-04379	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Cove 2	98-04380	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/28/98
Cove 2	98-04380	05/19/98	05/19/98		05/28/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/26/98
Cove 2	98-04380	05/19/98	05/19/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		05/20/98
Cove 2	98-04380	05/19/98	05/19/98		05/20/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/28/98	06/01/98
Cove 2	98-04380	05/19/98	05/19/98	05/28/98	06/01/98

Analysis: 7470A_AQUEOUS
 Analysis Desc: Mercury in Water

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	06/18/98	06/18/98
Cove 2	98-04380	05/19/98	05/19/98	06/18/98	06/18/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Cove 1	98-04379	05/19/98	05/19/98	05/22/98	05/22/98
Cove 2	98-04380	05/19/98	05/19/98	05/22/98	05/22/98

HOLDTIME SUMMARY

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98	05/21/98	05/21/98
Cove 2	98-04380	05/19/98	05/19/98	05/21/98	05/21/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		06/03/98
Cove 2	98-04380	05/19/98	05/19/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Date Prepared</u>	<u>Date Analyzed</u>
Cove 1	98-04379	05/19/98	05/19/98		06/02/98
Cove 2	98-04380	05/19/98	05/19/98		06/02/98

353.2 AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	1980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.05	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	1980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.00	<1.0	
1,1,1-Trichloroethane	1.00	<1.0	
1,1,2,2-Tetrachloroethane	1.00	<1.0	
1,1,2-Trichloroethane	1.00	<1.0	
1,1-Dichloroethane	1.00	<1.0	
1,1-Dichloroethene	1.00	<1.0	
1,1-Dichloropropene	1.00	<1.0	
1,2,3-Trichlorobenzene	1.00	<1.0	
1,2,3-Trichloropropane	1.00	<1.0	
1,2,4-Trichlorobenzene	1.00	<1.0	
1,2,4-Trimethylbenzene	1.00	<1.0	
1,2-Dibromo-3-chloropropane	1.00	<1.0	
1,2-Dibromoethane	1.00	<1.0	
1,2-Dichlorobenzene	1.00	<1.0	
1,2-Dichloroethane	1.00	<1.0	
1,2-Dichloropropane	1.00	<1.0	
1,3,5-Trimethylbenzene	1.00	<1.0	
1,3-Dichlorobenzene	1.00	<1.0	
1,3-Dichloropropane	1.00	<1.0	
1,4-Dichlorobenzene	1.00	<1.0	
2,2-Dichloropropane	1.00	<1.0	
2-Butanone	20.00	<20	
2-Chlorotoluene	1.00	<1.0	
2-Hexanone	20.00	<20	
4-Chlorotoluene	1.00	<1.0	
4-Methyl-2-pentanone	20.00	<20	
Acetone	20.00	<20	
Benzene	1.00	<1.0	

8260A AQUEOUS BLANK REPORT

SDG #: 980519-632
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Bromobenzene	1.00	<1.0	
Bromochloromethane	1.00	<1.0	
Bromodichloromethane	1.00	<1.0	
Bromoform	1.00	<1.0	
Bromomethane	5.00	<5.0	
Carbon tetrachloride	1.00	<1.0	
Chlorobenzene	1.00	<1.0	
Chloroethane	5.00	<5.0	
Chloroform	5.00	<5.0	
Chloromethane	5.00	<5.0	
Dibromochloromethane	1.00	<1.0	
Dibromomethane	1.00	<1.0	
Dichlorodifluoromethane	1.00	<1.0	
Ethylbenzene	1.00	<1.0	
Hexachlorobutadiene	1.00	<1.0	
Isopropylbenzene	1.00	<1.0	
Isopropylmethylbenzene	1.00	<1.0	
Methyl tert-butyl ether	1.00	<1.0	
Methylene chloride	5.00	<5.0	
Naphthalene	1.00	<1.0	
Styrene	1.00	<1.0	
Tetrachloroethene	1.00	<1.0	
Toluene	1.00	<1.0	
Trichloroethene	1.00	<1.0	
Trichlorofluoromethane	1.00	<1.0	
Vinyl chloride	1.00	<1.0	
cis-1,2-Dichloroethene	1.00	<1.0	
cis-1,3-Dichloropropene	1.00	<1.0	
m- and p-Xylenes	1.00	<1.0	
n-Butylbenzene	1.00	<1.0	
n-Propylbenzene	1.00	<1.0	
o-Xylene	1.00	<1.0	
sec-Butylbenzene	1.00	<1.0	
tert-Butylbenzene	1.00	<1.0	
trans-1,2-Dichloroethene	1.00	<1.0	
trans-1,3-Dichloropropene	1.00	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012 AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980526/9012_AQ_P/22
Lab Sample ID: B98-03097 Prep Analyst: DEVLINHA
EPA Number: EPA 9012
Units: mg/L Analytical Batch ID: I980526/9012_AQUE/22
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.02	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03208 Prep Analyst:
EPA Number: SM 2540C
Units: mg/L Analytical Batch ID: I980529/2540C_AQU/41
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03282 Prep Analyst:
EPA Number: SM 2320B
Units: mg/L CaCO3 Analytical Batch ID: I980601/2320B_AQU/36
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Alkalinity	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

6010A AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A
Units: ug/L Analytical Batch ID: I980602/6010A_AQU/95
Matrix: AQUEOUS Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Barium	5.00	<5.0	
Iron	25.00	<25	

6010A AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A
Units: ug/L Analytical Batch ID: I980602/6010A_AQU/95
Matrix: AQUEOUS Analysis Analyst: LESHINSKYA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Manganese	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251 AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03346 Prep Analyst:
EPA Number: EPA 9251
Units: mg/L Analytical Batch ID: I980603/9251_AQUE/15
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251 AQUEOUS BLANK REPORT

SDG #: 980519-632 Preparation Batch ID:
Lab Sample ID: B98-03348 Prep Analyst:
EPA Number: EPA 9251
Units: mg/L Analytical Batch ID: I980603/9251_AQUE/15
Matrix: AQUEOUS Analysis Analyst: DEVLINHA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03352
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03354
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03356
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: 1980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038 AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	B98-03379	Prep Analyst:	
EPA Number:	EPA 9038	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038 AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	
Lab Sample ID:	B98-03381	Prep Analyst:	
EPA Number:	EPA 9038	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

6010A AQUEOUS BLANK REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	B98-03772	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Arsenic	5.00	<5.0	
Barium	5.00	<5.0	
Cadmium	1.00	<1.0	
Chromium	5.00	<5.0	
Copper	5.00	<5.0	
Iron	25.00	<25	
Lead	5.00	<5.0	
Manganese	5.00	<5.0	
Selenium	10.00	<10	
Silver	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A AQUEOUS BLANK REPORT

SDG #: 980519-632
Lab Sample ID: B98-03779
EPA Number: EPA 7470A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Mercury	0.20	<0.20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/19/98

353.2 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 Lab Sample ID: QCS98-03016 Prep. Analyst:
 Units: mg/L Analytical Batch ID: I980521/353.2_AQU/65
 Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.05	0.88	0.82	93.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID: P980526/9012_AQ_P/22
 Lab Sample ID: QCS98-03098 Prep. Analyst: DEVLINHA
 Units: mg/L Analytical Batch ID: I980526/9012_AQUE/22
 Matrix: AQUEOUS Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.02	0.20	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 Lab Sample ID: QCS98-03209 Prep. Analyst:
 Units: mg/L Analytical Batch ID: I980529/2540C_AQU/41
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	1200.00	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

2320B AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03283
 Units: mg/L CaCO₃
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980601/2320B_AQU/36
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.00	131.00	140	104.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03347
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
 Lab Sample ID: QCS98-03349
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/9251_AQUE/15
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 Lab Sample ID: QCS98-03353 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 Lab Sample ID: QCS98-03355 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 Lab Sample ID: QCS98-03357 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	272.00	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Spike Amount</u>	<u>QCS Result</u>	<u>% Analyte Recovery</u>	<u>Acceptable Range</u>	<u>Qualifier</u>
Sulfate	10.00	254.00	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038 AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980519-632
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: 1980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

<u>Component Name</u>	<u>MRL</u>	<u>Spike Amount</u>	<u>QCS Result</u>	<u>% Analyte Recovery</u>	<u>Acceptable Range</u>	<u>Qualifier</u>
Sulfate	10.00	254.00	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	LFB98-03067	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.00	50.00	106.9	109.9	2.73	61 - 145	0 - 14	
Benzene	1.00	50.00	108.3	109.7	1.36	76 - 127	0 - 11	
Chlorobenzene	1.00	50.00	104.4	107.5	2.93	75 - 130	0 - 13	
Toluene	1.00	50.00	105.6	100.6	4.79	76 - 125	0 - 13	
Trichloroethene	1.00	50.00	105.6	104.8	0.72	71 - 120	0 - 14	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

6010A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980602/6010A_AQU/95
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.00	1000.00	93.8			80 - 120		
Iron	25.00	200.00	103.5			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.00	100.00	100.4			80 - 120		
Barium	5.00	1000.00	93.8			80 - 120		
Cadmium	1.00	50.00	89.4			80 - 120		
Chromium	5.00	100.00	91.8			80 - 120		
Copper	5.00	100.00	98.6			80 - 120		

6010A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980619/6010A_AQU/107
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Iron	25.00	200.00	103.3			80 - 120		
Lead	5.00	100.00	88.2			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Selenium	10.00	50.00	111.3			80 - 120		
Silver	5.00	100.00	106.3			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/7470A_PRE/78
Lab Sample ID:	LFB98-03778	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 7470A	Analytical Batch ID:	I980619/7470A_AQU/63
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.20	5.00	97.6			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

2540C AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	P980526/9012_AQ_P/22
EPA Method #:	EPA 9012	Prep. Analyst:	DEVLINHA
Lab Sample ID:	98-04319	Analytical Batch ID:	I980526/9012_AQUE/22
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.02	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

7470A AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	P980619/7470A_PRE/78
EPA Method #:	EPA 7470A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04319	Analytical Batch ID:	I980619/7470A_AQU/63
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	0.22	0.26	20.238	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

8000 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: HACH 8000 Prep. Analyst:
 Lab Sample ID: 98-04319 Analytical Batch ID: 1980603/8000_AQUE/35
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

2320B AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: SM 2320B Prep. Analyst:
 Lab Sample ID: 98-04353 Analytical Batch ID: 1980601/2320B_AQU/36
 Units: mg/L CaCO₃ Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	<5.0	<5.0	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

353.2 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-04379 Analytical Batch ID: 1980521/353.2_AQU/65
 Units: mg/L Analysis Analyst: DEVLINHA
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.05	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9038 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 9038
 Lab Sample ID: 98-04401
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980604/9038_AQUE/15
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2540C AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: SM 2540C
 Lab Sample ID: 98-04404
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980529/2540C_AQU/41
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: HACH 8000
 Lab Sample ID: 98-04405
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-04435
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.00	120	130	4.672	0 - 20	
Iron	25.00	810	1100	27.144	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980519-632
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-04435
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.00	12	12	6.193	0 - 20	
Barium	5.00	120	130	4.672	0 - 20	
Cadmium	1.00	<1.0	<1.0	N/A	0 - 20	
Chromium	5.00	<5.0	<5.0	N/A	0 - 20	
Copper	5.00	<5.0	<5.0	N/A	0 - 20	
Iron	25.00	990	1100	7.863	0 - 20	
Lead	5.00	<5.0	<5.0	N/A	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Selenium	10.00	<10	<10	N/A	0 - 20	
Silver	5.00	<5.0	<5.0	N/A	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

2320B AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-04444	Analytical Batch ID:	I980601/2320B_AQU/36
Units:	mg/L CaCO ₃	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	15	16	3.279	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/1/98

9251 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.00	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038 AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980519-632	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

353.2 AQUEOUS MS/MSD RPD REPORT

SDG #: 980519-632
 Lab Sample ID: 98-04379
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: 1980521/353.2_AQU/65
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Nitrate	99			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

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Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
2320B_AQUEOUS	Lab ID	98-04379	98-04380
2540C_AQUEOUS	Alkalinity	180	160
353.2_AQUEOUS	Total Dissolved Solids	340	280
6010A_AQUEOUS	Nitrate	0.36	0.22
	Arsenic	5.2	<5.0
	Barium	260	230
	Cadmium	<1.0	<1.0
	Chromium	<5.0	<5.0
	Copper	9.8	17
	Iron	5100	5800
	Lead	8.4	18
	Manganese	190	140
	Selenium	<10	<10
	Silver	<5.0	<5.0
	Zinc	91	86
7470A_AQUEOUS	Mercury	<0.20	<0.20
8000_AQUEOUS	COD	57	140
8260A_AQUEOUS	1,1,1,2-Tetrachloroeth	<1.0	<1.0
	1,1,1-Trichloroethane	<1.0	<1.0
	1,1,2,2-Tetrachloroeth	<1.0	<1.0
	1,1,2-Trichloroethane	<1.0	<1.0
	1,1-Dichloroethane	<1.0	<1.0
	1,1-Dichloroethene	<1.0	<1.0
	1,1-Dichloropropene	<1.0	<1.0
	1,2,3-Trichlorobenz	<1.0	<1.0
	1,2,3-Trichloropropan	<1.0	<1.0
	1,2,4-Trichlorobenz	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
3260A_AQUEOUS	Lab ID	98-04379	98-04380
	1,2,4-Trimethylbenzer	<1.0	<1.0
	1,2-Dibromo-3-chloro	<1.0	<1.0
	1,2-Dibromoethane	<1.0	<1.0
	1,2-Dichlorobenzene	<1.0	<1.0
	1,2-Dichloroethane	<1.0	<1.0
	1,2-Dichloropropane	<1.0	<1.0
	1,3,5-Trimethylbenzer	<1.0	<1.0
	1,3-Dichlorobenzene	<1.0	<1.0
	1,3-Dichloropropane	<1.0	<1.0
	1,4-Dichlorobenzene	<1.0	<1.0
	2,2-Dichloropropane	<1.0	<1.0
	2-Butanone	<20	<20
	2-Chlorotoluene	<1.0	<1.0
	2-Hexanone	<20	<20
	4-Chlorotoluene	<1.0	<1.0
	4-Methyl-2-pentanone	<20	<20
	Acetone	<20	<20
	Benzene	<1.0	<1.0
	Bromobenzene	<1.0	<1.0
	Bromochloromethane	<1.0	<1.0
	Bromodichloromethane	<1.0	<1.0
	Bromoform	<1.0	<1.0
	Bromomethane	<5.0	<5.0
	Carbon tetrachloride	<1.0	<1.0
	Chlorobenzene	<1.0	<1.0
	Chloroethane	<5.0	<5.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
8260A_AQUEOUS	Lab ID	98-04379	98-04380
	Chloroform	<5.0	<5.0
	Chloromethane	<5.0	<5.0
	cis-1,2-Dichloroethen	<1.0	<1.0
	cis-1,3-Dichloroprope	<1.0	<1.0
	Dibromochlorometha	<1.0	<1.0
	Dibromomethane	<1.0	<1.0
	Dichlorodifluorometh	<1.0	<1.0
	Ethylbenzene	<1.0	<1.0
	Hexachlorobutadiene	<1.0	<1.0
	Isopropylbenzene	<1.0	<1.0
	Isopropylmethylbenz	<1.0	<1.0
	m- and p-Xylenes	<1.0	<1.0
	Methyl tert-butyl ethe	3.2	1.7
	Methylene chloride	<5.0	<5.0
	n-Butylbenzene	<1.0	<1.0
	n-Propylbenzene	<1.0	<1.0
	Naphthalene	<1.0	<1.0
	o-Xylene	<1.0	<1.0
	sec-Butylbenzene	<1.0	<1.0
	Styrene	<1.0	<1.0
	tert-Butylbenzene	<1.0	<1.0
	Tetrachloroethene	<1.0	<1.0
	Toluene	<1.0	<1.0
	trans-1,2-Dichloroeth	<1.0	<1.0
	trans-1,3-Dichloroproj	<1.0	<1.0
	Trichloroethene	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980519-632

Analysis Name	Client Identifier	Cove 1	Cove 2
8260A_AQUEOUS	Lab ID	98-04379	98-04380
	Trichlorofluoromethan	<1.0	<1.0
	Vinyl chloride	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	<0.015	<0.015
9038_AQUEOUS	Sulfate	36	43
9251_AQUEOUS	Chloride	60	50



Client: City of Waltham

Project: Waltham Landfill

SDG: 980518-620

Date: 6/24/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980518-620
Client: City of Waltham
Project: Waltham Landfill

Print Date: 6/24/98
Client Contact:
Address: Camp Dresser & McKee
Ten Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples. No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

NOTES

SDG 980518-620: Results for this sample group were originally reported on 6/5/98; after which, it was discovered that the trace metals target list was incomplete. Additional testing was conducted on these samples and this report contains the results reported on 6/5/98 as well as any additional metals results needed.

TDS: I980529/2540C_AQU/41; Samples , 98-04319, 98-04320, 98-04321, and 98-04322 were all analyzed one day beyond the EPA recommended maximum holding time due to intervening holiday and laboratory oversight.

RESULT NOTES

Metals: It should be noted that the analysis of these samples for trace metals was complicated by the large amounts of sediment found in the preserved samples. The sediment contributed to matrix interferences both as non-target and target chemicals requiring dilution.

98-04322 (Silver) M qualifier = Sample matrix interference is suspected, which may have biased results for this analyte. Sample result should be considered an estimate.
I980619/6010A_AQU/107; All samples were reanalyzed for silver on 6/19/98. The concentrations of samples 98-04322 (potential high bias) and 98-04434 (potential low bias) were confirmed. Sample matrix interference is suspected due to very high levels of aluminum and iron.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge complete & accurate.

LABORATORY MANAGEMENT REVIEW:

James F. O'Neil

LABORATORY QA/QC REVIEW:

Pete May - 1

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
CDM 2	05/18/98	05/18/98	98-04319	AQUEOUS
Duplicate	05/18/98	05/18/98	98-04321	AQUEOUS
CDM 1	05/18/98	05/18/98	98-04320	AQUEOUS
CDM 4	05/18/98	05/18/98	98-04322	AQUEOUS
Trip Blank	05/18/98	05/18/98	98-04323	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980524/5030/361
SDG #:	980518-620	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 2	Analytical Batch ID:	I980524/8260A_AQU/261
Lab Sample ID:	98-04319	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 2
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	96.92	86 - 115
Dibromofluoromethane	100.32	86 - 118
Toluene-d8	99.58	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980518-620
Client Sample ID: CDM 2
Lab Sample ID: 98-04319
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980619/6010A_AQU/107
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	9.5	
Barium	5	590	
Cadmium	1	2.0	
Chromium	5	11	
Copper	5	70	
Iron	50	27000	
Lead	5	430	
Manganese	5	540	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	470	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 1
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 1
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	87.58	86 - 115
Dibromofluoromethane	92.52	86 - 118
Toluene-d8	101.44	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980518-620
 Client Sample ID: CDM 1
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	11	
Barium	5	260	
Cadmium	1	4.0	
Chromium	5	66	
Copper	5	740	
Iron	50	47000	
Lead	5	1300	
Manganese	5	1500	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	380	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: Duplicate
 Lab Sample ID: 98-04321
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980518-620
Client Sample ID: Duplicate
Lab Sample ID: 98-04321
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	89.62	86 - 115
Dibromofluoromethane	94.16	86 - 118
Toluene-d8	97.48	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980518-620
 Client Sample ID: Duplicate
 Lab Sample ID: 98-04321
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	<5.0	
Barium	5	110	
Cadmium	1	1.3	
Chromium	5	19	
Copper	5	220	
Iron	25	11000	
Lead	5	380	
Manganese	5	1300	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	120	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 4
 Lab Sample ID: 98-04322
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: CDM 4
 Lab Sample ID: 98-04322
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: 1980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	2.8	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	104.72	86 - 115
Dibromofluoromethane	101.00	86 - 118
Toluene-d8	101.50	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980518-620
 Client Sample ID: CDM 4
 Lab Sample ID: 98-04322
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	120	
Barium	5	5400	
Cadmium	1	83	
Chromium	5	2000	
Copper	5	17000	
Iron	500	370000	
Lead	5	14000	
Manganese	5	1800	
Selenium	10	28	
Silver	5	55	M
Zinc	20	13000	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 06/23/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: Trip Blank
 Lab Sample ID: 98-04323
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 05/26/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980518-620
 Client Sample ID: Trip Blank
 Lab Sample ID: 98-04323
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	114.36	86 - 115
Dibromofluoromethane	109.76	86 - 118
Toluene-d8	101.30	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 05/26/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Preparation Batch:	P980526/9012_AQ_P/22	Prep. Analyst:	DEVLINHA
Component Name:	Cyanide, Total	EPA Method #:	EPA 9012
Analytical Batch:	1980526/9012_AQUE/22	Analyst:	DEVLINHA
Reviewed By - Date:	GOTTSHALLDL - 5/26/98	Matrix:	AQUEOUS
		Units:	mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.015	<0.015	1	
CDM 1	98-04320	0.015	<0.015	1	
Duplicate	98-04321	0.015	<0.015	1	
CDM 4	98-04322	0.015	<0.015	1	

Preparation Batch:	P980619/7470A_PRE/78	Prep. Analyst:	LESHINSKYA
Component Name:	Mercury	EPA Method #:	EPA 7470A
Analytical Batch:	1980619/7470A_AQU/63	Analyst:	LESHINSKYA
Reviewed By - Date:	GOTTSHALLDL - 6/19/98	Matrix:	AQUEOUS
		Units:	ug/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.200	0.22	1	
CDM 1	98-04320	0.200	<0.20	1	
Duplicate	98-04321	0.200	0.26	1	
CDM 4	98-04322	0.200	3.3	1	

Component Name:	Alkalinity	EPA Method #:	SM 2320B
Analytical Batch:	1980519/2320B_AQU/35	Analyst:	DEVLINHA
Reviewed By - Date:	GOTTSHALLDL - 5/19/98	Matrix:	AQUEOUS
		Units:	mg/L CaCO3

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	5.000	660	1	
CDM 1	98-04320	5.000	140	1	
Duplicate	98-04321	5.000	130	1	
CDM 4	98-04322	5.000	900	1	

Component Name:	Nitrate	EPA Method #:	EPA 353.2
Analytical Batch:	1980521/353.2_AQU/65	Analyst:	DEVLINHA
Reviewed By - Date:	GOTTSHALLDL - 5/26/98	Matrix:	AQUEOUS
		Units:	mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 2	98-04319	0.050	<0.050	1	
CDM 1	98-04320	0.500	4.0	10	
Duplicate	98-04321	0.500	4.0	10	
CDM 4	98-04322	0.050	0.58	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980518-620

Component Name: Total Dissolved Solids EPA Method #: SM 2540C Matrix: AQUEOUS
 Analytical Batch: I980529/2540C_AQU/41 Analyst: NGUYENMH Units: mg/L
 Reviewed By - Date: GOTTSALLDL - 5/29/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	5.000	760	1	
CDM 1	98-04320	5.000	240	1	
Duplicate	98-04321	5.000	730	1	
CDM 4	98-04322	5.000	1400	1	

Component Name: COD EPA Method #: HACH 8000 Matrix: AQUEOUS
 Analytical Batch: I980603/8000_AQUE/35 Analyst: NGUYENMH Units: mg/L
 Reviewed By - Date: GOTTSALLDL - 6/3/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	5.000	120	1	
CDM 1	98-04320	5.000	20	1	
Duplicate	98-04321	5.000	31	1	
CDM 4	98-04322	5.000	140	1	

Component Name: Chloride EPA Method #: EPA 9251 Matrix: AQUEOUS
 Analytical Batch: I980603/9251_AQUE/15 Analyst: DEVLINHA Units: mg/L
 Reviewed By - Date: GOTTSALLDL - 6/3/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	1.000	22	1	
CDM 1	98-04320	1.000	3.6	1	
Duplicate	98-04321	1.000	3.8	1	
CDM 4	98-04322	1.000	66	1	

Component Name: Sulfate EPA Method #: EPA 9038 Matrix: AQUEOUS
 Analytical Batch: I980604/9038_AQUE/15 Analyst: NGUYENMH Units: mg/L
 Reviewed By - Date: GOTTSALLDL - 6/4/98

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>MRL</u>	<u>Result</u>	<u>Dilution Factor</u>	<u>Qualifier</u>
CDM 2	98-04319	10.000	79	1	
CDM 1	98-04320	10.000	36	1	
Duplicate	98-04321	10.000	27	1	
CDM 4	98-04322	10.000	85	1	

PREPARATION INFORMATION REPORT

SDG #: 980518-620

Preparation Batch ID: P980524/5030/361

Preparation ID: 5030

EPA Method #: EPA 5030

Batch Approved By: GOTTSHALLDL

Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 1	98-04320	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Duplicate	98-04321	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 4	98-04322	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Trip Blank	98-04323	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980526/9012_AQ_P/22

Preparation ID: 9012_AQ_Prep

EPA Method #: EPA 9012

Batch Approved By: GOTTSHALLDL

Batch Approved On: 5/26/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments	
CDM 2	98-04319	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		
			Final Volume	50.0	mL		
		DUPLICATE	Initial Volume	50.0	mL		
			MATRIX_SPIKE	Final Volume	50.0	mL	
				Initial Volume	50.0	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		
Duplicate	98-04321	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		
CDM 4	98-04322	SAMPLE	Final Volume	50.0	mL		
			Initial Volume	50.0	mL		

Preparation Batch ID: P980601/3015/121

Preparation ID: 3015

EPA Method #: 3015

Batch Approved By: GOTTSHALLDL

Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

PREPARATION INFORMATION REPORT

SDG #: 980518-620

Preparation Batch ID: P980601/3015/121
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/3/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Duplicate	98-04321	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/3015/136
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 6/23/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-04320	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Duplicate	98-04321	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-04322	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980619/7470A_PRE/78
 Preparation ID: 7470A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 7470A
 Batch Approved On: 6/19/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2	98-04319	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		DUPLICATE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		MATRIX_SPIKE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 1	98-04320	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Duplicate	98-04321	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 4	98-04322	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/19/98
CDM 1	98-04320	05/18/98	05/18/98		05/19/98
Duplicate	98-04321	05/18/98	05/18/98		05/19/98
CDM 4	98-04322	05/18/98	05/18/98		05/19/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/26/98
CDM 1	98-04320	05/18/98	05/18/98		05/26/98
Duplicate	98-04321	05/18/98	05/18/98		05/26/98
CDM 4	98-04322	05/18/98	05/18/98		05/26/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		05/20/98
CDM 1	98-04320	05/18/98	05/18/98		05/20/98
Duplicate	98-04321	05/18/98	05/18/98		05/20/98
CDM 4	98-04322	05/18/98	05/18/98		05/20/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/28/98	06/01/98
CDM 1	98-04320	05/18/98	05/18/98	05/28/98	06/01/98
Duplicate	98-04321	05/18/98	05/18/98	05/28/98	06/01/98
CDM 4	98-04322	05/18/98	05/18/98	05/28/98	06/01/98

Analysis: 7470A_AQUEOUS
 Analysis Desc: Mercury in Water

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	06/18/98	06/18/98
CDM 1	98-04320	05/18/98	05/18/98	06/18/98	06/18/98
Duplicate	98-04321	05/18/98	05/18/98	06/18/98	06/18/98
CDM 4	98-04322	05/18/98	05/18/98	06/18/98	06/18/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98

HOLDTIME SUMMARY

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/22/98	05/22/98
CDM 1	98-04320	05/18/98	05/18/98	05/22/98	05/22/98
Duplicate	98-04321	05/18/98	05/18/98	05/22/98	05/22/98
CDM 4	98-04322	05/18/98	05/18/98	05/22/98	05/22/98
Trip Blank	98-04323	05/18/98	05/18/98	05/22/98	05/22/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98	05/21/98	05/21/98
CDM 1	98-04320	05/18/98	05/18/98	05/21/98	05/21/98
Duplicate	98-04321	05/18/98	05/18/98	05/21/98	05/21/98
CDM 4	98-04322	05/18/98	05/18/98	05/21/98	05/21/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/03/98
CDM 1	98-04320	05/18/98	05/18/98		06/03/98
Duplicate	98-04321	05/18/98	05/18/98		06/03/98
CDM 4	98-04322	05/18/98	05/18/98		06/03/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 2	98-04319	05/18/98	05/18/98		06/02/98
CDM 1	98-04320	05/18/98	05/18/98		06/02/98
Duplicate	98-04321	05/18/98	05/18/98		06/02/98
CDM 4	98-04322	05/18/98	05/18/98		06/02/98

2320B_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	B98-02935	Prep Analyst:	
EPA Number:	SM 2320B	Analytical Batch ID:	I980519/2320B_AQU/35
Units:	mg/L CaCO ₃	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Alkalinity	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	
Lab Sample ID:	98-04415	Prep Analyst:	
EPA Number:	EPA 353.2	Analytical Batch ID:	I980521/353.2_AQU/65
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Nitrate	0.05	<0.050	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	B98-03066	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.00	<1.0	
1,1,1-Trichloroethane	1.00	<1.0	
1,1,2,2-Tetrachloroethane	1.00	<1.0	
1,1,2-Trichloroethane	1.00	<1.0	
1,1-Dichloroethane	1.00	<1.0	
1,1-Dichloroethene	1.00	<1.0	
1,1-Dichloropropene	1.00	<1.0	
1,2,3-Trichlorobenzene	1.00	<1.0	
1,2,3-Trichloropropane	1.00	<1.0	
1,2,4-Trichlorobenzene	1.00	<1.0	
1,2,4-Trimethylbenzene	1.00	<1.0	
1,2-Dibromo-3-chloropropane	1.00	<1.0	
1,2-Dibromoethane	1.00	<1.0	
1,2-Dichlorobenzene	1.00	<1.0	
1,2-Dichloroethane	1.00	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620
 Lab Sample ID: B98-03066
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980524/8260A_AQU/261
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,2-Dichloropropane	1.00	<1.0	
1,3,5-Trimethylbenzene	1.00	<1.0	
1,3-Dichlorobenzene	1.00	<1.0	
1,3-Dichloropropane	1.00	<1.0	
1,4-Dichlorobenzene	1.00	<1.0	
2,2-Dichloropropane	1.00	<1.0	
2-Butanone	20.00	<20	
2-Chlorotoluene	1.00	<1.0	
2-Hexanone	20.00	<20	
4-Chlorotoluene	1.00	<1.0	
4-Methyl-2-pentanone	20.00	<20	
Acetone	20.00	<20	
Benzene	1.00	<1.0	
Bromobenzene	1.00	<1.0	
Bromochloromethane	1.00	<1.0	
Bromodichloromethane	1.00	<1.0	
Bromoform	1.00	<1.0	
Bromomethane	5.00	<5.0	
Carbon tetrachloride	1.00	<1.0	
Chlorobenzene	1.00	<1.0	
Chloroethane	5.00	<5.0	
Chloroform	5.00	<5.0	
Chloromethane	5.00	<5.0	
Dibromochloromethane	1.00	<1.0	
Dibromomethane	1.00	<1.0	
Dichlorodifluoromethane	1.00	<1.0	
Ethylbenzene	1.00	<1.0	
Hexachlorobutadiene	1.00	<1.0	
Isopropylbenzene	1.00	<1.0	
Isopropylmethylbenzene	1.00	<1.0	
Methyl tert-butyl ether	1.00	<1.0	
Methylene chloride	5.00	<5.0	
Naphthalene	1.00	<1.0	
Styrene	1.00	<1.0	
Tetrachloroethene	1.00	<1.0	
Toluene	1.00	<1.0	
Trichloroethene	1.00	<1.0	
Trichlorofluoromethane	1.00	<1.0	
Vinyl chloride	1.00	<1.0	
cis-1,2-Dichloroethene	1.00	<1.0	
cis-1,3-Dichloropropene	1.00	<1.0	
m- and p-Xylenes	1.00	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03066
EPA Number: EPA 8260A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
Prep Analyst: MITCHELLMR
Analytical Batch ID: I980524/8260A_AQU/261
Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
n-Butylbenzene	1.00	<1.0	
n-Propylbenzene	1.00	<1.0	
o-Xylene	1.00	<1.0	
sec-Butylbenzene	1.00	<1.0	
tert-Butylbenzene	1.00	<1.0	
trans-1,2-Dichloroethene	1.00	<1.0	
trans-1,3-Dichloropropene	1.00	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03097
EPA Number: EPA 9012
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
Prep Analyst: DEVLINHA
Analytical Batch ID: I980526/9012_AQUE/22
Analysis Analyst: DEVLINHA

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.02	<0.015	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03208
EPA Number: SM 2540C
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.00	<5.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/29/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980601/3015/121
Lab Sample ID: B98-03298 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980602/6010A_AQU/95
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Barium	5.00	<5.0	
Iron	25.00	<25	
Manganese	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03346 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03348 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980603/9251_AQUE/15
Units: mg/L Analysis Analyst: DEVLINHA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03352
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03354
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03356
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980603/8000_AQUE/35
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03379 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID:
Lab Sample ID: B98-03381 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980604/9038_AQUE/15
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980518-620 Preparation Batch ID: P980619/3015/136
Lab Sample ID: B98-03772 Prep Analyst: LESHINSKYA
EPA Number: EPA 6010A Analytical Batch ID: I980619/6010A_AQU/107
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Arsenic	5.00	<5.0	
Barium	5.00	<5.0	
Cadmium	1.00	<1.0	
Chromium	5.00	<5.0	
Copper	5.00	<5.0	
Iron	25.00	<25	
Lead	5.00	<5.0	
Manganese	5.00	<5.0	
Selenium	10.00	<10	
Silver	5.00	<5.0	
Zinc	20.00	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A_AQUEOUS BLANK REPORT

SDG #: 980518-620
Lab Sample ID: B98-03779
EPA Number: EPA 7470A
Units: ug/L
Matrix: AQUEOUS

Preparation Batch ID: P980619/7470A_PRE/78
Prep Analyst: LESHINSKYA
Analytical Batch ID: I980619/7470A_AQU/63
Analysis Analyst: LESHINSKYA

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
Mercury	0.20	<0.20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-02936
 Units: mg/L CaCO3
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980519/2320B_AQU/35
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.00	131.00	130	99.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03016
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980521/353.2_AQU/65
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.05	0.88	0.82	93.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03098
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
 Prep. Analyst: DEVLINHA
 Analytical Batch ID: I980526/9012_AQUE/22
 Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.02	0.20	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03209
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980529/2540C_AQU/41
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	1200.00	1200	101.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03347
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	240	97.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03349
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980603/9251_AQUE/15
Analysis Analyst: DEVLINHA

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	10.00	242.00	230	95.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03353
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	70	102.9	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03355
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	68.00	67	98.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
 Lab Sample ID: QCS98-03357
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980603/8000_AQUE/35
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	272.00	270	99.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03380
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	254.00	250	98.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980518-620
Lab Sample ID: QCS98-03384
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980604/9038_AQUE/15
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	254.00	260	101.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980524/5030/361
Lab Sample ID:	LFB98-03067	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980524/8260A_AQU/261
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.00	50.00	106.9	109.9	2.73	61 - 145	0 - 14	
Benzene	1.00	50.00	108.3	109.7	1.36	76 - 127	0 - 11	
Chlorobenzene	1.00	50.00	104.4	107.5	2.93	75 - 130	0 - 13	
Toluene	1.00	50.00	105.6	100.6	4.79	76 - 125	0 - 13	
Trichloroethene	1.00	50.00	105.6	104.8	0.72	71 - 120	0 - 14	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980601/3015/121
Lab Sample ID:	LFB98-03299	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980602/6010A_AQU/95
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Barium	5.00	1000.00	93.8			80 - 120		
Iron	25.00	200.00	103.5			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/3015/136
Lab Sample ID:	LFB98-03773	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980619/6010A_AQU/107
Units:	ug/L	Analyst:	LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.00	100.00	100.4			80 - 120		
Barium	5.00	1000.00	93.8			80 - 120		
Cadmium	1.00	50.00	89.4			80 - 120		
Chromium	5.00	100.00	91.8			80 - 120		
Copper	5.00	100.00	98.6			80 - 120		

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980518-620
 Lab Sample ID: LFB98-03773
 EPA Method #: EPA 6010A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Iron	25.00	200.00	103.3			80 - 120		
Lead	5.00	100.00	88.2			80 - 120		
Manganese	5.00	100.00	88.4			80 - 120		
Selenium	10.00	50.00	111.3			80 - 120		
Silver	5.00	100.00	106.3			80 - 120		
Zinc	20.00	100.00	95.1			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

7470A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980518-620
 Lab Sample ID: LFB98-03778
 EPA Method #: EPA 7470A
 Matrix: AQUEOUS
 Units: ug/L

Preparation Batch ID: P980619/7470A_PRE/78
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/7470A_AQU/63
 Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.20	5.00	97.6			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-02644		
Units:	mg/L CaCO3	Analytical Batch ID:	1980519/2320B_AQU/35
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	24	24	0	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/19/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04310		
Units:	mg/L	Analytical Batch ID:	1980529/2540C_AQU/41
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	380	380	0.261	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980526/9012_AQ_P/22
EPA Method #:	EPA 9012	Prep. Analyst:	DEVLINHA
Lab Sample ID:	98-04319		
Units:	mg/L	Analytical Batch ID:	1980526/9012_AQUE/22
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.02	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	P980619/7470A_PRE/78
EPA Method #:	EPA 7470A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-04319		
Units:	ug/L	Analytical Batch ID:	I980619/7470A_AQU/63
Matrix:	AQUEOUS	Analysis Analyst:	LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	0.22	0.26	20.238	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/19/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04319		
Units:	mg/L	Analytical Batch ID:	I980603/8000_AQUE/35
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	120	100	17.352	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-04379		
Units:	mg/L	Analytical Batch ID:	I980521/353.2_AQU/65
Matrix:	AQUEOUS	Analysis Analyst:	DEVLINHA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.05	0.36	0.38	4.324	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/26/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04401	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	34	33	2.985	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-04404	Analytical Batch ID:	I980529/2540C_AQU/41
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	55	42	26.804	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 5/29/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-04405	Analytical Batch ID:	I980603/8000_AQUE/35
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	540	540	0.185	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-04435
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980601/3015/121
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980602/6010A_AQU/95
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Barium	5.00	120	130	4.672	0 - 20	
Iron	25.00	810	1100	27.144	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980518-620
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-04435
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980619/3015/136
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980619/6010A_AQU/107
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.00	12	12	6.193	0 - 20	
Barium	5.00	120	130	4.672	0 - 20	
Cadmium	1.00	<1.0	<1.0	N/A	0 - 20	
Chromium	5.00	<5.0	<5.0	N/A	0 - 20	
Copper	5.00	<5.0	<5.0	N/A	0 - 20	
Iron	25.00	990	1100	7.863	0 - 20	
Lead	5.00	<5.0	<5.0	N/A	0 - 20	
Manganese	5.00	380	400	4.779	0 - 20	
Selenium	10.00	<10	<10	N/A	0 - 20	
Silver	5.00	<5.0	<5.0	N/A	0 - 20	
Zinc	20.00	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/23/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980603/9251_AQUE/15
Units:	mg/L	Analysis Analyst:	DEVLINHA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.00	15	15	0.027	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/3/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980518-620	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-04450	Analytical Batch ID:	I980604/9038_AQUE/15
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	16	17	6.061	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 6/4/98

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04320
 Matrix: AQUEOUS

Preparation Batch ID: P980524/5030/361
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980524/8260A_AQU/261
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	112			61 - 145		
Benzene	111			76 - 127		
Chlorobenzene	104			75 - 130		
Toluene	99			76 - 125		
Trichloroethene	106			71 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 5/26/98

9012_AQUEOUS MS/MSD RPD REPORT

SDG #: 980518-620
 Lab Sample ID: 98-04319
 Matrix: AQUEOUS

Preparation Batch ID: P980526/9012_AQ_P/22
 Prep. Analyst: DEVLINHA

Analytical Batch ID: I980526/9012_AQUE/22
 Analyst: DEVLINHA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Cyanide, Total	94			80 - 120		
Mercury	95			80 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 6/19/98

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Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
2320B_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
2540C_AQUEOUS	Alkalinity	140	660	900	130	
353.2_AQUEOUS	Total Dissolved Solid	240	760	1400	730	
6010A_AQUEOUS	Nitrate	4.0	<0.050	0.58	4.0	
	Arsenic	11	9.5	120	<5.0	
	Barium	260	590	5400	110	
	Cadmium	4.0	2.0	83	1.3	
	Chromium	66	11	2000	19	
	Copper	740	70	17000	220	
7470A_AQUEOUS	Iron	47000	27000	370000	11000	
8000_AQUEOUS	Lead	1300	430	14000	380	
	Manganese	1500	540	1800	1300	
	Selenium	<10	<10	28	<10	
	Silver	<5.0	<5.0	55	<5.0	
	Zinc	380	470	13000	120	
	Mercury	<0.20	0.22	3.3	0.26	
	COD	20	120	140	31	
8260A_AQUEOUS	1,1,1,2-Tetrachloroet	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,1-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2,2-Tetrachloroet	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2-Trichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloropropene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichlorobenzen	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichloropropan	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,4-Trichlorobenzen	<1.0	<1.0	<1.0	<1.0	<1.0

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
8260A_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
	1,2,4-Trimethylbenze	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dibromo-3-chloro	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dibromoethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichloroethane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3,5-Trimethylbenze	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
	1,4-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	2,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0	<1.0
	2-Butanone	<20	<20	<20	<20	<20
	2-Chlorotoluene	<1.0	<1.0	<1.0	<1.0	<1.0
	2-Hexanone	<20	<20	<20	<20	<20
	4-Chlorotoluene	<1.0	<1.0	<1.0	<1.0	<1.0
	4-Methyl-2-pentanone	<20	<20	<20	<20	<20
	Acetone	<20	<20	<20	<20	<20
	Benzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromochloromethan	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromodichlorometha	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromoform	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromomethane	<5.0	<5.0	<5.0	<5.0	<5.0
	Carbon tetrachloride	<1.0	<1.0	<1.0	<1.0	<1.0
	Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0
	Chloroethane	<5.0	<5.0	<5.0	<5.0	<5.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
3250A_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
Chloroform		<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane		<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethen		<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloroprope		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochlorometha		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluorometh		<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylmethyl/benz		<1.0	<1.0	<1.0	<1.0	<1.0
m- and p-Xylenes		<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ethe		<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		<5.0	<5.0	<5.0	<5.0	<5.0
n-Butylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	2.8	<1.0	<1.0
o-Xylene		<1.0	<1.0	<1.0	<1.0	<1.0
sec-Butylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Styrene		<1.0	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroeth		<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropro		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: City of Waltham

SDG: 980518-620

Analysis Name	Client Identifier	CDM 1	CDM 2	CDM 4	Duplicate	Trip Blank
3260A_AQUEOUS	Lab ID	98-04320	98-04319	98-04322	98-04321	98-04323
9012_AQUEOUS	Trichlorofluorometha	<1.0	<1.0	<1.0	<1.0	<1.0
9038_AQUEOUS	Vinyl chloride	<1.0	<1.0	<1.0	<1.0	<1.0
9251_AQUEOUS	Cyanide, Total	<0.015	<0.015	<0.015	<0.015	
	Sulfate	36	79	85	27	
	Chloride	3.6	22	66	3.8	

CDM Analytical Laboratory

240 Memorial Drive
Cambridge, MA 02139

Phone: (617) 354-4448
Fax: (617) 354-0764

Field Log # Q 1435 Page 1 of 1

Client: CITY OF WALTHAM Address: 752-81st St - Waltham

Project Name: Walton Landfill

Project #: SDG# 980518-620 TAT: STD TAT Approved by: [Signature]

Contact: Sampled by CEB Biological Services Fax #: [Blank]

Report to: Jill Laurs

CLIENT SAMPLE ID	DATE TIME	MATRIX	# OF CONT	CDM SAMPLE ID <small>See Attached SDG DR for Alcohol #'s & CDM Bottle Id's</small>	VOA			SEMI VOA			MISC			METALS			OTHER			
					8260	8260	Other	525	625/8270 A, B/N, AB/N	PAH	Other	PEST/PCB	TPH 418.1	PET ID	PP13	RCRA 8	Other	Filtered (Y/N)		
CDM 2	5/16/88 1:20	W	6	98-04319	✓															
CDM 1	5/16/88 2:30	W	6	98-04320	✓															
Duplicate	5/16/88 2:55	W	6	98-04321	✓															
CDM 4	5/16/88 3:00	W	6	98-04322	✓															
Trip Blank	5/16/88 3:15	W	81	98-04323	✓															
A - HCl	D - NaOH	P - Plastic	Container Type:			Fed-ex			U Airborne			U Courier			U Other			U Hand		
B - HNO ₃	E - NaThio	G - Glass	Preservative:			U UPS			U Fed-ex			U Airborne			U Courier			U Other		
C - H ₂ SO ₄	F - Other	V - Vol	Volume:			U UPS			U Fed-ex			U Airborne			U Courier			U Other		

Samples Received: Fax Results
 Cooler Temperature State Forms
 Chilled/properly preserved? SMART Report
 In good condition? Disk Deliverable
 Evidence of tampering? TICS

Shipped/Analyze: _____
 Method of Shipment: _____
 Shipper/Analyze: _____

Comments:
 * Chlorides
 Sulfate
 Nitrate nitrogen
 TDS
 Alkalinity
 Iron
 Barium
 Zinc
 Manganese
 Total Chloride

Chain of Custody

Lab Acct. #: _____
 NOTE: All samples submitted subject to Standard Terms & Conditions

Appendix G
Water Quality Analytical Data, Round 2



Client: Woerd Avenue Landfill

Project: Monitoring

SDG: 980819-1155

Date: 9/4/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980819-1155
Client: Woerd Avenue Landfill
Project: Monitoring

Print Date: 9/4/98
Client Contact:
Address: Camp Dresser & McKee Inc.
10 Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples. No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge complete & accurate.

LABORATORY MANAGEMENT REVIEW: *James F. Orlowski*

LABORATORY QA/QC REVIEW: *Paula May - 1*

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509,
NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
FB	08/17/98	08/19/98	98-06556	AQUEOUS
CDM 1A	08/18/98	08/19/98	98-06553	AQUEOUS
CDM 1	08/18/98	08/19/98	98-06554	AQUEOUS
CDM 1 Dup	08/18/98	08/19/98	98-06555	AQUEOUS

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980828/3015/169
SDG #:	980819-1155	Prep. Analyst:	LESHINSKYA
Client Sample ID:	CDM 1A	Analytical Batch ID:	I980828/6010A_AQU/137
Lab Sample ID:	98-06553	Analyst:	LESHINSKYA
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	5	< 5.0	
Barium	5	5.8	
Cadmium	1	11	
Chromium	5	< 5.0	
Copper	5	6.8	
Iron	25	300	
Lead	5	< 5.0	
Manganese	5	170	
Selenium	10	< 10	
Silver	5	< 5.0	
Zinc	20	150	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 08/31/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980819-1155
 Client Sample ID: CDM 1A
 Lab Sample ID: 98-06553
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980828/5030/484
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980828/8260A_AQU/335
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 08/31/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980819-1155
Client Sample ID: CDM 1A
Lab Sample ID: 98-06553
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980828/5030/484
Prep. Analyst: MITCHELLMR
Analytical Batch ID: I980828/8260A_AQU/335
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	102.94	86 - 115
Dibromofluoromethane	103.14	86 - 118
Toluene-d8	98.38	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 08/31/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980819-1155
 Client Sample ID: CDM 1
 Lab Sample ID: 98-06554
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980828/3015/169
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: 1980828/6010A_AQU/137
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	<5.0	
Barium	5	37	
Cadmium	1	7.5	
Chromium	5	<5.0	
Copper	5	8.3	
Iron	25	770	
Lead	5	<5.0	
Manganese	5	1300	
Selenium	10	<10	
Silver	5	<5.0	
Zinc	20	56	

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980828/5030/484
SDG #:	980819-1155	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 1	Analytical Batch ID:	I980828/8260A_AQU/335
Lab Sample ID:	98-06554	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 08/31/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980819-1155
 Client Sample ID: CDM 1
 Lab Sample ID: 98-06554
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980828/5030/484
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980828/8260A_AQU/335
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	111.70	86 - 115
Dibromofluoromethane	105.94	86 - 118
Toluene-d8	102.26	88 - 110

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980819-1155
 Client Sample ID: CDM 1 Dup
 Lab Sample ID: 98-06555
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980828/3015/169
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980828/6010A_AQU/137
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5	< 5.0	
Barium	5	35	
Cadmium	1	< 1.0	
Chromium	5	< 5.0	
Copper	5	< 5.0	
Iron	25	< 25	
Lead	5	< 5.0	
Manganese	5	1200	
Selenium	10	< 10	
Silver	5	< 5.0	
Zinc	20	39	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 08/31/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980819-1155
 Client Sample ID: CDM 1 Dup
 Lab Sample ID: 98-06555
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980828/5030/484
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980828/8260A_AQU/335
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1	<1.0	
Bromobenzene	1	<1.0	
Bromochloromethane	1	<1.0	
Bromodichloromethane	1	<1.0	
Bromoform	1	<1.0	
Bromomethane	5	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1	<1.0	
sec-Butylbenzene	1	<1.0	
tert-Butylbenzene	1	<1.0	
Carbon tetrachloride	1	<1.0	
Chlorobenzene	1	<1.0	
Chloroethane	5	<5.0	
Chloroform	5	<5.0	
Chloromethane	5	<5.0	
2-Chlorotoluene	1	<1.0	
4-Chlorotoluene	1	<1.0	
1,2-Dibromo-3-chloropropane	1	<1.0	
1,2-Dibromoethane	1	<1.0	
Dibromochloromethane	1	<1.0	
Dibromomethane	1	<1.0	
1,2-Dichlorobenzene	1	<1.0	
1,3-Dichlorobenzene	1	<1.0	
1,4-Dichlorobenzene	1	<1.0	
Dichlorodifluoromethane	1	<1.0	
1,1-Dichloroethane	1	<1.0	
1,2-Dichloroethane	1	<1.0	
cis-1,2-Dichloroethene	1	<1.0	
trans-1,2-Dichloroethene	1	<1.0	
1,2-Dichloropropane	1	<1.0	
1,3-Dichloropropane	1	<1.0	
2,2-Dichloropropane	1	<1.0	
1,1-Dichloropropene	1	<1.0	
cis-1,3-Dichloropropene	1	<1.0	
trans-1,3-Dichloropropene	1	<1.0	
Ethylbenzene	1	<1.0	
Hexachlorobutadiene	1	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1	<1.0	
n-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1	<1.0	
Methylene chloride	5	<5.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 08/31/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980819-1155
 Client Sample ID: CDM 1 Dup
 Lab Sample ID: 98-06555
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980828/5030/484
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980828/8260A_AQU/335
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Naphthalene	1	<1.0	
n-Propylbenzene	1	<1.0	
Styrene	1	<1.0	
1,1,1,2-Tetrachloroethane	1	<1.0	
1,1,2,2-Tetrachloroethane	1	<1.0	
Tetrachloroethene	1	<1.0	
Toluene	1	<1.0	
1,2,3-Trichlorobenzene	1	<1.0	
1,2,4-Trichlorobenzene	1	<1.0	
1,1,1-Trichloroethane	1	<1.0	
1,1,2-Trichloroethane	1	<1.0	
Trichloroethene	1	<1.0	
Trichlorofluoromethane	1	<1.0	
1,2,4-Trimethylbenzene	1	<1.0	
1,3,5-Trimethylbenzene	1	<1.0	
1,2,3-Trichloropropane	1	<1.0	
Vinyl chloride	1	<1.0	
m- and p-Xylenes	1	<1.0	
o-Xylene	1	<1.0	
1,1-Dichloroethene	1	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	100.04	86 - 115
Dibromofluoromethane	102.40	86 - 118
Toluene-d8	97.78	88 - 110

Batch Approved By: GOTTSALLDL

Batch Approval Date: 08/31/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980819-1155

Preparation Batch: P980826/7470A_PRE/91

Prep. Analyst: NGUYENP

Component Name: Mercury EPA Method #: EPA 7470A Matrix: AQUEOUS
 Analytical Batch: I980826/7470A_AQU/74 Analyst: NGUYENP Units: ug/L
 Reviewed By - Date: OCCHIALINIJF - 8/28/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 1A	98-06553	0.200	<0.20	1	
CDM 1	98-06554	0.200	<0.20	1	
CDM 1 Dup	98-06555	0.200	<0.20	1	

Preparation Batch: P980828/9012_AQ_P/29

Prep. Analyst: NGUYENMH

Component Name: Cyanide, Total EPA Method #: EPA 9012 Matrix: AQUEOUS
 Analytical Batch: I980831/9012_AQUE/29 Analyst: NGUYENMH Units: mg/L
 Reviewed By - Date: GOTTSHALLDL - 8/31/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 1A	98-06553	0.015	<0.015	1	
CDM 1	98-06554	0.015	<0.015	1	
CDM 1 Dup	98-06555	0.015	<0.015	1	

Component Name: Nitrate EPA Method #: EPA 353.2 Matrix: AQUEOUS
 Analytical Batch: I980825/353.2_AQU/81 Analyst: NGUYENMH Units: mg/L
 Reviewed By - Date: OCCHIALINIJF - 8/28/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 1A	98-06553	0.050	0.42	1	
CDM 1	98-06554	0.500	4.0	10	
CDM 1 Dup	98-06555	0.500	4.0	10	

Component Name: COD EPA Method #: HACH 8000 Matrix: AQUEOUS
 Analytical Batch: I980826/8000_AQUE/37 Analyst: NGUYENMH Units: mg/L
 Reviewed By - Date: GOTTSHALLDL - 8/31/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 1A	98-06553	5.000	9.0	1	
CDM 1	98-06554	5.000	24	1	
CDM 1 Dup	98-06555	5.000	14	1	

Component Name: Alkalinity EPA Method #: SM 2320B Matrix: AQUEOUS
 Analytical Batch: I980828/2320B_AQU/45 Analyst: NGUYENMH Units: mg/L CaCO3
 Reviewed By - Date: GOTTSHALLDL - 8/31/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 1A	98-06553	5.000	91	1	
CDM 1	98-06554	5.000	130	1	

PREPARATION INFORMATION REPORT

SDG #: 980819-1155

Preparation Batch ID: P980826/7470A_PRE/91
 Preparation ID: 7470A_PREP
 Batch Approved By: OCCHIALINI JF

EPA Method #: EPA 7470A
 Batch Approved On: 8/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 1A	98-06553	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 1	98-06554	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 1 Dup	98-06555	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

Preparation Batch ID: P980828/3015/169
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 1A	98-06553	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1	98-06554	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 1 Dup	98-06555	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980828/5030/484
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 1A	98-06553	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 1	98-06554	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 1 Dup	98-06555	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980828/9012_AQ_P/29
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 1A	98-06553	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
		DUPLICATE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
		MATRIX_SPIKE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 1	98-06554	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

PREPARATION INFORMATION REPORT

SDG #: 980819-1155

Preparation Batch ID: P980828/9012_AQ_P/29

Preparation ID: 9012_AQ_Prep

EPA Method #: EPA 9012

Batch Approved By: GOTTSALLDL

Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 1 Dup	98-06555	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Alkalinity

Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98		08/27/98
CDM 1	98-06554	08/18/98	08/19/98		08/27/98
CDM 1 Dup	98-06555	08/18/98	08/19/98		08/27/98

Analysis: 2540C_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Dissolved Solids (TDS)

Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98		08/25/98
CDM 1	98-06554	08/18/98	08/19/98		08/25/98
CDM 1 Dup	98-06555	08/18/98	08/19/98		08/25/98

Analysis: 353.2_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98		08/20/98
CDM 1	98-06554	08/18/98	08/19/98		08/20/98
CDM 1 Dup	98-06555	08/18/98	08/19/98		08/20/98

Analysis: 6010A_AQUEOUS

Required Preparation Holdtime: 180 days

Analysis Desc: ICP Metals

Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98	08/26/98	08/26/98
CDM 1	98-06554	08/18/98	08/19/98	08/26/98	08/26/98
CDM 1 Dup	98-06555	08/18/98	08/19/98	08/26/98	08/26/98

Analysis: 7470A_AQUEOUS

Required Preparation Holdtime: 28 days

Analysis Desc: Mercury in Water

Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98	08/24/98	08/25/98
CDM 1	98-06554	08/18/98	08/19/98	08/24/98	08/25/98
CDM 1 Dup	98-06555	08/18/98	08/19/98	08/24/98	08/25/98

Analysis: 8000_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Chemical Oxygen Demand

Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98		08/25/98
CDM 1	98-06554	08/18/98	08/19/98		08/25/98
CDM 1 Dup	98-06555	08/18/98	08/19/98		08/25/98

HOLDTIME SUMMARY

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98	08/27/98	08/27/98
CDM 1	98-06554	08/18/98	08/19/98	08/27/98	08/27/98
CDM 1 Dup	98-06555	08/18/98	08/19/98	08/27/98	08/27/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98	08/26/98	08/26/98
CDM 1	98-06554	08/18/98	08/19/98	08/26/98	08/26/98
CDM 1 Dup	98-06555	08/18/98	08/19/98	08/26/98	08/26/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98		09/01/98
CDM 1	98-06554	08/18/98	08/19/98		09/01/98
CDM 1 Dup	98-06555	08/18/98	08/19/98		09/01/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 1A	98-06553	08/18/98	08/19/98		08/31/98
CDM 1	98-06554	08/18/98	08/19/98		08/31/98
CDM 1 Dup	98-06555	08/18/98	08/19/98		08/31/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980819-1155
Lab Sample ID: B98-05304
EPA Number: EPA 353.2
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980825/353.2_AQU/81
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Nitrate	0.05	<0.050	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980819-1155
Lab Sample ID: B98-05306
EPA Number: EPA 353.2
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980825/353.2_AQU/81
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Nitrate	0.05	<0.050	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

8000_AQUEOUS BLANK REPORT

SDG #: 980819-1155
Lab Sample ID: B98-05319
EPA Number: HACH 8000
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980826/8000_AQUE/37
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
COD	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

7470A_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980826/7470A_PRE/91
Lab Sample ID:	B98-05335	Prep Analyst:	NGUYENP
EPA Number:	EPA 7470A		
Units:	ug/L	Analytical Batch ID:	I980826/7470A_AQU/74
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENP

Component Name	MRL	Result	Qualifier
Mercury	0.20	<0.20	

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

2320B_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	
Lab Sample ID:	B98-05385	Prep Analyst:	
EPA Number:	SM 2320B		
Units:	mg/L CaCO3	Analytical Batch ID:	I980828/2320B_AQU/45
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Result	Qualifier
Alkalinity	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	
Lab Sample ID:	B98-05390	Prep Analyst:	
EPA Number:	SM 2540C		
Units:	mg/L	Analytical Batch ID:	I980828/2540C_AQU/48
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.00	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

6010A_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980828/3015/169
Lab Sample ID:	B98-05394	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A		
Units:	ug/L	Analytical Batch ID:	I980828/6010A_AQU/137
Matrix:	AQUEOUS	Analysis Analyst:	LESHINSKYA

Component Name	MRL	Result	Qualifier
Antimony	30.00	<30	
Arsenic	10.00	<10	

6010A_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980828/3015/169
Lab Sample ID:	B98-05394	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A		
Units:	ug/L	Analytical Batch ID:	I980828/6010A_AQU/137
Matrix:	AQUEOUS	Analysis Analyst:	LESHINSKYA

Component Name	MRL	Result	Qualifier
Barium	500.00	<500	
Beryllium	2.00	<2.0	
Cadmium	1.00	<1.0	
Chromium	10.00	<10	
Cobalt	10.00	<10	
Copper	200.00	<200	
Lead	10.00	<10	
Nickel	50.00	<50	
Selenium	20.00	<20	
Silver	10.00	<10	
Thallium	10.00	<10	
Vanadium	40.00	<40	
Zinc	50.00	<50	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	B98-05406	Prep Analyst:	NGUYENMH
EPA Number:	EPA 9012		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.02	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	B98-05406	Prep Analyst:	NGUYENMH
EPA Number:	EPA 9012		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.02	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980819-1155
 Lab Sample ID: B98-05410
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980828/5030/484
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980828/8260A_AQU/335
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.00	<1.0	
1,1,1-Trichloroethane	1.00	<1.0	
1,1,2,2-Tetrachloroethane	1.00	<1.0	
1,1,2-Trichloroethane	1.00	<1.0	
1,1-Dichloroethane	1.00	<1.0	
1,1-Dichloroethene	1.00	<1.0	
1,1-Dichloropropene	1.00	<1.0	
1,2,3-Trichlorobenzene	1.00	<1.0	
1,2,3-Trichloropropane	1.00	<1.0	
1,2,4-Trichlorobenzene	1.00	<1.0	
1,2,4-Trimethylbenzene	1.00	<1.0	
1,2-Dibromo-3-chloropropane	1.00	<1.0	
1,2-Dibromoethane	1.00	<1.0	
1,2-Dichlorobenzene	1.00	<1.0	
1,2-Dichloroethane	1.00	<1.0	
1,2-Dichloropropane	1.00	<1.0	
1,3,5-Trimethylbenzene	1.00	<1.0	
1,3-Dichlorobenzene	1.00	<1.0	
1,3-Dichloropropane	1.00	<1.0	
1,4-Dichlorobenzene	1.00	<1.0	
2,2-Dichloropropane	1.00	<1.0	
2-Butanone	20.00	<20	
2-Chlorotoluene	1.00	<1.0	
2-Hexanone	20.00	<20	
4-Chlorotoluene	1.00	<1.0	
4-Methyl-2-pentanone	20.00	<20	
Acetone	20.00	<20	
Benzene	1.00	<1.0	
Bromobenzene	1.00	<1.0	
Bromochloromethane	1.00	<1.0	
Bromodichloromethane	1.00	<1.0	
Bromoform	1.00	<1.0	
Bromomethane	5.00	<5.0	
Carbon tetrachloride	1.00	<1.0	
Chlorobenzene	1.00	<1.0	
Chloroethane	5.00	<5.0	
Chloroform	5.00	<5.0	
Chloromethane	5.00	<5.0	
Dibromochloromethane	1.00	<1.0	
Dibromomethane	1.00	<1.0	
Dichlorodifluoromethane	1.00	<1.0	
Ethylbenzene	1.00	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980819-1155
 Lab Sample ID: B98-05410
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980828/5030/484
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980828/8260A_AQU/335
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Hexachlorobutadiene	1.00	<1.0	
Isopropylbenzene	1.00	<1.0	
Isopropylmethylbenzene	1.00	<1.0	
Methyl tert-butyl ether	1.00	<1.0	
Methylene chloride	5.00	<5.0	
Naphthalene	1.00	<1.0	
Styrene	1.00	<1.0	
Tetrachloroethene	1.00	<1.0	
Toluene	1.00	<1.0	
Trichloroethene	1.00	<1.0	
Trichlorofluoromethane	1.00	<1.0	
Vinyl chloride	1.00	<1.0	
cis-1,2-Dichloroethene	1.00	<1.0	
cis-1,3-Dichloropropene	1.00	<1.0	
m- and p-Xylenes	1.00	<1.0	
n-Butylbenzene	1.00	<1.0	
n-Propylbenzene	1.00	<1.0	
o-Xylene	1.00	<1.0	
sec-Butylbenzene	1.00	<1.0	
tert-Butylbenzene	1.00	<1.0	
trans-1,2-Dichloroethene	1.00	<1.0	
trans-1,3-Dichloropropene	1.00	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approved Date: 8/31/98

9251_AQUEOUS BLANK REPORT

SDG #: 980819-1155
 Lab Sample ID: B98-05462
 EPA Number: EPA 9251
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Chloride	1.00	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980819-1155
Lab Sample ID: B98-05464
EPA Number: EPA 9251
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980901/9251_AQUE/20
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Chloride	1.00	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980819-1155
Lab Sample ID: B98-05473
EPA Number: EPA 9038
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980901/9038_AQUE/19
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980819-1155
Lab Sample ID: B98-05477
EPA Number: EPA 9038
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep Analyst:
Analytical Batch ID: I980901/9038_AQUE/19
Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Sulfate	10.00	<10	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05305 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980825/353.2_AQU/81
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.05	1.28	1.4	110.3	80 - 120	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05307 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980825/353.2_AQU/81
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.05	1.28	1.3	99.2	80 - 120	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05320 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980826/8000_AQUE/37
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.00	77.70	74	95.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05386 Prep. Analyst:
 Units: mg/L CaCO3
 Matrix: AQUEOUS Analytical Batch ID: I980828/2320B_AQU/45
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.00	116.00	120	105.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05391 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980828/2540C_AQU/48
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	750.00	730	97.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID: P980828/9012_AQ_P/29
 Lab Sample ID: QCS98-05407 Prep. Analyst: NGUYENMH
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980831/9012_AQUE/29
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.02	0.20	0.21	103.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID: P980828/9012_AQ_P/29
 Lab Sample ID: QCS98-05409 Prep. Analyst: NGUYENMH
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980831/9012_AQUE/29
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.02	0.20	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05463 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.00	12.20	11	89.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 Lab Sample ID: QCS98-05466 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.00	12.20	11	91.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155
Lab Sample ID: QCS98-05474
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980901/9038_AQUE/19
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	122.00	130	104.0	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980819-1155
Lab Sample ID: QCS98-05478
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980901/9038_AQUE/19
Analysis Analyst: NGUYENMH

Component Name	MRL	Spike Amount	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10.00	122.00	120	103.3	80 - 120	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

7470A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980819-1155 Preparation Batch ID: P980826/7470A_PRE/91
 Lab Sample ID: LFB98-05336 Prep. Analyst: NGUYENP
 EPA Method #: EPA 7470A Analytical Batch ID: I980826/7470A_AQU/74
 Matrix: AQUEOUS Analyst: NGUYENP
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.20	5.00	83.6			80 - 120		

Batch Approved By: OCCHIALINI JF Batch Approved Date: 8/28/98

6010A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980819-1155 Preparation Batch ID: P980828/3015/169
 Lab Sample ID: LFB98-05395 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 6010A Analytical Batch ID: I980828/6010A_AQU/137
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Antimony	30.00	50.00	109.9			80 - 120		
Arsenic	10.00	100.00	100.1			80 - 120		
Barium	500.00	1000.00	93.4			80 - 120		
Beryllium	2.00	50.00	98.3			80 - 120		
Cadmium	1.00	50.00	104.9			80 - 120		
Chromium	10.00	100.00	101.4			80 - 120		
Cobalt	10.00	100.00	96.9			80 - 120		
Copper	200.00	100.00	94.4			80 - 120		
Lead	10.00	100.00	99.3			80 - 120		
Nickel	50.00	100.00	92.6			80 - 120		
Selenium	20.00	50.00	93.5			80 - 120		
Silver	10.00	100.00	100.8			80 - 120		
Thallium	10.00	50.00	100.2			80 - 120		
Vanadium	40.00	200.00	102.8			80 - 120		
Zinc	50.00	100.00	118.5			80 - 120		

Batch Approved By: GOTTSHALL DL Batch Approved Date: 8/31/98

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980828/5030/484
Lab Sample ID:	LFB98-05411	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A	Analytical Batch ID:	I980828/8260A_AQU/335
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.00	50.00	96.8	95.8	1.10	61 - 145	0 - 14	
Benzene	1.00	50.00	101.6	102.0	0.35	76 - 127	0 - 11	
Chlorobenzene	1.00	50.00	103.4	103.1	0.29	75 - 130	0 - 13	
Toluene	1.00	50.00	103.6	100.3	3.20	76 - 125	0 - 13	
Trichloroethene	1.00	50.00	101.8	101.5	0.32	71 - 120	0 - 14	

Batch Approved By:	<u>GOTTSHALLDL</u>	Batch Approved Date:	<u>8/31/98</u>
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9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06357		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.02	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980819-1155	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-06357		
Units:	mg/L	Analytical Batch ID:	I980826/8000_AQUE/37
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	100	110	7.339	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980819-1155	Preparation Batch ID:	P980826/7470A_PRE/91
EPA Method #:	EPA 7470A	Prep. Analyst:	NGUYENP
Lab Sample ID:	98-06545		
Units:	ug/L	Analytical Batch ID:	I980826/7470A_AQU/74
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENP

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	<0.20	<0.20	N/A	0 - 20	

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-06546
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980828/3015/169
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980828/6010A_AQU/137
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Antimony	30.00	<30	<30	N/A	0 - 20	
Arsenic	10.00	<10	<10	N/A	0 - 20	
Barium	500.00	<500	<500	N/A	0 - 20	
Beryllium	2.00	<2.0	<2.0	N/A	0 - 20	
Cadmium	1.00	1.3	1.3	4.974	0 - 20	
Chromium	10.00	<10	<10	N/A	0 - 20	
Cobalt	10.00	<10	<10	N/A	0 - 20	
Copper	200.00	<200	<200	N/A	0 - 20	
Lead	10.00	<10	<10	N/A	0 - 20	
Nickel	50.00	<50	<50	N/A	0 - 20	
Selenium	20.00	<20	<20	N/A	0 - 20	
Silver	10.00	<10	<10	N/A	0 - 20	
Thallium	10.00	<10	<10	N/A	0 - 20	
Vanadium	40.00	<40	<40	N/A	0 - 20	
Zinc	50.00	<50	<50	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 8/31/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155
 EPA Method #: EPA 9012
 Lab Sample ID: 98-06553
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID: P980828/9012_AQ_P/29
 Prep. Analyst: NGUYENMH
 Analytical Batch ID: I980831/9012_AQUE/29
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.02	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 8/31/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 EPA Method #: SM 2320B Prep. Analyst:
 Lab Sample ID: 98-06553
 Units: mg/L CaCO3 Analytical Batch ID: 1980828/2320B_AQU/45
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.00	91	92	1.533	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 EPA Method #: SM 2540C Prep. Analyst:
 Lab Sample ID: 98-06553
 Units: mg/L Analytical Batch ID: 1980828/2540C_AQU/48
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.00	140	130	8	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-06553
 Units: mg/L Analytical Batch ID: 1980901/9038_AQUE/19
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	10	< 10	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155
 EPA Method #: EPA 9251
 Lab Sample ID: 98-06553
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.00	9.9	9.9	0.202	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155
 EPA Method #: HACH 8000
 Lab Sample ID: 98-06555
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980826/8000_AQUE/37
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.00	14	13	7.407	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155
 EPA Method #: EPA 353.2
 Lab Sample ID: 98-06559
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: 1980825/353.2_AQU/81
 Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	2.50	32	32	0	0 - 20	

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-06579
 Units: mg/L Analytical Batch ID: I980825/353.2_AQU/81
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.05	<0.050	<0.050	N/A	0 - 20	

Batch Approved By: OCCHIALINI JF Batch Approved Date: 8/28/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-06678
 Units: mg/L Analytical Batch ID: I980901/9038_AQUE/19
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10.00	12	12	0.206	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980819-1155 Preparation Batch ID:
 EPA Method #: EPA 9251 Prep. Analyst:
 Lab Sample ID: 98-06678
 Units: mg/L Analytical Batch ID: I980901/9251_AQUE/20
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.00	13	14	4.726	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9012_AQUEOUS MS/MSD RPD REPORT

SDG #: 980819-1155
 Lab Sample ID: 98-06357
 Matrix: AQUEOUS

Preparation Batch ID: P980828/9012_AQ_P/29
 Prep. Analyst: NGUYENMH

Analytical Batch ID: I980831/9012_AQUE/29
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Cyanide, Total	94			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS MS/MSD RPD REPORT

SDG #: 980819-1155
 Lab Sample ID: 98-06553
 Matrix: AQUEOUS

Preparation Batch ID: P980828/9012_AQ_P/29
 Prep. Analyst: NGUYENMH

Analytical Batch ID: I980831/9012_AQUE/29
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Cyanide, Total	103			80 - 120		
Sulfate	107			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS MS/MSD RPD REPORT

SDG #: 980819-1155
 Lab Sample ID: 98-06678
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: I980901/9038_AQUE/19
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Sulfate	91			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS MS/MSD RPD REPORT

SDG #: 980819-1155
 Lab Sample ID: 98-06553
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: 1980901/9251_AQUE/20
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Chloride	98			80 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9251_AQUEOUS MS/MSD RPD REPORT

SDG #: 980819-1155
 Lab Sample ID: 98-06678
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: 1980901/9251_AQUE/20
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Chloride	108			80 - 120		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

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	Client Identifier	CDM 1	CDM 1 Dup	CDM 1A
Analysis Name	Lab ID	98-06554	98-06555	98-06553
2320B_AQUEOUS	Alkalinity	130	130	91
2540C_AQUEOUS	Total Dissolved Solids	200	200	140
353.2_AQUEOUS	Nitrate	4.0	4.0	0.42
6010A_AQUEOUS	Arsenic	<5.0	<5.0	<5.0
	Barium	37	35	5.8
	Cadmium	7.5	<1.0	11
	Chromium	<5.0	<5.0	<5.0
	Copper	8.3	<5.0	6.8
	Iron	770	<25	300
	Lead	<5.0	<5.0	<5.0
	Manganese	1300	1200	170
	Selenium	<10	<10	<10
	Silver	<5.0	<5.0	<5.0
	Zinc	56	39	150
7470A_AQUEOUS	Mercury	<0.20	<0.20	<0.20
8000_AQUEOUS	COD	24	14	9.0
8260A_AQUEOUS	1,1,1,2-Tetrachloroet	<1.0	<1.0	<1.0
	1,1,1-Trichloroethane	<1.0	<1.0	<1.0
	1,1,2,2-Tetrachloroet	<1.0	<1.0	<1.0
	1,1,2-Trichloroethane	<1.0	<1.0	<1.0
	1,1-Dichloroethane	<1.0	<1.0	<1.0
	1,1-Dichloroethene	<1.0	<1.0	<1.0
	1,1-Dichloropropene	<1.0	<1.0	<1.0
	1,2,3-Trichlorobenzen	<1.0	<1.0	<1.0
	1,2,3-Trichloropropan	<1.0	<1.0	<1.0
	1,2,4-Trichlorobenzen	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: Woerd Avenue Landfill

SDG: 980819-1155

Analysis Name	Client Identifier	CDM 1	CDM 1 Dup	CDM 1A
8260A_AQUEOUS	Lab ID	98-06554	98-06555	98-06553
	1,2,4-Trimethylbenze	<1.0	<1.0	<1.0
	1,2-Dibromo-3-chloro	<1.0	<1.0	<1.0
	1,2-Dibromoethane	<1.0	<1.0	<1.0
	1,2-Dichlorobenzene	<1.0	<1.0	<1.0
	1,2-Dichloroethane	<1.0	<1.0	<1.0
	1,2-Dichloropropane	<1.0	<1.0	<1.0
	1,3,5-Trimethylbenze	<1.0	<1.0	<1.0
	1,3-Dichlorobenzene	<1.0	<1.0	<1.0
	1,3-Dichloropropane	<1.0	<1.0	<1.0
	1,4-Dichlorobenzene	<1.0	<1.0	<1.0
	2,2-Dichloropropane	<1.0	<1.0	<1.0
	2-Butanone	<20	<20	<20
	2-Chlorotoluene	<1.0	<1.0	<1.0
	2-Hexanone	<20	<20	<20
	4-Chlorotoluene	<1.0	<1.0	<1.0
	4-Methyl-2-pentanone	<20	<20	<20
	Acetone	<20	<20	<20
	Benzene	<1.0	<1.0	<1.0
	Bromobenzene	<1.0	<1.0	<1.0
	Bromochloromethane	<1.0	<1.0	<1.0
	Bromodichloromethan	<1.0	<1.0	<1.0
	Bromoform	<1.0	<1.0	<1.0
	Bromomethane	<5.0	<5.0	<5.0
	Carbon tetrachloride	<1.0	<1.0	<1.0
	Chlorobenzene	<1.0	<1.0	<1.0
	Chloroethane	<5.0	<5.0	<5.0

Analysis Name	Client Identifier	CDM 1	CDM 1 Dup	CDM 1A
8260A_AQUEOUS	Lab ID	98-06554	98-06555	98-06553
	Chloroform	<5.0	<5.0	<5.0
	Chloromethane	<5.0	<5.0	<5.0
	cis-1,2-Dichloroethen	<1.0	<1.0	<1.0
	cis-1,3-Dichloroprope	<1.0	<1.0	<1.0
	Dibromochloromethan	<1.0	<1.0	<1.0
	Dibromomethane	<1.0	<1.0	<1.0
	Dichlorodifluorometha	<1.0	<1.0	<1.0
	Ethylbenzene	<1.0	<1.0	<1.0
	Hexachlorobutadiene	<1.0	<1.0	<1.0
	Isopropylbenzene	<1.0	<1.0	<1.0
	Isopropylmethylbenze	<1.0	<1.0	<1.0
	m- and p-Xylenes	<1.0	<1.0	<1.0
	Methyl tert-butyl ethe	<1.0	<1.0	<1.0
	Methylene chloride	<5.0	<5.0	<5.0
	n-Butylbenzene	<1.0	<1.0	<1.0
	n-Propylbenzene	<1.0	<1.0	<1.0
	Naphthalene	<1.0	<1.0	<1.0
	o-Xylene	<1.0	<1.0	<1.0
	sec-Butylbenzene	<1.0	<1.0	<1.0
	Styrene	<1.0	<1.0	<1.0
	tert-Butylbenzene	<1.0	<1.0	<1.0
	Tetrachloroethene	<1.0	<1.0	<1.0
	Toluene	<1.0	<1.0	<1.0
	trans-1,2-Dichloroethe	<1.0	<1.0	<1.0
	trans-1,3-Dichloropro	<1.0	<1.0	<1.0
	Trichloroethene	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: Woerd Avenue Landfill

SDG: 980819-1155

Analysis Name	Client Identifier	CDM 1	CDM 1 Dup	CDM 1A
8260A_AQUEOUS	Lab ID	98-06554	98-06555	98-06553
	Trichlorofluoromethan	<1.0	<1.0	<1.0
	Vinyl chloride	<1.0	<1.0	<1.0
9012_AQUEOUS	Cyanide, Total	<0.015	<0.015	<0.015
9038_AQUEOUS	Sulfate	35	36	10
9251_AQUEOUS	Chloride	3.4	2.9	9.9



Client: Woerd Avenue Landfill

Project: Monitoring

SDG: 980821-1165

Date: 9/8/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980821-1165
Client: Woerd Avenue Landfill
Project: Monitoring

Print Date: 9/8/98
Client Contact:
Address: Camp Dresser & McKee Inc.
10 Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

BATCH NOTES

1980901/8260A_AQU/340; B98-05452 is the blank associated with the North Wake program (project specific RLs).

RESULT NOTES

98-06579 (Manganese) N Footnote : Determination of spike recovery hindered by high native concentration relative to spike amount,

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW:

James F. O'Rourke

LABORATORY QA/QC REVIEW:

Pete May

AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
FB	08/17/98	08/21/98	98-06582	AQUEOUS
CDM 4	08/19/98	08/21/98	98-06580	AQUEOUS
CDM 3A	08/19/98	08/21/98	98-06579	AQUEOUS
CDM 4A	08/19/98	08/21/98	98-06581	AQUEOUS

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980831/3015/171
SDG #:	980821-1165	Prep. Analyst:	LESHINSKYA
Client Sample ID:	CDM 3A		
Lab Sample ID:	98-06579	Analytical Batch ID:	I980831/6010A_AQU/139
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	9.8	
Barium	5.0	160	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	390	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980821-1165
 Client Sample ID: CDM 3A
 Lab Sample ID: 98-06579
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	1.6	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
1-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	1.2	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	21	
cis-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
1-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
1-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1165	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 3A		
Lab Sample ID:	98-06579	Analytical Batch ID:	I980901/8260A_AQU/340
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	102.58	86 - 115
Dibromofluoromethane	103.56	86 - 118
Toluene-d8	100.04	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980821-1165
 Client Sample ID: CDM 4
 Lab Sample ID: 98-06580
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980831/3015/171
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980831/6010A_AQU/139
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	860	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	9.1	
Manganese	5.0	200	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	77	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1165	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 4	Analytical Batch ID:	I980901/8260A_AQU/340
Lab Sample ID:	98-06580	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	1.2	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1165	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 4		
Lab Sample ID:	98-06580	Analytical Batch ID:	I980901/8260A_AQU/340
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	97.36	86 - 115
Dibromofluoromethane	106.04	86 - 118
Toluene-d8	97.36	88 - 110

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A Preparation Batch ID: P980831/3015/171
 SDG #: 980821-1165 Prep. Analyst: LESHINSKYA
 Client Sample ID: CDM 4A
 Lab Sample ID: 98-06581 Analytical Batch ID: I980831/6010A_AQU/139
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L
 Dilution Factor: 1

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	98	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	2700	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	29	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980821-1165
 Client Sample ID: CDM 4A
 Lab Sample ID: 98-06581
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
o-Chlorotoluene	1.0	<1.0	
m-Chlorotoluene	1.0	<1.0	
p-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,1-Dibromochloromethane	1.0	<1.0	
1,1-Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
1,1-Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
n-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
n-Methyl-2-pentanone	20	<20	
n-Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1165	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 4A		
Lab Sample ID:	98-06581	Analytical Batch ID:	I980901/8260A_AQU/340
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	110.54	86 - 115
Dibromofluoromethane	108.92	86 - 118
Toluene-d8	102.86	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980831/5030/487
SDG #:	980821-1165	Prep. Analyst:	MITCHELLMR
Client Sample ID:	TB		
Lab Sample ID:	98-06582	Analytical Batch ID:	I980831/8260A_AQU/338
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
o-Chlorotoluene	1.0	<1.0	
p-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
o,2-Dichlorobenzene	1.0	<1.0	
m,3-Dichlorobenzene	1.0	<1.0	
p,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
o,1-Dichloroethane	1.0	<1.0	
m,2-Dichloroethane	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
o,2-Dichloropropane	1.0	<1.0	
m,3-Dichloropropane	1.0	<1.0	
p,2-Dichloropropane	1.0	<1.0	
o,1-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
n-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
n-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
o,1,1,2-Tetrachloroethane	1.0	<1.0	
m,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 08/31/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980831/5030/487
SDG #:	980821-1165	Prep. Analyst:	MITCHELLMR
Client Sample ID:	TB		
Lab Sample ID:	98-06582	Analytical Batch ID:	I980831/8260A_AQU/338
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	104.54	86 - 115
Dibromofluoromethane	106.02	86 - 118
Toluene-d8	102.38	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 08/31/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1165

Preparation Batch: P980826/7470A_PRE/93
 Component Name: Mercury
 Analytical Batch: I980826/7470A_AQU/76
 Reviewed By - Date: OCCHIALINI JF - 8/28/98
 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7470A
 Analyst: LESHINSKYA
 Matrix: AQUEOUS
 Units: ug/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 3A	98-06579	0.20	<0.20	1	
CDM 4	98-06580	0.20	<0.20	1	
CDM 4A	98-06581	0.20	<0.20	1	

Preparation Batch: P980828/9012_AQ_P/29
 Component Name: Cyanide, Total
 Analytical Batch: I980831/9012_AQUE/29
 Reviewed By - Date: GOTTSALLDL - 8/31/98
 Prep. Analyst: NGUYENMH
 EPA Method #: EPA 9012
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 3A	98-06579	0.015	<0.015	1	
CDM 4	98-06580	0.015	<0.015	1	
CDM 4A	98-06581	0.015	<0.015	1	

Component Name: Nitrate
 Analytical Batch: I980825/353.2_AQU/81
 Reviewed By - Date: OCCHIALINI JF - 8/28/98
 EPA Method #: EPA 353.2
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 3A	98-06579	0.050	<0.050	1	
CDM 4	98-06580	0.050	1.4	1	
CDM 4A	98-06581	0.050	<0.050	1	

Component Name: COD
 Analytical Batch: I980826/8000_AQUE/37
 Reviewed By - Date: GOTTSALLDL - 8/31/98
 EPA Method #: HACH 8000
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 3A	98-06579	5.0	19	1	
CDM 4A	98-06581	5.0	12	1	

Component Name: COD
 Analytical Batch: I980828/8000_AQUE/38
 Reviewed By - Date: GOTTSALLDL - 8/31/98
 EPA Method #: HACH 8000
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 4	98-06580	5.0	140	1	

Component Name: Total Dissolved Solids
 Analytical Batch: I980828/2540C_AQU/48
 Reviewed By - Date: GOTTSALLDL - 8/31/98
 EPA Method #: SM 2540C
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
CDM 3A	98-06579	5.0	290	1	
CDM 4	98-06580	5.0	1100	1	
CDM 4A	98-06581	5.0	690	1	

PREPARATION INFORMATION REPORT

DG #: 980821-1165

Preparation Batch ID: P980826/7470A_PRE/93
 Preparation ID: 7470A_PREP
 Batch Approved By: OCCHIALINI JF

EPA Method #: EPA 7470A
 Batch Approved On: 8/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 3A	98-06579	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 4	98-06580	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 4A	98-06581	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

Preparation Batch ID: P980828/9012_AQ_P/29
 Preparation ID: 9012_AQ_Prep
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9012
 Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 3A	98-06579	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 4	98-06580	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 4A	98-06581	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980831/3015/171
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 3A	98-06579	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
		DUPLICATE	Final Volume	50	mL	
			Initial Volume	45	mL	
		MATRIX_SPIKE	Final Volume	50	mL	
			Initial Volume	45	mL	
		MS_DUPLICATE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4	98-06580	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 4A	98-06581	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980831/5030/487
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
TB	98-06582	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980901/5030/489
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 3A	98-06579	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

PREPARATION INFORMATION REPORT

SDG #: 980821-1165

Preparation Batch ID: P980901/5030/489

Preparation ID: 5030

EPA Method #: EPA 5030

Batch Approved By: GOTTSALLDL

Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 4	98-06580	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 4A	98-06581	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Alkalinity

Required Analytical Holdtime: 14 days

Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
M 3A	98-06579	08/19/98	08/21/98		08/28/98
M 4	98-06580	08/19/98	08/21/98		08/28/98
M 4A	98-06581	08/19/98	08/21/98		08/28/98

Analysis: 2540C_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Dissolved Solids (TDS)

Required Analytical Holdtime: 7 days

Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
M 3A	98-06579	08/19/98	08/21/98		08/25/98
M 4	98-06580	08/19/98	08/21/98		08/25/98
M 4A	98-06581	08/19/98	08/21/98		08/25/98

Analysis: 353.2_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Analytical Holdtime: 0 days 48 hrs

Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
M 3A	98-06579	08/19/98	08/21/98		08/21/98
M 4	98-06580	08/19/98	08/21/98		08/21/98
M 4A	98-06581	08/19/98	08/21/98		08/21/98

Analysis: 6010A_AQUEOUS

Required Preparation Holdtime: 180 days

Analysis Desc: ICP Metals

Required Analytical Holdtime: 180 days

Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
M 3A	98-06579	08/19/98	08/21/98	08/27/98	08/28/98
M 4	98-06580	08/19/98	08/21/98	08/27/98	08/28/98
M 4A	98-06581	08/19/98	08/21/98	08/27/98	08/28/98

Analysis: 7470A_AQUEOUS

Required Preparation Holdtime: 28 days

Analysis Desc: Mercury in Water

Required Analytical Holdtime: 28 days

Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
M 3A	98-06579	08/19/98	08/21/98	08/26/98	08/26/98
M 4	98-06580	08/19/98	08/21/98	08/26/98	08/26/98
M 4A	98-06581	08/19/98	08/21/98	08/26/98	08/26/98

Analysis: 8000_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Chemical Oxygen Demand

Required Analytical Holdtime: 28 days

Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
M 3A	98-06579	08/19/98	08/21/98		08/25/98
M 4	98-06580	08/19/98	08/21/98		08/25/98
M 4A	98-06581	08/19/98	08/21/98		08/25/98

HOLDTIME SUMMARY

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 3A	98-06579	08/19/98	08/21/98	08/31/98	08/31/98
CDM 4	98-06580	08/19/98	08/21/98	08/31/98	08/31/98
CDM 4A	98-06581	08/19/98	08/21/98	08/31/98	08/31/98
TB	98-06582	08/17/98	08/21/98	08/28/98	08/28/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 3A	98-06579	08/19/98	08/21/98	08/26/98	08/26/98
CDM 4	98-06580	08/19/98	08/21/98	08/26/98	08/26/98
CDM 4A	98-06581	08/19/98	08/21/98	08/26/98	08/26/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 3A	98-06579	08/19/98	08/21/98		09/01/98
CDM 4	98-06580	08/19/98	08/21/98		09/01/98
CDM 4A	98-06581	08/19/98	08/21/98		09/01/98

Analysis: 9251_AQUEOUS
 Analysis Desc: Chloride

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
CDM 3A	98-06579	08/19/98	08/21/98		08/31/98
CDM 4	98-06580	08/19/98	08/21/98		08/31/98
CDM 4A	98-06581	08/19/98	08/21/98		08/31/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: B98-05304 Prep Analyst:
 EPA Number: EPA 353.2 Analytical Batch ID: I980825/353.2_AQU/81
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: B98-05306 Prep Analyst:
 EPA Number: EPA 353.2 Analytical Batch ID: I980825/353.2_AQU/81
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

8000_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: B98-05319 Prep Analyst:
 EPA Number: HACH 8000 Analytical Batch ID: I980826/8000_AQUE/37
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: B98-05326 Prep Analyst:
 EPA Number: HACH 8000 Analytical Batch ID: I980826/8000_AQUE/38
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

7470A_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID: P980826/7470A_PRE/93
Lab Sample ID: B98-05349 Prep Analyst: LESHINSKYA
EPA Number: EPA 7470A
Units: ug/L Analytical Batch ID: I980826/7470A_AQU/76
Matrix: AQUEOUS Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Mercury	0.20	<0.20	

Batch Approved By: OCCHIALINI JF Batch Approved Date: 8/28/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
Lab Sample ID: B98-05390 Prep Analyst:
EPA Number: SM 2540C
Units: mg/L Analytical Batch ID: I980828/2540C_AQU/48
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID: P980828/9012_AQ_P/29
Lab Sample ID: B98-05406 Prep Analyst: NGUYENMH
EPA Number: EPA 9012
Units: mg/L Analytical Batch ID: I980831/9012_AQUE/29
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID: P980828/9012_AQ_P/29
Lab Sample ID: B98-05408 Prep Analyst: NGUYENMH
EPA Number: EPA 9012
Units: mg/L Analytical Batch ID: I980831/9012_AQUE/29
Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05432
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980831/5030/487
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980831/8260A_AQU/338
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05432
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980831/5030/487
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980831/8260A_AQU/338
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 8/31/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05436
 EPA Number: EPA 6010A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980831/3015/171
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980831/6010A_AQU/139
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	

6010A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05436
 EPA Number: EPA 6010A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980831/3015/171
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980831/6010A_AQU/139
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSALLDL

Batch Approved Date: 9/1/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05452
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	5.0	<5.0	
1,1,1-Trichloroethane	5.0	<5.0	
1,1,2,2-Tetrachloroethane	5.0	<5.0	
1,1,2-Trichloroethane	5.0	<5.0	
1,1-Dichloroethane	5.0	<5.0	
1,1-Dichloroethene	5.0	<5.0	
1,2,3-Trichloropropane	15	<15	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	5.0	<5.0	
1,2-Dichlorobenzene	5.0	<5.0	
1,2-Dichloroethane	5.0	<5.0	
1,2-Dichloropropane	5.0	<5.0	
1,4-Dichlorobenzene	5.0	<5.0	
2-Butanone	100	<100	
2-Hexanone	50	<50	
4-Methyl-2-pentanone	100	<100	
Acetone	100	<100	
Acrylonitrile	200	<200	
Benzene	5.0	<5.0	
Bromochloromethane	5.0	<5.0	
Bromodichloromethane	5.0	<5.0	
Bromoform	5.0	<5.0	
Bromomethane	10	<10	
Carbon disulfide	100	<100	
Carbon tetrachloride	10	<10	
Chlorobenzene	5.0	<5.0	
Chloroethane	10	<10	
Chloroform	5.0	<5.0	
Chloromethane	10	<10	
Dibromochloromethane	5.0	<5.0	
Dibromomethane	10	<10	
Dichlorodifluoromethane	5.0	<5.0	
Ethylbenzene	5.0	<5.0	
Iodomethane	10	<10	
Methylene chloride	10	<10	
Styrene	10	<10	
Tetrachloroethene	5.0	<5.0	
Toluene	5.0	<5.0	
Trichloroethene	5.0	<5.0	
Trichlorofluoromethane	5.0	<5.0	
Vinyl acetate	50	<50	
Vinyl chloride	10	<10	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05452
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
cis-1,2-Dichloroethene	5.0	<5.0	
cis-1,3-Dichloropropene	10	<10	
m- and p-Xylenes	5.0	<5.0	
o-Xylene	5.0	<5.0	
trans-1,2-Dichloroethene	5.0	<5.0	
trans-1,3-Dichloropropene	10	<10	
trans-1,4-Dichloro-2-butene	100	<100	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05462
 EPA Number: EPA 9251
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980821-1165
 Lab Sample ID: B98-05464
 EPA Number: EPA 9251
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep Analyst:
 Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
Lab Sample ID: B98-05473 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980901/9038_AQUE/19
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
Lab Sample ID: B98-05477 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980901/9038_AQUE/19
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSALLDL Batch Approved Date: 9/1/98

2320B_AQUEOUS BLANK REPORT

SDG #: 980821-1165 Preparation Batch ID:
Lab Sample ID: B98-05483 Prep Analyst:
EPA Number: SM 2320B Analytical Batch ID: I980901/2320B_AQU/46
Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 9/1/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: QCS98-05305 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980825/353.2_AQU/81
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	1.4	110.3	80 - 120	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: QCS98-05307 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980825/353.2_AQU/81
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	1.3	99.2	80 - 120	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 Lab Sample ID: QCS98-05320 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980826/8000_AQUE/37
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	74	95.2	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
Lab Sample ID:	QCS98-05327	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980826/8000_AQUE/38
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	310	100.1	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
Lab Sample ID:	QCS98-05391	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980828/2540C_AQU/48
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	730	97.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	QCS98-05407	Prep. Analyst:	NGUYENMH
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980831/9012_AQUE/29
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.21	103.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	QCS98-05409	Prep. Analyst:	NGUYENMH
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980831/9012_AQUE/29
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
Lab Sample ID:	QCS98-05466	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980901/9251_AQUE/20
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.0	11	89.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
Lab Sample ID:	QCS98-05466	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980901/9251_AQUE/20
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.0	11	91.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1165
 Lab Sample ID: QCS98-05474
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/9038_AQUE/19
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	130	104.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1165
 Lab Sample ID: QCS98-05474
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/9038_AQUE/19
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	120	103.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1165
 Lab Sample ID: QCS98-05484
 Units: mg/L CaCO3
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/2320B_AQU/46
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	120	101.7	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

7470A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980821-1165 Preparation Batch ID: P980826/7470A_PRE/93
 Lab Sample ID: LFB98-05350 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7470A
 Matrix: AQUEOUS Analytical Batch ID: I980826/7470A_AQU/76
 Units: ug/L Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.2	5.00	102.4			80 - 120		

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

SDG #: 980821-1165 Preparation Batch ID: P980831/3015/171
 Lab Sample ID: LFB98-05437 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 6010A
 Matrix: AQUEOUS Analytical Batch ID: I980831/6010A_AQU/139
 Units: ug/L Analyst: LESHINSKYA

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.0	100.00	93.6			80 - 120		
Barium	5.0	1000.00	93.0			80 - 120		
Cadmium	1.0	50.00	98.3			80 - 120		
Chromium	5.0	100.00	99.2			80 - 120		
Copper	5.0	100.00	90.6			80 - 120		
Iron	25	200.00	91.6			80 - 120		
Lead	5.0	100.00	95.4			80 - 120		
Manganese	5.0	100.00	94.0			80 - 120		
Selenium	10	50.00	111.3			80 - 120		
Silver	5.0	100.00	95.6			80 - 120		
Zinc	20	100.00	100.6			80 - 120		

Batch Approved By: GOTTSALLDL Batch Approved Date: 9/1/98

SDG #: 980821-1165 Preparation Batch ID: P980831/5030/487
 Lab Sample ID: LFB98-05433 Prep. Analyst: MITCHELLMR
 EPA Method #: EPA 8260A
 Matrix: AQUEOUS Analytical Batch ID: I980831/8260A_AQU/338
 Units: ug/L Analyst: MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	107.2	111.2	3.63	61 - 145	0 - 14	
Benzene	1.0	50.00	105.6	106.4	0.68	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	104.9	103.8	1.02	75 - 130	0 - 13	
Toluene	1.0	50.00	102.5	105.4	2.75	76 - 125	0 - 13	

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980821-1165 Preparation Batch ID: P980831/5030/487
 Lab Sample ID: LFB98-05433 Prep. Analyst: MITCHELLMR
 EPA Method #: EPA 8260A Analytical Batch ID: I980831/8260A_AQU/338
 Matrix: AQUEOUS Analyst: MITCHELLMR
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Trichloroethene	1.0	50.00	102.5	104.6	2.03	71 - 120	0 - 14	
Batch Approved By: GOTTSHALLDL				Batch Approved Date:		8/31/98		

SDG #: 980821-1165 Preparation Batch ID: P980901/5030/489
 Lab Sample ID: LFB98-05453 Prep. Analyst: MITCHELLMR
 EPA Method #: EPA 8260A Analytical Batch ID: I980901/8260A_AQU/340
 Matrix: AQUEOUS Analyst: MITCHELLMR
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	104.9	105.3	0.34	61 - 145	0 - 14	
Benzene	1.0	50.00	105.6	104.7	0.86	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	105.3	103.8	1.42	75 - 130	0 - 13	
Toluene	1.0	50.00	106.9	94.3	12.53	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	105.1	102.9	2.14	71 - 120	0 - 14	
Batch Approved By: GOTTSHALLDL				Batch Approved Date:		9/1/98		

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06357		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-06357		
Units:	mg/L	Analytical Batch ID:	I980826/8000_AQUE/37
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	100	110	7.339	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06553		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: SM 2540C Prep. Analyst:
 Lab Sample ID: 98-06553 Analytical Batch ID: I980828/2540C_AQU/48
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	140	130	8	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-06553 Analytical Batch ID: I980901/9038_AQUE/19
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	10	<10	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: EPA 9251 Prep. Analyst:
 Lab Sample ID: 98-06553 Analytical Batch ID: I980901/9251_AQUE/20
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	9.9	9.9	0.202	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: HACH 8000 Prep. Analyst:
 Lab Sample ID: 98-06555 Analytical Batch ID: I980826/8000_AQUE/37
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	14	13	7.407	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-06559 Analytical Batch ID: I980825/353.2_AQU/81
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	2.5	32	32	0	0 - 20	

Batch Approved By: OCCHIALINIUF Batch Approved Date: 8/28/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID: P980831/3015/171
 EPA Method #: EPA 6010A Prep. Analyst: LESHINSKYA
 Lab Sample ID: 98-06579 Analytical Batch ID: I980831/6010A_AQU/139
 Units: ug/L Analysis Analyst: LESHINSKYA
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.0	9.8	8.4	15.358	0 - 20	
Barium	5.0	160	160	0.755	0 - 20	
Cadmium	1.0	<1.0	<1.0	N/A	0 - 20	
Chromium	5.0	<5.0	<5.0	N/A	0 - 20	
Copper	5.0	<5.0	<5.0	N/A	0 - 20	
Iron	25	<25	<25	N/A	0 - 20	
Lead	5.0	<5.0	<5.0	N/A	0 - 20	
Manganese	5.0	390	380	0.919	0 - 20	
Selenium	10	<10	<10	N/A	0 - 20	
Silver	5.0	<5.0	<5.0	N/A	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-06579 Analytical Batch ID: 1980825/353.2_AQU/81
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	<0.050	<0.050	N/A	0 - 20	

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID:
 EPA Method #: SM 2320B Prep. Analyst:
 Lab Sample ID: 98-06579 Analytical Batch ID: 1980901/2320B_AQU/46
 Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	180	180	0.271	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1165 Preparation Batch ID: P980826/7470A_PRE/93
 EPA Method #: EPA 7470A Prep. Analyst: LESHINSKYA
 Lab Sample ID: 98-06616 Analytical Batch ID: 1980826/7470A_AQU/76
 Units: ug/L Analysis Analyst: LESHINSKYA
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	<0.20	<0.20	N/A	0 - 20	

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-06678	Analytical Batch ID:	I980901/9038_AQUE/19
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	12	12	0.206	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1165	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-06678	Analytical Batch ID:	I980901/9251_AQUE/20
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	13	14	4.726	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

353.2_AQUEOUS MS/MSD RPD REPORT

G #: 980821-1165
 Sample ID: 98-06559
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: I980825/353.2_AQU/81
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Nitrate	91			80 - 120		
Batch Approved By: OCCHIALINIJJ		Batch Approved Date: 8/28/98				

353.2_AQUEOUS MS/MSD RPD REPORT

G #: 980821-1165
 Sample ID: 98-06579
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:

Analytical Batch ID: I980825/353.2_AQU/81
 Analyst: NGUYENMH

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Nitrate	102			80 - 120		

6010A_AQUEOUS MS/MSD RPD REPORT

G #: 980821-1165
 Sample ID: 98-06579
 Matrix: AQUEOUS

Preparation Batch ID: P980831/3015/171
 Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980831/6010A_AQU/139
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Arsenic	95	96	0.84	80 - 120	0 - 20	
Barium	90	91	0.31	80 - 120	0 - 20	
Cadmium	97	97	0.44	80 - 120	0 - 20	
Chromium	96	96	0.34	80 - 120	0 - 20	
Copper	98	98	0.09	80 - 120	0 - 20	
Iron	94	94	0.45	80 - 120	0 - 20	
Lead	93	92	0.83	80 - 120	0 - 20	
Manganese	69	70	0.35	80 - 120	0 - 20	N
Selenium	98	96	2.61	80 - 120	0 - 20	
Silver	88	87	1.21	80 - 120	0 - 20	
Zinc	100	100	0.02	80 - 120	0 - 20	
Batch Approved By: GOTTSALLDL		Batch Approved Date: 9/1/98				

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Analysis Name	Description	Id Text	CDM 3A	CDM 4	CDM 4A	TB
Name	Units	98-06579	98-06580	98-06581	98-06582	
3260A_AQUEOUS	1,1,1-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2,2-Tetrachloroet ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1,2-Trichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloroethene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,1-Dichloropropene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichlorobenzene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,3-Trichloropropane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,4-Trichlorobenzene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2,4-Trimethylbenzene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dibromo-3-chloro ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dibromoethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichlorobenzene ug/L	1.2	<1.0	<1.0	<1.0	<1.0
	1,2-Dichloroethane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,2-Dichloropropane ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3,5-Trimethylbenzene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
	1,3-Dichlorobenzene ug/L	<1.0	<1.0	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: Woerd Avenue Landfill

SDG: 980821-1165

Description	Id Text	CDM 3A	CDM 4	CDM 4A	TB
Analysis Name	Units	98-06579	98-06580	98-06581	98-06582
8260A_AQUEOUS					
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0
2-Butanone	ug/L	<20	<20	<20	<20
2-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0
2-Hexanone	ug/L	<20	<20	<20	<20
4-Chlorotoluene	ug/L	<1.0	<1.0	<1.0	<1.0
4-Methyl-2-pentanone	ug/L	<20	<20	<20	<20
Acetone	ug/L	<20	<20	<20	<20
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0
Bromobenzene	ug/L	<1.0	<1.0	<1.0	<1.0
Bromochloromethan	ug/L	<1.0	<1.0	<1.0	<1.0
Bromodichlorometha	ug/L	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	1.6	<1.0	<1.0	<1.0

Description	Id Text	CDM 3A	CDM 4	CDM 4A	TB
Analysis Name	Units	98-06579	98-06580	98-06581	98-06582
8260A_AQUEOUS	ug/L	<5.0	<5.0	<5.0	<5.0
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0
Chloroform	ug/L	<5.0	<5.0	<5.0	<5.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethen	ug/L	21	<1.0	<1.0	<1.0
cis-1,3-Dichloroprope	ug/L	<1.0	<1.0	<1.0	<1.0
Dibromochlorometha	ug/L	<1.0	<1.0	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0
Dichlorodifluorometh	ug/L	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	ug/L	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0
Isopropylmethylbenz	ug/L	<1.0	<1.0	<1.0	<1.0
m- and p-Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ethe	ug/L	<1.0	<1.0	<1.0	<1.0
Methylene chloride	ug/L	<5.0	<5.0	<5.0	<5.0
n-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0
n-Propylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0

Laboratory Summary Report

Client: Woerd Avenue Landfill

SDG: 980821-1165

Description	Id Text	CDM 3A	CDM 4	CDM 4A	TB
Analysis Name	Units	98-06579	98-06580	98-06581	98-06582
8260A_AQUEOUS	ug/L	<1.0	1.2	<1.0	<1.0
Naphthalene	ug/L	<1.0	<1.0	<1.0	<1.0
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0
sec-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0
tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroeth	ug/L	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropro	ug/L	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0
Trichlorofluorometha	ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	ug/L	<1.0	<1.0	<1.0	<1.0
Cyanide, Total	mg/L	<0.015	<0.015	<0.015	<0.015
9072_AQUEOUS	mg/L	13	75	<10	
9038_AQUEOUS	mg/L	29	58	240	
9251_AQUEOUS	mg/L				



Client: Woerd Avenue Landfill

Project: Monitoring

SDG: 980821-1170

Date: 9/15/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980821-1170
Client: Woerd Avenue Landfill
Project: Monitoring

Print Date: 9/15/98
Client Contact:
Address: Camp Dresser & McKee Inc.
10 Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

BATCH NOTES

1980904/8260A_SOI/157

Sample and its spike were analyzed at lesser volumes due to matrix problems when analyzed undiluted.

1980910/8081_SOIL/56

Recovery of one of the two surrogates for samples 98-06610, MS98-06610, 98-06609, 98-06610, and 98-06611 were outside the recommended quality control criteria. Matrix interference is suspected.

RESULT NOTES

98-06610 (Arsenic)

RPD is not determinable for this sample due to low original concentration (less than 10x MDL).

98-06610 (Iron, Lead)

N Footnote. High native concentration interfered with spike recovery.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW:



LABORATORY QA/QC REVIEW:



AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Cove 1	08/20/98	08/21/98	98-06614	AQUEOUS
Stream 1	08/20/98	08/21/98	98-06609	SOIL
Stream 1	08/20/98	08/21/98	98-06613	AQUEOUS
Swale 1	08/20/98	08/21/98	98-06610	SOIL
Cove 1	08/20/98	08/21/98	98-06611	SOIL
Cove 2	08/20/98	08/21/98	98-06612	SOIL
Cove 2	08/20/98	08/21/98	98-06615	AQUEOUS
CDM 2	08/20/98	08/21/98	98-06616	AQUEOUS
CDM 2A	08/20/98	08/21/98	98-06617	AQUEOUS

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980821-1170
 Client Sample ID: Stream 1
 Lab Sample ID: 98-06613
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 2

Preparation Batch ID: P980904/5030/495
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980904/8260A_AQU/342
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	2.0	<2.0	
Bromobenzene	2.0	<2.0	
Bromochloromethane	2.0	<2.0	
Bromodichloromethane	2.0	<2.0	
Bromoform	2.0	<2.0	
Bromomethane	10	<10	
2-Butanone	40	<40	
n-Butylbenzene	2.0	<2.0	
sec-Butylbenzene	2.0	<2.0	
tert-Butylbenzene	2.0	<2.0	
Carbon tetrachloride	2.0	<2.0	
Chlorobenzene	2.0	<2.0	
Chloroethane	10	<10	
Chloroform	10	<10	
Chloromethane	10	<10	
2-Chlorotoluene	2.0	<2.0	
4-Chlorotoluene	2.0	<2.0	
1,2-Dibromo-3-chloropropane	2.0	<2.0	
1,2-Dibromoethane	2.0	<2.0	
Dibromochloromethane	2.0	<2.0	
Dibromomethane	2.0	<2.0	
1,2-Dichlorobenzene	2.0	<2.0	
1,3-Dichlorobenzene	2.0	<2.0	
1,4-Dichlorobenzene	2.0	<2.0	
Dichlorodifluoromethane	2.0	<2.0	
1,1-Dichloroethane	2.0	<2.0	
1,2-Dichloroethane	2.0	<2.0	
cis-1,2-Dichloroethene	2.0	<2.0	
trans-1,2-Dichloroethene	2.0	<2.0	
1,2-Dichloropropane	2.0	<2.0	
1,3-Dichloropropane	2.0	<2.0	
2,2-Dichloropropane	2.0	<2.0	
1,1-Dichloropropene	2.0	<2.0	
cis-1,3-Dichloropropene	2.0	<2.0	
trans-1,3-Dichloropropene	2.0	<2.0	
Ethylbenzene	2.0	<2.0	
Hexachlorobutadiene	2.0	<2.0	
2-Hexanone	40	<40	
Isopropylbenzene	2.0	<2.0	
4-Methyl-2-pentanone	40	<40	
Methyl tert-butyl ether	2.0	<2.0	
Methylene chloride	10	<10	
Naphthalene	2.0	<2.0	
n-Propylbenzene	2.0	<2.0	
Styrene	2.0	<2.0	
1,1,1,2-Tetrachloroethane	2.0	<2.0	
1,1,2,2-Tetrachloroethane	2.0	<2.0	
Tetrachloroethene	2.0	<2.0	
Toluene	2.0	<2.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/04/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980821-1170
Client Sample ID: Stream 1
Lab Sample ID: 98-06613
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 2

Preparation Batch ID: P980904/5030/495
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980904/8260A_AQU/342
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	2.0	<2.0	
1,2,4-Trichlorobenzene	2.0	<2.0	
1,1,1-Trichloroethane	2.0	<2.0	
1,1,2-Trichloroethane	2.0	<2.0	
Trichloroethene	2.0	<2.0	
Trichlorofluoromethane	2.0	<2.0	
1,2,4-Trimethylbenzene	2.0	<2.0	
1,3,5-Trimethylbenzene	2.0	<2.0	
1,2,3-Trichloropropane	2.0	<2.0	
Vinyl chloride	2.0	<2.0	
m- and p-Xylenes	2.0	<2.0	
o-Xylene	2.0	<2.0	
1,1-Dichloroethene	2.0	<2.0	
Acetone	40	99	
Isopropylmethylbenzene	2.0	<2.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	100.54	86 - 115
Dibromofluoromethane	108.42	86 - 118
Toluene-d8	97.60	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/04/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980821-1170
 Client Sample ID: Stream 1
 Lab Sample ID: 98-06613
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980831/3015/171
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980831/6010A_AQU/139
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	13	
Barium	5.0	24	
Cadmium	1.0	<1.0	
Chromium	5.0	32	
Copper	5.0	340	
Iron	25	810	
Lead	5.0	18	
Manganese	5.0	34	
Selenium	10	13	
Silver	5.0	<5.0	
Zinc	20	94	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980821-1170
 Client Sample ID: Cove 1
 Lab Sample ID: 98-06614
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	3.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 1	Analytical Batch ID:	I980901/8260A_AQU/340
Lab Sample ID:	98-06614	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	103.76	86 - 115
Dibromofluoromethane	101.96	86 - 118
Toluene-d8	101.06	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

6010A_AQUEOUS ANALYSIS REPORT

Method #: EPA 6010A
 SDG #: 980821-1170
 Client Sample ID: Cove 1
 Lab Sample ID: 98-06614
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980831/3015/171
 Prep. Analyst: LESHINSKYA

 Analytical Batch ID: I980831/6010A_AQU/139
 Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	480	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	360	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	65	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 2		
Lab Sample ID:	98-06615	Analytical Batch ID:	I980901/8260A_AQU/340
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980821-1170
 Client Sample ID: Cove 2
 Lab Sample ID: 98-06615
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	98.94	86 - 115
Dibromofluoromethane	105.92	86 - 118
Toluene-d8	98.24	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980831/3015/171
SDG #:	980821-1170	Prep. Analyst:	LESHINSKYA
Client Sample ID:	Cove 2	Analytical Batch ID:	I980831/6010A_AQU/139
Lab Sample ID:	98-06615	Analyst:	LESHINSKYA
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	57	
Selenium	10	<10	
Silver	5.0	5.7	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
SDG #: 980821-1170
Client Sample ID: CDM 2
Lab Sample ID: 98-06616
Matrix: AQUEOUS
Units: ug/L
Dilution Factor: 1

Preparation Batch ID: P980901/5030/489
Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980901/8260A_AQU/340
Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	2.1	
tert-Butylbenzene	1.0	1.5	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	2.3	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	2.2	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 2	Analytical Batch ID:	I980901/8260A_AQU/340
Lab Sample ID:	98-06616	Analyst:	MITCHELLMR
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	95.60	86 - 115
Dibromofluoromethane	105.96	86 - 118
Toluene-d8	96.98	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980831/3015/171
SDG #:	980821-1170	Prep. Analyst:	LESHINSKYA
Client Sample ID:	CDM 2		
Lab Sample ID:	98-06616	Analytical Batch ID:	I980831/6010A_AQU/139
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	1100	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	140	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980901/5030/489
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	CDM 2A		
Lab Sample ID:	98-06617	Analytical Batch ID:	I980901/8260A_AQU/340
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
2-Butanone	20	<20	
n-Butylbenzene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
2-Chlorotoluene	1.0	<1.0	
4-Chlorotoluene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
2-Hexanone	20	<20	
Isopropylbenzene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
Styrene	1.0	<1.0	
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/01/98

8260A_AQUEOUS ANALYSIS REPORT

Method #: EPA 8260A
 SDG #: 980821-1170
 Client Sample ID: CDM 2A
 Lab Sample ID: 98-06617
 Matrix: AQUEOUS
 Units: ug/L
 Dilution Factor: 1

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifiers
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
o-Xylene	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
Acetone	20	<20	
Isopropylmethylbenzene	1.0	<1.0	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	105.84	86 - 115
Dibromofluoromethane	113.28	86 - 118
Toluene-d8	100.98	88 - 110

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

6010A_AQUEOUS ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980831/3015/171
SDG #:	980821-1170	Prep. Analyst:	LESHINSKYA
Client Sample ID:	CDM 2A	Analytical Batch ID:	I980831/6010A_AQU/139
Lab Sample ID:	98-06617	Analyst:	LESHINSKYA
Matrix:	AQUEOUS		
Units:	ug/L		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	5.0	<5.0	
Barium	5.0	7.6	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	250	
Lead	5.0	<5.0	
Manganese	5.0	220	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/01/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1170

Preparation Batch: P980826/7470A_PRE/93

Prep. Analyst: LESHINSKYA

Component Name: Mercury

EPA Method #: EPA 7470A

Matrix: AQUEOUS

Analytical Batch: I980826/7470A_AQU/76

Analyst: LESHINSKYA

Units: ug/L

Reviewed By - Date: OCCHIALINI JF - 8/28/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	0.20	<0.20	1	
Cove 1	98-06614	0.20	<0.20	1	
Cove 2	98-06615	0.20	<0.20	1	
CDM 2	98-06616	0.20	<0.20	1	
CDM 2A	98-06617	0.20	<0.20	1	

Preparation Batch: P980828/9012_AQ_P/29

Prep. Analyst: NGUYENMH

Component Name: Cyanide, Total

EPA Method #: EPA 9012

Matrix: AQUEOUS

Analytical Batch: I980831/9012_AQUE/29

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: GOTTSALLDL - 8/31/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	0.015	0.029	1	
Cove 1	98-06614	0.015	<0.015	1	
Cove 2	98-06615	0.015	<0.015	1	
CDM 2	98-06616	0.015	<0.015	1	
CDM 2A	98-06617	0.015	<0.015	1	

Preparation Batch: P980901/7471A_PRE/68

Prep. Analyst: LESHINSKYA

Component Name: Mercury

EPA Method #: EPA 7471A

Matrix: SOIL

Analytical Batch: I980901/7471A_SOI/67

Analyst: LESHINSKYA

Units: mg/Kg dry

Reviewed By - Date: GOTTSALLDL - 9/1/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06609	0.65	1.0	1	
Swale 1	98-06610	0.38	<0.38	1	
Cove 1	98-06611	0.55	<0.55	1	
Cove 2	98-06612	0.48	<0.48	1	

Preparation Batch: P980904/9071A/52

Prep. Analyst: BUIT

Component Name: TPH

EPA Method #: EPA 418.1

Matrix: SOIL

Analytical Batch: I980904/418.1_SOI/50

Analyst: BUIT

Units: mg/Kg dry

Reviewed By - Date: GOTTSALLDL - 9/4/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06609	55	2800	1	
Swale 1	98-06610	32	490	1	
Cove 1	98-06611	540	5100	10	
Cove 2	98-06612	39	670	1	

Component Name: Nitrate

EPA Method #: EPA 353.2

Matrix: AQUEOUS

Analytical Batch: I980825/353.2_AQU/81

Analyst: NGUYENMH

Units: mg/L

Reviewed By - Date: OCCHIALINI JF - 8/28/98

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	0.050	<0.050	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1170

Component Name:	Nitrate	EPA Method #:	EPA 353.2	Matrix:	AQUEOUS
Analytical Batch:	I980825/353.2_AQU/81	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	OCCHIALINI JF - 8/28/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-06614	0.050	0.46	1	
Cove 2	98-06615	0.050	0.055	1	
CDM 2	98-06616	0.050	<0.050	1	
CDM 2A	98-06617	0.050	<0.050	1	

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980826/8000_AQUE/37	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 8/31/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-06614	5.0	48	1	
Cove 2	98-06615	5.0	54	1	
CDM 2	98-06616	5.0	120	1	
CDM 2A	98-06617	5.0	33	1	

Component Name:	COD	EPA Method #:	HACH 8000	Matrix:	AQUEOUS
Analytical Batch:	I980826/8000_AQUE/38	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 8/31/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	5.0	230	1	

Component Name:	Total Dissolved Solids	EPA Method #:	SM 2540C	Matrix:	AQUEOUS
Analytical Batch:	I980828/2540C_AQU/48	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 8/31/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	5.0	1000	1	
Cove 1	98-06614	5.0	550	1	
Cove 2	98-06615	5.0	500	1	
CDM 2	98-06616	5.0	700	1	
CDM 2A	98-06617	5.0	700	1	

Component Name:	Alkalinity	EPA Method #:	SM 2320B	Matrix:	AQUEOUS
Analytical Batch:	I980901/2320B_AQU/46	Analyst:	NGUYENMH	Units:	mg/L CaCO3
Reviewed By - Date:	GOTTSHALLDL - 9/1/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	5.0	510	1	
Cove 1	98-06614	5.0	390	1	
Cove 2	98-06615	5.0	380	1	
CDM 2	98-06616	5.0	640	1	
CDM 2A	98-06617	5.0	63	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1170

Component Name: Sulfate	EPA Method #: EPA 9038	Matrix: AQUEOUS
Analytical Batch: I980901/9038_AQUE/19	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 9/1/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	10	140	1	
Cove 1	98-06614	10	<10	1	
Cove 2	98-06615	10	<10	1	
CDM 2	98-06616	10	<10	1	
CDM 2A	98-06617	10	<10	1	

Component Name: Chloride	EPA Method #: EPA 9251	Matrix: AQUEOUS
Analytical Batch: I980901/9251_AQUE/20	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 9/1/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	10	230	10	
Cove 1	98-06614	10	110	10	
Cove 2	98-06615	1.0	64	1	
CDM 2	98-06616	1.0	58	1	
CDM 2A	98-06617	1.0	3.8	1	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

% Solids Results

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609		Percent Solids	44.6	%	
Swale 1	98-06610		Percent Solids	77.0	%	
Cove 1	98-06611		Percent Solids	45.7	%	
Cove 2	98-06612		Percent Solids	63.5	%	

Preparation Batch ID: P980826/7470A_PRE/93

Preparation ID: 7470A_PREP

EPA Method #: EPA 7470A

Batch Approved By: OCCHIALINI

Batch Approved On: 8/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Cove 1	98-06614	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Cove 2	98-06615	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 2	98-06616	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		DUPLICATE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		MATRIX_SPIKE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 2A	98-06617	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

Preparation Batch ID: P980828/9012_AQ_P/29

Preparation ID: 9012_AQ_Prep

EPA Method #: EPA 9012

Batch Approved By: GOTTSALLDL

Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 1	98-06614	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 2	98-06615	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 2	98-06616	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 2A	98-06617	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980831/3015/171

Preparation ID: 3015

EPA Method #: 3015

Batch Approved By: GOTTSALLDL

Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 1	98-06614	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-06615	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 2	98-06616	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

Preparation Batch ID: P980831/3015/171
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2A	98-06617	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980901/5030/489
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-06614	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
Cove 2	98-06615	SAMPLE	Surrogate Volume	0.010	ml	
			Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 2	98-06616	SAMPLE	MATRIX_SPIKE			
			Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 2A	98-06617	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980901/7471A_PRE/68
 Preparation ID: 7471A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #:
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.52	g	
Swale 1	98-06610	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.51	g	
Cove 1	98-06611	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.60	g	
Cove 2	98-06612	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.49	g	

Preparation Batch ID: P980903/3051/133
 Preparation ID: 3051
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 3051
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	500	mL	
			Initial Weight	0.477	g	
Swale 1	98-06610	SAMPLE	Final Volume	500	mL	
			Initial Weight	0.519	g	
		DUPLICATE	Final Volume	500	mL	
			Initial Weight	0.500	g	
		MATRIX_SPIKE	Final Volume	500	mL	
			Initial Weight	0.522	g	
Cove 1	98-06611	SAMPLE	Final Volume	500	mL	
			Initial Weight	0.500	g	
Cove 2	98-06612	SAMPLE	Final Volume	500	mL	
			Final Volume	500	mL	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

Preparation Batch ID: P980903/3051/133
 Preparation ID: 3051
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 3051
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
			Initial Weight	0.644	g	

Preparation Batch ID: P980903/5035_SOIL/156
 Preparation ID: 5035_SOIL_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5035
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Swale 1	98-06610	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	
Cove 1	98-06611	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	
Cove 2	98-06612	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980904/5030/495
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	12.5	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980904/5035_SOIL/157
 Preparation ID: 5035_SOIL_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5035
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	5.00	g	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Weight	5.00	g	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980904/9071A/52
 Preparation ID: 9071A
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9071A
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.5	g	
Swale 1	98-06610	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.7	g	
Cove 1	98-06611	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.5	g	
Cove 2	98-06612	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.4	g	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

Preparation Batch ID: P980908/3550_8270/82
 Preparation ID: 3550_8270B
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 3550
 Batch Approved On: 9/8/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.4	g	
			Surrogate Volume	1.0	mL	
Swale 1	98-06610	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.1	g	
			Surrogate Volume	1.0	mL	
Cove 1	98-06611	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.3	g	
			Surrogate Volume	1.0	mL	
		DUPLICATE	Final Volume	5.00	mL	
			Initial Weight	30.4	g	
			Surrogate Volume	1.0	mL	
Cove 2	98-06612	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.8	g	
			Surrogate Volume	1.0	mL	
			Surrogate Volume	1.0	mL	

Preparation Batch ID: P980910/3550_8081/57
 Preparation ID: 3550_8081
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 3550
 Batch Approved On: 9/10/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.6	g	
			Surrogate Volume	1.00	mL	
		DUPLICATE	Final Volume	10.0	mL	
			Initial Weight	30.3	g	
			Surrogate Volume	1.00	mL	
Swale 1	98-06610	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.2	g	
			Surrogate Volume	1.00	mL	
		MATRIX_SPIKE	Final Volume	10.0	mL	
			Initial Weight	30.3	g	
			Surrogate Volume	1.00	mL	
Cove 1	98-06611	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.1	g	
			Surrogate Volume	1.00	mL	
Cove 2	98-06612	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.0	g	
			Surrogate Volume	1.00	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS
 Analysis Desc: Total Alkalinity

Required Preparation Holdtime: None
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/28/98
Cove 1	98-06614	08/20/98	08/21/98		08/28/98
Cove 2	98-06615	08/20/98	08/21/98		08/28/98
CDM 2	98-06616	08/20/98	08/21/98		08/28/98
CDM 2A	98-06617	08/20/98	08/21/98		08/28/98

Analysis: 2540C_AQUEOUS
 Analysis Desc: Total Dissolved Solids (TDS)

Required Preparation Holdtime: None
 Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/25/98
Cove 1	98-06614	08/20/98	08/21/98		08/25/98
Cove 2	98-06615	08/20/98	08/21/98		08/25/98
CDM 2	98-06616	08/20/98	08/21/98		08/25/98
CDM 2A	98-06617	08/20/98	08/21/98		08/25/98

Analysis: 353.2_AQUEOUS
 Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Preparation Holdtime: None
 Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/21/98
Cove 1	98-06614	08/20/98	08/21/98		08/21/98
Cove 2	98-06615	08/20/98	08/21/98		08/21/98
CDM 2	98-06616	08/20/98	08/21/98		08/21/98
CDM 2A	98-06617	08/20/98	08/21/98		08/21/98

Analysis: 418.1_SOIL
 Analysis Desc: Total Petroleum Hydrocarbons by IR

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/02/98	09/04/98
Swale 1	98-06610	08/20/98	08/21/98	09/02/98	09/04/98
Cove 1	98-06611	08/20/98	08/21/98	09/02/98	09/04/98
Cove 2	98-06612	08/20/98	08/21/98	09/02/98	09/04/98

Analysis: 6010A_AQUEOUS
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	08/27/98	08/28/98
Cove 1	98-06614	08/20/98	08/21/98	08/27/98	08/28/98
Cove 2	98-06615	08/20/98	08/21/98	08/27/98	08/28/98
CDM 2	98-06616	08/20/98	08/21/98	08/27/98	08/28/98
CDM 2A	98-06617	08/20/98	08/21/98	08/27/98	08/28/98

HOLDTIME SUMMARY

Analysis: 6010A_SOIL
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/01/98	09/02/98
Swale 1	98-06610	08/20/98	08/21/98	09/01/98	09/02/98
Cove 1	98-06611	08/20/98	08/21/98	09/01/98	09/02/98
Cove 2	98-06612	08/20/98	08/21/98	09/01/98	09/02/98

Analysis: 7470A_AQUEOUS
 Analysis Desc: Mercury in Water

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	08/26/98	08/26/98
Cove 1	98-06614	08/20/98	08/21/98	08/26/98	08/26/98
Cove 2	98-06615	08/20/98	08/21/98	08/26/98	08/26/98
CDM 2	98-06616	08/20/98	08/21/98	08/26/98	08/26/98
CDM 2A	98-06617	08/20/98	08/21/98	08/26/98	08/26/98

Analysis: 7471A_SOIL
 Analysis Desc: Mercury in Soil/Sediment/Sludge

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	08/28/98	08/28/98
Swale 1	98-06610	08/20/98	08/21/98	08/28/98	08/28/98
Cove 1	98-06611	08/20/98	08/21/98	08/28/98	08/28/98
Cove 2	98-06612	08/20/98	08/21/98	08/28/98	08/28/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/25/98
Cove 1	98-06614	08/20/98	08/21/98		08/25/98
Cove 2	98-06615	08/20/98	08/21/98		08/25/98
CDM 2	98-06616	08/20/98	08/21/98		08/25/98
CDM 2A	98-06617	08/20/98	08/21/98		08/25/98

Analysis: 8081_SOIL
 Analysis Desc: Pesticides/PCBs

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 40 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/03/98	09/04/98
Swale 1	98-06610	08/20/98	08/21/98	09/03/98	09/04/98
Cove 1	98-06611	08/20/98	08/21/98	09/03/98	09/04/98
Cove 2	98-06612	08/20/98	08/21/98	09/03/98	09/05/98

HOLDTIME SUMMARY

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	09/02/98	09/02/98
Cove 1	98-06614	08/20/98	08/21/98	08/31/98	08/31/98
Cove 2	98-06615	08/20/98	08/21/98	08/31/98	08/31/98
CDM 2	98-06616	08/20/98	08/21/98	08/31/98	08/31/98
CDM 2A	98-06617	08/20/98	08/21/98	08/31/98	08/31/98

Analysis: 8260A_SOIL
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/03/98	09/03/98
Swale 1	98-06610	08/20/98	08/21/98	09/02/98	09/02/98
Cove 1	98-06611	08/20/98	08/21/98	09/02/98	09/02/98
Cove 2	98-06612	08/20/98	08/21/98	09/02/98	09/02/98

Analysis: 8270B_SOIL
 Analysis Desc: Semivolatile analysis in soils

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 40 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/03/98	09/04/98
Swale 1	98-06610	08/20/98	08/21/98	09/03/98	09/04/98
Cove 1	98-06611	08/20/98	08/21/98	09/03/98	09/04/98
Cove 2	98-06612	08/20/98	08/21/98	09/03/98	09/05/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	08/26/98	08/26/98
Cove 1	98-06614	08/20/98	08/21/98	08/26/98	08/26/98
Cove 2	98-06615	08/20/98	08/21/98	08/26/98	08/26/98
CDM 2	98-06616	08/20/98	08/21/98	08/26/98	08/26/98
CDM 2A	98-06617	08/20/98	08/21/98	08/26/98	08/26/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		09/01/98
Cove 1	98-06614	08/20/98	08/21/98		09/01/98
Cove 2	98-06615	08/20/98	08/21/98		09/01/98
CDM 2	98-06616	08/20/98	08/21/98		09/01/98
CDM 2A	98-06617	08/20/98	08/21/98		09/01/98

HOLDTIME SUMMARY

Analysis: 9251_AQUEOUS
Analysis Desc: Chloride

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/31/98
Cove 1	98-06614	08/20/98	08/21/98		08/31/98
Cove 2	98-06615	08/20/98	08/21/98		08/31/98
CDM 2	98-06616	08/20/98	08/21/98		08/31/98
CDM 2A	98-06617	08/20/98	08/21/98		08/31/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05304 Prep Analyst:
EPA Number: EPA 353.2 Analytical Batch ID: I980825/353.2_AQU/81
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: OCCHIALINIUF Batch Approved Date: 8/28/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05306 Prep Analyst:
EPA Number: EPA 353.2 Analytical Batch ID: I980825/353.2_AQU/81
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: OCCHIALINIUF Batch Approved Date: 8/28/98

8000_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05319 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980826/8000_AQUE/37
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05326 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980826/8000_AQUE/38
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

7470A_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980826/7470A_PRE/93
Lab Sample ID:	B98-05349	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 7470A	Analytical Batch ID:	I980826/7470A_AQU/76
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Mercury	0.20	<0.20	

Batch Approved By: OCCHIALINI JF Batch Approved Date: 8/28/98

2540C_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	B98-05390	Prep Analyst:	
EPA Number:	SM 2540C	Analytical Batch ID:	I980828/2540C_AQU/48
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	B98-05406	Prep Analyst:	NGUYENMH
EPA Number:	EPA 9012	Analytical Batch ID:	I980831/9012_AQUE/29
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	B98-05408	Prep Analyst:	NGUYENMH
EPA Number:	EPA 9012	Analytical Batch ID:	I980831/9012_AQUE/29
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05436
 EPA Number: EPA 6010A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980831/3015/171
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980831/6010A_AQU/139
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

7471A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05449
 EPA Number: EPA 7471A
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980901/7471A_PRE/68
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980901/7471A_SOI/67
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Mercury	0.25	<0.25	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05452
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	5.0	<5.0	
1,1,1-Trichloroethane	5.0	<5.0	
1,1,2,2-Tetrachloroethane	5.0	<5.0	
1,1,2-Trichloroethane	5.0	<5.0	
1,1-Dichloroethane	5.0	<5.0	
1,1-Dichloroethene	5.0	<5.0	
1,2,3-Trichloropropane	15	<15	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	5.0	<5.0	
1,2-Dichlorobenzene	5.0	<5.0	
1,2-Dichloroethane	5.0	<5.0	
1,2-Dichloropropane	5.0	<5.0	
1,4-Dichlorobenzene	5.0	<5.0	
2-Butanone	100	<100	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05452
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
2-Hexanone	50	<50	
4-Methyl-2-pentanone	100	<100	
Acetone	100	<100	
Acrylonitrile	200	<200	
Benzene	5.0	<5.0	
Bromochloromethane	5.0	<5.0	
Bromodichloromethane	5.0	<5.0	
Bromoform	5.0	<5.0	
Bromomethane	10	<10	
Carbon disulfide	100	<100	
Carbon tetrachloride	10	<10	
Chlorobenzene	5.0	<5.0	
Chloroethane	10	<10	
Chloroform	5.0	<5.0	
Chloromethane	10	<10	
Dibromochloromethane	5.0	<5.0	
Dibromomethane	10	<10	
Dichlorodifluoromethane	5.0	<5.0	
Ethylbenzene	5.0	<5.0	
Iodomethane	10	<10	
Methylene chloride	10	<10	
Styrene	10	<10	
Tetrachloroethene	5.0	<5.0	
Toluene	5.0	<5.0	
Trichloroethene	5.0	<5.0	
Trichlorofluoromethane	5.0	<5.0	
Vinyl acetate	50	<50	
Vinyl chloride	10	<10	
cis-1,2-Dichloroethene	5.0	<5.0	
cis-1,3-Dichloropropene	10	<10	
m- and p-Xylenes	5.0	<5.0	
o-Xylene	5.0	<5.0	
trans-1,2-Dichloroethene	5.0	<5.0	
trans-1,3-Dichloropropene	10	<10	
trans-1,4-Dichloro-2-butene	100	<100	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05462 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980901/9251_AQUE/20
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05464 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980901/9251_AQUE/20
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05473 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980901/9038_AQUE/19
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05477 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980901/9038_AQUE/19
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

2320B_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
 Lab Sample ID: B98-05483 Prep Analyst:
 EPA Number: SM 2320B Analytical Batch ID: I980901/2320B_AQU/46
 Units: mg/L CaCO3 Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

6010A_SOIL BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980903/3051/133
 Lab Sample ID: B98-05545 Prep Analyst: LESHINSKYA
 EPA Number: EPA 6010A Analytical Batch ID: I980903/6010A_SOI/133
 Units: mg/Kg dry Analysis Analyst: LESHINSKYA
 Matrix: SOIL

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/9/98

8260A_SOIL BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980903/5035_SOIL/156
 Lab Sample ID: B98-05547 Prep Analyst: MITCHELLMR
 EPA Number: EPA 8260A Analytical Batch ID: I980903/8260A_SOI/156
 Units: ug/Kg dry Analysis Analyst: MITCHELLMR
 Matrix: SOIL

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	2.5	<2.5	
1,1,1-Trichloroethane	2.5	<2.5	
1,1,2,2-Tetrachloroethane	2.5	<2.5	
1,1,2-Trichloroethane	2.5	<2.5	
1,1-Dichloroethane	2.5	<2.5	
1,1-Dichloroethene	2.5	<2.5	

8260A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05547
 EPA Number: EPA 8260A
 Units: ug/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/5035_SOIL/156
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980903/8260A_SOI/156
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1-Dichloropropene	2.5	<2.5	
1,2,3-Trichlorobenzene	2.5	<2.5	
1,2,3-Trichloropropane	2.5	<2.5	
1,2,4-Trichlorobenzene	2.5	<2.5	
1,2,4-Trimethylbenzene	2.5	<2.5	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	2.5	<2.5	
1,2-Dichlorobenzene	2.5	<2.5	
1,2-Dichloroethane	2.5	<2.5	
1,2-Dichloropropane	2.5	<2.5	
1,3,5-Trimethylbenzene	2.5	<2.5	
1,3-Dichlorobenzene	2.5	<2.5	
1,3-Dichloropropane	2.5	<2.5	
1,4-Dichlorobenzene	2.5	<2.5	
2,2-Dichloropropane	2.5	<2.5	
2-Butanone	50	<50	
2-Chlorotoluene	2.5	<2.5	
2-Hexanone	50	<50	
4-Chlorotoluene	2.5	<2.5	
4-Methyl-2-pentanone	50	<50	
Acetone	50	<50	
Benzene	2.5	<2.5	
Bromobenzene	2.5	<2.5	
Bromochloromethane	2.5	<2.5	
Bromodichloromethane	2.5	<2.5	
Bromoform	2.5	<2.5	
Bromomethane	12	<12	
Carbon tetrachloride	2.5	<2.5	
Chlorobenzene	2.5	<2.5	
Chloroethane	12	<12	
Chloroform	12	<12	
Chloromethane	12	<12	
Dibromochloromethane	2.5	<2.5	
Dibromomethane	2.5	<2.5	
Dichlorodifluoromethane	2.5	<2.5	
Ethylbenzene	2.5	<2.5	
Hexachlorobutadiene	2.5	<2.5	
Isopropylbenzene	2.5	<2.5	
Isopropylmethylbenzene	2.5	<2.5	
Methyl tert-butyl ether	25	<25	
Methylene chloride	13	<13	
Naphthalene	2.5	<2.5	

8260A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980903/5035_SOIL/156
Lab Sample ID:	B98-05547	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A		
Units:	ug/Kg dry	Analytical Batch ID:	I980903/8260A_SOI/156
Matrix:	SOIL	Analysis Analyst:	MITCHELLMR

Component Name	MRL	Result	Qualifier
Styrene	2.5	<2.5	
Tetrachloroethene	2.5	<2.5	
Toluene	2.5	<2.5	
Trichloroethene	2.5	<2.5	
Trichlorofluoromethane	2.5	<2.5	
Vinyl chloride	2.5	<2.5	
cis-1,2-Dichloroethene	2.5	<2.5	
cis-1,3-Dichloropropene	2.5	<2.5	
m- and p-Xylenes	2.5	<2.5	
n-Butylbenzene	2.5	<2.5	
n-Propylbenzene	2.5	<2.5	
o-Xylene	2.5	<2.5	
sec-Butylbenzene	2.5	<2.5	
tert-Butylbenzene	2.5	<2.5	
trans-1,2-Dichloroethene	2.5	<2.5	
trans-1,3-Dichloropropene	2.5	<2.5	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5030/495
Lab Sample ID:	B98-05557	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A		
Units:	ug/L	Analytical Batch ID:	I980904/8260A_AQU/342
Matrix:	AQUEOUS	Analysis Analyst:	MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05557
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980904/5030/495
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980904/8260A_AQU/342
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5030/495
Lab Sample ID:	B98-05557	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980904/8260A_AQU/342
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By:	GOTTSHALLDL	Batch Approved Date:	9/4/98
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8260A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5035_SOIL/157
Lab Sample ID:	B98-05572	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980904/8260A_SOI/157
Units:	ug/Kg dry	Analysis Analyst:	MITCHELLMR
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	2.5	<2.5	
1,1,1-Trichloroethane	2.5	<2.5	
1,1,2,2-Tetrachloroethane	2.5	<2.5	
1,1,2-Trichloroethane	2.5	<2.5	
1,1-Dichloroethane	2.5	<2.5	
1,1-Dichloroethene	2.5	<2.5	
1,1-Dichloropropene	2.5	<2.5	
1,2,3-Trichlorobenzene	2.5	<2.5	
1,2,3-Trichloropropane	2.5	<2.5	
1,2,4-Trichlorobenzene	2.5	<2.5	
1,2,4-Trimethylbenzene	2.5	<2.5	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	2.5	<2.5	
1,2-Dichlorobenzene	2.5	<2.5	
1,2-Dichloroethane	2.5	<2.5	
1,2-Dichloropropane	2.5	<2.5	
1,3,5-Trimethylbenzene	2.5	<2.5	
1,3-Dichlorobenzene	2.5	<2.5	
1,3-Dichloropropane	2.5	<2.5	
1,4-Dichlorobenzene	2.5	<2.5	
2,2-Dichloropropane	2.5	<2.5	
2-Butanone	50	<50	

8260A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: 898-05572
 EPA Number: EPA 8260A
 Units: ug/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980904/5035_SOIL/157
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980904/8260A_SOI/157
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
2-Chlorotoluene	2.5	<2.5	
2-Hexanone	50	<50	
4-Chlorotoluene	2.5	<2.5	
4-Methyl-2-pentanone	50	<50	
Acetone	50	<50	
Benzene	2.5	<2.5	
Bromobenzene	2.5	<2.5	
Bromochloromethane	2.5	<2.5	
Bromodichloromethane	2.5	<2.5	
Bromoform	2.5	<2.5	
Bromomethane	12	<12	
Carbon tetrachloride	2.5	<2.5	
Chlorobenzene	2.5	<2.5	
Chloroethane	12	<12	
Chloroform	12	<12	
Chloromethane	12	<12	
Dibromochloromethane	2.5	<2.5	
Dibromomethane	2.5	<2.5	
Dichlorodifluoromethane	2.5	<2.5	
Ethylbenzene	2.5	<2.5	
Hexachlorobutadiene	2.5	<2.5	
Isopropylbenzene	2.5	<2.5	
Isopropylmethylbenzene	2.5	<2.5	
Methyl tert-butyl ether	25	<25	
Methylene chloride	13	<13	
Naphthalene	2.5	<2.5	
Styrene	2.5	<2.5	
Tetrachloroethene	2.5	<2.5	
Toluene	2.5	<2.5	
Trichloroethene	2.5	<2.5	
Trichlorofluoromethane	2.5	<2.5	
Vinyl chloride	2.5	<2.5	
cis-1,2-Dichloroethene	2.5	<2.5	
cis-1,3-Dichloropropene	2.5	<2.5	
m- and p-Xylenes	2.5	<2.5	
n-Butylbenzene	2.5	<2.5	
n-Propylbenzene	2.5	<2.5	
o-Xylene	2.5	<2.5	
sec-Butylbenzene	2.5	<2.5	
tert-Butylbenzene	2.5	<2.5	
trans-1,2-Dichloroethene	2.5	<2.5	

8260A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5035_SOIL/157
Lab Sample ID:	B98-05572	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980904/8260A_SOI/157
Units:	ug/Kg dry	Analysis Analyst:	MITCHELLMR
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
trans-1,3-Dichloropropene	2.5	<2.5	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

418.1_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/9071A/52
Lab Sample ID:	B98-05582	Prep Analyst:	BUIT
EPA Number:	EPA 418.1	Analytical Batch ID:	I980904/418.1_SOI/50
Units:	mg/Kg dry	Analysis Analyst:	BUIT
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
TPH	25	<25	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

8270B_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980908/3550_8270/82
Lab Sample ID:	B98-05595	Prep Analyst:	CROWELLS
EPA Number:	EPA 8270B	Analytical Batch ID:	I980908/8270B_SOI/114
Units:	ug/Kg dry	Analysis Analyst:	CROWELLS
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
2-Methylnaphthalene	170	<170	
Acenaphthene	170	<170	
Acenaphthylene	170	<170	
Anthracene	170	<170	
Benz(a)anthracene	170	<170	
Benzo(a)pyrene	170	<170	
Benzo(b)fluoranthene	170	<170	
Benzo(g,h,i)perylene	170	<170	
Benzo(k)fluoranthene	170	<170	
Chrysene	170	<170	
Dibenz(a,h)anthracene	170	<170	
Fluoranthene	170	<170	
Fluorene	170	<170	
Indeno(1,2,3-cd)pyrene	170	<170	
Naphthalene	170	<170	
Phenanthrene	170	<170	

8270B_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980908/3550_8270/82
Lab Sample ID:	B98-05595	Prep Analyst:	CROWELLSD
EPA Number:	EPA 8270B	Analytical Batch ID:	I980908/8270B_SOI/114
Units:	ug/Kg dry	Analysis Analyst:	CROWELLSD
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
Pyrene	170	<170	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/8/98

8081_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980910/3550_8081/57
Lab Sample ID:	B98-05638	Prep Analyst:	CROWELLSD
EPA Number:	EPA 8081	Analytical Batch ID:	I980910/8081_SOIL/56
Units:	mg/Kg dry	Analysis Analyst:	CROWELLSD
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
4,4'-DDD	0.0033	<0.0033	
4,4'-DDE	0.0033	<0.0033	
4,4'-DDT	0.0033	<0.0033	
Aldrin	0.0033	<0.0033	
Aroclor 1221	0.0333	<0.0333	
Aroclor 1232	0.0333	<0.0333	
Aroclor 1242/1016	0.0333	<0.0333	
Aroclor 1248	0.0333	<0.0333	
Aroclor 1254	0.0333	<0.0333	
Aroclor 1260	0.0333	<0.0333	
Chlordane (Technical)	0.0167	<0.0167	
Dieldrin	0.0033	<0.0033	
Endosulfan I	0.0033	<0.0033	
Endosulfan II	0.0033	<0.0033	
Endosulfan sulfate	0.0033	<0.0033	
Endrin	0.0033	<0.0033	
Endrin aldehyde	0.0033	<0.0033	
Heptachlor	0.0033	<0.0033	
Heptachlor epoxide	0.0033	<0.0033	
Methoxychlor	0.0067	<0.0067	
Toxaphene	0.167	<0.167	
alpha-BHC	0.0033	<0.0033	
beta-BHC	0.0033	<0.0033	
delta-BHC	0.0033	<0.0033	
gamma-BHC	0.0033	<0.0033	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/10/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05305	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	1980825/353.2_AQU/81
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	1.4	110.3	80 - 120	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05307	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	1980825/353.2_AQU/81
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	1.3	99.2	80 - 120	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05320	Prep. Analyst:	
Units:	mg/L	Analytical Batch ID:	1980826/8000_AQUE/37
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	74	95.2	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05327	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	1980826/8000_AQUE/38
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	310	100.1	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05391	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	1980828/2540C_AQU/48
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	730	97.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	QCS98-05407	Prep. Analyst:	NGUYENMH
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	1980831/9012_AQUE/29
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.21	103.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	QCS98-05409	Prep. Analyst:	NGUYENMH
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980831/9012_AQUE/29
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

7471A_SOIL QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980901/7471A_PRE/68
Lab Sample ID:	QCS98-05450	Prep. Analyst:	LESHINSKYA
Units:	mg/Kg dry		
Matrix:	SOIL	Analytical Batch ID:	I980901/7471A_SOI/67
		Analysis Analyst:	LESHINSKYA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Mercury	0.75	1.1	94.4	66.3 - 131.9	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05463	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980901/9251_AQUE/20
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.0	11	89.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05466
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.0	11	91.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05474
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/9038_AQUE/19
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	130	104.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05478
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/9038_AQUE/19
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	120	103.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05484
 Units: mg/L CaCO3
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/2320B_AQU/46
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	120	101.7	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 9/1/98

6010A_SOIL QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05546
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980903/6010A_SOI/133
 Analysis Analyst: LESHINSKYA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Arsenic	12	140	89.7	74.1 - 126	
Barium	12	140	81.1	76.9 - 123	
Cadmium	2.4	100	77.5	77.2 - 122.7	
Chromium	12	48	84.1	77 - 122.9	
Copper	12	52	86.7	79.1 - 121	
Iron	60	8000	91.7	60.8 - 139	
Lead	12	66	77.3	73.4 - 127	
Manganese	12	230	80.9	80.7 - 119	
Selenium	24	120	90.5	71.4 - 128	
Silver	12	40	71.0	73.8 - 126	
Zinc	48	860	87.2	73.9 - 126.4	

Batch Approved By: GOTTSALLDL Batch Approved Date: 9/9/98

7470A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980826/7470A_PRE/93
Lab Sample ID:	LFB98-05350	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 7470A	Analytical Batch ID:	I980826/7470A_AQU/76
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.2	5.00	102.4			80 - 120		

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

SDG #:	980821-1170	Preparation Batch ID:	P980831/3015/171
Lab Sample ID:	LFB98-05437	Prep. Analyst:	LESHINSKYA
EPA Method #:	EPA 6010A	Analytical Batch ID:	I980831/6010A_AQU/139
Matrix:	AQUEOUS	Analyst:	LESHINSKYA
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.0	100.00	93.6			80 - 120		
Barium	5.0	1000.00	93.0			80 - 120		
Cadmium	1.0	50.00	98.3			80 - 120		
Chromium	5.0	100.00	99.2			80 - 120		
Copper	5.0	100.00	90.6			80 - 120		
Iron	25	200.00	91.6			80 - 120		
Lead	5.0	100.00	95.4			80 - 120		
Manganese	5.0	100.00	94.0			80 - 120		
Selenium	10	50.00	111.3			80 - 120		
Silver	5.0	100.00	95.6			80 - 120		
Zinc	20	100.00	100.6			80 - 120		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

SDG #:	980821-1170	Preparation Batch ID:	P980901/5030/489
Lab Sample ID:	LFB98-05453	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A	Analytical Batch ID:	I980901/8260A_AQU/340
Matrix:	AQUEOUS	Analyst:	MITCHELLMR
Units:	ug/L		

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	104.9	105.3	0.34	61 - 145	0 - 14	
Benzene	1.0	50.00	105.6	104.7	0.86	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	105.3	103.8	1.42	75 - 130	0 - 13	
Toluene	1.0	50.00	106.9	94.3	12.53	76 - 125	0 - 13	

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980901/5030/489
Lab Sample ID:	LFB98-05453	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980901/8260A_AQU/340
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Trichloroethene	1.0	50.00	105.1	102.9	2.14	71 - 120	0 - 14	
Batch Approved By: GOTTSHALLDL						Batch Approved Date: 9/1/98		

SDG #:	980821-1170	Preparation Batch ID:	P980903/5035_SOIL/156
Lab Sample ID:	LFB98-05548	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	SOIL	Analytical Batch ID:	I980903/8260A_SOI/156
Units:	ug/Kg dry	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	2.5	50.00	106.0	105.5	0.47	59 - 172	0 - 22	
Benzene	2.5	50.00	110.3	117.3	6.22	66 - 142	0 - 21	
Chlorobenzene	2.5	50.00	102.9	101.2	1.61	60 - 133	0 - 21	
Toluene	2.5	50.00	105.2	106.6	1.28	59 - 139	0 - 21	
Trichloroethene	2.5	50.00	104.3	104.6	0.27	62 - 137	0 - 24	
Batch Approved By: GOTTSHALLDL						Batch Approved Date: 9/4/98		

SDG #:	980821-1170	Preparation Batch ID:	P980904/5030/495
Lab Sample ID:	LFB98-05558	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980904/8260A_AQU/342
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	106.0	105.5	0.47	61 - 145	0 - 14	
Benzene	1.0	50.00	110.3	117.3	6.22	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	102.9	101.2	1.61	75 - 130	0 - 13	
Toluene	1.0	50.00	105.2	106.6	1.28	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	104.3	104.6	0.27	71 - 120	0 - 14	
Batch Approved By: GOTTSHALLDL						Batch Approved Date: 9/4/98		

8260A_SOIL LFB/LFB DUPLICATE RPD REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5035_SOIL/157
Lab Sample ID:	LFB98-05573	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	SOIL	Analytical Batch ID:	I980904/8260A_SOI/157
Units:	ug/Kg dry	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
1,1-Dichloroethene	2.5	50.00	110.5	105.7	4.39	59 - 172	0 - 22		
Benzene	2.5	50.00	107.3	107.1	0.15	66 - 142	0 - 21		
Chlorobenzene	2.5	50.00	102.8	102.1	0.74	60 - 133	0 - 21		
Toluene	2.5	50.00	102.8	95.1	7.82	59 - 139	0 - 21		
Trichloroethene	2.5	50.00	101.2	101.4	0.22	62 - 137	0 - 24		
Batch Approved By: GOTTSHALLDL		Batch Approved Date: 9/4/98							

SDG #:	980821-1170	Preparation Batch ID:	P980904/9071A/52
Lab Sample ID:	LFB98-05583	Prep. Analyst:	BUIT
EPA Method #:	EPA 418.1		
Matrix:	SOIL	Analytical Batch ID:	I980904/418.1_SOI/50
Units:	mg/Kg dry	Analyst:	BUIT

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
TPH		80.23	118.2			80 - 120			
Batch Approved By: GOTTSHALLDL		Batch Approved Date: 9/4/98							

SDG #:	980821-1170	Preparation Batch ID:	P980908/3550_8270/82
Lab Sample ID:	LFB98-05596	Prep. Analyst:	CROWELLSD
EPA Method #:	EPA 8270B		
Matrix:	SOIL	Analytical Batch ID:	I980908/8270B_SOI/114
Units:	ug/Kg dry	Analyst:	CROWELLSD

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
Acenaphthene		100.00	72.8			31 - 137			
Pyrene		100.00	66.7			35 - 142			
Batch Approved By: GOTTSHALLDL		Batch Approved Date: 9/8/98							

8081_SOIL LFB/LFB DUPLICATE RPD REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980910/3550_8081/57
Lab Sample ID:	LFB98-05639	Prep. Analyst:	CROWELLS D
EPA Method #:	EPA 8081		
Matrix:	SOIL	Analytical Batch ID:	1980910/8081_SOIL/56
Units:	mg/Kg dry	Analyst:	CROWELLS D

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
4,4'-DDT	0.003	100.00	108.7			25 - 160		
Aldrin	0.003	25.00	88.6			42 - 122		
Dieldrin	0.003	100.00	95.7			36 - 146		
Endrin	0.003	100.00	113.9			30 - 147		
Heptachlor	0.003	25.00	90.7			34 - 111		
gamma-BHC	0.003	25.00	91.8			32 - 127		
Aroclor 1260	0.033	5000.00	83.5			8 - 127		
Batch Approved By: GOTTSHALLDL				Batch Approved Date: 9/10/98				

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06357	Analytical Batch ID:	I980831/9012_AQUE/29
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	HACH 8000	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06357	Analytical Batch ID:	I980826/8000_AQUE/37
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	100	110	7.339	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06553	Analytical Batch ID:	I980831/9012_AQUE/29
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 EPA Method #: SM 2540C Prep. Analyst:
 Lab Sample ID: 98-06553 Analytical Batch ID: I980828/2540C_AQU/48
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	140	130	8	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 EPA Method #: EPA 9038 Prep. Analyst:
 Lab Sample ID: 98-06553 Analytical Batch ID: I980901/9038_AQUE/19
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	10	<10	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 EPA Method #: EPA 9251 Prep. Analyst:
 Lab Sample ID: 98-06553 Analytical Batch ID: I980901/9251_AQUE/20
 Units: mg/L Analysis Analyst: NGUYENMH
 Matrix: AQUEOUS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	9.9	9.9	0.202	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-06555	Analytical Batch ID:	I980826/8000_AQUE/37
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	14	13	7.407	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-06559	Analytical Batch ID:	I980825/353.2_AQU/81
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	2.5	32	32	0	0 - 20	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980831/3015/171
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-06579	Analytical Batch ID:	I980831/6010A_AQU/139
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.0	9.8	8.4	15.358	0 - 20	
Barium	5.0	160	160	0.755	0 - 20	
Cadmium	1.0	<1.0	<1.0	N/A	0 - 20	
Chromium	5.0	<5.0	<5.0	N/A	0 - 20	
Copper	5.0	<5.0	<5.0	N/A	0 - 20	
Iron	25	<25	<25	N/A	0 - 20	
Lead	5.0	<5.0	<5.0	N/A	0 - 20	
Manganese	5.0	390	380	0.919	0 - 20	
Selenium	10	<10	<10	N/A	0 - 20	
Silver	5.0	<5.0	<5.0	N/A	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-06579	Analytical Batch ID:	I980825/353.2_AQU/81
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	<0.050	<0.050	N/A	0 - 20	

Batch Approved By: OCCHIALINI JF Batch Approved Date: 8/28/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-06579	Analytical Batch ID:	I980901/2320B_AQU/46
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	180	180	0.271	0 - 20	

Batch Approved By: GOTTSHALL DL Batch Approved Date: 9/1/98

7471A_SOIL DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980901/7471A_PRE/68
EPA Method #:	EPA 7471A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-06605	Analytical Batch ID:	I980901/7471A_SOI/67
Units:	mg/Kg dry	Analysis Analyst:	LESHINSKYA
Matrix:	SOIL		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.32	<0.28	<0.32	N/A	0 - 20	

Batch Approved By: GOTTSHALL DL Batch Approved Date: 9/1/98

8081_SOIL DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980910/3550_8081/57
EPA Method #:	EPA 8081	Prep. Analyst:	CROWELLS D
Lab Sample ID:	98-06609	Analytical Batch ID:	I980910/8081_SOIL/56
Units:	mg/Kg dry	Analysis Analyst:	CROWELLS D
Matrix:	SOIL		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
4,4'-DDD	0.0074	0.0526	0.0567	7.487	0 - 20	
4,4'-DDE	0.0074	0.0229	0.0178	25.124	0 - 20	

8081_SOIL DUPLICATE SAMPLE REPORT

SDG #: 980821-1170
 EPA Method #: EPA 8081
 Lab Sample ID: 98-06609
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980910/3550_8081/57
 Prep. Analyst: CROWELLS
 Analytical Batch ID: I980910/8081_SOIL/56
 Analysis Analyst: CROWELLS

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
4,4'-DDT	0.0074	0.0298	0.0087	109.424	0 - 20	
Aldrin	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Aroclor 1221	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1232	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1242/1016	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1248	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1254	0.0739	0.299	0.258	14.645	0 - 20	
Aroclor 1260	0.0739	0.114	0.187	48.836	0 - 20	
Chlordane (Technical)	0.0371	0.264	0.246	7.326	0 - 20	
Dieldrin	0.0074	0.0275	0.0225	19.658	0 - 20	
Endosulfan I	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endosulfan II	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endosulfan sulfate	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endrin	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endrin aldehyde	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Heptachlor	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Heptachlor epoxide	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Methoxychlor	0.0148	<0.0146	<0.0148	N/A	0 - 20	
Toxaphene	0.370	<0.366	<0.370	N/A	0 - 20	
alpha-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	
beta-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	
delta-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	
gamma-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/10/98

6010A_SOIL DUPLICATE SAMPLE REPORT

SDG #: 980821-1170
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-06610
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980903/6010A_SOI/133
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	6.5	11	7.1	45.911	0 - 20	
Barium	6.5	150	150	0.233	0 - 20	
Cadmium	1.3	11	10	7.829	0 - 20	
Chromium	6.5	73	70	3.948	0 - 20	
Copper	6.5	80	95	17.19	0 - 20	
Iron	32	18000	15000	14.365	0 - 20	
Lead	6.5	570	530	7.446	0 - 20	
Manganese	6.5	230	230	1.141	0 - 20	

6010A_SOIL DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980903/3051/133
EPA Method #:	EPA 6010A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-06610	Analytical Batch ID:	I980903/6010A_SOI/133
Units:	mg/Kg dry	Analysis Analyst:	LESHINSKYA
Matrix:	SOIL		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Selenium	13	<12	<13	N/A	0 - 20	
Silver	6.5	<6.2	<6.5	N/A	0 - 20	
Zinc	26	450	440	3.238	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/9/98

8270B_SOIL DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980908/3550_8270/82
EPA Method #:	EPA 8270B	Prep. Analyst:	CROWELLSD
Lab Sample ID:	98-06611	Analytical Batch ID:	I980908/8270B_SOI/114
Units:	ug/Kg dry	Analysis Analyst:	CROWELLSD
Matrix:	SOIL		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
2-Methylnaphthalene	1800	<1800	<1800	N/A	0 - 35	
Acenaphthene	1800	3000	<1800	N/A	0 - 35	
Acenaphthylene	1800	<1800	<1800	N/A	0 - 35	
Anthracene	1800	9400	<1800	N/A	0 - 35	
Benz(a)anthracene	1800	10070	<1800	N/A	0 - 35	
Benzo(a)pyrene	1800	8100	<1800	N/A	0 - 35	
Benzo(b)fluoranthene	1800	5300	<1800	N/A	0 - 35	
Benzo(g,h,i)perylene	1800	3400	<1800	N/A	0 - 35	
Benzo(k)fluoranthene	1800	6400	<1800	N/A	0 - 35	
Chrysene	1800	10000	<1800	N/A	0 - 35	
Dibenz(a,h)anthracene	1800	<1800	<1800	N/A	0 - 35	
Fluoranthene	1800	23000	<1800	N/A	0 - 35	
Fluorene	1800	3800	<1800	N/A	0 - 35	
Indeno(1,2,3-cd)pyrene	1800	3100	<1800	N/A	0 - 35	
Naphthalene	1800	2000	<1800	N/A	0 - 35	
Phenanthrene	1800	30000	<1800	N/A	0 - 35	
Pyrene	1800	19000	<1800	N/A	0 - 35	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/8/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980826/7470A_PRE/93
EPA Method #:	EPA 7470A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-06616	Analytical Batch ID:	I980826/7470A_AQU/76
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	<0.20	<0.20	N/A	0 - 20	

Batch Approved By: OCCHIALINIJJF Batch Approved Date: 8/28/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-06678	Analytical Batch ID:	I980901/9038_AQUE/19
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	12	12	0.206	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-06678	Analytical Batch ID:	I980901/9251_AQUE/20
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	13	14	4.726	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

7470A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06616
 Matrix: AQUEOUS

Preparation Batch ID: P980826/7470A_PRE/93
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980826/7470A_AQU/76
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Mercury	98			80 - 120		
Batch Approved By:	OCCHIALINI JF			Batch Approved Date:	8/28/98	

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06615
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	108			61 - 145		
Benzene	105			76 - 127		
Chlorobenzene	104			75 - 130		
Toluene	106			76 - 125		
Trichloroethene	106			71 - 120		
Batch Approved By:	GOTTSHALLDL			Batch Approved Date:	9/1/98	

6010A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980903/6010A_SOI/133
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Arsenic	85			75 - 125		
Barium	86			75 - 125		
Cadmium	87			75 - 125		
Chromium	83			75 - 125		
Copper	88			75 - 125		
Iron	975			75 - 125		N
Lead	68			75 - 125		N
Manganese	83			75 - 125		

6010A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980903/6010A_SOI/133
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Selenium	92			75 - 125		
Silver	85			75 - 125		
Zinc	90			75 - 125		

8260A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980903/5035_SOIL/156
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980903/8260A_SOI/156
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	115			59 - 172		
Benzene	113			66 - 142		
Chlorobenzene	105			60 - 133		
Toluene	110			59 - 139		
Trichloroethene	109			62 - 137		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

8260A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06609
 Matrix: SOIL

Preparation Batch ID: P980904/5035_SOIL/157
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980904/8260A_SOI/157
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	116			59 - 172		
Benzene	111			66 - 142		
Chlorobenzene	106			60 - 133		
Toluene	104			59 - 139		
Trichloroethene	102			62 - 137		

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

8081_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980910/3550_8081/57
 Prep. Analyst: CROWELLSD

Analytical Batch ID: I980910/8081_SOIL/56
 Analyst: CROWELLSD

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
4,4'-DDT	125			25 - 160		
Aldrin	98			42 - 122		
Dieldrin	127			36 - 146		
Endrin	141			30 - 147		
Heptachlor	129			34 - 111		
gamma-BHC	90			32 - 127		
Batch Approved By: <u>GOTTSHALLDL</u>				Batch Approved Date: <u>9/10/98</u>		

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Client: Town of Waltham
Project Name: Wood Ave Landfill

Address: Wood Ave

SDG#: 980821-1170

TAT: STD

Phone: 978-371-1170/617-252-8000

Fax #: 617-252-8000

Contact: Cliff Webster/Clissa Brown

Bill to: Paul Tamasi/CDM

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle ID's	VOA				SEMI VOA			MISC			METALS		Lab Acct. #:	
						524.2	824/8240	8260 A	Other	525	A. B.N. ABN	PAH	Other	PEST/PCB	TPH 418.1	PET ID	PP13		RCRA8
Stream 1	8/24/88	1:30	S	2	98-06609	<input checked="" type="checkbox"/>										X		See below	980821-1170
Stream 1		1:30	W	6	98-06613		<input checked="" type="checkbox"/>									X			980821-1170
Swale 1		1:45	S	2	98-06610											X			980821-1170
Cove 1		2:05	S	2	98-06611											X			980821-1170
Cove 1		2:05	W	6	98-06614		<input checked="" type="checkbox"/>									X			980821-1170
Cove 2		2:30	S	2	98-06612		<input checked="" type="checkbox"/>									X			980821-1170
Cove 2		2:30	W	6	98-06615		<input checked="" type="checkbox"/>									X			980821-1170
CDM 2		3:45	W	6	98-06616		<input checked="" type="checkbox"/>									X			980821-1170
CDM 2A		4:30	W	6	98-06617		<input checked="" type="checkbox"/>									X			980821-1170

Chain of Custody

Samples Received:
 • Cooler Temperature: _____ °C
 • Chilled/property preserved? yes no
 • In good condition? yes no
 • Evidence of tampering? yes no

Instructions:
 Fax Results
 State Forms
 SMART Report
 Disk Deliverable
 TICS

Container Type: _____
 Preservative: _____
 Volume: _____

Shipper/Airbill: _____
 Custody Seal: _____

Method of Shipment: Courier Airborne Land Fed-ex UPS Other

NOTE: All samples submitted subject to Standard Terms & Conditions

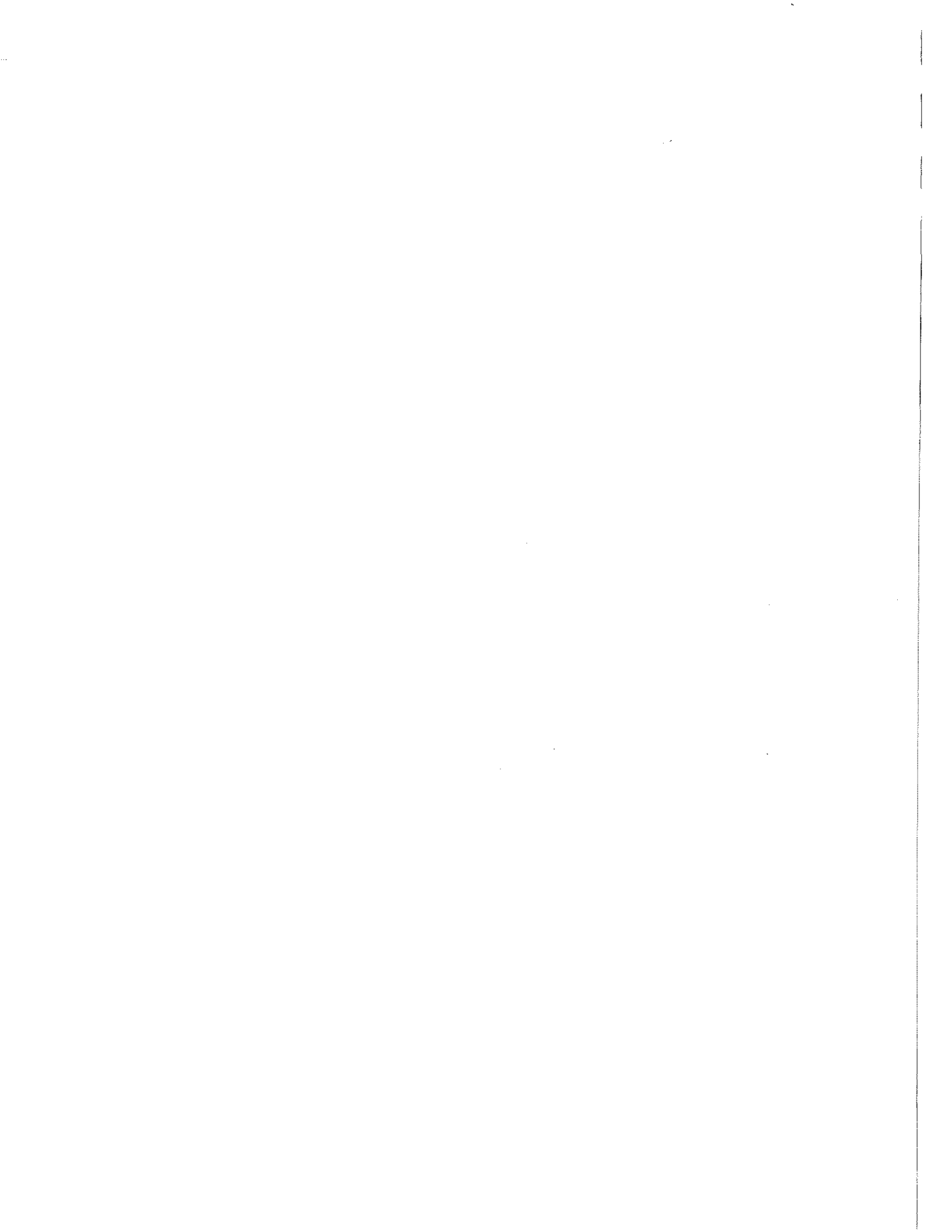
Comments: Please filter metals
 HAC # 8000 (01)
 Sm 2540C TDS
 Sm 2320B Total Alkalinity

EPA 353.2 Nitrate
 EPA 9012 Cyanide
 EPA 9251 Chloride

VEPA 9038 Sulfide
 EPA 7470A Mercury

METALS ADDED FOR
 ALH SOILS PER
 LARRIE WEBSTER (CRB)
 8/24/88

Received by: [Signature] Date: 8/24/88 Time: 11:00 AM
 Received by: [Signature] Date: 8/24/88 Time: 11:00 AM
 Received by: _____ Date: _____ Time: _____



Appendix H
Water Quality Analytical Data, Round 3



Client: Town of Waltham
Project: Waltham Landfill
SDG: 981209-1664
Date: December 23, 1998

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617)-354-4448 - fax (617)-354-0764

Laboratory Report

Client: Town of Waltham

Client Contact: Paul Taurasi

Project: Waltham Landfill

Address: Camp Dresser & McKee
Ten Cambridge Center

Project Narrative

The following report contains the analytical results for samples submitted to CDM Laboratory Services on December 9, 1998. The samples were received into the laboratory in accordance with documented sample acceptance procedures. All sample identification agreed with accompanying Chain of Custody documentation. Please refer to the Sample Description Information sheet for the list of samples included within this report.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples.

Note: Analytical testing was conducted by Alpha Analytical Laboratories under subcontract to CDM. The report is attached.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete and accurate.

LABORATORY MANAGEMENT REVIEW: _____

LABORATORY QA/QC REVIEW: _____

AZ DOH # AZ0553, CO DPHE (RECIPROCITY), CT DPH # 0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES#2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

ALPHA ANALYTICAL LABORATORIES

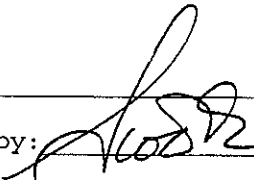
Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Camp Dresser & McKee, Inc. Laboratory Job Number: L9809864
Address: 840 Memorial Drive Invoice Number: 21745
Riverside Technology Center
Cambridge, MA 02139 Date Received: 10-DEC-98
Attn: Paul Taurasi Date Reported: 23-DEC-98
Project Number: 0519-22913-RT.SHMP Delivery Method: Alpha
Site: TOWN OF WALTHAM

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9809864-01	CDM 1	WALTHAM LANDFILL
L9809864-02	CDM 1A	WALTHAM LANDFILL
L9809864-03	CDM DUP	WALTHAM LANDFILL
L9809864-04	CDM 2	WALTHAM LANDFILL
L9809864-05	CDM 2A	WALTHAM LANDFILL

Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-01
 Sample Matrix: CDM 1 WATER
 Condition of Sample: Satisfactory
 Number & Type of Containers: 4-Plastic

Date Collected: 09-DEC-1998
 Date Received : 10-DEC-98
 Date Reported : 23-DEC-98
 Field Prep: Field Filtered

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	
						PREP	ANALYSIS
Alkalinity, Total	120	mg CaCO3/L2.0		30	2320B		14-Dec
Solids, Total Dissolved	190	mg/l	5.0	30	2540C		18-Dec
Cyanide, Total	ND	mg/l	0.005	1	9010B		15-Dec
Chloride	4.3	mg/l	1.0	1	9251		11-Dec
Nitrogen, Nitrate	2.7	mg/l	0.10	30	4500NO3-F		11-Dec
Sulfate	26.	mg/l	10.	1	9038		15-Dec
Chemical Oxygen Demand	130	mg/l	20.	30	5220D		18-Dec
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec
Barium, Dissolved	0.04	mg/l	0.01	1	6010B		22-Dec
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec
Iron, Dissolved	0.26	mg/l	0.05	1	6010B		22-Dec
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec
Manganese, Dissolved	1.2	mg/l	0.01	1	6010B		22-Dec
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec
Selenium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-02 Date Collected: 09-DEC-1998
 CDM 1A Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 23-DEC-98
 Condition of Sample: Satisfactory Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Alkalinity, Total	120	mg CaCO ₃ /L2.0		30	2320B	14-Dec	KF
Solids, Total Dissolved	190	mg/l	5.0	30	2540C	18-Dec	DK
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AU
Chloride	8.4	mg/l	1.0	1	9251	11-Dec	ED
Nitrogen, Nitrate	0.80	mg/l	0.10	30	4500NO ₃ -F	11-Dec	ED
Sulfate	20.	mg/l	10.	1	9038	15-Dec	KF
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	DK
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MG
Barium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MG
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Iron, Dissolved	0.10	mg/l	0.05	1	6010B	22-Dec	MG
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Manganese, Dissolved	0.46	mg/l	0.01	1	6010B	22-Dec	MG
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec 23-Dec	DM
Selenium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MG
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	MG

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-03 Date Collected: 09-DEC-1998
 CDM DUP Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 23-DEC-98
 Condition of Sample: Satisfactory Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS
Alkalinity, Total	120	mg CaCO3/L2.0		30	2320B	14-Dec K
Solids, Total Dissolved	200	mg/l	5.0	30	2540C	18-Dec D
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec A
Chloride	4.2	mg/l	1.0	1	9251	11-Dec E
Nitrogen, Nitrate	2.7	mg/l	0.10	30	4500NO3-F	11-Dec E
Sulfate	26.	mg/l	10.	1	9038	15-Dec
Chemical Oxygen Demand	120	mg/l	20.	30	5220D	18-Dec
Dissolved Metals						
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec
Barium, Dissolved	0.04	mg/l	0.01	1	6010B	22-Dec
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec
Iron, Dissolved	0.18	mg/l	0.05	1	6010B	22-Dec
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec
Manganese, Dissolved	1.2	mg/l	0.01	1	6010B	22-Dec M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec 23-Dec V
Selenium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-04 Date Collected: 09-DEC-1998
 CDM 2 Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 23-DEC-98
 Condition of Sample: Satisfactory Field Prep: None
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Alkalinity, Total	650	mg CaCO3/L2.0		30	2320B	14-Dec	KF
Solids, Total Dissolved	690	mg/l	5.0	30	2540C	18-Dec	DK
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AU
Chloride	66.	mg/l	1.0	1	9251	11-Dec	ED
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	ED
Sulfate	ND	mg/l	10.	1	9038	15-Dec	KF
Chemical Oxygen Demand	620	mg/l	20.	30	5220D	18-Dec	DK
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B	22-Dec	MG
Barium, Dissolved	1.4	mg/l	0.01	1	6010B	22-Dec	MG
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MG
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Iron, Dissolved	9.8	mg/l	0.05	1	6010B	22-Dec	MG
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Manganese, Dissolved	0.13	mg/l	0.01	1	6010B	22-Dec	MG
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec DM
Selenium, Dissolved	0.025	mg/l	0.005	1	6010B	22-Dec	MG
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	MG

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809864-05
CDM 2A
Sample Matrix: WATER

Date Collected: 09-DEC-1998
Date Received : 10-DEC-98
Date Reported : 23-DEC-98

Condition of Sample: Satisfactory

Field Prep: Field Filtered

Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Alkalinity, Total	69.	mg CaCO3/L	2.0	30	2320B	14-Dec	K
Solids, Total Dissolved	120	mg/l	5.0	30	2540C	18-Dec	F
Cyanide, Total	ND	mg/l	0.005	1	9010B	17-Dec	A
Chloride	4.0	mg/l	1.0	1	9251	11-Dec	E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	E
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Barium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Iron, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Manganese, Dissolved	0.18	mg/l	0.01	1	6010B	22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	D
Selenium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L9809864

Parameter	Value 1	Value 2	RPD	Units
Alkalinity, Total for sample(s) 01-05				
Alkalinity, Total	69.	69.	0	mg CaCO3/L
Chloride for sample(s) 01-05				
Chloride	6.5	6.1	6	mg/l
Nitrogen, Nitrate for sample(s) 01-05				
Nitrogen, Nitrate	0.76	0.76	0	mg/l
Sulfate for sample(s) 01-05				
Sulfate	20.	20.	0	mg/l
Dissolved Metals for sample(s) 01-05				
Arsenic, Dissolved	ND	ND	NC	mg/l
Barium, Dissolved	0.04	0.04	0	mg/l
Cadmium, Dissolved	ND	ND	NC	mg/l
Chromium, Dissolved	ND	ND	NC	mg/l
Copper, Dissolved	ND	ND	NC	mg/l
Iron, Dissolved	0.26	0.27	4	mg/l
Lead, Dissolved	ND	ND	NC	mg/l
Manganese, Dissolved	1.2	1.2	0	mg/l
Selenium, Dissolved	ND	0.005	NC	mg/l
Silver, Dissolved	ND	ND	NC	mg/l
Zinc, Dissolved	ND	ND	NC	mg/l
Dissolved Metals for sample(s) 01-05				
Mercury, Dissolved	ND	ND	NC	mg/l

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809864

Parameter	% Recovery
Alkalinity, Total	100
Alkalinity, Total LCS for sample(s) 01-05	
Cyanide, Total	76
Cyanide, Total LCS for sample(s) 05	
Cyanide, Total	103
Cyanide, Total LCS for sample(s) 01-04	
Chloride	98
Chloride LCS for sample(s) 01-05	
Nitrogen, Nitrate	94
Nitrogen, Nitrate LCS for sample(s) 01-05	
Sulfate	95
Sulfate LCS for sample(s) 01-05	
Chemical Oxygen Demand	96
Chemical Oxygen Demand LCS for sample(s) 01-05	
Chemical Oxygen Demand	100
Chemical Oxygen Demand LCS for sample(s) 01-05	
Mercury, Dissolved	108
Dissolved Metals LCS for sample(s) 01-05	
Alkalinity, Total	100
Alkalinity, Total SPIKE for sample(s) 01-05	
Cyanide, Total	87
Cyanide, Total SPIKE for sample(s) 05	
Chloride	100
Chloride SPIKE for sample(s) 01-05	
Nitrogen, Nitrate	78
Nitrogen, Nitrate SPIKE for sample(s) 01-05	
Sulfate	93
Sulfate SPIKE for sample(s) 01-05	
Chemical Oxygen Demand	120
Chemical Oxygen Demand SPIKE for sample(s) 01-05	
Arsenic, Dissolved	104
Dissolved Metals SPIKE for sample(s) 01-05	
Barium, Dissolved	100
Cadmium, Dissolved	105

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809864

Continued

Parameter	% Recovery
Dissolved Metals SPIKE for sample(s) 01-05	
Chromium, Dissolved	100
Copper, Dissolved	100
Iron, Dissolved	100
Lead, Dissolved	100
Manganese, Dissolved	98
Selenium, Dissolved	127
Silver, Dissolved	84
Zinc, Dissolved	100

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809864

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Blank Analysis for sample(s) 01-05							
Alkalinity, Total	ND	mg CaCO3/L2.0		30	2320B	14-Dec	K
Blank Analysis for sample(s) 01-05							
Solids, Total Dissolved	ND	mg/l	5.0	30	2540C	18-Dec	D
Blank Analysis for sample(s) 05							
Cyanide, Total	ND	mg/l	0.005	1	9010B	17-Dec	A
Blank Analysis for sample(s) 01-04							
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Blank Analysis for sample(s) 01-05							
Chloride	ND	mg/l	1.0	1	9251	11-Dec	E
Blank Analysis for sample(s) 01-05							
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	E
Blank Analysis for sample(s) 01-05							
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Blank Analysis for sample(s) 01-05							
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	D

ALPHA ANALYTICAL LABORATORIES
ADDENDUM I

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Update III, 1997.
30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617)-354-4448 - fax (617)-354-0764

Laboratory Report

Client: Town of Waltham

Client Contact: Paul Taurasi

Project: Waltham Landfill

Address: Camp Dresser & McKee
Ten Cambridge Center

Project Narrative

The following report contains the analytical results for samples submitted to CDM Laboratory Services on December 10, 1998. The samples were received into the laboratory in accordance with documented sample acceptance procedures. All sample identification agreed with accompanying Chain of Custody documentation. Please refer to the Sample Description Information sheet for the list of samples included within this report.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples.

Note: Analytical testing was conducted by Alpha Analytical Laboratories under subcontract to CDM. The report is attached.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete and accurate.

LABORATORY MANAGEMENT REVIEW: _____

LABORATORY QA/QC REVIEW: _____

AZ DOH # AZ0553, CO DPHE (RECIPROCITY), CT DPH # 0682, LA DOHH, MA DEP M-MA012, MD DHS (RECIPROCITY), NH DES#2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

ALPHA ANALYTICAL LABORATORIES

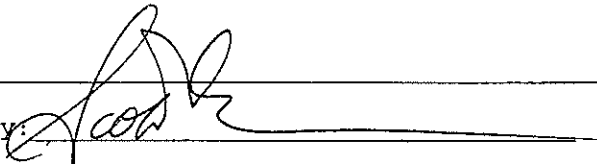
Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

CERTIFICATE OF ANALYSIS

Client: Camp Dresser & McKee, Inc. Laboratory Job Number: L9809865
Address: 840 Memorial Drive Invoice Number: 21787
Riverside Technology Center
Cambridge, MA 02139 Date Received: 10-DEC-98
Attn: Paul Taurasi Date Reported: 24-DEC-98
Project Number: Delivery Method: Alpha
Site: TOWN OF WALTHAM

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9809865-01	CDM 4	WALTHAM LANDFILL
L9809865-02	CDM 4A	WALTHAM LANDFILL
L9809865-03	STREAM 1	WALTHAM LANDFILL
L9809865-04	CDM 3A	WALTHAM LANDFILL
L9809865-05	COVE 1	WALTHAM LANDFILL
L9809865-06	COVE 2	WALTHAM LANDFILL
L9809865-07	COMPOSITE OF SED 1 - SED 3	WALTHAM LANDFILL

Authorized by: 

Scott McLean - Laboratory Director

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-01

Date Collected: 10-DEC-1998

Sample Matrix: CDM 4

Date Received : 10-DEC-98

Sample Matrix: WATER

Date Reported : 24-DEC-98

Condition of Sample: Satisfactory

Field Prep: Field Filtered

Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	I
						PREP ANALYSIS	
Alkalinity, Total	900	mg CaCO3/L2.0		30	2320B	14-Dec	K
Solids, Total Dissolved	940	mg/l	5.0	30	2540C	18-Dec	D
Cyanide, Total	ND	mg/l	0.025	1	9010B	22-Dec	A
Chloride	58.	mg/l	1.0	1	9251	11-Dec	E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	E
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Chemical Oxygen Demand	710	mg/l	20.	30	5220D	18-Dec	D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B	22-Dec	M
Barium, Dissolved	0.87	mg/l	0.01	1	6010B	22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Iron, Dissolved	1.7	mg/l	0.05	1	6010B	22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Manganese, Dissolved	0.17	mg/l	0.01	1	6010B	22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	D
Selenium, Dissolved	0.025	mg/l	0.005	1	6010B	22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-02 Date Collected: 10-DEC-1998
 CDM 4A Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: None
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES		ID
						PREP	ANALYSIS	
Alkalinity, Total	310	mg CaCO3/L2.0		30	2320B		14-Dec	KF
Solids, Total Dissolved	710	mg/l	5.0	30	2540C		18-Dec	DK
Cyanide, Total	ND	mg/l	0.005	1	9010B		15-Dec	AU
Chloride	240	mg/l	10.	1	9251		11-Dec	ED
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F		11-Dec	ED
Sulfate	ND	mg/l	10.	1	9038		15-Dec	KF
Chemical Oxygen Demand	51.	mg/l	20.	30	5220D		18-Dec	DK
Dissolved Metals								
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	MG
Barium, Dissolved	0.12	mg/l	0.01	1	6010B		22-Dec	MG
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec	MG
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MG
Copper, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MG
Iron, Dissolved	0.35	mg/l	0.05	1	6010B		22-Dec	MG
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MG
Manganese, Dissolved	3.2	mg/l	0.01	1	6010B		22-Dec	MG
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec	DM
Selenium, Dissolved	0.007	mg/l	0.005	1	6010B		22-Dec	MG
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec	MG
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec	MG

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-03
STREAM 1
Sample Matrix: WATER

Date Collected: 10-DEC-1998
Date Received : 10-DEC-98
Date Reported : 24-DEC-98

Condition of Sample: Satisfactory

Field Prep: Field Filtered

Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	
						PREP	ANALYSIS
Alkalinity, Total	510	mg CaCO3/L2.0		30	2320B		14-Dec K
Solids, Total Dissolved	820	mg/l	5.0	30	2540C		18-Dec D
Cyanide, Total	ND	mg/l	0.005	1	9010B		15-Dec A
Chloride	220	mg/l	10.	1	9251		11-Dec E
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F		11-Dec E
Sulfate	53.	mg/l	50.	1	9038		15-Dec K
Chemical Oxygen Demand	150	mg/l	20.	30	5220D		18-Dec D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec M
Barium, Dissolved	0.20	mg/l	0.01	1	6010B		22-Dec M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B		22-Dec M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Copper, Dissolved	0.01	mg/l	0.01	1	6010B		22-Dec M
Iron, Dissolved	1.1	mg/l	0.05	1	6010B		22-Dec M
Lead, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Manganese, Dissolved	0.37	mg/l	0.01	1	6010B		22-Dec M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	23-Dec D
Selenium, Dissolved	0.010	mg/l	0.005	1	6010B		22-Dec M
Silver, Dissolved	ND	mg/l	0.01	1	6010B		22-Dec M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B		22-Dec M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-04 Date Collected: 10-DEC-1998
 CDM 3A Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: None
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Alkalinity, Total	230	mg CaCO ₃ /L	2.0	30	2320B	14-Dec	KF
Solids, Total Dissolved	320	mg/l	5.0	30	2540C	18-Dec	DK
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AU
Chloride	32.	mg/l	1.0	1	9251	11-Dec	ED
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO ₃ -F	11-Dec	ED
Sulfate	13.	mg/l	10.	1	9038	15-Dec	KF
Chemical Oxygen Demand	41.	mg/l	20.	30	5220D	18-Dec	DK
Dissolved Metals							
Arsenic, Dissolved	0.008	mg/l	0.005	1	6010B	22-Dec	MG
Barium, Dissolved	0.16	mg/l	0.01	1	6010B	22-Dec	MG
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MG
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Iron, Dissolved	0.05	mg/l	0.05	1	6010B	22-Dec	MG
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Manganese, Dissolved	0.56	mg/l	0.01	1	6010B	22-Dec	MG
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	DM
Selenium, Dissolved	0.006	mg/l	0.005	1	6010B	22-Dec	MG
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	MG

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-05 Date Collected: 10-DEC-1998
 COVE 1 Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	I
Alkalinity, Total	500	mg CaCO3/L2.0		30	2320B	14-Dec	K
Solids, Total Dissolved	780	mg/l	5.0	30	2540C	18-Dec	D
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	A
Chloride	150	mg/l	10.	1	9251	11-Dec	E
Nitrogen, Nitrate	0.46	mg/l	0.10	30	4500NO3-F	11-Dec	E
Sulfate	ND	mg/l	10.	1	9038	15-Dec	K
Chemical Oxygen Demand	46.	mg/l	20.	30	5220D	18-Dec	D
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B	22-Dec	M
Barium, Dissolved	0.96	mg/l	0.01	1	6010B	22-Dec	M
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	M
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Iron, Dissolved	19.	mg/l	0.05	1	6010B	22-Dec	M
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Manganese, Dissolved	0.50	mg/l	0.01	1	6010B	22-Dec	M
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec 23-Dec	D
Selenium, Dissolved	0.016	mg/l	0.005	1	6010B	22-Dec	M
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	M
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	M

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-06 Date Collected: 10-DEC-1998
 COVE 2 Date Received : 10-DEC-98
 Sample Matrix: WATER Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: Field Filtered
 Number & Type of Containers: 4-Plastic

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Alkalinity, Total	400	mg CaCO3/L2.0		30	2320B	14-Dec	KF
Solids, Total Dissolved	470	mg/l	5.0	30	2540C	18-Dec	DK
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AU
Chloride	40.	mg/l	1.0	1	9251	11-Dec	ED
Nitrogen, Nitrate	0.16	mg/l	0.10	30	4500NO3-F	11-Dec	ED
Sulfate	ND	mg/l	10.	1	9038	15-Dec	KF
Chemical Oxygen Demand	110	mg/l	20.	30	5220D	18-Dec	DK
Dissolved Metals							
Arsenic, Dissolved	ND	mg/l	0.050	1	6010B	22-Dec	MG
Barium, Dissolved	0.34	mg/l	0.01	1	6010B	22-Dec	MG
Cadmium, Dissolved	ND	mg/l	0.005	1	6010B	22-Dec	MG
Chromium, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Copper, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Iron, Dissolved	0.49	mg/l	0.05	1	6010B	22-Dec	MG
Lead, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Manganese, Dissolved	0.19	mg/l	0.01	1	6010B	22-Dec	MG
Mercury, Dissolved	ND	mg/l	0.0005	1	7470A	22-Dec	DM
Selenium, Dissolved	0.009	mg/l	0.005	1	6010B	22-Dec	MG
Silver, Dissolved	ND	mg/l	0.01	1	6010B	22-Dec	MG
Zinc, Dissolved	ND	mg/l	0.05	1	6010B	22-Dec	MG

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L9809865

Parameter	Value 1	Value 2	RPD	Units
Alkalinity, Total for sample(s) 01-06				
Alkalinity, Total	69.	69.	0	mg CaCO3/L
Chloride for sample(s) 01-06				
Chloride	6.5	6.1	6	mg/l
Nitrogen, Nitrate for sample(s) 01-06				
Nitrogen, Nitrate	0.76	0.76	0	mg/l
Sulfate for sample(s) 01-06				
Sulfate	20.	20.	0	mg/l
Total Metals for sample(s) 07				
Arsenic, Total	17.	21.	21	mg/kg
Barium, Total	530	610	14	mg/kg
Cadmium, Total	6.4	6.6	3	mg/kg
Chromium, Total	63.	70.	11	mg/kg
Copper, Total	210	220	5	mg/kg
Iron, Total	34000	43000	23	mg/kg
Lead, Total	490	510	4	mg/kg
Manganese, Total	270	320	17	mg/kg
Selenium, Total	ND	ND	NC	mg/kg
Silver, Total	ND	ND	NC	mg/kg
Zinc, Total	840	880	5	mg/kg
Dissolved Metals for sample(s) 01-06				
Arsenic, Dissolved	ND	ND	NC	mg/l
Barium, Dissolved	0.04	0.04	0	mg/l
Cadmium, Dissolved	ND	ND	NC	mg/l
Chromium, Dissolved	ND	ND	NC	mg/l
Copper, Dissolved	ND	ND	NC	mg/l
Iron, Dissolved	0.26	0.27	4	mg/l
Lead, Dissolved	ND	ND	NC	mg/l
Manganese, Dissolved	1.2	1.2	0	mg/l
Selenium, Dissolved	ND	0.005	NC	mg/l
Silver, Dissolved	ND	ND	NC	mg/l
Zinc, Dissolved	ND	ND	NC	mg/l
Dissolved Metals for sample(s) 01-06				
Mercury, Dissolved	ND	ND	NC	mg/l

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Parameter	% Recovery
Alkalinity, Total LCS for sample(s) 01-06	
Alkalinity, Total	100
Cyanide, Total LCS for sample(s) 01	
Cyanide, Total	100
Cyanide, Total LCS for sample(s) 02-06	
Cyanide, Total	103
Chloride LCS for sample(s) 01-06	
Chloride	98
Nitrogen, Nitrate LCS for sample(s) 01-06	
Nitrogen, Nitrate	94
Sulfate LCS for sample(s) 01-06	
Sulfate	95
Chemical Oxygen Demand LCS for sample(s) 01-06	
Chemical Oxygen Demand	96
Chemical Oxygen Demand LCS for sample(s) 01-06	
Chemical Oxygen Demand	100
Hydrocarbons, Total (IR) LCS for sample(s) 07	
Hydrocarbons, Total (IR)	115
Total Metals LCS for sample(s) 07	
Arsenic, Total	89
Barium, Total	95
Cadmium, Total	92
Chromium, Total	93
Copper, Total	97
Lead, Total	95
Manganese, Total	110
Selenium, Total	84
Silver, Total	91
Zinc, Total	95
Total Metals LCS for sample(s) 07	
Mercury, Total	103
Dissolved Metals LCS for sample(s) 01-06	
Mercury, Dissolved	108
SVOC's by GC/MS 8270 LCS for sample(s) 07	
Acenaphthene	120
1,2,4-Trichlorobenzene	110
1,4-Dichlorobenzene	80

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Continued

Parameter	% Recovery
SVOC's by GC/MS 8270 LCS for sample(s) 07	
2,4-Dinitrotoluene	120
n-Nitrosodi-n-propylamine	89
Pyrene	110
p-Chloro-m-cresol	95
2-Chlorophenol	67
4-Nitrophenol	84
Pentachlorophenol	110
Phenol	44
PCB/Pesticides LCS for sample(s) 07	
Lindane	79
Heptachlor	73
Aldrin	105
Endrin	84
Dieldrin	56
4,4'-DDT	76
Alkalinity, Total SPIKE for sample(s) 01-06	
Alkalinity, Total	100
Cyanide, Total SPIKE for sample(s) 01	
Cyanide, Total	61
Chloride SPIKE for sample(s) 01-06	
Chloride	100
Nitrogen, Nitrate SPIKE for sample(s) 01-06	
Nitrogen, Nitrate	78
Sulfate SPIKE for sample(s) 01-06	
Sulfate	93
Chemical Oxygen Demand SPIKE for sample(s) 01-06	
Chemical Oxygen Demand	120
Total Metals SPIKE for sample(s) 07	
Arsenic, Total	100
Barium, Total	98
Cadmium, Total	86
Chromium, Total	85
Copper, Total	110
Lead, Total	90
Manganese, Total	120
Selenium, Total	100
Silver, Total	100
Zinc, Total	64

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Continued

Parameter	% Recovery
Total Metals SPIKE for sample(s) 07	
Mercury, Total	146
Dissolved Metals SPIKE for sample(s) 01-06	
Arsenic, Dissolved	104
Barium, Dissolved	100
Cadmium, Dissolved	105
Chromium, Dissolved	100
Copper, Dissolved	100
Iron, Dissolved	100
Lead, Dissolved	100
Manganese, Dissolved	98
Selenium, Dissolved	127
Silver, Dissolved	84
Zinc, Dissolved	100

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH MS/MSD ANALYSIS

Laboratory Job Number: L9809865

Parameter	MS %	MSD %	RPD
Volatile Organics by GC/MS 8260 for sample(s) 07			
Chlorobenzene	83	81	2
Benzene	83	88	6
Toluene	83	88	6
1,1-Dichloroethene	97	95	2
Trichloroethene	83	81	2
SVOC's by GC/MS 8270 for sample(s) 07			
Acenaphthene	130	140	7
1,2,4-Trichlorobenzene	130	130	0
1,4-Dichlorobenzene	100	100	0
2,4-Dinitrotoluene	160	180	12
n-Nitrosodi-n-propylamine	110	110	0
Pyrene	120	130	8
p-Chloro-m-cresol	110	110	0
2-Chlorophenol	84	84	0
4-Nitrophenol	60	92	42
Pentachlorophenol	100	130	26
Phenol	72	60	18
PCB/Pesticides for sample(s) 07			
Lindane	71	72	1
Heptachlor	65	66	1
Aldrin	67	70	4
Endrin	76	78	3
Dieldrin	52	54	4
4,4'-DDT	68	70	3

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 01-06							
Alkalinity, Total	ND	mg CaCO ₃ /L2.0		30	2320B	14-Dec	KF
Blank Analysis for sample(s) 01-06							
Solids, Total Dissolved	ND	mg/l	5.0	30	2540C	18-Dec	DK
Blank Analysis for sample(s) 01							
Cyanide, Total	ND	mg/l	0.005	1	9010B	22-Dec	AU
Blank Analysis for sample(s) 02-06							
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AU
Blank Analysis for sample(s) 01-06							
Chloride	ND	mg/l	1.0	1	9251	11-Dec	ED
Blank Analysis for sample(s) 01-06							
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO ₃ -F	11-Dec	ED
Blank Analysis for sample(s) 01-06							
Sulfate	ND	mg/l	10.	1	9038	15-Dec	KF
Blank Analysis for sample(s) 01-06							
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	DK
Blank Analysis for sample(s) 07							
Hydrocarbons, Total (IR)	ND	mg/kg	40.	4	418.1	21-Dec 23-Dec	SN
Blank Analysis for sample(s) 07							
Total Metals				1	3051		
Arsenic, Total	ND	mg/kg	0.20	1	6010B	15-Dec 16-Dec	MG
Barium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Cadmium, Total	ND	mg/kg	0.20	1	6010B	15-Dec 16-Dec	MG
Chromium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Copper, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Iron, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	MG
Lead, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	MG
Manganese, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Selenium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Silver, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS
Blank Analysis for sample(s) 07						
Total Metals				1	3051	
Zinc, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec M
Blank Analysis for sample(s) 07						
Volatile Organics by GC/MS 8260				1	8260B	24-Dec B
Methylene chloride	ND	ug/kg	25.			
1,1-Dichloroethane	ND	ug/kg	7.5			
Chloroform	ND	ug/kg	7.5			
Carbon tetrachloride	ND	ug/kg	5.0			
1,2-Dichloropropane	ND	ug/kg	18.			
Dibromochloromethane	ND	ug/kg	5.0			
1,1,2-Trichloroethane	ND	ug/kg	7.5			
2-Chloroethylvinyl ether	ND	ug/kg	50.			
Tetrachloroethene	ND	ug/kg	7.5			
Chlorobenzene	ND	ug/kg	18.			
Trichlorofluoromethane	ND	ug/kg	25.			
1,2-Dichloroethane	ND	ug/kg	7.5			
1,1,1-Trichloroethane	ND	ug/kg	5.0			
Bromodichloromethane	ND	ug/kg	5.0			
trans-1,3-Dichloropropene	ND	ug/kg	5.0			
cis-1,3-Dichloropropene	ND	ug/kg	5.0			
1,1-Dichloropropene	ND	ug/kg	120			
Bromoform	ND	ug/kg	5.0			
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0			
Benzene	ND	ug/kg	5.0			
Toluene	ND	ug/kg	7.5			
Ethylbenzene	ND	ug/kg	5.0			
Chloromethane	ND	ug/kg	50.			
Bromomethane	ND	ug/kg	10.			
Vinyl chloride	ND	ug/kg	10.			
Chloroethane	ND	ug/kg	10.			
1,1-Dichloroethene	ND	ug/kg	7.5			
trans-1,2-Dichloroethene	ND	ug/kg	7.5			
Trichloroethene	ND	ug/kg	5.0			
1,2-Dichlorobenzene	ND	ug/kg	50.			
1,3-Dichlorobenzene	ND	ug/kg	50.			
1,4-Dichlorobenzene	ND	ug/kg	50.			
Methyl tert butyl ether	ND	ug/kg	50.			
p/m-Xylene	ND	ug/kg	5.0			
o-Xylene	ND	ug/kg	5.0			
cis-1,2-Dichloroethene	ND	ug/kg	5.0			
Dibromomethane	ND	ug/kg	50.			
1,4-Dichlorobutane	ND	ug/kg	50.			
Iodomethane	ND	ug/kg	50.			
1,2,3-Trichloropropane	ND	ug/kg	50.			
Styrene	ND	ug/kg	5.0			

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 07							
Volatile Organics by GC/MS 8260 continued				1	8260B	24-Dec	BT
Dichlorodifluoromethane	ND	ug/kg	50.				
Acetone	ND	ug/kg	50.				
Carbon disulfide	ND	ug/kg	50.				
2-Butanone	ND	ug/kg	50.				
Vinyl acetate	ND	ug/kg	50.				
4-Methyl-2-pentanone	ND	ug/kg	50.				
2-Hexanone	ND	ug/kg	50.				
Ethyl methacrylate	ND	ug/kg	50.				
Acrolein	ND	ug/kg	120				
Acrylonitrile	ND	ug/kg	50.				
Bromochloromethane	ND	ug/kg	25.				
Tetrahydrofuran	ND	ug/kg	250				
2,2-Dichloropropane	ND	ug/kg	25.				
1,2-Dibromoethane	ND	ug/kg	25.				
1,3-Dichloropropane	ND	ug/kg	25.				
1,1,1,2-Tetrachloroethane	ND	ug/kg	25.				
Bromobenzene	ND	ug/kg	25.				
n-Butylbenzene	ND	ug/kg	25.				
sec-Butylbenzene	ND	ug/kg	25.				
tert-Butylbenzene	ND	ug/kg	25.				
o-Chlorotoluene	ND	ug/kg	25.				
p-Chlorotoluene	ND	ug/kg	25.				
1,2-Dibromo-3-chloropropane	ND	ug/kg	25.				
Hexachlorobutadiene	ND	ug/kg	25.				
Isopropylbenzene	ND	ug/kg	25.				
p-Isopropyltoluene	ND	ug/kg	25.				
Naphthalene	ND	ug/kg	25.				
n-Propylbenzene	ND	ug/kg	25.				
1,2,3-Trichlorobenzene	ND	ug/kg	25.				
1,2,4-Trichlorobenzene	ND	ug/kg	25.				
1,3,5-Trimethylbenzene	ND	ug/kg	25.				
1,2,4-Trimethylbenzene	ND	ug/kg	25.				
trans-1,4-Dichloro-2-butene	ND	ug/kg	25.				
Ethyl ether	ND	ug/kg	120				
Surrogate Recovery							
1,2-Dichloroethane-d4	98.0	%					
Toluene-d8	98.0	%					
4-Bromofluorobenzene	95.0	%					
Dibromofluoromethane	94.0	%					
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270				1	8270C	11-Dec 14-Dec	MK
Acenaphthene	ND	ug/kg	500				
Benzidine	ND	ug/kg	5000				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS
Blank Analysis for sample(s) 07						
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec M
1,2,4-Trichlorobenzene	ND	ug/kg	500			
Hexachlorobenzene	ND	ug/kg	500			
Bis(2-chloroethyl) ether	ND	ug/kg	500			
1-Chloronaphthalene	ND	ug/kg	500			
2-Chloronaphthalene	ND	ug/kg	500			
1,2-Dichlorobenzene	ND	ug/kg	500			
1,3-Dichlorobenzene	ND	ug/kg	500			
1,4-Dichlorobenzene	ND	ug/kg	500			
3,3'-Dichlorobenzidine	ND	ug/kg	5000			
2,4-Dinitrotoluene	ND	ug/kg	500			
2,6-Dinitrotoluene	ND	ug/kg	500			
Azobenzene	ND	ug/kg	500			
Fluoranthene	ND	ug/kg	500			
4-Chlorophenyl phenyl ether	ND	ug/kg	500			
4-Bromophenyl phenyl ether	ND	ug/kg	500			
Bis(2-chloroisopropyl) ether	ND	ug/kg	500			
Bis(2-chloroethoxy) methane	ND	ug/kg	500			
Hexachlorocyclopentadiene	ND	ug/kg	1000			
Hexachlorocyclopentadiene	ND	ug/kg	1000			
Hexachloroethane	ND	ug/kg	500			
Isophorone	ND	ug/kg	500			
Naphthalene	ND	ug/kg	500			
Nitrobenzene	ND	ug/kg	500			
NDPA/DPA	ND	ug/kg	500			
n-Nitrosodi-n-propylamine	ND	ug/kg	500			
Bis(2-ethylhexyl) phthalate	ND	ug/kg	1000			
Butyl benzyl phthalate	ND	ug/kg	500			
Di-n-butylphthalate	ND	ug/kg	500			
Di-n-octylphthalate	ND	ug/kg	500			
Diethyl phthalate	ND	ug/kg	500			
Dimethyl phthalate	ND	ug/kg	500			
Benzo(a) anthracene	ND	ug/kg	500			
Benzo(a) pyrene	ND	ug/kg	500			
Benzo(b) fluoranthene	ND	ug/kg	500			
Benzo(k) fluoranthene	ND	ug/kg	500			
Chrysene	ND	ug/kg	500			
Acenaphthylene	ND	ug/kg	500			
Anthracene	ND	ug/kg	500			
Benzo(ghi) perylene	ND	ug/kg	500			
Fluorene	ND	ug/kg	500			
Phenanthrene	ND	ug/kg	500			
Dibenzo(a, h) anthracene	ND	ug/kg	500			
Indeno(1,2,3-cd) pyrene	ND	ug/kg	500			
Pyrene	ND	ug/kg	500			
Aniline	ND	ug/kg	1000			
4-Chloroaniline	ND	ug/kg	500			
1-Methylnaphthalene	ND	ug/kg	500			

ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MK
2-Nitroaniline	ND	ug/kg	500				
3-Nitroaniline	ND	ug/kg	500				
4-Nitroaniline	ND	ug/kg	500				
Dibenzofuran	ND	ug/kg	500				
a,a-Dimethylphenethylamine	ND	ug/kg	5000				
Hexachloropropene	ND	ug/kg	5000				
Nitrosodi-n-butylamine	ND	ug/kg	1000				
2-Methylnaphthalene	ND	ug/kg	500				
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	2000				
Pentachlorobenzene	ND	ug/kg	2000				
a-Naphthylamine	ND	ug/kg	2000				
b-Naphthylamine	ND	ug/kg	2000				
Phenacetin	ND	ug/kg	1000				
Dimethoate	ND	ug/kg	2000				
4-Aminobiphenyl	ND	ug/kg	1000				
Pentachloronitrobenzene	ND	ug/kg	1000				
Isodrin	ND	ug/kg	1000				
p-Dimethylaminoazobenzene	ND	ug/kg	1000				
Chlorobenzilate	ND	ug/kg	2000				
3-Methylcholanthrene	ND	ug/kg	2000				
Ethyl Methanesulfonate	ND	ug/kg	1500				
Acetophenone	ND	ug/kg	2000				
Nitrosodipiperidine	ND	ug/kg	2000				
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	1000				
n-Nitrosodimethylamine	ND	ug/kg	5000				
2,4,6-Trichlorophenol	ND	ug/kg	500				
p-Chloro-m-cresol	ND	ug/kg	500				
2-Chlorophenol	ND	ug/kg	500				
2,4-Dichlorophenol	ND	ug/kg	1000				
2,4-Dimethylphenol	ND	ug/kg	1000				
2-Nitrophenol	ND	ug/kg	1000				
4-Nitrophenol	ND	ug/kg	1000				
2,4-Dinitrophenol	ND	ug/kg	2000				
4,6-Dinitro-o-cresol	ND	ug/kg	2000				
Pentachlorophenol	ND	ug/kg	2000				
Phenol	ND	ug/kg	500				
2-Methylphenol	ND	ug/kg	500				
3-Methylphenol/4-Methylphenol	ND	ug/kg	500				
2,4,5-Trichlorophenol	ND	ug/kg	500				
2,6-Dichlorophenol	ND	ug/kg	1000				
Benzoic Acid	ND	ug/kg	5000				
Benzyl Alcohol	ND	ug/kg	1000				
Carbazole	ND	ug/kg	500				
Pyridine	ND	ug/kg	5000				
2-Picoline	ND	ug/kg	2000				
Pronamide	ND	ug/kg	2000				
Methyl methanesulfonate	ND	ug/kg	2000				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS
Blank Analysis for sample(s) 07						
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec
Surrogate Recovery						
2-Fluorophenol	48.0	%				
Phenol-d6	59.0	%				
Nitrobenzene-d5	92.0	%				
2-Fluorobiphenyl	98.0	%				
2,4,6-Tribromophenol	83.0	%				
4-Terphenyl-d14	126.	%				
Blank Analysis for sample(s) 07						
PCB/Pesticides				1	8082/8081	11-Dec 16-Dec
Delta-BHC	ND	ug/kg	5.00			
Lindane	ND	ug/kg	5.00			
Alpha-BHC	ND	ug/kg	5.00			
Beta-BHC	ND	ug/kg	5.00			
Heptachlor	ND	ug/kg	5.00			
Aldrin	ND	ug/kg	5.00			
Heptachlor epoxide	ND	ug/kg	5.00			
Endrin	ND	ug/kg	5.00			
Endrin aldehyde	ND	ug/kg	5.00			
Endrin ketone	ND	ug/kg	5.00			
Dieldrin	ND	ug/kg	5.00			
4,4'-DDE	ND	ug/kg	5.00			
4,4'-DDD	ND	ug/kg	5.00			
4,4'-DDT	ND	ug/kg	5.00			
Endosulfan I	ND	ug/kg	5.00			
Endosulfan II	ND	ug/kg	5.00			
Endosulfan sulfate	ND	ug/kg	5.00			
Methoxychlor	ND	ug/kg	5.00			
Toxaphene	ND	ug/kg	20.0			
Chlordane	ND	ug/kg	20.0			
cis-Chlordane	ND	ug/kg	5.00			
trans-Chlordane	ND	ug/kg	5.00			
Aroclor 1221	ND	ug/kg	25.0			
Aroclor 1232	ND	ug/kg	25.0			
Aroclor 1242/1016	ND	ug/kg	25.0			
Aroclor 1248	ND	ug/kg	25.0			
Aroclor 1254	ND	ug/kg	25.0			
Aroclor 1260	ND	ug/kg	25.0			
Surrogate Recovery						
2,4,5,6-Tetrachloro-m-xylene	48.0	%				
Decachlorobiphenyl	57.0	%				

ALPHA ANALYTICAL LABORATORIES
ADDENDUM I

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Update III, 1997.
4. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-82-055. 1982.
30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

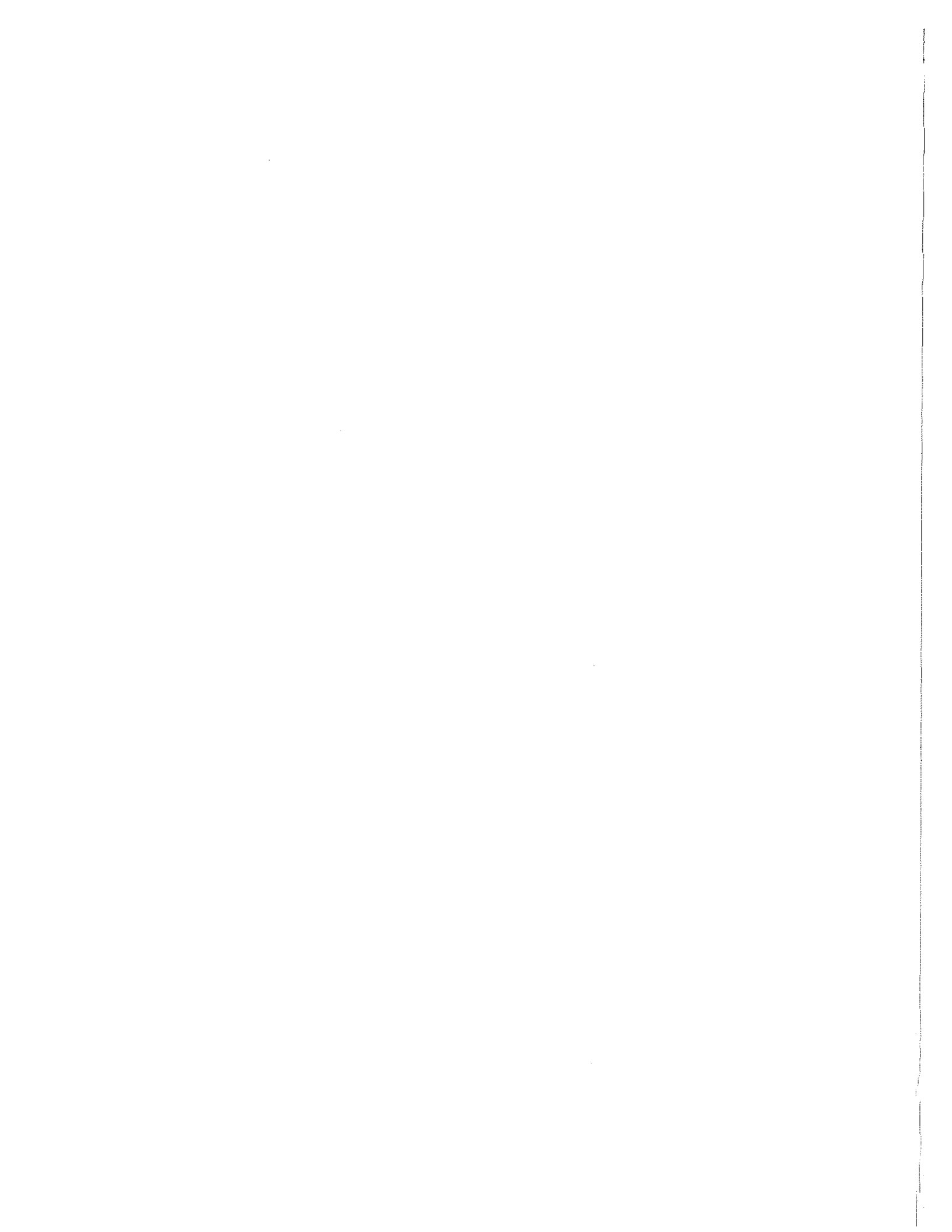
METHOD Method number by which analysis was performed.

ID Initials of the analyst.

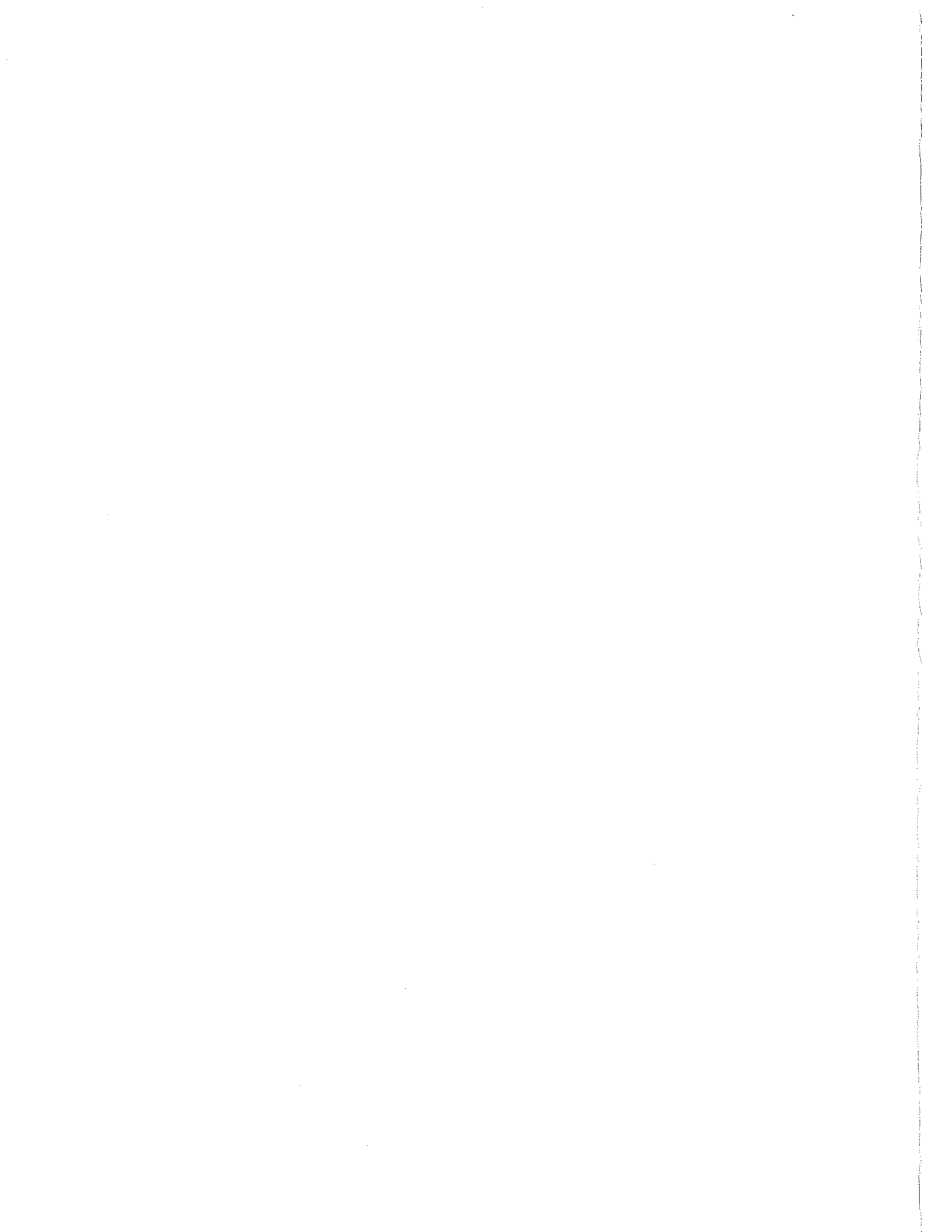
LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.



Appendix I
Sediment Quality Analytical Data



Client: Woerd Avenue Landfill

Project: Monitoring

SDG: 980821-1170

Date: 9/15/98

CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617) 354-4448 - fax (617) 354-0764

Laboratory Report

SDG #: 980821-1170
Client: Woerd Avenue Landfill
Project: Monitoring

Print Date: 9/15/98
Client Contact:
Address: Camp Dresser & McKee Inc.
10 Cambridge Center
Cambridge, MA 02142

Project Narrative

Attached please find the analytical results for this sample delivery group. Please refer to the Sample List Report for sample identification. All associated quality control information is summarized following the analytical results for all samples.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples unless as noted below.

BATCH NOTES

I980904/8260A_SOI/157

Sample and its spike were analyzed at lesser volumes due to matrix problems when analyzed undiluted.

I980910/8081_SOIL/56

Recovery of one of the two surrogates for samples 98-06610, MS98-06610, 98-06609, 98-06610, and 98-06611 were outside the recommended quality control criteria. Matrix interference is suspected.

RESULT NOTES

98-06610 (Arsenic)

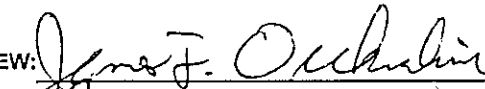
RPD is not determinable for this sample due to low original concentration (less than 10x MDL).

98-06610 (Iron, Lead)

N Footnote. High native concentration interfered with spike recovery.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete & accurate.

LABORATORY MANAGEMENT REVIEW:



LABORATORY QA/QC REVIEW:



AZ DOH #AZ0553, CO DPHE (RECIPROCITY), CT DPH #0682, LA DOHH, MA DEP M-MA012, ME DHS (RECIPROCITY), NH DES #2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001

SAMPLE LIST REPORT

Client Sample ID	Date Collected	Received Date	Lab Sample ID	Matrix Type
Cove 1	08/20/98	08/21/98	98-06614	AQUEOUS
Stream 1	08/20/98	08/21/98	98-06609	SOIL
Stream 1	08/20/98	08/21/98	98-06613	AQUEOUS
Swale 1	08/20/98	08/21/98	98-06610	SOIL
Cove 1	08/20/98	08/21/98	98-06611	SOIL
Cove 2	08/20/98	08/21/98	98-06612	SOIL
Cove 2	08/20/98	08/21/98	98-06615	AQUEOUS
CDM 2	08/20/98	08/21/98	98-06616	AQUEOUS
CDM 2A	08/20/98	08/21/98	98-06617	AQUEOUS

8081_SOIL ANALYSIS REPORT

Method #:	EPA 8081	Preparation Batch ID:	P980910/3550_8081/57
SDG #:	980821-1170	Prep. Analyst:	CROWELLS
Client Sample ID:	Stream 1		
Lab Sample ID:	98-06609	Analytical Batch ID:	I980910/8081_SOIL/56
Matrix:	SOIL	Analyst:	CROWELLS
Units:	mg/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Aldrin	0.0073	<0.0073	
Aroclor 1221	0.0732	<0.0732	
Aroclor 1232	0.0732	<0.0732	
Aroclor 1248	0.0732	<0.0732	
Aroclor 1254	0.0732	0.299	
Aroclor 1260	0.0732	0.114	
alpha-BHC	0.0073	<0.0073	
beta-BHC	0.0073	<0.0073	
gamma-BHC	0.0073	<0.0073	
Chlordane (Technical)	0.0367	0.264	
4,4'-DDD	0.0073	0.0526	
4,4'-DDE	0.0073	0.0229	
4,4'-DDT	0.0073	0.0298	
Dieldrin	0.0073	0.0275	
Endosulfan I	0.0073	<0.0073	
Endosulfan II	0.0073	<0.0073	
Endosulfan sulfate	0.0073	<0.0073	
Endrin	0.0073	<0.0073	
Endrin aldehyde	0.0073	<0.0073	
Heptachlor	0.0073	<0.0073	
Heptachlor epoxide	0.0073	<0.0073	
Methoxychlor	0.0146	<0.0146	
Toxaphene	0.366	<0.366	
delta-BHC	0.0073	<0.0073	
Aroclor 1242/1016	0.0732	<0.0732	

Surrogate	% Recovery	Accep. Range
Decachlorobiphenyl	98.84	60 - 150
Tetrachloro-m-xylene	84.12	60 - 150

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/10/98

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980904/5035_SOIL/157
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Stream 1		
Lab Sample ID:	98-06609	Analytical Batch ID:	I980904/8260A_SOI/157
Matrix:	SOIL	Analyst:	MITCHELLMR
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	11	<11	
Bromobenzene	11	<11	
Bromochloromethane	11	<11	
Bromodichloromethane	11	<11	
Bromoform	11	<11	
Bromomethane	56	<56	
2-Butanone	220	<220	
n-Butylbenzene	11	<11	
sec-Butylbenzene	11	<11	
tert-Butylbenzene	11	<11	
Carbon tetrachloride	11	<11	
Chlorobenzene	11	<11	
Chloroethane	56	<56	
Chloroform	56	<56	
Chloromethane	56	<56	
2-Chlorotoluene	11	<11	
4-Chlorotoluene	11	<11	
1,2-Dibromo-3-chloropropane	110	<110	
1,2-Dibromoethane	11	<11	
Dibromochloromethane	11	<11	
Dibromomethane	11	<11	
1,2-Dichlorobenzene	11	<11	
1,3-Dichlorobenzene	11	<11	
1,4-Dichlorobenzene	11	<11	
Dichlorodifluoromethane	11	<11	
1,1-Dichloroethane	11	<11	
1,2-Dichloroethane	11	<11	
cis-1,2-Dichloroethene	11	<11	
trans-1,2-Dichloroethene	11	<11	
1,2-Dichloropropane	11	<11	
1,3-Dichloropropane	11	<11	
2,2-Dichloropropane	11	<11	
1,1-Dichloropropene	11	<11	
cis-1,3-Dichloropropene	11	<11	
trans-1,3-Dichloropropene	11	<11	
Ethylbenzene	11	<11	
Hexachlorobutadiene	11	<11	
2-Hexanone	220	<220	
Isopropylbenzene	11	<11	
4-Methyl-2-pentanone	220	<220	
Methylene chloride	58	<58	
Naphthalene	11	<11	
n-Propylbenzene	11	<11	
Styrene	11	<11	
1,1,1,2-Tetrachloroethane	11	<11	
1,1,2,2-Tetrachloroethane	11	<11	
Tetrachloroethene	11	<11	
Toluene	11	<11	
1,2,3-Trichlorobenzene	11	<11	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/04/98

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980904/5035_SOIL/157
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Stream 1		
Lab Sample ID:	98-06609	Analytical Batch ID:	1980904/8260A_SOI/157
Matrix:	SOIL	Analyst:	MITCHELLMR
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,4-Trichlorobenzene	11	<11	
1,1,1-Trichloroethane	11	<11	
1,1,2-Trichloroethane	11	<11	
Trichloroethene	11	<11	
Trichlorofluoromethane	11	<11	
1,2,4-Trimethylbenzene	11	<11	
1,3,5-Trimethylbenzene	11	<11	
1,2,3-Trichloropropane	11	<11	
Vinyl chloride	11	<11	
m- and p-Xylenes	11	<11	
o-Xylene	11	<11	
1,1-Dichloroethene	11	<11	
Acetone	220	<220	
Isopropylmethylbenzene	11	<11	
Methyl tert-butyl ether	110	<110	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	83.78	74 - 121
Dibromofluoromethane	113.80	80 - 120
Toluene-d8	95.88	81 - 117

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/04/98

8270B_SOIL ANALYSIS REPORT

Method #: EPA 8270B
 SDG #: 980821-1170
 Client Sample ID: Stream 1
 Lab Sample ID: 98-06609
 Matrix: SOIL
 Units: ug/Kg dry
 Dilution Factor: 1

Preparation Batch ID: P980908/3550_8270/82
 Prep. Analyst: CROWELLS
 Analytical Batch ID: I980908/8270B_SOI/114
 Analyst: CROWELLS

Component Name	MRL	Result	Qualifiers
Acenaphthene	1900	<1900	
Acenaphthylene	1900	<1900	
Anthracene	1900	<1900	
Benz(a)anthracene	1900	2400	
Benzo(b)fluoranthene	1900	2000	
Benzo(k)fluoranthene	1900	2400	
Benzo(g,h,i)perylene	1900	1900	
Benzo(a)pyrene	1900	2600	
Chrysene	1900	2800	
Dibenz(a,h)anthracene	1900	<1900	
Fluoranthene	1900	5400	
Fluorene	1900	<1900	
Indeno(1,2,3-cd)pyrene	1900	<1900	
2-Methylnaphthalene	1900	<1900	
Naphthalene	1900	<1900	
Phenanthrene	1900	2500	
Pyrene	1900	4600	

Surrogate	% Recovery	Accep. Range
2-Fluorobiphenyl	54.00	30 - 115
4-Terphenyl-d14	77.15	18 - 137
Nitrobenzene-d5	49.25	23 - 120

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/08/98

6010A_SOIL ANALYSIS REPORT

Method #: EPA 6010A
SDG #: 980821-1170
Client Sample ID: Stream 1
Lab Sample ID: 98-06609
Matrix: SOIL
Units: mg/Kg dry
Dilution Factor: 1

Preparation Batch ID: P980903/3051/133
Prep. Analyst: LESHINSKYA
Analytical Batch ID: I980903/6010A_SOI/133
Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifiers
Arsenic	12	20	
Barium	12	430	
Cadmium	2.4	20	
Chromium	12	64	
Copper	12	160	
Iron	59	28000	
Lead	12	490	
Manganese	12	400	
Selenium	24	<24	
Silver	12	<12	
Zinc	47	1800	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/09/98

8081_SOIL ANALYSIS REPORT

Method #:	EPA 8081	Preparation Batch ID:	P980910/3550_8081/57
SDG #:	980821-1170	Prep. Analyst:	CROWELLS
Client Sample ID:	Swale 1	Analytical Batch ID:	I980910/8081_SOIL/56
Lab Sample ID:	98-06610	Analyst:	CROWELLS
Matrix:	SOIL		
Units:	mg/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Aldrin	0.0043	<0.0043	
Aroclor 1221	0.0430	<0.0430	
Aroclor 1232	0.0430	<0.0430	
Aroclor 1248	0.0430	<0.0430	
Aroclor 1254	0.0430	0.0774	
Aroclor 1260	0.0430	0.0691	
alpha-BHC	0.0043	<0.0043	
beta-BHC	0.0043	<0.0043	
gamma-BHC	0.0043	<0.0043	
Chlordane (Technical)	0.0215	0.0948	
4,4'-DDD	0.0043	<0.0043	
4,4'-DDE	0.0043	<0.0043	
4,4'-DDT	0.0043	0.0406	
Dieldrin	0.0043	<0.0043	
Endosulfan I	0.0043	<0.0043	
Endosulfan II	0.0043	<0.0043	
Endosulfan sulfate	0.0043	<0.0043	
Endrin	0.0043	<0.0043	
Endrin aldehyde	0.0043	<0.0043	
Heptachlor	0.0043	<0.0043	
Heptachlor epoxide	0.0043	<0.0043	
Methoxychlor	0.0086	<0.0086	
Toxaphene	0.215	<0.215	
delta-BHC	0.0043	<0.0043	
Aroclor 1242/1016	0.0430	<0.0430	

Surrogate	% Recovery	Accep. Range
Decachlorobiphenyl	167.62	60 - 150
Tetrachloro-m-xylene	89.68	60 - 150

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980903/5035_SOIL/156
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Swale 1		
Lab Sample ID:	98-06610	Analytical Batch ID:	I980903/8260A_SOI/156
Matrix:	SOIL	Analyst:	MITCHELLMR
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	3.2	<3.2	
Bromobenzene	3.2	<3.2	
Bromochloromethane	3.2	<3.2	
Bromodichloromethane	3.2	<3.2	
Bromoform	3.2	<3.2	
Bromomethane	16	<16	
2-Butanone	65	<65	
n-Butylbenzene	3.2	<3.2	
sec-Butylbenzene	3.2	<3.2	
tert-Butylbenzene	3.2	<3.2	
Carbon tetrachloride	3.2	<3.2	
Chlorobenzene	3.2	<3.2	
Chloroethane	16	<16	
Chloroform	16	<16	
Chloromethane	16	<16	
2-Chlorotoluene	3.2	<3.2	
4-Chlorotoluene	3.2	<3.2	
1,2-Dibromo-3-chloropropane	32	<32	
1,2-Dibromoethane	3.2	<3.2	
Dibromochloromethane	3.2	<3.2	
Dibromomethane	3.2	<3.2	
1,2-Dichlorobenzene	3.2	<3.2	
1,3-Dichlorobenzene	3.2	<3.2	
1,4-Dichlorobenzene	3.2	<3.2	
Dichlorodifluoromethane	3.2	<3.2	
1,1-Dichloroethane	3.2	<3.2	
1,2-Dichloroethane	3.2	<3.2	
cis-1,2-Dichloroethene	3.2	<3.2	
trans-1,2-Dichloroethene	3.2	<3.2	
1,2-Dichloropropane	3.2	<3.2	
1,3-Dichloropropane	3.2	<3.2	
2,2-Dichloropropane	3.2	<3.2	
1,1-Dichloropropene	3.2	<3.2	
cis-1,3-Dichloropropene	3.2	<3.2	
trans-1,3-Dichloropropene	3.2	<3.2	
Ethylbenzene	3.2	<3.2	
Hexachlorobutadiene	3.2	<3.2	
2-Hexanone	65	<65	
Isopropylbenzene	3.2	<3.2	
4-Methyl-2-pentanone	65	<65	
Methylene chloride	17	<17	
Naphthalene	3.2	<3.2	
n-Propylbenzene	3.2	<3.2	
Styrene	3.2	<3.2	
1,1,1,2-Tetrachloroethane	3.2	<3.2	
1,1,1,2,2-Tetrachloroethane	3.2	<3.2	
Tetrachloroethene	3.2	<3.2	
Toluene	3.2	<3.2	
1,2,3-Trichlorobenzene	3.2	<3.2	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/04/98

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980903/5035_SOIL/156
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Swale 1	Analytical Batch ID:	I980903/8260A_SOI/156
Lab Sample ID:	98-06610	Analyst:	MITCHELLMR
Matrix:	SOIL		
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,4-Trichlorobenzene	3.2	<3.2	
1,1,1-Trichloroethane	3.2	<3.2	
1,1,2-Trichloroethane	3.2	<3.2	
Trichloroethene	3.2	<3.2	
Trichlorofluoromethane	3.2	<3.2	
1,2,4-Trimethylbenzene	3.2	<3.2	
1,3,5-Trimethylbenzene	3.2	<3.2	
1,2,3-Trichloropropane	3.2	<3.2	
Vinyl chloride	3.2	<3.2	
m- and p-Xylenes	3.2	<3.2	
o-Xylene	3.2	<3.2	
1,1-Dichloroethene	3.2	<3.2	
Acetone	65	<65	
Isopropylmethylbenzene	3.2	<3.2	
Methyl tert-butyl ether	32	<32	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	88.70	74 - 121
Dibromofluoromethane	113.76	80 - 120
Toluene-d8	88.08	81 - 117

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/04/98

8270B_SOIL ANALYSIS REPORT

Method #:	EPA 8270B	Preparation Batch ID:	P980908/3550_8270/82
SDG #:	980821-1170	Prep. Analyst:	CROWELLS D
Client Sample ID:	Swale 1		
Lab Sample ID:	98-06610	Analytical Batch ID:	I980908/8270B_SOI/114
Matrix:	SOIL	Analyst:	CROWELLS D
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Acenaphthene	1100	<1100	
Acenaphthylene	1100	<1100	
Anthracene	1100	<1100	
Benz(a)anthracene	1100	<1100	
Benzo(b)fluoranthene	1100	<1100	
Benzo(k)fluoranthene	1100	<1100	
Benzo(g,h,i)perylene	1100	<1100	
Benzo(a)pyrene	1100	<1100	
Chrysene	1100	<1100	
Dibenz(a,h)anthracene	1100	<1100	
Fluoranthene	1100	1300	
Fluorene	1100	<1100	
Indeno(1,2,3-cd)pyrene	1100	<1100	
2-Methylnaphthalene	1100	<1100	
Naphthalene	1100	<1100	
Phenanthrene	1100	<1100	
Pyrene	1100	1300	

Surrogate	% Recovery	Accep. Range
2-Fluorobiphenyl	74.65	30 - 115
4-Terphenyl-d14	86.15	18 - 137
Nitrobenzene-d5	66.20	23 - 120

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/08/98

6010A_SOIL ANALYSIS REPORT

Method #: EPA 6010A	Preparation Batch ID: P980903/3051/133
SDG #: 980821-1170	Prep. Analyst: LESHINSKYA
Client Sample ID: Swale 1	
Lab Sample ID: 98-06610	Analytical Batch ID: I980903/6010A_SOI/133
Matrix: SOIL	Analyst: LESHINSKYA
Units: mg/Kg dry	
Dilution Factor: 1	

Component Name	MRL	Result	Qualifiers
Arsenic	6.2	11	
Barium	6.2	150	
Cadmium	1.2	11	
Chromium	6.2	73	
Copper	6.2	80	
Iron	31	18000	
Lead	6.2	570	
Manganese	6.2	230	
Selenium	12	<12	
Silver	6.2	<6.2	
Zinc	25	450	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/09/98

8081_SOIL ANALYSIS REPORT

Method #:	EPA 8081	Preparation Batch ID:	P980910/3550_8081/57
SDG #:	980821-1170	Prep. Analyst:	CROWELLS
Client Sample ID:	Cove 1	Analytical Batch ID:	1980910/8081_SOIL/56
Lab Sample ID:	98-06611	Analyst:	CROWELLS
Matrix:	SOIL		
Units:	mg/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Aldrin	0.0073	<0.0073	
Aroclor 1221	0.0726	<0.0726	
Aroclor 1232	0.0726	<0.0726	
Aroclor 1248	0.0726	<0.0726	
Aroclor 1254	0.0726	0.727	
Aroclor 1260	0.0726	0.122	
alpha-BHC	0.0073	<0.0073	
beta-BHC	0.0073	<0.0073	
gamma-BHC	0.0073	<0.0073	
Chlordane (Technical)	0.0364	<0.0364	
4,4'-DDD	0.0073	0.132	
4,4'-DDE	0.0073	0.0427	
4,4'-DDT	0.0073	0.0079	
Dieldrin	0.0073	<0.0073	
Endosulfan I	0.0073	<0.0073	
Endosulfan II	0.0073	<0.0073	
Endosulfan sulfate	0.0073	<0.0073	
Endrin	0.0073	<0.0073	
Endrin aldehyde	0.0073	<0.0073	
Heptachlor	0.0073	<0.0073	
Heptachlor epoxide	0.0073	<0.0073	
Methoxychlor	0.0145	<0.0145	
Toxaphene	0.364	<0.364	
delta-BHC	0.0073	<0.0073	
Aroclor 1242/1016	0.0726	<0.0726	

Surrogate	% Recovery	Accep. Range
Decachlorobiphenyl	142.54	60 - 150
Tetrachloro-m-xylene	54.60	60 - 150

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/10/98

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980903/5035_SOIL/156
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 1		
Lab Sample ID:	98-06611	Analytical Batch ID:	I980903/8260A_SOI/156
Matrix:	SOIL	Analyst:	MITCHELLMR
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	5.5	<5.5	
Bromobenzene	5.5	<5.5	
Bromochloromethane	5.5	<5.5	
Bromodichloromethane	5.5	<5.5	
Bromoform	5.5	<5.5	
Bromomethane	27	<27	
2-Butanone	110	<110	
n-Butylbenzene	5.5	<5.5	
sec-Butylbenzene	5.5	<5.5	
tert-Butylbenzene	5.5	<5.5	
Carbon tetrachloride	5.5	<5.5	
Chlorobenzene	5.5	<5.5	
Chloroethane	27	<27	
Chloroform	27	<27	
Chloromethane	27	<27	
2-Chlorotoluene	5.5	<5.5	
4-Chlorotoluene	5.5	<5.5	
1,2-Dibromo-3-chloropropane	55	<55	
1,2-Dibromoethane	5.5	<5.5	
Dibromochloromethane	5.5	<5.5	
Dibromomethane	5.5	<5.5	
1,2-Dichlorobenzene	5.5	<5.5	
1,3-Dichlorobenzene	5.5	<5.5	
1,4-Dichlorobenzene	5.5	<5.5	
Dichlorodifluoromethane	5.5	<5.5	
1,1-Dichloroethane	5.5	<5.5	
1,2-Dichloroethane	5.5	<5.5	
cis-1,2-Dichloroethene	5.5	<5.5	
trans-1,2-Dichloroethene	5.5	<5.5	
1,2-Dichloropropane	5.5	<5.5	
1,3-Dichloropropane	5.5	<5.5	
2,2-Dichloropropane	5.5	<5.5	
1,1-Dichloropropene	5.5	<5.5	
cis-1,3-Dichloropropene	5.5	<5.5	
trans-1,3-Dichloropropene	5.5	<5.5	
Ethylbenzene	5.5	<5.5	
Hexachlorobutadiene	5.5	<5.5	
2-Hexanone	110	<110	
Isopropylbenzene	5.5	<5.5	
4-Methyl-2-pentanone	110	<110	
Methylene chloride	28	<28	
Naphthalene	5.5	<5.5	
n-Propylbenzene	5.5	<5.5	
Styrene	5.5	<5.5	
1,1,1,2-Tetrachloroethane	5.5	<5.5	
1,1,2,2-Tetrachloroethane	5.5	<5.5	
Tetrachloroethene	5.5	<5.5	
Toluene	5.5	<5.5	
1,2,3-Trichlorobenzene	5.5	<5.5	

Batch Approved By: GOTTSALLDL

Batch Approval Date: 09/04/98

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980903/5035_SOIL/156
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 1	Analytical Batch ID:	I980903/8260A_SOI/156
Lab Sample ID:	98-06611	Analyst:	MITCHELLMR
Matrix:	SOIL		
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,4-Trichlorobenzene	5.5	<5.5	
1,1,1-Trichloroethane	5.5	<5.5	
1,1,2-Trichloroethane	5.5	<5.5	
Trichloroethene	5.5	<5.5	
Trichlorofluoromethane	5.5	<5.5	
1,2,4-Trimethylbenzene	5.5	<5.5	
1,3,5-Trimethylbenzene	5.5	<5.5	
1,2,3-Trichloropropane	5.5	<5.5	
Vinyl chloride	5.5	<5.5	
m- and p-Xylenes	5.5	<5.5	
o-Xylene	5.5	<5.5	
1,1-Dichloroethene	5.5	<5.5	
Acetone	110	150	
Isopropylmethylbenzene	5.5	<5.5	
Methyl tert-butyl ether	55	<55	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	107.56	74 - 121
Dibromofluoromethane	119.38	80 - 120
Toluene-d8	96.94	81 - 117

8270B_SOIL ANALYSIS REPORT

Method #:	EPA 8270B	Preparation Batch ID:	P980908/3550_8270/82
SDG #:	980821-1170	Prep. Analyst:	CROWELLS
Client Sample ID:	Cove 1		
Lab Sample ID:	98-06611	Analytical Batch ID:	I980908/8270B_SOI/114
Matrix:	SOIL	Analyst:	CROWELLS
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Acenaphthene	1800	3000	
Acenaphthylene	1800	<1800	
Anthracene	1800	9400	
Benz(a)anthracene	1800	10000	
Benzo(b)fluoranthene	1800	5300	
Benzo(k)fluoranthene	1800	6400	
Benzo(g,h,i)perylene	1800	3400	
Benzo(a)pyrene	1800	8100	
Chrysene	1800	10000	
Dibenz(a,h)anthracene	1800	<1800	
Fluoranthene	1800	23000	
Fluorene	1800	3800	
Indeno(1,2,3-cd)pyrene	1800	3100	
2-Methylnaphthalene	1800	<1800	
Naphthalene	1800	2000	
Phenanthrene	1800	30000	
Pyrene	1800	19000	

Surrogate	% Recovery	Accep. Range
2-Fluorobiphenyl	76.30	30 - 115
4-Terphenyl-d14	73.80	18 - 137
Nitrobenzene-d5	67.70	23 - 120

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/08/98

6010A_SOIL ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980903/3051/133
SDG #:	980821-1170	Prep. Analyst:	LESHINSKYA
Client Sample ID:	Cove 1		
Lab Sample ID:	98-06611	Analytical Batch ID:	1980903/6010A_SOI/133
Matrix:	SOIL	Analyst:	LESHINSKYA
Units:	mg/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	11	<11	
Barium	11	470	
Cadmium	2.2	2.8	
Chromium	11	44	
Copper	11	140	
Iron	55	10000	
Lead	11	1000	
Manganese	11	56	
Selenium	22	<22	
Silver	11	<11	
Zinc	44	450	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/09/98

8081_SOIL ANALYSIS REPORT

Method #:	EPA 8081	Preparation Batch ID:	P980910/3550_8081/57
SDG #:	980821-1170	Prep. Analyst:	CROWELLSO
Client Sample ID:	Cove 2	Analytical Batch ID:	I980910/8081_SOIL/56
Lab Sample ID:	98-06612	Analyst:	CROWELLSO
Matrix:	SOIL		
Units:	mg/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Aldrin	0.0052	<0.0052	
Aroclor 1221	0.0524	<0.0524	
Aroclor 1232	0.0524	<0.0524	
Aroclor 1248	0.0524	<0.0524	
Aroclor 1254	0.0524	0.136	
Aroclor 1260	0.0524	0.119	
alpha-BHC	0.0052	<0.0052	
beta-BHC	0.0052	<0.0052	
gamma-BHC	0.0052	<0.0052	
Chlordane (Technical)	0.0263	<0.0263	
4,4'-DDD	0.0052	0.0117	
4,4'-DDE	0.0052	<0.0052	
4,4'-DDT	0.0052	<0.0052	
Dieldrin	0.0052	0.0217	
Endosulfan I	0.0052	<0.0052	
Endosulfan II	0.0052	<0.0052	
Endosulfan sulfate	0.0052	<0.0052	
Endrin	0.0052	<0.0052	
Endrin aldehyde	0.0052	<0.0052	
Heptachlor	0.0052	<0.0052	
Heptachlor epoxide	0.0052	<0.0052	
Methoxychlor	0.0105	<0.0105	
Toxaphene	0.262	<0.262	
delta-BHC	0.0052	<0.0052	
Aroclor 1242/1016	0.0524	<0.0524	

Surrogate	% Recovery	Accep. Range
Decachlorobiphenyl	91.08	60 - 150
Tetrachloro-m-xylene	72.60	60 - 150

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980903/5035_SOIL/156
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 2		
Lab Sample ID:	98-06612	Analytical Batch ID:	I980903/8260A_SOI/156
Matrix:	SOIL	Analyst:	MITCHELLMR
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Benzene	3.9	<3.9	
Bromobenzene	3.9	<3.9	
Bromochloromethane	3.9	<3.9	
Bromodichloromethane	3.9	<3.9	
Bromoform	3.9	<3.9	
Bromomethane	20	<20	
2-Butanone	79	<79	
n-Butylbenzene	3.9	<3.9	
sec-Butylbenzene	3.9	<3.9	
tert-Butylbenzene	3.9	<3.9	
Carbon tetrachloride	3.9	<3.9	
Chlorobenzene	3.9	<3.9	
Chloroethane	20	<20	
Chloroform	20	<20	
Chloromethane	20	<20	
2-Chlorotoluene	3.9	<3.9	
4-Chlorotoluene	3.9	<3.9	
1,2-Dibromo-3-chloropropane	39	<39	
1,2-Dibromoethane	3.9	<3.9	
Dibromochloromethane	3.9	<3.9	
Dibromomethane	3.9	<3.9	
1,2-Dichlorobenzene	3.9	<3.9	
1,3-Dichlorobenzene	3.9	<3.9	
1,4-Dichlorobenzene	3.9	<3.9	
Dichlorodifluoromethane	3.9	<3.9	
1,1-Dichloroethane	3.9	<3.9	
1,2-Dichloroethane	3.9	<3.9	
cis-1,2-Dichloroethene	3.9	<3.9	
trans-1,2-Dichloroethene	3.9	<3.9	
1,2-Dichloropropane	3.9	<3.9	
1,3-Dichloropropane	3.9	<3.9	
2,2-Dichloropropane	3.9	<3.9	
1,1-Dichloropropene	3.9	<3.9	
cis-1,3-Dichloropropene	3.9	<3.9	
trans-1,3-Dichloropropene	3.9	<3.9	
Ethylbenzene	3.9	<3.9	
Hexachlorobutadiene	3.9	<3.9	
2-Hexanone	79	<79	
Isopropylbenzene	3.9	<3.9	
4-Methyl-2-pentanone	79	<79	
Methylene chloride	20	<20	
Naphthalene	3.9	<3.9	
n-Propylbenzene	3.9	<3.9	
Styrene	3.9	<3.9	
1,1,1,2-Tetrachloroethane	3.9	<3.9	
1,1,2,2-Tetrachloroethane	3.9	<3.9	
Tetrachloroethene	3.9	<3.9	
Toluene	3.9	<3.9	
1,2,3-Trichlorobenzene	3.9	<3.9	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/04/98

8260A_SOIL ANALYSIS REPORT

Method #:	EPA 8260A	Preparation Batch ID:	P980903/5035_SOIL/156
SDG #:	980821-1170	Prep. Analyst:	MITCHELLMR
Client Sample ID:	Cove 2		
Lab Sample ID:	98-06612	Analytical Batch ID:	I980903/8260A_SOI/156
Matrix:	SOIL	Analyst:	MITCHELLMR
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
1,2,4-Trichlorobenzene	3.9	<3.9	
1,1,1-Trichloroethane	3.9	<3.9	
1,1,2-Trichloroethane	3.9	<3.9	
Trichloroethene	3.9	<3.9	
Trichlorofluoromethane	3.9	<3.9	
1,2,4-Trimethylbenzene	3.9	<3.9	
1,3,5-Trimethylbenzene	3.9	<3.9	
1,2,3-Trichloropropane	3.9	<3.9	
Vinyl chloride	3.9	<3.9	
m- and p-Xylenes	3.9	<3.9	
o-Xylene	3.9	<3.9	
1,1-Dichloroethene	3.9	<3.9	
Acetone	79	<79	
Isopropylmethylbenzene	3.9	<3.9	
Methyl tert-butyl ether	39	<39	

Surrogate	% Recovery	Accep. Range
4-Bromofluorobenzene	92.24	74 - 121
Dibromofluoromethane	116.06	80 - 120
Toluene-d8	88.76	81 - 117

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/04/98

8270B_SOIL ANALYSIS REPORT

Method #:	EPA 8270B	Preparation Batch ID:	P980908/3550_8270/82
SDG #:	980821-1170	Prep. Analyst:	CROWELLSD
Client Sample ID:	Cove 2		
Lab Sample ID:	98-06612	Analytical Batch ID:	1980908/8270B_SOI/114
Matrix:	SOIL	Analyst:	CROWELLSD
Units:	ug/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Acenaphthene	1300	<1300	
Acenaphthylene	1300	<1300	
Anthracene	1300	<1300	
Benz(a)anthracene	1300	1400	
Benzo(b)fluoranthene	1300	<1300	
Benzo(k)fluoranthene	1300	<1300	
Benzo(g,h,i)perylene	1300	<1300	
Benzo(a)pyrene	1300	1300	
Chrysene	1300	1500	
Dibenz(a,h)anthracene	1300	<1300	
Fluoranthene	1300	3000	
Fluorene	1300	<1300	
Indeno(1,2,3-cd)pyrene	1300	<1300	
2-Methylnaphthalene	1300	<1300	
Naphthalene	1300	<1300	
Phenanthrene	1300	2300	
Pyrene	1300	2300	

Surrogate	% Recovery	Accep. Range
2-Fluorobiphenyl	49.95	30 - 115
4-Terphenyl-d14	77.85	18 - 137
Nitrobenzene-d5	42.25	23 - 120

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/08/98

6010A_SOIL ANALYSIS REPORT

Method #:	EPA 6010A	Preparation Batch ID:	P980903/3051/133
SDG #:	980821-1170	Prep. Analyst:	LESHINSKYA
Client Sample ID:	Cove 2		
Lab Sample ID:	98-06612	Analytical Batch ID:	I980903/6010A_SOI/133
Matrix:	SOIL	Analyst:	LESHINSKYA
Units:	mg/Kg dry		
Dilution Factor:	1		

Component Name	MRL	Result	Qualifiers
Arsenic	6.1	14	
Barium	6.1	170	
Cadmium	1.2	14	
Chromium	6.1	74	
Copper	6.1	120	
Iron	30	64000	
Lead	6.1	110000	
Manganese	6.1	190	
Selenium	12	<12	
Silver	6.1	<6.1	
Zinc	24	600	

Batch Approved By: GOTTSHALLDL

Batch Approval Date: 09/09/98

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1170

Preparation Batch: P980826/7470A_PRE/93
 Component Name: Mercury
 Analytical Batch: I980826/7470A_AQU/76
 Reviewed By - Date: OCCHIALINI/JF - 8/28/98
 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7470A
 Analyst: LESHINSKYA
 Matrix: AQUEOUS
 Units: ug/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	0.20	<0.20	1	
Cove 1	98-06614	0.20	<0.20	1	
Cove 2	98-06615	0.20	<0.20	1	
CDM 2	98-06616	0.20	<0.20	1	
CDM 2A	98-06617	0.20	<0.20	1	

Preparation Batch: P980828/9012_AQ_P/29
 Component Name: Cyanide, Total
 Analytical Batch: I980831/9012_AQUE/29
 Reviewed By - Date: GOTTSALLDL - 8/31/98
 Prep. Analyst: NGUYENMH
 EPA Method #: EPA 9012
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	0.015	0.029	1	
Cove 1	98-06614	0.015	<0.015	1	
Cove 2	98-06615	0.015	<0.015	1	
CDM 2	98-06616	0.015	<0.015	1	
CDM 2A	98-06617	0.015	<0.015	1	

Preparation Batch: P980901/7471A_PRE/68
 Component Name: Mercury
 Analytical Batch: I980901/7471A_SOI/67
 Reviewed By - Date: GOTTSALLDL - 9/1/98
 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7471A
 Analyst: LESHINSKYA
 Matrix: SOIL
 Units: mg/Kg dry

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06609	0.65	1.0	1	
Swale 1	98-06610	0.38	<0.38	1	
Cove 1	98-06611	0.55	<0.55	1	
Cove 2	98-06612	0.48	<0.48	1	

Preparation Batch: P980904/9071A/52
 Component Name: TPH
 Analytical Batch: I980904/418.1_SOI/50
 Reviewed By - Date: GOTTSALLDL - 9/4/98
 Prep. Analyst: BUIT
 EPA Method #: EPA 418.1
 Analyst: BUIT
 Matrix: SOIL
 Units: mg/Kg dry

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06609	55	2800	1	
Swale 1	98-06610	32	490	1	
Cove 1	98-06611	540	5100	10	
Cove 2	98-06612	39	670	1	

Component Name: Nitrate
 Analytical Batch: I980825/353.2_AQU/81
 Reviewed By - Date: OCCHIALINI/JF - 8/28/98
 EPA Method #: EPA 353.2
 Analyst: NGUYENMH
 Matrix: AQUEOUS
 Units: mg/L

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	0.050	<0.050	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1170

Component Name: Nitrate	EPA Method #: EPA 353.2	Matrix: AQUEOUS
Analytical Batch: I980825/353.2_AQU/81	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: OCCHIALINI/JF - 8/28/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-06614	0.050	0.46	1	
Cove 2	98-06615	0.050	0.055	1	
CDM 2	98-06616	0.050	<0.050	1	
CDM 2A	98-06617	0.050	<0.050	1	

Component Name: COD	EPA Method #: HACH 8000	Matrix: AQUEOUS
Analytical Batch: I980826/8000_AQUE/37	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 8/31/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Cove 1	98-06614	5.0	48	1	
Cove 2	98-06615	5.0	54	1	
CDM 2	98-06616	5.0	120	1	
CDM 2A	98-06617	5.0	33	1	

Component Name: COD	EPA Method #: HACH 8000	Matrix: AQUEOUS
Analytical Batch: I980826/8000_AQUE/38	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 8/31/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	5.0	230	1	

Component Name: Total Dissolved Solids	EPA Method #: SM 2540C	Matrix: AQUEOUS
Analytical Batch: I980828/2540C_AQU/48	Analyst: NGUYENMH	Units: mg/L
Reviewed By - Date: GOTTSALLDL - 8/31/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	5.0	1000	1	
Cove 1	98-06614	5.0	550	1	
Cove 2	98-06615	5.0	500	1	
CDM 2	98-06616	5.0	700	1	
CDM 2A	98-06617	5.0	700	1	

Component Name: Alkalinity	EPA Method #: SM 2320B	Matrix: AQUEOUS
Analytical Batch: I980901/2320B_AQU/46	Analyst: NGUYENMH	Units: mg/L CaCO ₃
Reviewed By - Date: GOTTSALLDL - 9/1/98		

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	5.0	510	1	
Cove 1	98-06614	5.0	390	1	
Cove 2	98-06615	5.0	380	1	
CDM 2	98-06616	5.0	640	1	
CDM 2A	98-06617	5.0	63	1	

SINGLE COMPONENT ANALYTICAL REPORT

SDG#: 980821-1170

Component Name:	Sulfate	EPA Method #:	EPA 9038	Matrix:	AQUEOUS
Analytical Batch:	I980901/9038_AQUE/19	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 9/1/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	10	140	1	
Cove 1	98-06614	10	<10	1	
Cove 2	98-06615	10	<10	1	
CDM 2	98-06616	10	<10	1	
CDM 2A	98-06617	10	<10	1	

Component Name:	Chloride	EPA Method #:	EPA 9251	Matrix:	AQUEOUS
Analytical Batch:	I980901/9251_AQUE/20	Analyst:	NGUYENMH	Units:	mg/L
Reviewed By - Date:	GOTTSHALLDL - 9/1/98				

Client Sample ID	Lab Sample ID	MRL	Result	Dilution Factor	Qualifier
Stream 1	98-06613	10	230	10	
Cove 1	98-06614	10	110	10	
Cove 2	98-06615	1.0	64	1	
CDM 2	98-06616	1.0	58	1	
CDM 2A	98-06617	1.0	3.8	1	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

% Solids Results

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609		Percent Solids	44.6	%	
Swale 1	98-06610		Percent Solids	77.0	%	
Cove 1	98-06611		Percent Solids	45.7	%	
Cove 2	98-06612		Percent Solids	63.5	%	

Preparation Batch ID: P980826/7470A_PRE/93

Preparation ID: 7470A_PREP

EPA Method #: EPA 7470A

Batch Approved By: OCCHIALINI JF

Batch Approved On: 8/28/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Cove 1	98-06614	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
Cove 2	98-06615	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 2	98-06616	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		DUPLICATE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
		MATRIX_SPIKE	Final Volume	100	ml	
			Initial Volume	70.0	ml	
CDM 2A	98-06617	SAMPLE	Final Volume	100	ml	
			Initial Volume	70.0	ml	

Preparation Batch ID: P980828/9012_AQ_P/29

Preparation ID: 9012_AQ_Prep

EPA Method #: EPA 9012

Batch Approved By: GOTTSALLDL

Batch Approved On: 8/31/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 1	98-06614	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
Cove 2	98-06615	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 2	98-06616	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	
CDM 2A	98-06617	SAMPLE	Final Volume	50.0	mL	
			Initial Volume	50.0	mL	

Preparation Batch ID: P980831/3015/171

Preparation ID: 3015

EPA Method #: 3015

Batch Approved By: GOTTSALLDL

Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 1	98-06614	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
Cove 2	98-06615	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	
CDM 2	98-06616	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

Preparation Batch ID: P980831/3015/171
 Preparation ID: 3015
 Batch Approved By: GOTTSALLDL

EPA Method #: 3015
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
CDM 2A	98-06617	SAMPLE	Final Volume	50	mL	
			Initial Volume	45	mL	

Preparation Batch ID: P980901/5030/489
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Cove 1	98-06614	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
Cove 2	98-06615	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 2	98-06616	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	
CDM 2A	98-06617	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	25.0	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980901/7471A_PRE/68
 Preparation ID: 7471A_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #:
 Batch Approved On: 9/1/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.52	g	
Swale 1	98-06610	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.51	g	
Cove 1	98-06611	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.60	g	
Cove 2	98-06612	SAMPLE	Final Volume	100	ml	
			Initial Weight	0.49	g	

Preparation Batch ID: P980903/3051/133
 Preparation ID: 3051
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 3051
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	500	mL	
			Initial Weight	0.477	g	
Swale 1	98-06610	SAMPLE	Final Volume	500	mL	
			Initial Weight	0.519	g	
		DUPLICATE	Final Volume	500	mL	
			Initial Weight	0.500	g	
Cove 1	98-06611	SAMPLE	Final Volume	500	mL	
			Initial Weight	0.522	g	
Cove 2	98-06612	SAMPLE	Final Volume	500	mL	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

Preparation Batch ID: P980903/3051/133
 Preparation ID: 3051
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 3051
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
			Initial Weight	0.644	g	

Preparation Batch ID: P980903/5035_SOIL/156
 Preparation ID: 5035_SOIL_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5035
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Swale 1	98-06610	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	
Cove 1	98-06611	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	
Cove 2	98-06612	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	10.0	g	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980904/5030/495
 Preparation ID: 5030
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5030
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06613	SAMPLE	Final Volume	25.0	ml	
			Initial Volume	12.5	ml	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980904/5035_SOIL/157
 Preparation ID: 5035_SOIL_PREP
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 5035
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	25.0	ml	
			Initial Weight	5.00	g	
			Surrogate Volume	0.010	ml	
		MATRIX_SPIKE	Final Volume	25.0	ml	
			Initial Weight	5.00	g	
			Surrogate Volume	0.010	ml	

Preparation Batch ID: P980904/9071A/52
 Preparation ID: 9071A
 Batch Approved By: GOTTSALLDL

EPA Method #: EPA 9071A
 Batch Approved On: 9/4/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.5	g	
Swale 1	98-06610	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.7	g	
Cove 1	98-06611	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.5	g	
Cove 2	98-06612	SAMPLE	Final Volume	100	ml	
			Initial Weight	30.4	g	

PREPARATION INFORMATION REPORT

SDG #: 980821-1170

Preparation Batch ID: P980908/3550_8270/82
 Preparation ID: 3550_8270B
 Batch Approved By: GOTTSHALLDL

EPA Method #: EPA 3550
 Batch Approved On: 9/8/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.4	g	
			Surrogate Volume	1.0	mL	
Swale 1	98-06610	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.1	g	
			Surrogate Volume	1.0	mL	
Cove 1	98-06611	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.3	g	
			Surrogate Volume	1.0	mL	
		DUPLICATE	Final Volume	5.00	mL	
			Initial Weight	30.4	g	
			Surrogate Volume	1.0	mL	
Cove 2	98-06612	SAMPLE	Final Volume	5.00	mL	
			Initial Weight	30.8	g	
			Surrogate Volume	1.0	mL	

Preparation Batch ID: P980910/3550_8081/57
 Preparation ID: 3550_8081
 Batch Approved By: GOTTSHALLDL

EPA Method #: EPA 3550
 Batch Approved On: 9/10/98

Client Sample ID	Lab Sample ID	Aliquot Type	Prep. Component	Value	Units	Comments
Stream 1	98-06609	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.6	g	
			Surrogate Volume	1.00	mL	
		DUPLICATE	Final Volume	10.0	mL	
			Initial Weight	30.3	g	
			Surrogate Volume	1.00	mL	
Swale 1	98-06610	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.2	g	
			Surrogate Volume	1.00	mL	
		MATRIX_SPIKE	Final Volume	10.0	mL	
			Initial Weight	30.3	g	
			Surrogate Volume	1.00	mL	
Cove 1	98-06611	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.1	g	
			Surrogate Volume	1.00	mL	
Cove 2	98-06612	SAMPLE	Final Volume	10.0	mL	
			Initial Weight	30.0	g	
			Surrogate Volume	1.00	mL	

HOLDTIME SUMMARY

Analysis: 2320B_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Alkalinity

Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/28/98
Flow 1	98-06614	08/20/98	08/21/98		08/28/98
Flow 2	98-06615	08/20/98	08/21/98		08/28/98
DM 2	98-06616	08/20/98	08/21/98		08/28/98
DM 2A	98-06617	08/20/98	08/21/98		08/28/98

Analysis: 2540C_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Total Dissolved Solids (TDS)

Required Analytical Holdtime: 7 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/25/98
Flow 1	98-06614	08/20/98	08/21/98		08/25/98
Flow 2	98-06615	08/20/98	08/21/98		08/25/98
DM 2	98-06616	08/20/98	08/21/98		08/25/98
DM 2A	98-06617	08/20/98	08/21/98		08/25/98

Analysis: 353.2_AQUEOUS

Required Preparation Holdtime: None

Analysis Desc: Nitrate or Nitrite as Nitrogen

Required Analytical Holdtime: 0 days 48 hrs

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/21/98
Flow 1	98-06614	08/20/98	08/21/98		08/21/98
Flow 2	98-06615	08/20/98	08/21/98		08/21/98
DM 2	98-06616	08/20/98	08/21/98		08/21/98
DM 2A	98-06617	08/20/98	08/21/98		08/21/98

Analysis: 418.1_SOIL

Required Preparation Holdtime: 14 days

Analysis Desc: Total Petroleum Hydrocarbons by IR

Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/02/98	09/04/98
Flow 1	98-06610	08/20/98	08/21/98	09/02/98	09/04/98
Flow 2	98-06611	08/20/98	08/21/98	09/02/98	09/04/98
Flow 2	98-06612	08/20/98	08/21/98	09/02/98	09/04/98

Analysis: 6010A_AQUEOUS

Required Preparation Holdtime: 180 days

Analysis Desc: ICP Metals

Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	08/27/98	08/28/98
Flow 1	98-06614	08/20/98	08/21/98	08/27/98	08/28/98
Flow 2	98-06615	08/20/98	08/21/98	08/27/98	08/28/98
DM 2	98-06616	08/20/98	08/21/98	08/27/98	08/28/98
DM 2A	98-06617	08/20/98	08/21/98	08/27/98	08/28/98

HOLDTIME SUMMARY

Analysis: 6010A_SOIL
 Analysis Desc: ICP Metals

Required Preparation Holdtime: 180 days
 Required Analytical Holdtime: 180 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/01/98	09/02/98
Swale 1	98-06610	08/20/98	08/21/98	09/01/98	09/02/98
Cove 1	98-06611	08/20/98	08/21/98	09/01/98	09/02/98
Cove 2	98-06612	08/20/98	08/21/98	09/01/98	09/02/98

Analysis: 7470A_AQUEOUS
 Analysis Desc: Mercury in Water

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	08/26/98	08/26/98
Cove 1	98-06614	08/20/98	08/21/98	08/26/98	08/26/98
Cove 2	98-06615	08/20/98	08/21/98	08/26/98	08/26/98
CDM 2	98-06616	08/20/98	08/21/98	08/26/98	08/26/98
CDM 2A	98-06617	08/20/98	08/21/98	08/26/98	08/26/98

Analysis: 7471A_SOIL
 Analysis Desc: Mercury in Soil/Sediment/Sludge

Required Preparation Holdtime: 28 days
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	08/28/98	08/28/98
Swale 1	98-06610	08/20/98	08/21/98	08/28/98	08/28/98
Cove 1	98-06611	08/20/98	08/21/98	08/28/98	08/28/98
Cove 2	98-06612	08/20/98	08/21/98	08/28/98	08/28/98

Analysis: 8000_AQUEOUS
 Analysis Desc: Chemical Oxygen Demand

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/25/98
Cove 1	98-06614	08/20/98	08/21/98		08/25/98
Cove 2	98-06615	08/20/98	08/21/98		08/25/98
CDM 2	98-06616	08/20/98	08/21/98		08/25/98
CDM 2A	98-06617	08/20/98	08/21/98		08/25/98

Analysis: 8081_SOIL
 Analysis Desc: Pesticides/PCBs

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 40 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/03/98	09/04/98
Swale 1	98-06610	08/20/98	08/21/98	09/03/98	09/04/98
Cove 1	98-06611	08/20/98	08/21/98	09/03/98	09/04/98
Cove 2	98-06612	08/20/98	08/21/98	09/03/98	09/05/98

HOLDTIME SUMMARY

Analysis: 8260A_AQUEOUS
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	09/02/98	09/02/98
Flow 1	98-06614	08/20/98	08/21/98	08/31/98	08/31/98
Flow 2	98-06615	08/20/98	08/21/98	08/31/98	08/31/98
DM 2	98-06616	08/20/98	08/21/98	08/31/98	08/31/98
DM 2A	98-06617	08/20/98	08/21/98	08/31/98	08/31/98

Analysis: 8260A_SOIL
 Analysis Desc: Volatile Organics

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/03/98	09/03/98
Flow 1	98-06610	08/20/98	08/21/98	09/02/98	09/02/98
Flow 2	98-06611	08/20/98	08/21/98	09/02/98	09/02/98
Flow 2	98-06612	08/20/98	08/21/98	09/02/98	09/02/98

Analysis: 8270B_SOIL
 Analysis Desc: Semivolatile analysis in soils

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 40 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06609	08/20/98	08/21/98	09/03/98	09/04/98
Flow 1	98-06610	08/20/98	08/21/98	09/03/98	09/04/98
Flow 2	98-06611	08/20/98	08/21/98	09/03/98	09/04/98
Flow 2	98-06612	08/20/98	08/21/98	09/03/98	09/05/98

Analysis: 9012_AQUEOUS
 Analysis Desc: Total Cyanide

Required Preparation Holdtime: 14 days
 Required Analytical Holdtime: 14 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98	08/26/98	08/26/98
Flow 1	98-06614	08/20/98	08/21/98	08/26/98	08/26/98
Flow 2	98-06615	08/20/98	08/21/98	08/26/98	08/26/98
DM 2	98-06616	08/20/98	08/21/98	08/26/98	08/26/98
DM 2A	98-06617	08/20/98	08/21/98	08/26/98	08/26/98

Analysis: 9038_AQUEOUS
 Analysis Desc: Sulfate

Required Preparation Holdtime: None
 Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		09/01/98
Flow 1	98-06614	08/20/98	08/21/98		09/01/98
Flow 2	98-06615	08/20/98	08/21/98		09/01/98
DM 2	98-06616	08/20/98	08/21/98		09/01/98
DM 2A	98-06617	08/20/98	08/21/98		09/01/98

HOLDTIME SUMMARY

Analysis: 9251_AQUEOUS
Analysis Desc: Chloride

Required Preparation Holdtime: None
Required Analytical Holdtime: 28 days

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Prepared	Date Analyzed
Stream 1	98-06613	08/20/98	08/21/98		08/31/98
Cove 1	98-06614	08/20/98	08/21/98		08/31/98
Cove 2	98-06615	08/20/98	08/21/98		08/31/98
CDM 2	98-06616	08/20/98	08/21/98		08/31/98
CDM 2A	98-06617	08/20/98	08/21/98		08/31/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05304 Prep Analyst:
EPA Number: EPA 353.2 Analytical Batch ID: I980825/353.2_AQU/81
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

353.2_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05306 Prep Analyst:
EPA Number: EPA 353.2 Analytical Batch ID: I980825/353.2_AQU/81
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Nitrate	0.050	<0.050	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

8000_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05319 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980826/8000_AQUE/37
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05326 Prep Analyst:
EPA Number: HACH 8000 Analytical Batch ID: I980826/8000_AQUE/38
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
COD	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

7470A_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980826/7470A_PRE/93
Lab Sample ID: B98-05349 Prep Analyst: LESHINSKYA
EPA Number: EPA 7470A Analytical Batch ID: I980826/7470A_AQU/76
Units: ug/L Analysis Analyst: LESHINSKYA
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Mercury	0.20	<0.20	

Batch Approved By: OCCHIALINIJF Batch Approved Date: 8/28/98

2540C_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05390 Prep Analyst:
EPA Number: SM 2540C Analytical Batch ID: I980828/2540C_AQU/48
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Total Dissolved Solids	5.0	<5.0	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980828/9012_AQ_P/29
Lab Sample ID: B98-05406 Prep Analyst: NGUYENMH
EPA Number: EPA 9012 Analytical Batch ID: I980831/9012_AQUE/29
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980828/9012_AQ_P/29
Lab Sample ID: B98-05408 Prep Analyst: NGUYENMH
EPA Number: EPA 9012 Analytical Batch ID: I980831/9012_AQUE/29
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Cyanide, Total	0.015	<0.015	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

6010A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05436
 EPA Number: EPA 6010A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980831/3015/171
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980831/6010A_AQU/139
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

7471A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05449
 EPA Number: EPA 7471A
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980901/7471A_PRE/68
 Prep Analyst: LESHINSKYA
 Analytical Batch ID: I980901/7471A_SOI/67
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Result	Qualifier
Mercury	0.25	<0.25	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05451
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSALLDL

Batch Approved Date: 9/1/98

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05452
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	5.0	<5.0	
1,1,1-Trichloroethane	5.0	<5.0	
1,1,2,2-Tetrachloroethane	5.0	<5.0	
1,1,2-Trichloroethane	5.0	<5.0	
1,1-Dichloroethane	5.0	<5.0	
1,1-Dichloroethene	5.0	<5.0	
1,2,3-Trichloropropane	15	<15	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	5.0	<5.0	
1,2-Dichlorobenzene	5.0	<5.0	
1,2-Dichloroethane	5.0	<5.0	
1,2-Dichloropropane	5.0	<5.0	
1,4-Dichlorobenzene	5.0	<5.0	
2-Butanone	100	<100	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05452
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980901/8260A_AQU/340
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
2-Hexanone	50	<50	
4-Methyl-2-pentanone	100	<100	
Acetone	100	<100	
Acrylonitrile	200	<200	
Benzene	5.0	<5.0	
Bromochloromethane	5.0	<5.0	
Bromodichloromethane	5.0	<5.0	
Bromoform	5.0	<5.0	
Bromomethane	10	<10	
Carbon disulfide	100	<100	
Carbon tetrachloride	10	<10	
Chlorobenzene	5.0	<5.0	
Chloroethane	10	<10	
Chloroform	5.0	<5.0	
Chloromethane	10	<10	
Dibromochloromethane	5.0	<5.0	
Dibromomethane	10	<10	
Dichlorodifluoromethane	5.0	<5.0	
Ethylbenzene	5.0	<5.0	
Iodomethane	10	<10	
Methylene chloride	10	<10	
Styrene	10	<10	
Tetrachloroethene	5.0	<5.0	
Toluene	5.0	<5.0	
Trichloroethene	5.0	<5.0	
Trichlorofluoromethane	5.0	<5.0	
Vinyl acetate	50	<50	
Vinyl chloride	10	<10	
cis-1,2-Dichloroethene	5.0	<5.0	
cis-1,3-Dichloropropene	10	<10	
m- and p-Xylenes	5.0	<5.0	
o-Xylene	5.0	<5.0	
trans-1,2-Dichloroethene	5.0	<5.0	
trans-1,3-Dichloropropene	10	<10	
trans-1,4-Dichloro-2-butene	100	<100	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05462 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980901/9251_AQUE/20
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05464 Prep Analyst:
EPA Number: EPA 9251 Analytical Batch ID: I980901/9251_AQUE/20
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Chloride	1.0	<1.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05473 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980901/9038_AQUE/19
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID:
Lab Sample ID: B98-05477 Prep Analyst:
EPA Number: EPA 9038 Analytical Batch ID: I980901/9038_AQUE/19
Units: mg/L Analysis Analyst: NGUYENMH
Matrix: AQUEOUS

Component Name	MRL	Result	Qualifier
Sulfate	10	<10	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

2320B_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	B98-05483	Prep Analyst:	
EPA Number:	SM 2320B	Analytical Batch ID:	I980901/2320B_AQU/46
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
Alkalinity	5.0	<5.0	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

6010A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980903/3051/133
Lab Sample ID:	B98-05545	Prep Analyst:	LESHINSKYA
EPA Number:	EPA 6010A	Analytical Batch ID:	I980903/6010A_SOI/133
Units:	mg/Kg dry	Analysis Analyst:	LESHINSKYA
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
Arsenic	5.0	<5.0	
Barium	5.0	<5.0	
Cadmium	1.0	<1.0	
Chromium	5.0	<5.0	
Copper	5.0	<5.0	
Iron	25	<25	
Lead	5.0	<5.0	
Manganese	5.0	<5.0	
Selenium	10	<10	
Silver	5.0	<5.0	
Zinc	20	<20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/9/98

8260A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980903/5035_SOIL/156
Lab Sample ID:	B98-05547	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980903/8260A_SOI/156
Units:	ug/Kg dry	Analysis Analyst:	MITCHELLMR
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	2.5	<2.5	
1,1,1-Trichloroethane	2.5	<2.5	
1,1,2,2-Tetrachloroethane	2.5	<2.5	
1,1,2-Trichloroethane	2.5	<2.5	
1,1-Dichloroethane	2.5	<2.5	
1,1-Dichloroethene	2.5	<2.5	

8260A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05547
 EPA Number: EPA 8260A
 Units: ug/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/5035_SOIL/156
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980903/8260A_SOI/156
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1-Dichloropropene	2.5	<2.5	
1,2,3-Trichlorobenzene	2.5	<2.5	
1,2,3-Trichloropropane	2.5	<2.5	
1,2,4-Trichlorobenzene	2.5	<2.5	
1,2,4-Trimethylbenzene	2.5	<2.5	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	2.5	<2.5	
1,2-Dichlorobenzene	2.5	<2.5	
1,2-Dichloroethane	2.5	<2.5	
1,2-Dichloropropane	2.5	<2.5	
1,3,5-Trimethylbenzene	2.5	<2.5	
1,3-Dichlorobenzene	2.5	<2.5	
1,3-Dichloropropane	2.5	<2.5	
1,4-Dichlorobenzene	2.5	<2.5	
2,2-Dichloropropane	2.5	<2.5	
2-Butanone	50	<50	
2-Chlorotoluene	2.5	<2.5	
2-Hexanone	50	<50	
4-Chlorotoluene	2.5	<2.5	
4-Methyl-2-pentanone	50	<50	
Acetone	50	<50	
Benzene	2.5	<2.5	
Bromobenzene	2.5	<2.5	
Bromochloromethane	2.5	<2.5	
Bromodichloromethane	2.5	<2.5	
Bromoform	2.5	<2.5	
Bromomethane	12	<12	
Carbon tetrachloride	2.5	<2.5	
Chlorobenzene	2.5	<2.5	
Chloroethane	12	<12	
Chloroform	12	<12	
Chloromethane	12	<12	
Dibromochloromethane	2.5	<2.5	
Dibromomethane	2.5	<2.5	
Dichlorodifluoromethane	2.5	<2.5	
Ethylbenzene	2.5	<2.5	
Hexachlorobutadiene	2.5	<2.5	
Isopropylbenzene	2.5	<2.5	
Isopropylmethylbenzene	2.5	<2.5	
Methyl tert-butyl ether	25	<25	
Methylene chloride	13	<13	
Naphthalene	2.5	<2.5	

8260A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980903/5035_SOIL/156
Lab Sample ID:	B98-05547	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980903/8260A_SOI/156
Units:	ug/Kg dry	Analysis Analyst:	MITCHELLMR
Matrix:	SOIL		

Component Name	MRL	Result	Qualifier
Styrene	2.5	<2.5	
Tetrachloroethene	2.5	<2.5	
Toluene	2.5	<2.5	
Trichloroethene	2.5	<2.5	
Trichlorofluoromethane	2.5	<2.5	
Vinyl chloride	2.5	<2.5	
cis-1,2-Dichloroethene	2.5	<2.5	
cis-1,3-Dichloropropene	2.5	<2.5	
m- and p-Xylenes	2.5	<2.5	
n-Butylbenzene	2.5	<2.5	
n-Propylbenzene	2.5	<2.5	
o-Xylene	2.5	<2.5	
sec-Butylbenzene	2.5	<2.5	
tert-Butylbenzene	2.5	<2.5	
trans-1,2-Dichloroethene	2.5	<2.5	
trans-1,3-Dichloropropene	2.5	<2.5	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/4/98

8260A_AQUEOUS BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5030/495
Lab Sample ID:	B98-05557	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980904/8260A_AQU/342
Units:	ug/L	Analysis Analyst:	MITCHELLMR
Matrix:	AQUEOUS		

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	1.0	<1.0	
1,1,1-Trichloroethane	1.0	<1.0	
1,1,2,2-Tetrachloroethane	1.0	<1.0	
1,1,2-Trichloroethane	1.0	<1.0	
1,1-Dichloroethane	1.0	<1.0	
1,1-Dichloroethene	1.0	<1.0	
1,1-Dichloropropene	1.0	<1.0	
1,2,3-Trichlorobenzene	1.0	<1.0	
1,2,3-Trichloropropane	1.0	<1.0	
1,2,4-Trichlorobenzene	1.0	<1.0	
1,2,4-Trimethylbenzene	1.0	<1.0	
1,2-Dibromo-3-chloropropane	1.0	<1.0	
1,2-Dibromoethane	1.0	<1.0	
1,2-Dichlorobenzene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05557
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980904/5030/495
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980904/8260A_AQU/342
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,2-Dichloroethane	1.0	<1.0	
1,2-Dichloropropane	1.0	<1.0	
1,3,5-Trimethylbenzene	1.0	<1.0	
1,3-Dichlorobenzene	1.0	<1.0	
1,3-Dichloropropane	1.0	<1.0	
1,4-Dichlorobenzene	1.0	<1.0	
2,2-Dichloropropane	1.0	<1.0	
2-Butanone	20	<20	
2-Chlorotoluene	1.0	<1.0	
2-Hexanone	20	<20	
4-Chlorotoluene	1.0	<1.0	
4-Methyl-2-pentanone	20	<20	
Acetone	20	<20	
Benzene	1.0	<1.0	
Bromobenzene	1.0	<1.0	
Bromochloromethane	1.0	<1.0	
Bromodichloromethane	1.0	<1.0	
Bromoform	1.0	<1.0	
Bromomethane	5.0	<5.0	
Carbon tetrachloride	1.0	<1.0	
Chlorobenzene	1.0	<1.0	
Chloroethane	5.0	<5.0	
Chloroform	5.0	<5.0	
Chloromethane	5.0	<5.0	
Dibromochloromethane	1.0	<1.0	
Dibromomethane	1.0	<1.0	
Dichlorodifluoromethane	1.0	<1.0	
Ethylbenzene	1.0	<1.0	
Hexachlorobutadiene	1.0	<1.0	
Isopropylbenzene	1.0	<1.0	
Isopropylmethylbenzene	1.0	<1.0	
Methyl tert-butyl ether	1.0	<1.0	
Methylene chloride	5.0	<5.0	
Naphthalene	1.0	<1.0	
Styrene	1.0	<1.0	
Tetrachloroethene	1.0	<1.0	
Toluene	1.0	<1.0	
Trichloroethene	1.0	<1.0	
Trichlorofluoromethane	1.0	<1.0	
Vinyl chloride	1.0	<1.0	
cis-1,2-Dichloroethene	1.0	<1.0	
cis-1,3-Dichloropropene	1.0	<1.0	

8260A_AQUEOUS BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05557
 EPA Number: EPA 8260A
 Units: ug/L
 Matrix: AQUEOUS

Preparation Batch ID: P980904/5030/495
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: 1980904/8260A_AQU/342
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
m- and p-Xylenes	1.0	<1.0	
n-Butylbenzene	1.0	<1.0	
n-Propylbenzene	1.0	<1.0	
o-Xylene	1.0	<1.0	
sec-Butylbenzene	1.0	<1.0	
tert-Butylbenzene	1.0	<1.0	
trans-1,2-Dichloroethene	1.0	<1.0	
trans-1,3-Dichloropropene	1.0	<1.0	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/4/98

8260A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05572
 EPA Number: EPA 8260A
 Units: ug/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980904/5035_SOIL/157
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: 1980904/8260A_SOI/157
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
1,1,1,2-Tetrachloroethane	2.5	<2.5	
1,1,1-Trichloroethane	2.5	<2.5	
1,1,2,2-Tetrachloroethane	2.5	<2.5	
1,1,2-Trichloroethane	2.5	<2.5	
1,1-Dichloroethane	2.5	<2.5	
1,1-Dichloroethene	2.5	<2.5	
1,1-Dichloropropene	2.5	<2.5	
1,2,3-Trichlorobenzene	2.5	<2.5	
1,2,3-Trichloropropane	2.5	<2.5	
1,2,4-Trichlorobenzene	2.5	<2.5	
1,2,4-Trimethylbenzene	2.5	<2.5	
1,2-Dibromo-3-chloropropane	25	<25	
1,2-Dibromoethane	2.5	<2.5	
1,2-Dichlorobenzene	2.5	<2.5	
1,2-Dichloroethane	2.5	<2.5	
1,2-Dichloropropane	2.5	<2.5	
1,3,5-Trimethylbenzene	2.5	<2.5	
1,3-Dichlorobenzene	2.5	<2.5	
1,3-Dichloropropane	2.5	<2.5	
1,4-Dichlorobenzene	2.5	<2.5	
2,2-Dichloropropane	2.5	<2.5	
2-Butanone	50	<50	

8260A_SOIL BLANK REPORT

SDG #: 980821-1170
 Lab Sample ID: B98-05572
 EPA Number: EPA 8260A
 Units: ug/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980904/5035_SOIL/157
 Prep Analyst: MITCHELLMR
 Analytical Batch ID: I980904/8260A_SOI/157
 Analysis Analyst: MITCHELLMR

Component Name	MRL	Result	Qualifier
2-Chlorotoluene	2.5	<2.5	
2-Hexanone	50	<50	
4-Chlorotoluene	2.5	<2.5	
4-Methyl-2-pentanone	50	<50	
Acetone	50	<50	
Benzene	2.5	<2.5	
Bromobenzene	2.5	<2.5	
Bromochloromethane	2.5	<2.5	
Bromodichloromethane	2.5	<2.5	
Bromoform	2.5	<2.5	
Bromomethane	12	<12	
Carbon tetrachloride	2.5	<2.5	
Chlorobenzene	2.5	<2.5	
Chloroethane	12	<12	
Chloroform	12	<12	
Chloromethane	12	<12	
Dibromochloromethane	2.5	<2.5	
Dibromomethane	2.5	<2.5	
Dichlorodifluoromethane	2.5	<2.5	
Ethylbenzene	2.5	<2.5	
Hexachlorobutadiene	2.5	<2.5	
Isopropylbenzene	2.5	<2.5	
Isopropylmethylbenzene	2.5	<2.5	
Methyl tert-butyl ether	25	<25	
Methylene chloride	13	<13	
Naphthalene	2.5	<2.5	
Styrene	2.5	<2.5	
Tetrachloroethene	2.5	<2.5	
Toluene	2.5	<2.5	
Trichloroethene	2.5	<2.5	
Trichlorofluoromethane	2.5	<2.5	
Vinyl chloride	2.5	<2.5	
cis-1,2-Dichloroethene	2.5	<2.5	
cis-1,3-Dichloropropene	2.5	<2.5	
m- and p-Xylenes	2.5	<2.5	
n-Butylbenzene	2.5	<2.5	
n-Propylbenzene	2.5	<2.5	
o-Xylene	2.5	<2.5	
sec-Butylbenzene	2.5	<2.5	
tert-Butylbenzene	2.5	<2.5	
trans-1,2-Dichloroethene	2.5	<2.5	

8260A_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/5035_SOIL/157
Lab Sample ID:	B98-05572	Prep Analyst:	MITCHELLMR
EPA Number:	EPA 8260A	Analytical Batch ID:	I980904/8260A_SOI/157
Units:	ug/Kg dry	Analysis Analyst:	MITCHELLMR
Matrix:	SOIL		

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
trans-1,3-Dichloropropene	2.5	<2.5	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

418.1_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980904/9071A/52
Lab Sample ID:	B98-05582	Prep Analyst:	BUIT
EPA Number:	EPA 418.1	Analytical Batch ID:	I980904/418.1_SOI/50
Units:	mg/Kg dry	Analysis Analyst:	BUIT
Matrix:	SOIL		

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
TPH	25	<25	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/4/98

8270B_SOIL BLANK REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980908/3550_8270/82
Lab Sample ID:	B98-05595	Prep Analyst:	CROWELLS
EPA Number:	EPA 8270B	Analytical Batch ID:	I980908/8270B_SOI/114
Units:	ug/Kg dry	Analysis Analyst:	CROWELLS
Matrix:	SOIL		

<u>Component Name</u>	<u>MRL</u>	<u>Result</u>	<u>Qualifier</u>
2-Methylnaphthalene	170	<170	
Acenaphthene	170	<170	
Acenaphthylene	170	<170	
Anthracene	170	<170	
Benz(a)anthracene	170	<170	
Benzo(a)pyrene	170	<170	
Benzo(b)fluoranthene	170	<170	
Benzo(g,h,i)perylene	170	<170	
Benzo(k)fluoranthene	170	<170	
Chrysene	170	<170	
Dibenz(a,h)anthracene	170	<170	
Fluoranthene	170	<170	
Fluorene	170	<170	
Indeno(1,2,3-cd)pyrene	170	<170	
Naphthalene	170	<170	
Phenanthrene	170	<170	

8270B_SOIL BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980908/3550_8270/82
 Lab Sample ID: B98-05595 Prep Analyst: CROWELLS
 EPA Number: EPA 8270B Analytical Batch ID: I980908/8270B_SOI/114
 Units: ug/Kg dry Analysis Analyst: CROWELLS
 Matrix: SOIL

Component Name	MRL	Result	Qualifier
Pyrene	170	<170	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/8/98

8081_SOIL BLANK REPORT

SDG #: 980821-1170 Preparation Batch ID: P980910/3550_8081/57
 Lab Sample ID: B98-05638 Prep Analyst: CROWELLS
 EPA Number: EPA 8081 Analytical Batch ID: I980910/8081_SOIL/56
 Units: mg/Kg dry Analysis Analyst: CROWELLS
 Matrix: SOIL

Component Name	MRL	Result	Qualifier
4,4'-DDD	0.0033	<0.0033	
4,4'-DDE	0.0033	<0.0033	
4,4'-DDT	0.0033	<0.0033	
Aldrin	0.0033	<0.0033	
Aroclor 1221	0.0333	<0.0333	
Aroclor 1232	0.0333	<0.0333	
Aroclor 1242/1016	0.0333	<0.0333	
Aroclor 1248	0.0333	<0.0333	
Aroclor 1254	0.0333	<0.0333	
Aroclor 1260	0.0333	<0.0333	
Chlordane (Technical)	0.0167	<0.0167	
Dieldrin	0.0033	<0.0033	
Endosulfan I	0.0033	<0.0033	
Endosulfan II	0.0033	<0.0033	
Endosulfan sulfate	0.0033	<0.0033	
Endrin	0.0033	<0.0033	
Endrin aldehyde	0.0033	<0.0033	
Heptachlor	0.0033	<0.0033	
Heptachlor epoxide	0.0033	<0.0033	
Methoxychlor	0.0067	<0.0067	
Toxaphene	0.167	<0.167	
alpha-BHC	0.0033	<0.0033	
beta-BHC	0.0033	<0.0033	
delta-BHC	0.0033	<0.0033	
gamma-BHC	0.0033	<0.0033	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/10/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
Lab Sample ID: QCS98-05305
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980825/353.2_AQU/81
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	1.4	110.3	80 - 120	

Batch Approved By: OCCHIALINIJJF Batch Approved Date: 8/28/98

353.2_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
Lab Sample ID: QCS98-05307
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980825/353.2_AQU/81
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Nitrate	0.050	1.3	99.2	80 - 120	

Batch Approved By: OCCHIALINIJJF Batch Approved Date: 8/28/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
Lab Sample ID: QCS98-05320
Units: mg/L
Matrix: AQUEOUS

Preparation Batch ID:
Prep. Analyst:
Analytical Batch ID: I980826/8000_AQUE/37
Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	74	95.2	80 - 120	

Batch Approved By: GOTTSALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05327
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980826/8000_AQUE/38
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
COD	5.0	310	100.1	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05391
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980828/2540C_AQU/48
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	730	97.6	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05407
 Units: mg/L
 Matrix: AQUEOUS

Preparation Batch ID: P980828/9012_AQ_P/29
 Prep. Analyst: NGUYENMH
 Analytical Batch ID: I980831/9012_AQUE/29
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.21	103.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
Lab Sample ID:	QCS98-05409	Prep. Analyst:	NGUYENMH
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980831/9012_AQUE/29
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Cyanide, Total	0.015	0.19	95.5	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

7471A_SOIL QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980901/7471A_PRE/68
Lab Sample ID:	QCS98-05450	Prep. Analyst:	LESHINSKYA
Units:	mg/Kg dry		
Matrix:	SOIL	Analytical Batch ID:	I980901/7471A_SOI/67
		Analysis Analyst:	LESHINSKYA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Mercury	0.75	1.1	94.4	66.3 - 131.9	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
Lab Sample ID:	QCS98-05463	Prep. Analyst:	
Units:	mg/L		
Matrix:	AQUEOUS	Analytical Batch ID:	I980901/9251_AQUE/20
		Analysis Analyst:	NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.0	11	89.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 Lab Sample ID: QCS98-05466 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980901/9251_AQUE/20
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Chloride	1.0	11	91.8	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 Lab Sample ID: QCS98-05474 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980901/9038_AQUE/19
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	130	104.0	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9038_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 Lab Sample ID: QCS98-05478 Prep. Analyst:
 Units: mg/L
 Matrix: AQUEOUS Analytical Batch ID: I980901/9038_AQUE/19
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Sulfate	10	120	103.3	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

2320B_AQUEOUS QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05484
 Units: mg/L CaCO3
 Matrix: AQUEOUS

Preparation Batch ID:
 Prep. Analyst:
 Analytical Batch ID: I980901/2320B_AQU/46
 Analysis Analyst: NGUYENMH

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Alkalinity	5.0	120	101.7	80 - 120	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

6010A_SOIL QUALITY CONTROL SAMPLE REPORT

SDG #: 980821-1170
 Lab Sample ID: QCS98-05546
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980903/6010A_SOI/133
 Analysis Analyst: LESHINSKYA

Component Name	MRL	QCS Result	% Analyte Recovery	Acceptable Range	Qualifier
Arsenic	12	140	89.7	74.1 - 126	
Barium	12	140	81.1	76.9 - 123	
Cadmium	2.4	100	77.5	77.2 - 122.7	
Chromium	12	48	84.1	77 - 122.9	
Copper	12	52	86.7	79.1 - 121	
Iron	60	8000	91.7	60.8 - 139	
Lead	12	66	77.3	73.4 - 127	
Manganese	12	230	80.9	80.7 - 119	
Selenium	24	120	90.5	71.4 - 128	
Silver	12	40	71.0	73.8 - 126	
Zinc	48	860	87.2	73.9 - 126.4	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/9/98

7470A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #: 980821-1170 Preparation Batch ID: P980826/7470A_PRE/93
 Lab Sample ID: LFB98-05350 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 7470A Analytical Batch ID: I980826/7470A_AQU/76
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Mercury	0.2	5.00	102.4			80 - 120		
Batch Approved By: OCCHIALINI JF					Batch Approved Date: 8/28/98			

SDG #: 980821-1170 Preparation Batch ID: P980831/3015/171
 Lab Sample ID: LFB98-05437 Prep. Analyst: LESHINSKYA
 EPA Method #: EPA 6010A Analytical Batch ID: I980831/6010A_AQU/139
 Matrix: AQUEOUS Analyst: LESHINSKYA
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Arsenic	5.0	100.00	93.6			80 - 120		
Barium	5.0	1000.00	93.0			80 - 120		
Cadmium	1.0	50.00	98.3			80 - 120		
Chromium	5.0	100.00	99.2			80 - 120		
Copper	5.0	100.00	90.6			80 - 120		
Iron	25	200.00	91.6			80 - 120		
Lead	5.0	100.00	95.4			80 - 120		
Manganese	5.0	100.00	94.0			80 - 120		
Selenium	10	50.00	111.3			80 - 120		
Silver	5.0	100.00	95.6			80 - 120		
Zinc	20	100.00	100.6			80 - 120		
Batch Approved By: GOTTSALLDL					Batch Approved Date: 9/1/98			

SDG #: 980821-1170 Preparation Batch ID: P980901/5030/489
 Lab Sample ID: LFB98-05453 Prep. Analyst: MITCHELLMR
 EPA Method #: EPA 8260A Analytical Batch ID: I980901/8260A_AQU/340
 Matrix: AQUEOUS Analyst: MITCHELLMR
 Units: ug/L

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	104.9	105.3	0.34	61 - 145	0 - 14	
Benzene	1.0	50.00	105.6	104.7	0.86	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	105.3	103.8	1.42	75 - 130	0 - 13	
Toluene	1.0	50.00	106.9	94.3	12.53	76 - 125	0 - 13	

8260A_AQUEOUS LFB/LFB DUPLICATE RPD REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980901/5030/489
Lab Sample ID:	LFB98-05453	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980901/8260A_AQU/340
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Trichloroethene	1.0	50.00	105.1	102.9	2.14	71 - 120	0 - 14	
Batch Approved By: <u>GOTTSHALLDL</u>						Batch Approved Date: <u>9/1/98</u>		

SDG #:	980821-1170	Preparation Batch ID:	P980903/5035_SOIL/156
Lab Sample ID:	LFB98-05548	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	SOIL	Analytical Batch ID:	I980903/8260A_SOI/156
Units:	ug/Kg dry	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	2.5	50.00	106.0	105.5	0.47	59 - 172	0 - 22	
Benzene	2.5	50.00	110.3	117.3	6.22	66 - 142	0 - 21	
Chlorobenzene	2.5	50.00	102.9	101.2	1.61	60 - 133	0 - 21	
Toluene	2.5	50.00	105.2	106.6	1.28	59 - 139	0 - 21	
Trichloroethene	2.5	50.00	104.3	104.6	0.27	62 - 137	0 - 24	
Batch Approved By: <u>GOTTSHALLDL</u>						Batch Approved Date: <u>9/4/98</u>		

SDG #:	980821-1170	Preparation Batch ID:	P980904/5030/495
Lab Sample ID:	LFB98-05558	Prep. Analyst:	MITCHELLMR
EPA Method #:	EPA 8260A		
Matrix:	AQUEOUS	Analytical Batch ID:	I980904/8260A_AQU/342
Units:	ug/L	Analyst:	MITCHELLMR

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	1.0	50.00	106.0	105.5	0.47	61 - 145	0 - 14	
Benzene	1.0	50.00	110.3	117.3	6.22	76 - 127	0 - 11	
Chlorobenzene	1.0	50.00	102.9	101.2	1.61	75 - 130	0 - 13	
Toluene	1.0	50.00	105.2	106.6	1.28	76 - 125	0 - 13	
Trichloroethene	1.0	50.00	104.3	104.6	0.27	71 - 120	0 - 14	
Batch Approved By: <u>GOTTSHALLDL</u>						Batch Approved Date: <u>9/4/98</u>		

8260A_SOIL LFB/LFB DUPLICATE RPD REPORT

SDG #: 980821-1170 Preparation Batch ID: P980904/5035_SOIL/157
 Lab Sample ID: LFB98-05573 Prep. Analyst: MITCHELLMR
 EPA Method #: EPA 8260A Analytical Batch ID: I980904/8260A_SOI/157
 Matrix: SOIL Analyst: MITCHELLMR
 Units: ug/Kg dry

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
1,1-Dichloroethene	2.5	50.00	110.5	105.7	4.39	59 - 172	0 - 22	
Benzene	2.5	50.00	107.3	107.1	0.15	66 - 142	0 - 21	
Chlorobenzene	2.5	50.00	102.8	102.1	0.74	60 - 133	0 - 21	
Toluene	2.5	50.00	102.8	95.1	7.82	59 - 139	0 - 21	
Trichloroethene	2.5	50.00	101.2	101.4	0.22	62 - 137	0 - 24	
Batch Approved By: GOTTSALLDL					Batch Approved Date: 9/4/98			

SDG #: 980821-1170 Preparation Batch ID: P980904/9071A/52
 Lab Sample ID: LFB98-05583 Prep. Analyst: BUIT
 EPA Method #: EPA 418.1 Analytical Batch ID: I980904/418.1_SOI/50
 Matrix: SOIL Analyst: BUIT
 Units: mg/Kg dry

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
TPH		80.23	118.2			80 - 120		
Batch Approved By: GOTTSALLDL					Batch Approved Date: 9/4/98			

SDG #: 980821-1170 Preparation Batch ID: P980908/3550_8270/82
 Lab Sample ID: LFB98-05596 Prep. Analyst: CROWELLSD
 EPA Method #: EPA 8270B Analytical Batch ID: I980908/8270B_SOI/114
 Matrix: SOIL Analyst: CROWELLSD
 Units: ug/Kg dry

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers
			LFB	LFBD				
Acenaphthene		100.00	72.8			31 - 137		
Pyrene		100.00	66.7			35 - 142		
Batch Approved By: GOTTSALLDL					Batch Approved Date: 9/8/98			

8081_SOIL LFB/LFB DUPLICATE RPD REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980910/3550_8081/57
Lab Sample ID:	LFB98-05639	Prep. Analyst:	CROWELLS
EPA Method #:	EPA 8081		
Matrix:	SOIL	Analytical Batch ID:	I980910/8081_SOIL/56
Units:	mg/Kg dry	Analyst:	CROWELLS

Component Name	MRL	Spike Amount	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifiers	
			LFB	LFBD					
4,4'-DDT	0.003	100.00	108.7			25 - 160			
Aldrin	0.003	25.00	88.6			42 - 122			
Dieldrin	0.003	100.00	95.7			36 - 146			
Endrin	0.003	100.00	113.9			30 - 147			
Heptachlor	0.003	25.00	90.7			34 - 111			
gamma-BHC	0.003	25.00	91.8			32 - 127			
Aroclor 1260	0.033	5000.00	83.5			8 - 127			
Batch Approved By: <u>GOTTSHALLDL</u>						Batch Approved Date: <u>9/10/98</u>			

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06357		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	HACH 8000	Prep. Analyst:	
Lab Sample ID:	98-06357		
Units:	mg/L	Analytical Batch ID:	I980826/8000_AQUE/37
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	100	110	7,339	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9012_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980828/9012_AQ_P/29
EPA Method #:	EPA 9012	Prep. Analyst:	NGUYENMH
Lab Sample ID:	98-06553		
Units:	mg/L	Analytical Batch ID:	I980831/9012_AQUE/29
Matrix:	AQUEOUS	Analysis Analyst:	NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Cyanide, Total	0.015	<0.015	<0.015	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

2540C_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	SM 2540C	Prep. Analyst:	
Lab Sample ID:	98-06553	Analytical Batch ID:	I980828/2540C_AQU/48
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Total Dissolved Solids	5.0	140	130	8	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-06553	Analytical Batch ID:	I980901/9038_AQUE/19
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	10	<10	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-06553	Analytical Batch ID:	I980901/9251_AQUE/20
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	9.9	9.9	0.202	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

8000_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 EPA Method #: HACH 8000 Prep. Analyst:
 Lab Sample ID: 98-06555
 Units: mg/L Analytical Batch ID: I980826/8000_AQUE/37
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
COD	5.0	14	13	7.407	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 8/31/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID:
 EPA Method #: EPA 353.2 Prep. Analyst:
 Lab Sample ID: 98-06559
 Units: mg/L Analytical Batch ID: I980825/353.2_AQU/81
 Matrix: AQUEOUS Analysis Analyst: NGUYENMH

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	2.5	32	32	0	0 - 20	

Batch Approved By: OCCHIALINIJJ Batch Approved Date: 8/28/98

6010A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #: 980821-1170 Preparation Batch ID: P980831/3015/171
 EPA Method #: EPA 6010A Prep. Analyst: LESHINSKYA
 Lab Sample ID: 98-06579
 Units: ug/L Analytical Batch ID: I980831/6010A_AQU/139
 Matrix: AQUEOUS Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	5.0	9.8	8.4	15.358	0 - 20	
Barium	5.0	160	160	0.755	0 - 20	
Cadmium	1.0	<1.0	<1.0	N/A	0 - 20	
Chromium	5.0	<5.0	<5.0	N/A	0 - 20	
Copper	5.0	<5.0	<5.0	N/A	0 - 20	
Iron	25	<25	<25	N/A	0 - 20	
Lead	5.0	<5.0	<5.0	N/A	0 - 20	
Manganese	5.0	390	380	0.919	0 - 20	
Selenium	10	<10	<10	N/A	0 - 20	
Silver	5.0	<5.0	<5.0	N/A	0 - 20	
Zinc	20	<20	<20	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

353.2_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 353.2	Prep. Analyst:	
Lab Sample ID:	98-06579	Analytical Batch ID:	I980825/353.2_AQU/81
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Nitrate	0.050	<0.050	<0.050	N/A	0 - 20	

Batch Approved By: OCCHIALINIUF Batch Approved Date: 8/28/98

2320B_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	SM 2320B	Prep. Analyst:	
Lab Sample ID:	98-06579	Analytical Batch ID:	I980901/2320B_AQU/46
Units:	mg/L CaCO3	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Alkalinity	5.0	180	180	0.271	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

7471A_SOIL DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980901/7471A_PRE/68
EPA Method #:	EPA 7471A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-06605	Analytical Batch ID:	I980901/7471A_SOI/67
Units:	mg/Kg dry	Analysis Analyst:	LESHINSKYA
Matrix:	SOIL		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.32	<0.28	<0.32	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

8081_SOIL DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980910/3550_8081/57
EPA Method #:	EPA 8081	Prep. Analyst:	CROWELLS
Lab Sample ID:	98-06609	Analytical Batch ID:	I980910/8081_SOIL/56
Units:	mg/Kg dry	Analysis Analyst:	CROWELLS
Matrix:	SOIL		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
4,4'-DDD	0.0074	0.0526	0.0567	7.487	0 - 20	
4,4'-DDE	0.0074	0.0229	0.0178	25.124	0 - 20	

8081_SOIL DUPLICATE SAMPLE REPORT

SDG #: 980821-1170
 EPA Method #: EPA 8081
 Lab Sample ID: 98-06609
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980910/3550_8081/57
 Prep. Analyst: CROWELLSD
 Analytical Batch ID: I980910/8081_SOIL/56
 Analysis Analyst: CROWELLSD

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
4,4'-DDT	0.0074	0.0298	0.0087	109.424	0 - 20	
Aldrin	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Aroclor 1221	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1232	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1242/1016	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1248	0.0739	<0.0732	<0.0739	N/A	0 - 20	
Aroclor 1254	0.0739	0.299	0.258	14.645	0 - 20	
Aroclor 1260	0.0739	0.114	0.187	48.836	0 - 20	
Chlordane (Technical)	0.0371	0.264	0.246	7.326	0 - 20	
Dieldrin	0.0074	0.0275	0.0225	19.658	0 - 20	
Endosulfan I	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endosulfan II	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endosulfan sulfate	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endrin	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Endrin aldehyde	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Heptachlor	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Heptachlor epoxide	0.0074	<0.0073	<0.0074	N/A	0 - 20	
Methoxychlor	0.0148	<0.0146	<0.0148	N/A	0 - 20	
Toxaphene	0.370	<0.366	<0.370	N/A	0 - 20	
alpha-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	
beta-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	
delta-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	
gamma-BHC	0.0074	<0.0073	<0.0074	N/A	0 - 20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/10/98

6010A_SOIL DUPLICATE SAMPLE REPORT

SDG #: 980821-1170
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-06610
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980903/6010A_SOI/133
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Arsenic	6.5	11	7.1	45.911	0 - 20	
Barium	6.5	150	150	0.233	0 - 20	
Cadmium	1.3	11	10	7.829	0 - 20	
Chromium	6.5	73	70	3.948	0 - 20	
Copper	6.5	80	95	17.19	0 - 20	
Iron	32	18000	15000	14.365	0 - 20	
Lead	6.5	570	530	7.446	0 - 20	
Manganese	6.5	230	230	1.141	0 - 20	

6010A_SOIL DUPLICATE SAMPLE REPORT

SDG #: 980821-1170
 EPA Method #: EPA 6010A
 Lab Sample ID: 98-06610
 Units: mg/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA
 Analytical Batch ID: I980903/6010A_SOI/133
 Analysis Analyst: LESHINSKYA

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Selenium	13	<12	<13	N/A	0 - 20	
Silver	6.5	<6.2	<6.5	N/A	0 - 20	
Zinc	26	450	440	3.238	0 - 20	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/9/98

8270B_SOIL DUPLICATE SAMPLE REPORT

SDG #: 980821-1170
 EPA Method #: EPA 8270B
 Lab Sample ID: 98-06611
 Units: ug/Kg dry
 Matrix: SOIL

Preparation Batch ID: P980908/3550_8270/82
 Prep. Analyst: CROWELLSD
 Analytical Batch ID: I980908/8270B_SOI/114
 Analysis Analyst: CROWELLSD

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
2-Methylnaphthalene	1800	<1800	<1800	N/A	0 - 35	
Acenaphthene	1800	3000	<1800	N/A	0 - 35	
Acenaphthylene	1800	<1800	<1800	N/A	0 - 35	
Anthracene	1800	9400	<1800	N/A	0 - 35	
Benz(a)anthracene	1800	10000	<1800	N/A	0 - 35	
Benzo(a)pyrene	1800	8100	<1800	N/A	0 - 35	
Benzo(b)fluoranthene	1800	5300	<1800	N/A	0 - 35	
Benzo(g,h,i)perylene	1800	3400	<1800	N/A	0 - 35	
Benzo(k)fluoranthene	1800	6400	<1800	N/A	0 - 35	
Chrysene	1800	10000	<1800	N/A	0 - 35	
Dibenz(a,h)anthracene	1800	<1800	<1800	N/A	0 - 35	
Fluoranthene	1800	23000	<1800	N/A	0 - 35	
Fluorene	1800	3800	<1800	N/A	0 - 35	
Indeno(1,2,3-cd)pyrene	1800	3100	<1800	N/A	0 - 35	
Naphthalene	1800	2000	<1800	N/A	0 - 35	
Phenanthrene	1800	30000	<1800	N/A	0 - 35	
Pyrene	1800	19000	<1800	N/A	0 - 35	

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/8/98

7470A_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	P980826/7470A_PRE/93
EPA Method #:	EPA 7470A	Prep. Analyst:	LESHINSKYA
Lab Sample ID:	98-06616	Analytical Batch ID:	I980826/7470A_AQU/76
Units:	ug/L	Analysis Analyst:	LESHINSKYA
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Mercury	0.20	<0.20	<0.20	N/A	0 - 20	

Batch Approved By: OCCHIALINI JF Batch Approved Date: 8/28/98

9038_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 9038	Prep. Analyst:	
Lab Sample ID:	98-06678	Analytical Batch ID:	I980901/9038_AQUE/19
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Sulfate	10	12	12	0.206	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

9251_AQUEOUS DUPLICATE SAMPLE REPORT

SDG #:	980821-1170	Preparation Batch ID:	
EPA Method #:	EPA 9251	Prep. Analyst:	
Lab Sample ID:	98-06678	Analytical Batch ID:	I980901/9251_AQUE/20
Units:	mg/L	Analysis Analyst:	NGUYENMH
Matrix:	AQUEOUS		

Component Name	MRL	Sample Result	Duplicate Result	RPD	Acceptable Range	Qualifier
Chloride	1.0	13	14	4.726	0 - 20	

Batch Approved By: GOTTSHALLDL Batch Approved Date: 9/1/98

7470A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06616
 Matrix: AQUEOUS

Preparation Batch ID: P980826/7470A_PRE/93
 Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980826/7470A_AQU/76
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Mercury	98			80 - 120		
Batch Approved By:	OCCHIALINIUF			Batch Approved Date:	8/28/98	

8260A_AQUEOUS MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06615
 Matrix: AQUEOUS

Preparation Batch ID: P980901/5030/489
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980901/8260A_AQU/340
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	108			61 - 145		
Benzene	105			76 - 127		
Chlorobenzene	104			75 - 130		
Toluene	106			76 - 125		
Trichloroethene	106			71 - 120		
Batch Approved By:	GOTTSHALLDL			Batch Approved Date:	9/1/98	

6010A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980903/6010A_SOI/133
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Arsenic	85			75 - 125		
Barium	86			75 - 125		
Cadmium	87			75 - 125		
Chromium	83			75 - 125		
Copper	88			75 - 125		
Iron	975			75 - 125		N
Lead	68			75 - 125		N
Manganese	83			75 - 125		

6010A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980903/3051/133
 Prep. Analyst: LESHINSKYA

Analytical Batch ID: I980903/6010A_SOI/133
 Analyst: LESHINSKYA

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
Selenium	92			75 - 125		
Silver	85			75 - 125		
Zinc	90			75 - 125		

8260A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980903/5035_SOIL/156
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980903/8260A_SOI/156
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	115			59 - 172		
Benzene	113			66 - 142		
Chlorobenzene	105			60 - 133		
Toluene	110			59 - 139		
Trichloroethene	109			62 - 137		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/4/98

8260A_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06609
 Matrix: SOIL

Preparation Batch ID: P980904/5035_SOIL/157
 Prep. Analyst: MITCHELLMR

Analytical Batch ID: I980904/8260A_SOI/157
 Analyst: MITCHELLMR

Component Name	% Analyte Recovery			% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD	RPD			
1,1-Dichloroethene	116			59 - 172		
Benzene	111			66 - 142		
Chlorobenzene	106			60 - 133		
Toluene	104			59 - 139		
Trichloroethene	102			62 - 137		

Batch Approved By: GOTTSHALLDL

Batch Approved Date: 9/4/98

8081_SOIL MS/MSD RPD REPORT

SDG #: 980821-1170
 Lab Sample ID: 98-06610
 Matrix: SOIL

Preparation Batch ID: P980910/3550_8081/57
 Prep. Analyst: CROWELLS

Analytical Batch ID: I980910/8081_SOIL/56
 Analyst: CROWELLS

Component Name	% Analyte Recovery		RPD	% Rec. Accep. Range	RPD Accep. Range	Qualifier
	MS	MSD				
4,4'-DDT	125			25 - 160		
Aldrin	98			42 - 122		
Dieldrin	127			36 - 146		
Endrin	141			30 - 147		
Heptachlor	129			34 - 111		
gamma-BHC	90			32 - 127		
Batch Approved By: <u>GOTTSHALLDL</u>			Batch Approved Date: <u>9/10/98</u>			

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Field Log # **Q# 2034** Page **1** of **1**
 Client: Town of Waltham Address: Wood Ave SDGW: **780821-1170**
 Project Name: Wood Ave Lead 611 Phone: **978-371-1170** / **617-252-8000** TAT: **STD**
 Project #: TAT Approved by: **BT**

Contact: CEB Loren Webster / Chessa Brown Lab Acct. #: **10187**
 Report to: Paul Tannai/CDM Bill to:

CLIENT SAMPLE ID	DATE	TIME	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle ID's	VOA		SEMI VOA		MISC		METALS		OTHER
						624/8240	8260A	525	625/8270 ABZ	PAH	Other	PEST/PCB	TPH 418.1	
Stream 1	8/28/98	1:30	S	2	98-06609	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stream 1	1:30	W	6	98-06613	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Swale 1	1:45	S	2	98-06610	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cove 1	2:05	S	2	98-06611	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cove 1	2:05	W	6	98-06614	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cove 2	2:30	S	2	98-06612	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cove 2	2:30	W	6	98-06615	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CDM 2	3:45	W	6	98-06616	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CDM 2 A	4:30	W	6	98-06617	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Container Type: P - Plastic G - Glass V - Vial
 Preservative:
 Volume:
 Instructions: Fax Results State Forms SMART Report Disk Deliverable TICS
 Samples Received: Cooler Temperature: _____ °C yes no
 Chilled/property preserved? yes no
 In good condition? yes no
 Evidence of tampering? yes no
 Shipper/Airbill #: Custody Seal: Method of Shipment: Courier Airborne UPS Fed-ex Land Other
 NOTE: All samples submitted subject to Standard Terms & Conditions

Comments: Please filter metals
 ✓ HACH 8000 COD
 ✓ Sm 25406 TDS
 ✓ Sm 2300B Total Alkalinity
 ✓ EPA 353.2 Nitrate
 ✓ EPA 9012 Cyanide
 ✓ EPA 9251 Chloride
 VERA 9038 Sulfate
 EPA 7470A Mercury
METALS ADDED FOR ALL SOILS PER LARIE WEBSTER (CRB) 8/24/98

Chain of Custody

Client: Town of Waltham
Project: Waltham Landfill
SDG: 981209-1664
Date: December 23, 1998



CDM Laboratory
Riverside Technology Center
840 Memorial Drive
Cambridge, MA 02139
phone (617)-354-4448 - fax (617)-354-0764

Laboratory Report

Client: Town of Waltham

Client Contact: Paul Taurasi

Project: Waltham Landfill

Address: Camp Dresser & McKee
Ten Cambridge Center

Project Narrative

The following report contains the analytical results for samples submitted to CDM Laboratory Services on December 10, 1998. The samples were received into the laboratory in accordance with documented sample acceptance procedures. All sample identification agreed with accompanying Chain of Custody documentation. Please refer to the Sample Description Information sheet for the list of samples included within this report.

No significant deviations or anomalies were encountered during the preparation or analysis of these samples.

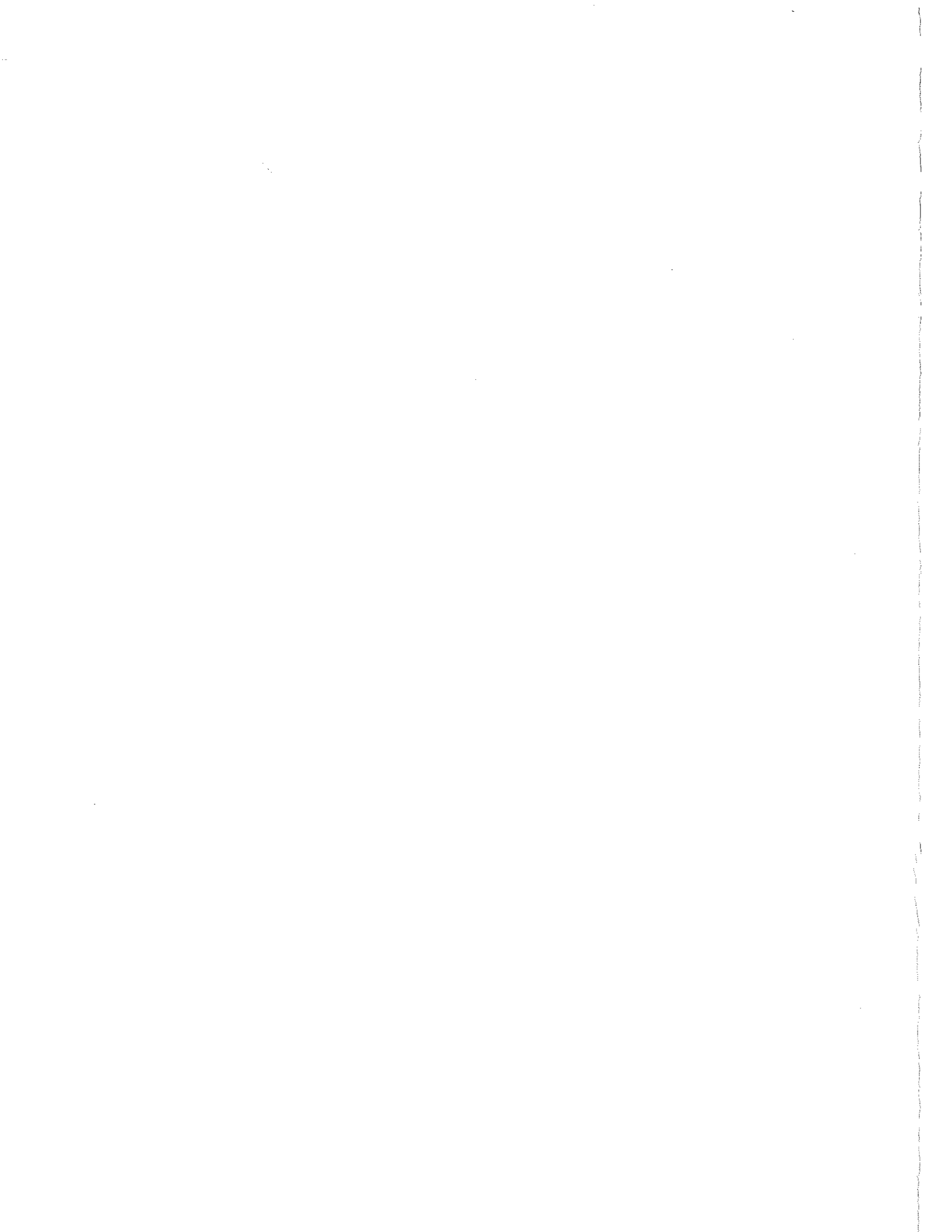
Note: Analytical testing was conducted by Alpha Analytical Laboratories under subcontract to CDM. The report is attached.

The undersigned hereby attest to the fact that the information contained in this report is, to the best of their knowledge, complete and accurate.

LABORATORY MANAGEMENT REVIEW:

LABORATORY QA/QC REVIEW:

AZ DOH # AZ0553, CO DPHE (RECIPROCITY), CT DPH # 0682, LA DOHH, MA DEP M-MA012, MD DHS (RECIPROCITY), NH DES#2509, NY ELAP #11330, NC DEHNR #553, PA DEP #68-469, RI DOH #48, VA DGS/DCLS #00046, EPA ICR MA001



ALPHA ANALYTICAL LABORATORIES

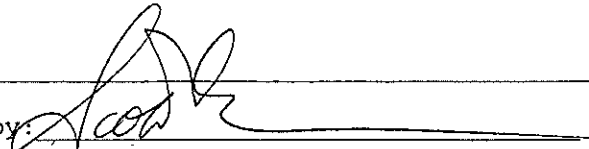
Eight Walkup Drive
Westborough, Massachusetts 01581-1019
(508) 898-9220

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

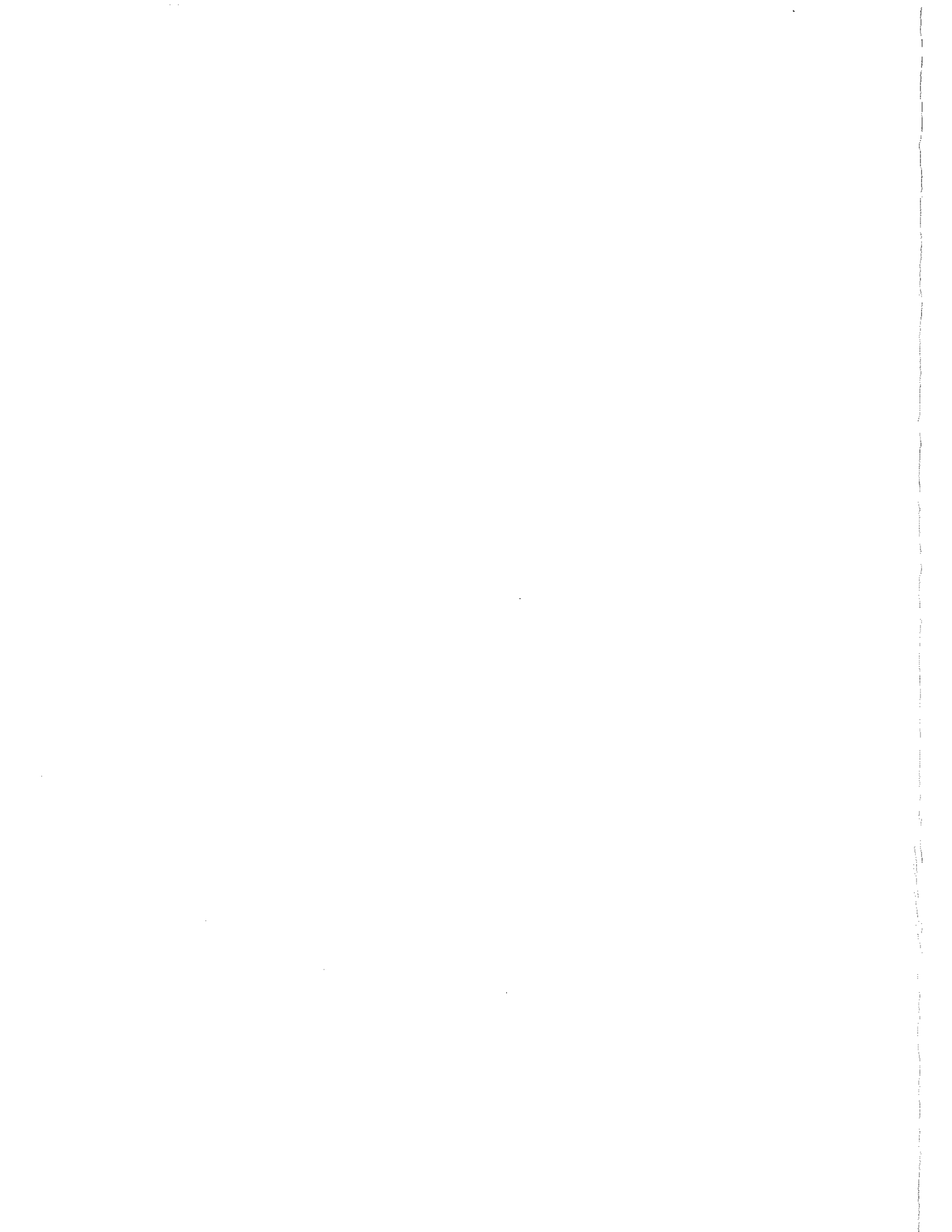
CERTIFICATE OF ANALYSIS

Client: Camp Dresser & McKee, Inc. Laboratory Job Number: L9809865
Address: 840 Memorial Drive Invoice Number: 21787
Riverside Technology Center
Cambridge, MA 02139 Date Received: 10-DEC-98
Attn: Paul Taurasi Date Reported: 24-DEC-98
Project Number: Delivery Method: Alpha
Site: TOWN OF WALTHAM

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L9809865-01	CDM 4	WALTHAM LANDFILL
L9809865-02	CDM 4A	WALTHAM LANDFILL
L9809865-03	STREAM 1	WALTHAM LANDFILL
L9809865-04	CDM 3A	WALTHAM LANDFILL
L9809865-05	COVE 1	WALTHAM LANDFILL
L9809865-06	COVE 2	WALTHAM LANDFILL
L9809865-07	COMPOSITE OF SED 1 - SED 3	WALTHAM LANDFILL

Authorized by: 

Scott McLean - Laboratory Director



ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA:M-MA-086 NH:200395-B/C CT:PH-0574 ME:MA086 RI:65

Laboratory Sample Number: L9809865-07 Date Collected: 10-DEC-1998
 COMPOSITE OF SED 1 - SED 3 Date Received : 10-DEC-98
 Sample Matrix: SOIL Date Reported : 24-DEC-98
 Condition of Sample: Satisfactory Field Prep: None
 Number & Type of Containers: 6-Glass

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Solids, Total	18.	%	0.10	30	2540G	21-Dec	SN
Hydrocarbons, Total (IR)	5800	mg/kg	220	4	418.1	21-Dec 23-Dec	SN
Total Metals					1	3051	
Arsenic, Total	17.	mg/kg	1.1	1	6010B	15-Dec 16-Dec	MG
Barium, Total	530	mg/kg	2.2	1	6010B	15-Dec 16-Dec	MG
Cadmium, Total	6.4	mg/kg	1.1	1	6010B	15-Dec 16-Dec	MG
Chromium, Total	63.	mg/kg	2.2	1	6010B	15-Dec 16-Dec	MG
Copper, Total	210	mg/kg	2.2	1	6010B	15-Dec 16-Dec	MG
Iron, Total	34000	mg/kg	11.	1	6010B	15-Dec 16-Dec	MG
Lead, Total	490	mg/kg	11.	1	6010B	15-Dec 16-Dec	MG
Manganese, Total	270	mg/kg	2.2	1	6010B	15-Dec 16-Dec	MG
Mercury, Total	ND	mg/kg	1.4	1	7471A	21-Dec 22-Dec	GF
Selenium, Total	ND	mg/kg	2.2	1	6010B	15-Dec 16-Dec	MG
Silver, Total	ND	mg/kg	2.2	1	6010B	15-Dec 16-Dec	MG
Zinc, Total	840	mg/kg	11.	1	6010B	15-Dec 16-Dec	MG
Volatile Organics by GC/MS 8260					1	8260B	24-Dec BT
Methylene chloride	660	ug/kg	560				
1,1-Dichloroethane	ND	ug/kg	170				
Chloroform	ND	ug/kg	170				
Carbon tetrachloride	ND	ug/kg	110				
1,2-Dichloropropane	ND	ug/kg	390				
Dibromochloromethane	ND	ug/kg	110				
1,1,2-Trichloroethane	ND	ug/kg	170				
Tetrachloroethene	ND	ug/kg	170				
Chlorobenzene	ND	ug/kg	390				
Trichlorofluoromethane	ND	ug/kg	560				
1,2-Dichloroethane	ND	ug/kg	170				
1,1,1-Trichloroethane	ND	ug/kg	110				
Bromodichloromethane	ND	ug/kg	110				
trans-1,3-Dichloropropene	ND	ug/kg	110				
cis-1,3-Dichloropropene	ND	ug/kg	110				
1,1-Dichloropropene	ND	ug/kg	2800				

Comments: Complete list of References and Glossary of Terms found in Addendum I

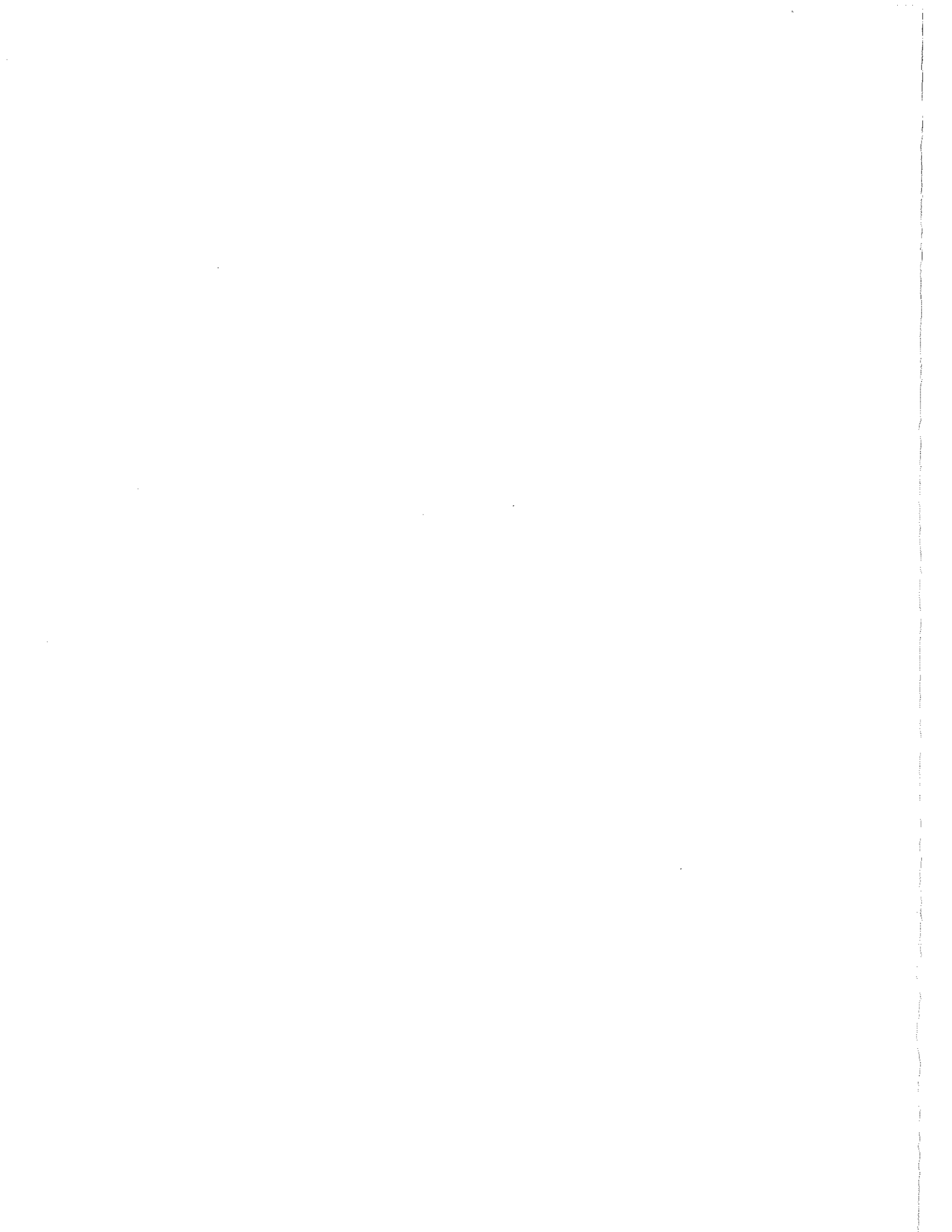


ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Volatile Organics by GC/MS 8260 continued				1	8260B	24-Dec	BT
Bromoform	ND	ug/kg	110				
1,1,2,2-Tetrachloroethane	ND	ug/kg	110				
Benzene	ND	ug/kg	110				
Toluene	ND	ug/kg	170				
Ethylbenzene	ND	ug/kg	110				
Chloromethane	ND	ug/kg	1100				
Bromomethane	ND	ug/kg	220				
Vinyl chloride	ND	ug/kg	220				
Chloroethane	ND	ug/kg	220				
1,1-Dichloroethene	ND	ug/kg	170				
trans-1,2-Dichloroethene	ND	ug/kg	170				
Trichloroethene	ND	ug/kg	110				
1,2-Dichlorobenzene	ND	ug/kg	1100				
1,3-Dichlorobenzene	ND	ug/kg	1100				
1,4-Dichlorobenzene	ND	ug/kg	1100				
Methyl tert butyl ether	ND	ug/kg	1100				
p/m-Xylene	ND	ug/kg	110				
o-Xylene	ND	ug/kg	110				
cis-1,2-Dichloroethene	ND	ug/kg	110				
Dibromomethane	ND	ug/kg	1100				
1,2,3-Trichloropropane	ND	ug/kg	1100				
Styrene	ND	ug/kg	110				
Dichlorodifluoromethane	ND	ug/kg	1100				
Acetone	2100	ug/kg	1100				
2-Butanone	ND	ug/kg	1100				
4-Methyl-2-pentanone	ND	ug/kg	1100				
2-Hexanone	ND	ug/kg	1100				
Bromochloromethane	ND	ug/kg	560				
2,2-Dichloropropane	ND	ug/kg	560				
1,2-Dibromoethane	ND	ug/kg	560				
1,3-Dichloropropane	ND	ug/kg	560				
1,1,1,2-Tetrachloroethane	ND	ug/kg	560				
Bromobenzene	ND	ug/kg	560				
n-Butylbenzene	ND	ug/kg	560				
sec-Butylbenzene	ND	ug/kg	560				
tert-Butylbenzene	ND	ug/kg	560				
o-Chlorotoluene	ND	ug/kg	560				
p-Chlorotoluene	ND	ug/kg	560				
1,2-Dibromo-3-chloropropane	ND	ug/kg	560				
Hexachlorobutadiene	ND	ug/kg	560				
Isopropylbenzene	ND	ug/kg	560				
p-Isopropyltoluene	ND	ug/kg	560				
Naphthalene	ND	ug/kg	560				
n-Propylbenzene	ND	ug/kg	560				
1,2,3-Trichlorobenzene	ND	ug/kg	560				
1,2,4-Trichlorobenzene	ND	ug/kg	560				
1,3,5-Trimethylbenzene	ND	ug/kg	560				
1,2,4-Trimethylbenzene	ND	ug/kg	560				

Comments: Complete list of References and Glossary of Terms found in Addendum I

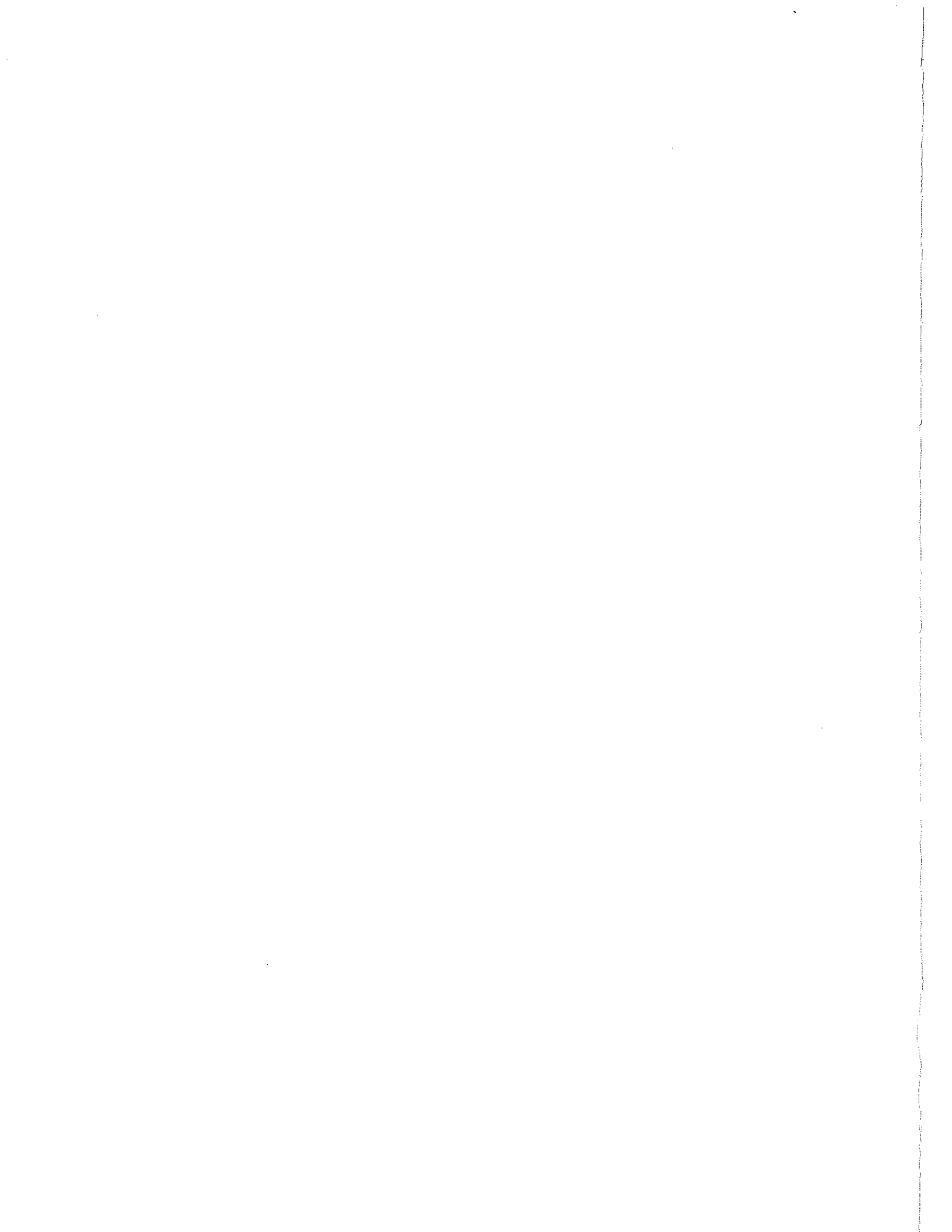


ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Volatile Organics by GC/MS 8260 continued				1	8260B	24-Dec	BT
Surrogate Recovery							
1,2-Dichloroethane-d4	94.0	%					
Toluene-d8	96.0	%					
4-Bromofluorobenzene	87.0	%					
Dibromofluoromethane	92.0	%					
SVOC's by GC/MS 8270				1	8270C	11-Dec 14-Dec	MK
Acenaphthene	ND	ug/kg	14000				
Benzidine	ND	ug/kg	140000				
1,2,4-Trichlorobenzene	ND	ug/kg	14000				
Hexachlorobenzene	ND	ug/kg	14000				
Bis(2-chloroethyl) ether	ND	ug/kg	14000				
1-Chloronaphthalene	ND	ug/kg	14000				
2-Chloronaphthalene	ND	ug/kg	14000				
1,2-Dichlorobenzene	ND	ug/kg	14000				
1,3-Dichlorobenzene	ND	ug/kg	14000				
1,4-Dichlorobenzene	ND	ug/kg	14000				
3,3'-Dichlorobenzidine	ND	ug/kg	140000				
2,4-Dinitrotoluene	ND	ug/kg	14000				
2,6-Dinitrotoluene	ND	ug/kg	14000				
Azobenzene	ND	ug/kg	14000				
Fluoranthene	ND	ug/kg	14000				
4-Chlorophenyl phenyl ether	ND	ug/kg	14000				
4-Bromophenyl phenyl ether	ND	ug/kg	14000				
Bis(2-chloroisopropyl) ether	ND	ug/kg	14000				
Bis(2-chloroethoxy) methane	ND	ug/kg	14000				
Hexachlorobutadiene	ND	ug/kg	28000				
Hexachlorocyclopentadiene	ND	ug/kg	28000				
Hexachloroethane	ND	ug/kg	14000				
Isophorone	ND	ug/kg	14000				
Naphthalene	ND	ug/kg	14000				
Nitrobenzene	ND	ug/kg	14000				
NDPA/DPA	ND	ug/kg	14000				
n-Nitrosodi-n-propylamine	ND	ug/kg	14000				
Bis(2-ethylhexyl) phthalate	ND	ug/kg	28000				
Butyl benzyl phthalate	ND	ug/kg	14000				
Di-n-butylphthalate	ND	ug/kg	14000				
Di-n-octylphthalate	ND	ug/kg	14000				
Diethyl phthalate	ND	ug/kg	14000				
Dimethyl phthalate	ND	ug/kg	14000				
Benzo(a)anthracene	ND	ug/kg	14000				
Benzo(a)pyrene	ND	ug/kg	14000				
Benzo(b)fluoranthene	ND	ug/kg	14000				
Benzo(k)fluoranthene	ND	ug/kg	14000				
Chrysene	ND	ug/kg	14000				
Acenaphthylene	ND	ug/kg	14000				
Anthracene	ND	ug/kg	14000				

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MK
Benzo (ghi) perylene	ND	ug/kg	14000				
Fluorene	ND	ug/kg	14000				
Phenanthrene	ND	ug/kg	14000				
Dibenzo (a, h) anthracene	ND	ug/kg	14000				
Indeno (1, 2, 3-cd) pyrene	ND	ug/kg	14000				
Pyrene	ND	ug/kg	14000				
Aniline	ND	ug/kg	28000				
4-Chloroaniline	ND	ug/kg	14000				
1-Methylnaphthalene	ND	ug/kg	14000				
2-Nitroaniline	ND	ug/kg	14000				
3-Nitroaniline	ND	ug/kg	14000				
4-Nitroaniline	ND	ug/kg	14000				
Dibenzofuran	ND	ug/kg	14000				
a, a-Dimethylphenethylamine	ND	ug/kg	140000				
Hexachloropropene	ND	ug/kg	140000				
Nitrosodi-n-butylamine	ND	ug/kg	28000				
2-Methylnaphthalene	ND	ug/kg	14000				
1, 2, 4, 5-Tetrachlorobenzene	ND	ug/kg	56000				
Pentachlorobenzene	ND	ug/kg	56000				
a-Naphthylamine	ND	ug/kg	56000				
b-Naphthylamine	ND	ug/kg	56000				
Phenacetin	ND	ug/kg	28000				
Dimethoate	ND	ug/kg	56000				
4-Aminobiphenyl	ND	ug/kg	28000				
Pentachloronitrobenzene	ND	ug/kg	28000				
Isodrin	ND	ug/kg	28000				
p-Dimethylaminoazobenzene	ND	ug/kg	28000				
Chlorobenzilate	ND	ug/kg	56000				
3-Methylcholanthrene	ND	ug/kg	56000				
Ethyl Methanesulfonate	ND	ug/kg	42000				
Acetophenone	ND	ug/kg	56000				
Nitrosodipiperidine	ND	ug/kg	56000				
7, 12-Dimethylbenz (a) anthracene	ND	ug/kg	28000				
n-Nitrosodimethylamine	ND	ug/kg	140000				
2, 4, 6-Trichlorophenol	ND	ug/kg	14000				
p-Chloro-m-cresol	ND	ug/kg	14000				
2-Chlorophenol	ND	ug/kg	14000				
2, 4-Dichlorophenol	ND	ug/kg	28000				
2, 4-Dimethylphenol	ND	ug/kg	28000				
2-Nitrophenol	ND	ug/kg	28000				
4-Nitrophenol	ND	ug/kg	28000				
2, 4-Dinitrophenol	ND	ug/kg	56000				
4, 6-Dinitro-o-cresol	ND	ug/kg	56000				
Pentachlorophenol	ND	ug/kg	56000				
Phenol	ND	ug/kg	14000				
2-Methylphenol	ND	ug/kg	14000				
3-Methylphenol/4-Methylphenol	ND	ug/kg	14000				
2, 4, 5-Trichlorophenol	ND	ug/kg	14000				
2, 6-Dichlorophenol	ND	ug/kg	28000				

Comments: Complete list of References and Glossary of Terms found in Addendum I

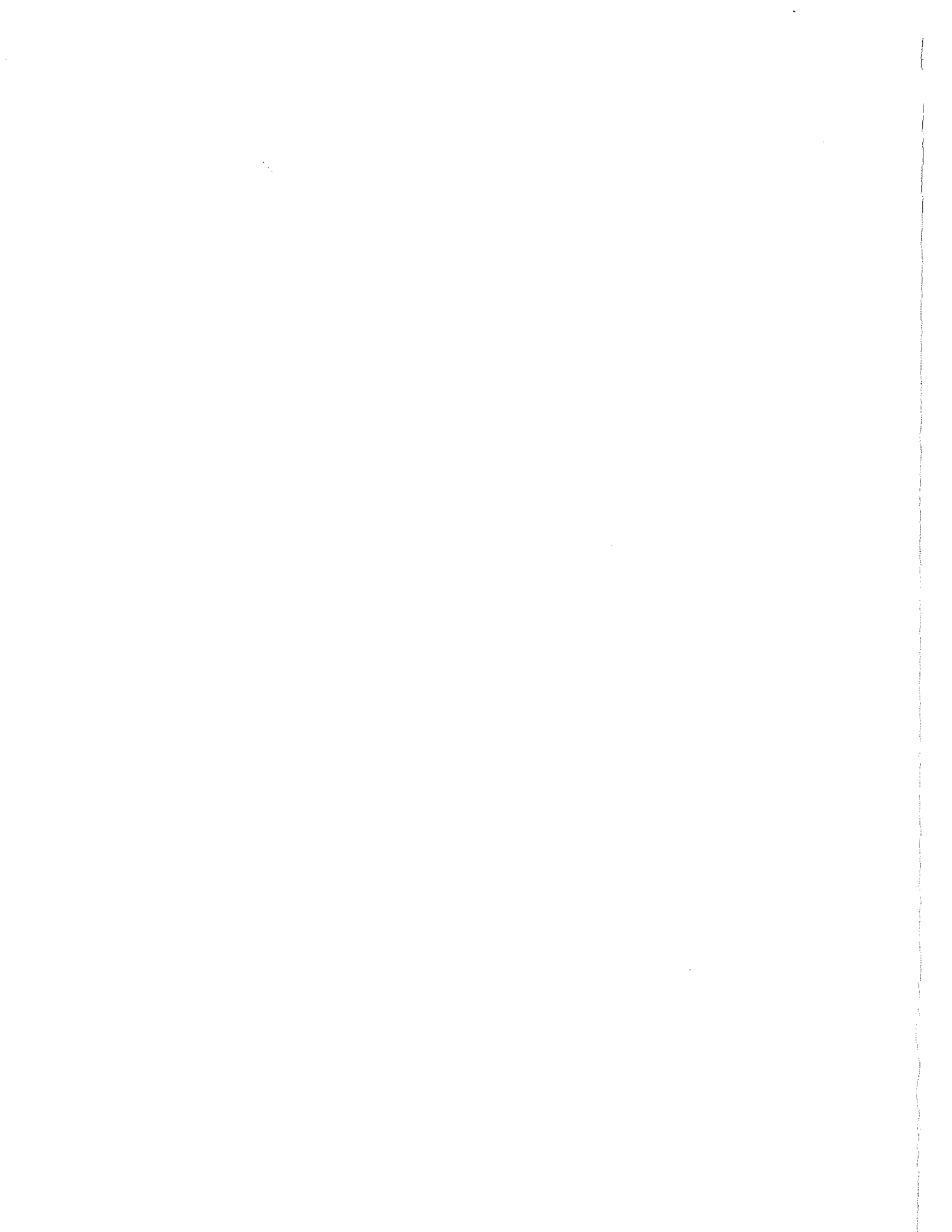


ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MK
Benzoic Acid	ND	ug/kg	140000				
Benzyl Alcohol	ND	ug/kg	28000				
Carbazole	ND	ug/kg	14000				
Pyridine	ND	ug/kg	140000				
2-Picoline	ND	ug/kg	56000				
Pronamide	ND	ug/kg	56000				
Methyl methanesulfonate	ND	ug/kg	56000				
Surrogate Recovery							
2-Fluorophenol	43.0	%					
Phenol-d6	48.0	%					
Nitrobenzene-d5	75.0	%					
2-Fluorobiphenyl	72.0	%					
2,4,6-Tribromophenol	61.0	%					
4-Terphenyl-d14	83.0	%					
PCB/Pesticides				1	8082/8081	11-Dec 16-Dec	PB
Delta-BHC	ND	ug/kg	278.				
Lindane	ND	ug/kg	278.				
Alpha-BHC	ND	ug/kg	278.				
Beta-BHC	ND	ug/kg	278.				
Heptachlor	ND	ug/kg	278.				
Aldrin	ND	ug/kg	278.				
Heptachlor epoxide	ND	ug/kg	278.				
Endrin	ND	ug/kg	278.				
Endrin aldehyde	ND	ug/kg	278.				
Endrin ketone	ND	ug/kg	278.				
Dieldrin	ND	ug/kg	278.				
4,4'-DDE	ND	ug/kg	278.				
4,4'-DDD	ND	ug/kg	278.				
4,4'-DDT	ND	ug/kg	278.				
Endosulfan I	ND	ug/kg	278.				
Endosulfan II	ND	ug/kg	278.				
Endosulfan sulfate	ND	ug/kg	278.				
Methoxychlor	ND	ug/kg	278.				
Toxaphene	ND	ug/kg	1110				
Chlordane	ND	ug/kg	1110				
cis-Chlordane	ND	ug/kg	278.				
trans-Chlordane	ND	ug/kg	278.				
Aroclor 1221	ND	ug/kg	1390				
Aroclor 1232	ND	ug/kg	1390				
Aroclor 1242/1016	ND	ug/kg	1390				
Aroclor 1248	ND	ug/kg	1390				
Aroclor 1254	ND	ug/kg	1390				
Aroclor 1260	ND	ug/kg	1390				

Comments: Complete list of References and Glossary of Terms found in Addendum I

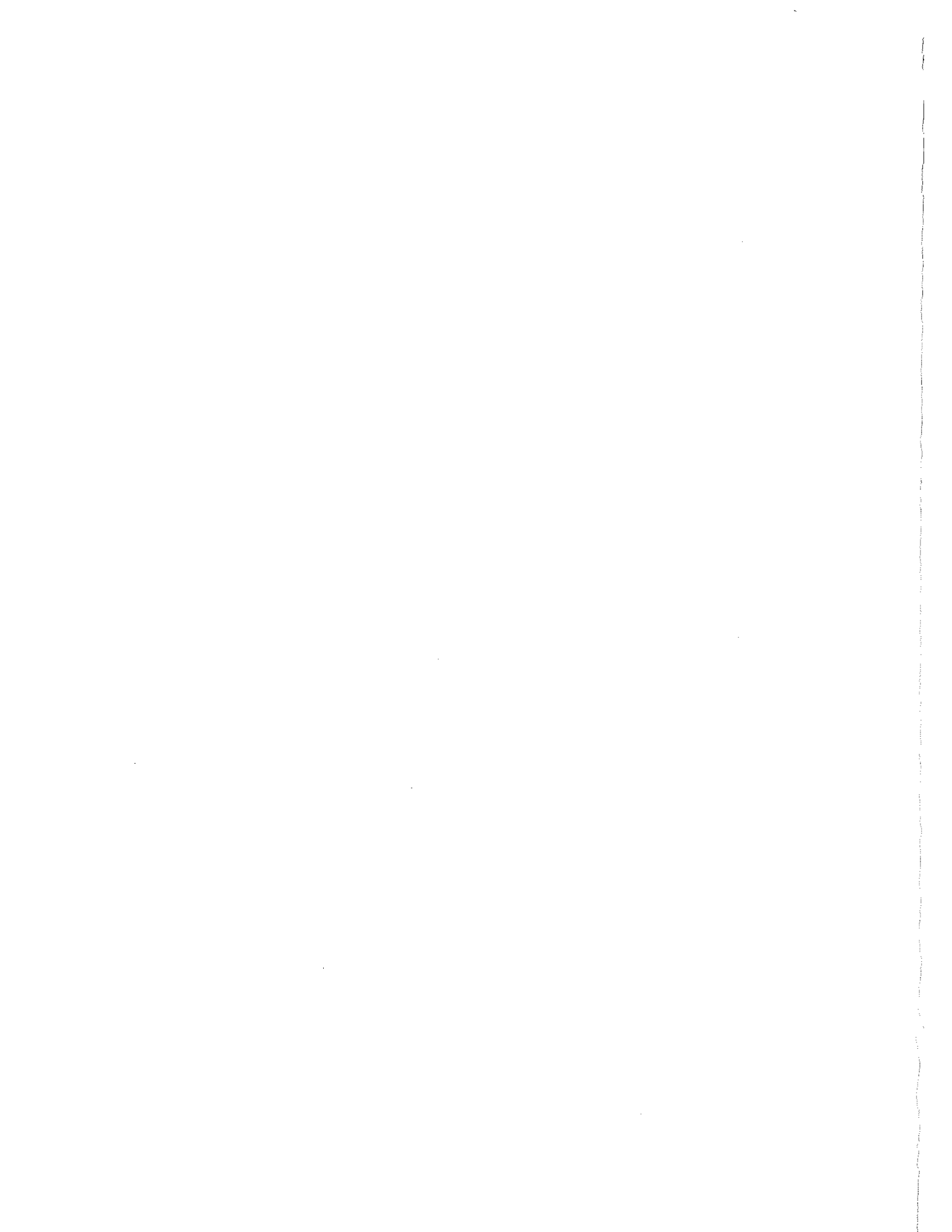


ALPHA ANALYTICAL LABORATORIES
 CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L9809865-07
 COMPOSITE OF SED 1 - SED 3

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
PCB/Pesticides continued Surrogate Recovery				1	8082/8081	11-Dec 16-Dec	PB
2,4,5,6-Tetrachloro-m-xylene	58.0	%					
Decachlorobiphenyl	42.0	%					

Comments: Complete list of References and Glossary of Terms found in Addendum I



ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L9809865

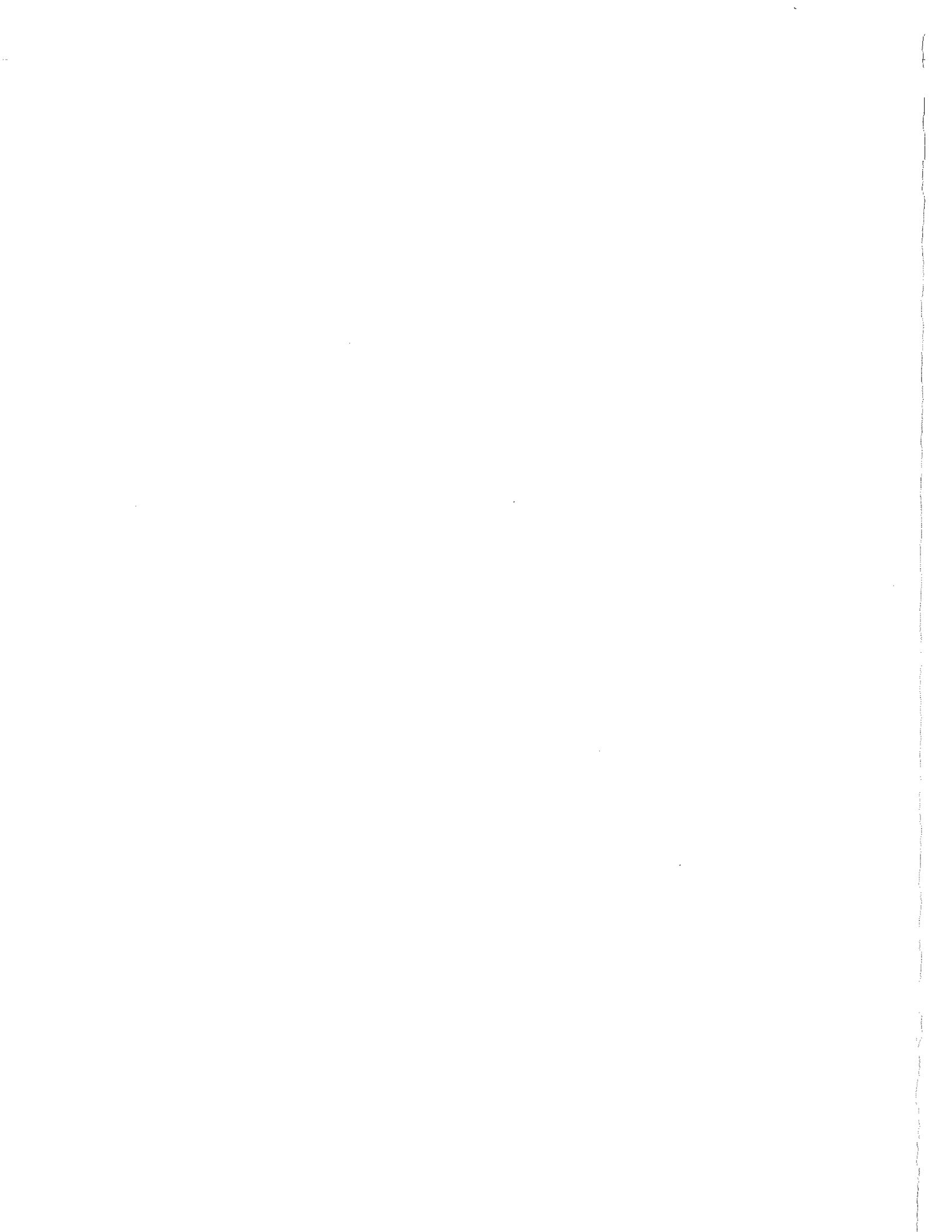
Parameter	Value 1	Value 2	RPD	Units
Alkalinity, Total for sample(s) 01-06				
Alkalinity, Total	69.	69.	0	mg CaCO3/L
Chloride for sample(s) 01-06				
Chloride	6.5	6.1	6	mg/l
Nitrogen, Nitrate for sample(s) 01-06				
Nitrogen, Nitrate	0.76	0.76	0	mg/l
Sulfate for sample(s) 01-06				
Sulfate	20.	20.	0	mg/l
Total Metals for sample(s) 07				
Arsenic, Total	17.	21.	21	mg/kg
Barium, Total	530	610	14	mg/kg
Cadmium, Total	6.4	6.6	3	mg/kg
Chromium, Total	63.	70.	11	mg/kg
Copper, Total	210	220	5	mg/kg
Iron, Total	34000	43000	23	mg/kg
Lead, Total	490	510	4	mg/kg
Manganese, Total	270	320	17	mg/kg
Selenium, Total	ND	ND	NC	mg/kg
Silver, Total	ND	ND	NC	mg/kg
Zinc, Total	840	880	5	mg/kg
Dissolved Metals for sample(s) 01-06				
Arsenic, Dissolved	ND	ND	NC	mg/l
Barium, Dissolved	0.04	0.04	0	mg/l
Cadmium, Dissolved	ND	ND	NC	mg/l
Chromium, Dissolved	ND	ND	NC	mg/l
Copper, Dissolved	ND	ND	NC	mg/l
Iron, Dissolved	0.26	0.27	4	mg/l
Lead, Dissolved	ND	ND	NC	mg/l
Manganese, Dissolved	1.2	1.2	0	mg/l
Selenium, Dissolved	ND	0.005	NC	mg/l
Silver, Dissolved	ND	ND	NC	mg/l
Zinc, Dissolved	ND	ND	NC	mg/l
Dissolved Metals for sample(s) 01-06				
Mercury, Dissolved	ND	ND	NC	mg/l



ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Parameter	% Recovery
Alkalinity, Total LCS for sample(s) 01-06	
Alkalinity, Total	100
Cyanide, Total LCS for sample(s) 01	
Cyanide, Total	100
Cyanide, Total LCS for sample(s) 02-06	
Cyanide, Total	103
Chloride LCS for sample(s) 01-06	
Chloride	98
Nitrogen, Nitrate LCS for sample(s) 01-06	
Nitrogen, Nitrate	94
Sulfate LCS for sample(s) 01-06	
Sulfate	95
Chemical Oxygen Demand LCS for sample(s) 01-06	
Chemical Oxygen Demand	96
Chemical Oxygen Demand LCS for sample(s) 01-06	
Chemical Oxygen Demand	100
Hydrocarbons, Total (IR) LCS for sample(s) 07	
Hydrocarbons, Total (IR)	115
Total Metals LCS for sample(s) 07	
Arsenic, Total	89
Barium, Total	95
Cadmium, Total	92
Chromium, Total	93
Copper, Total	97
Lead, Total	95
Manganese, Total	110
Selenium, Total	84
Silver, Total	91
Zinc, Total	95
Total Metals LCS for sample(s) 07	
Mercury, Total	103
Dissolved Metals LCS for sample(s) 01-06	
Mercury, Dissolved	108
SVOC's by GC/MS 8270 LCS for sample(s) 07	
Acenaphthene	120
1,2,4-Trichlorobenzene	110
1,4-Dichlorobenzene	80



ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Continued

Parameter	% Recovery
SVOC's by GC/MS 8270 LCS for sample(s) 07	
2,4-Dinitrotoluene	120
n-Nitrosodi-n-propylamine	89
Pyrene	110
p-Chloro-m-cresol	95
2-Chlorophenol	67
4-Nitrophenol	84
Pentachlorophenol	110
Phenol	44
PCB/Pesticides LCS for sample(s) 07	
Lindane	79
Heptachlor	73
Aldrin	105
Endrin	84
Dieldrin	56
4,4'-DDT	76
Alkalinity, Total SPIKE for sample(s) 01-06	
Alkalinity, Total	100
Cyanide, Total SPIKE for sample(s) 01	
Cyanide, Total	61
Chloride SPIKE for sample(s) 01-06	
Chloride	100
Nitrogen, Nitrate SPIKE for sample(s) 01-06	
Nitrogen, Nitrate	78
Sulfate SPIKE for sample(s) 01-06	
Sulfate	93
Chemical Oxygen Demand SPIKE for sample(s) 01-06	
Chemical Oxygen Demand	120
Total Metals SPIKE for sample(s) 07	
Arsenic, Total	100
Barium, Total	98
Cadmium, Total	86
Chromium, Total	85
Copper, Total	110
Lead, Total	90
Manganese, Total	120
Selenium, Total	100
Silver, Total	100
Zinc, Total	64



ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L9809865

Continued

Parameter	% Recovery
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Total Metals SPIKE for sample(s) 07

Mercury, Total	146
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Dissolved Metals SPIKE for sample(s) 01-06

Arsenic, Dissolved	104
Barium, Dissolved	100
Cadmium, Dissolved	105
Chromium, Dissolved	100
Copper, Dissolved	100
Iron, Dissolved	100
Lead, Dissolved	100
Manganese, Dissolved	98
Selenium, Dissolved	127
Silver, Dissolved	84
Zinc, Dissolved	100



ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH MS/MSD ANALYSIS

Laboratory Job Number: L9809865

Parameter	MS %	MSD %	RPD
Volatile Organics by GC/MS 8260 for sample(s) 07			
Chlorobenzene	83	81	2
Benzene	83	88	6
Toluene	83	88	6
1,1-Dichloroethene	97	95	2
Trichloroethene	83	81	2
SVOC's by GC/MS 8270 for sample(s) 07			
Acenaphthene	130	140	7
1,2,4-Trichlorobenzene	130	130	0
1,4-Dichlorobenzene	100	100	0
2,4-Dinitrotoluene	160	180	12
n-Nitrosodi-n-propylamine	110	110	0
Pyrene	120	130	8
p-Chloro-m-cresol	110	110	0
2-Chlorophenol	84	84	0
4-Nitrophenol	60	92	42
Pentachlorophenol	100	130	26
Phenol	72	60	18
PCB/Pesticides for sample(s) 07			
Lindane	71	72	1
Heptachlor	65	66	1
Aldrin	67	70	4
Endrin	76	78	3
Dieldrin	52	54	4
4,4'-DDT	68	70	3



ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 01-06							
Alkalinity, Total	ND	mg CaCO3/L2.0		30	2320B	14-Dec	KF
Blank Analysis for sample(s) 01-06							
Solids, Total Dissolved	ND	mg/l	5.0	30	2540C	18-Dec	DK
Blank Analysis for sample(s) 01							
Cyanide, Total	ND	mg/l	0.005	1	9010B	22-Dec	AU
Blank Analysis for sample(s) 02-06							
Cyanide, Total	ND	mg/l	0.005	1	9010B	15-Dec	AU
Blank Analysis for sample(s) 01-06							
Chloride	ND	mg/l	1.0	1	9251	11-Dec	ED
Blank Analysis for sample(s) 01-06							
Nitrogen, Nitrate	ND	mg/l	0.10	30	4500NO3-F	11-Dec	ED
Blank Analysis for sample(s) 01-06							
Sulfate	ND	mg/l	10.	1	9038	15-Dec	KF
Blank Analysis for sample(s) 01-06							
Chemical Oxygen Demand	ND	mg/l	20.	30	5220D	18-Dec	DK
Blank Analysis for sample(s) 07							
Hydrocarbons, Total (IR)	ND	mg/kg	40.	4	418.1	21-Dec 23-Dec	SN
Blank Analysis for sample(s) 07							
Total Metals				1	3051		
Arsenic, Total	ND	mg/kg	0.20	1	6010B	15-Dec 16-Dec	MG
Barium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Cadmium, Total	ND	mg/kg	0.20	1	6010B	15-Dec 16-Dec	MG
Chromium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Copper, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Iron, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	MG
Lead, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	MG
Manganese, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Selenium, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG
Silver, Total	ND	mg/kg	0.40	1	6010B	15-Dec 16-Dec	MG

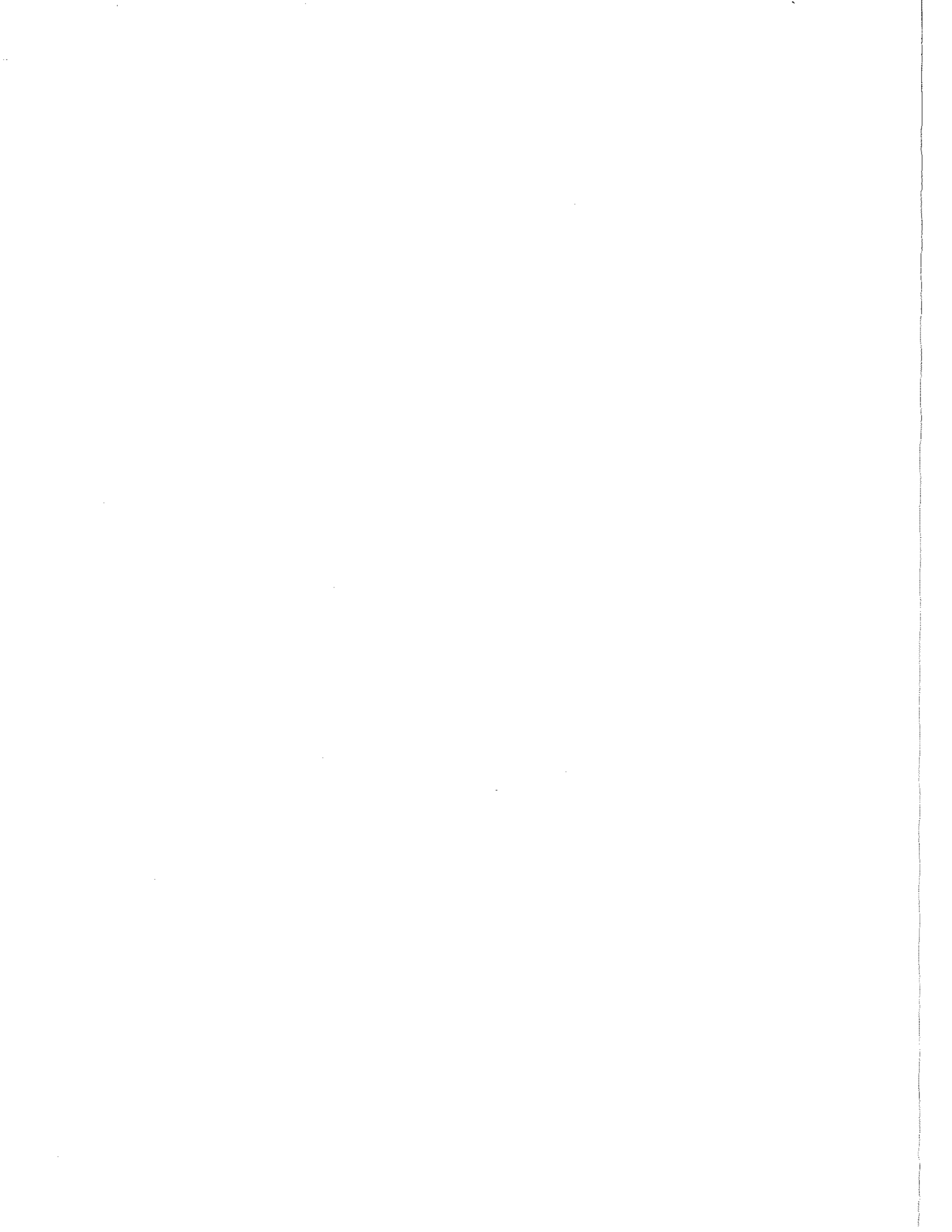


ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

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Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 07							
Total Metals				1	3051		
Zinc, Total	ND	mg/kg	2.0	1	6010B	15-Dec 16-Dec	MC
Blank Analysis for sample(s) 07							
Volatile Organics by GC/MS 8260				1	8260B		24-Dec BT
Methylene chloride	ND	ug/kg	25.				
1,1-Dichloroethane	ND	ug/kg	7.5				
Chloroform	ND	ug/kg	7.5				
Carbon tetrachloride	ND	ug/kg	5.0				
1,2-Dichloropropane	ND	ug/kg	18.				
Dibromochloromethane	ND	ug/kg	5.0				
1,1,2-Trichloroethane	ND	ug/kg	7.5				
2-Chloroethylvinyl ether	ND	ug/kg	50.				
Tetrachloroethene	ND	ug/kg	7.5				
Chlorobenzene	ND	ug/kg	18.				
Trichlorofluoromethane	ND	ug/kg	25.				
1,2-Dichloroethane	ND	ug/kg	7.5				
1,1,1-Trichloroethane	ND	ug/kg	5.0				
Bromodichloromethane	ND	ug/kg	5.0				
trans-1,3-Dichloropropene	ND	ug/kg	5.0				
cis-1,3-Dichloropropene	ND	ug/kg	5.0				
1,1-Dichloropropene	ND	ug/kg	120				
Bromoform	ND	ug/kg	5.0				
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0				
Benzene	ND	ug/kg	5.0				
Toluene	ND	ug/kg	7.5				
Ethylbenzene	ND	ug/kg	5.0				
Chloromethane	ND	ug/kg	50.				
Bromomethane	ND	ug/kg	10.				
Vinyl chloride	ND	ug/kg	10.				
Chloroethane	ND	ug/kg	10.				
1,1-Dichloroethene	ND	ug/kg	7.5				
trans-1,2-Dichloroethene	ND	ug/kg	7.5				
Trichloroethene	ND	ug/kg	5.0				
1,2-Dichlorobenzene	ND	ug/kg	50.				
1,3-Dichlorobenzene	ND	ug/kg	50.				
1,4-Dichlorobenzene	ND	ug/kg	50.				
Methyl tert butyl ether	ND	ug/kg	50.				
p/m-Xylene	ND	ug/kg	5.0				
o-Xylene	ND	ug/kg	5.0				
cis-1,2-Dichloroethene	ND	ug/kg	5.0				
Dibromomethane	ND	ug/kg	50.				
1,4-Dichlorobutane	ND	ug/kg	50.				
Iodomethane	ND	ug/kg	50.				
1,2,3-Trichloropropane	ND	ug/kg	50.				
Styrene	ND	ug/kg	5.0				



ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

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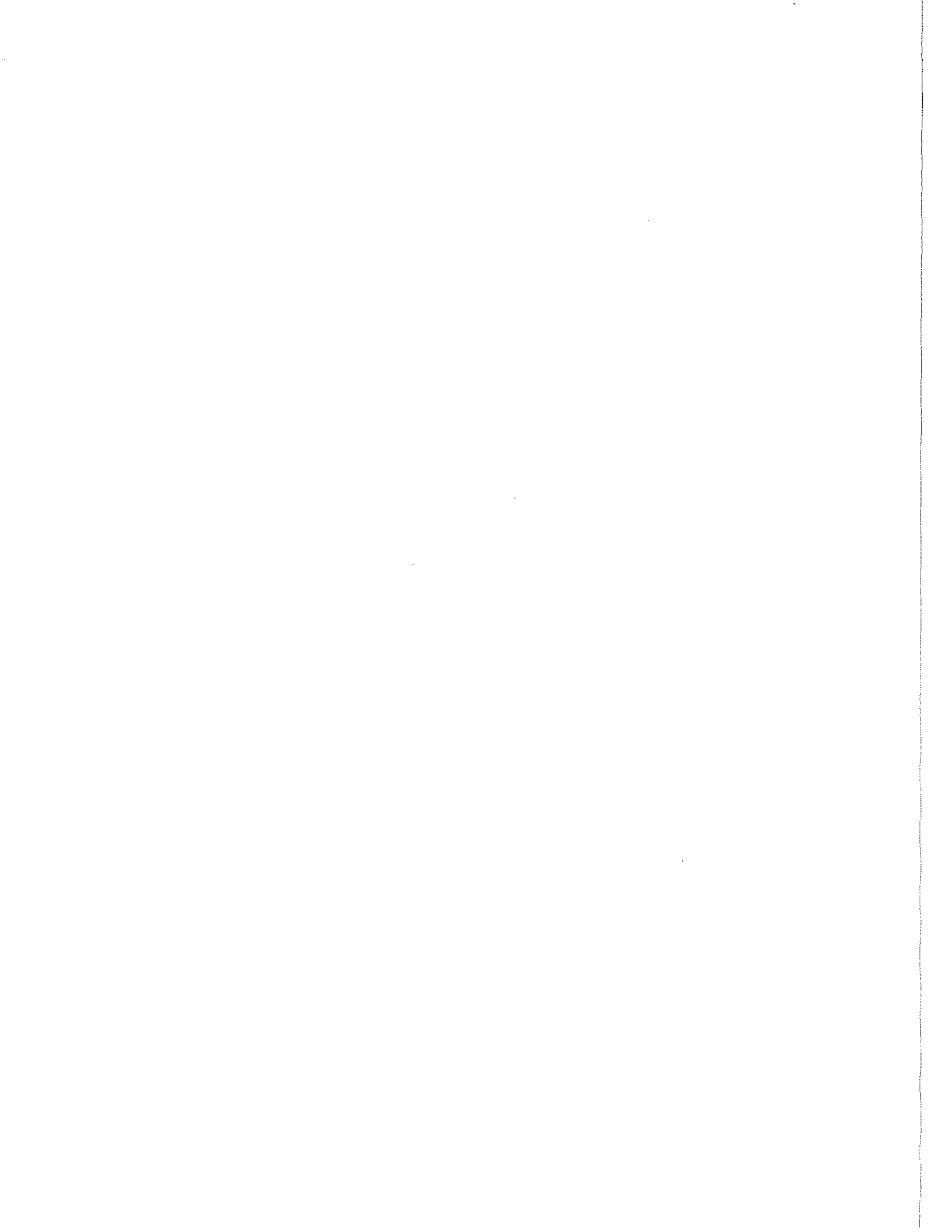
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PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 07							
Volatile Organics by GC/MS 8260 continued				1	8260B	24-Dec	BT
Dichlorodifluoromethane	ND	ug/kg	50.				
Acetone	ND	ug/kg	50.				
Carbon disulfide	ND	ug/kg	50.				
2-Butanone	ND	ug/kg	50.				
Vinyl acetate	ND	ug/kg	50.				
4-Methyl-2-pentanone	ND	ug/kg	50.				
2-Hexanone	ND	ug/kg	50.				
Ethyl methacrylate	ND	ug/kg	50.				
Acrolein	ND	ug/kg	120				
Acrylonitrile	ND	ug/kg	50.				
Bromochloromethane	ND	ug/kg	25.				
Tetrahydrofuran	ND	ug/kg	250				
2,2-Dichloropropane	ND	ug/kg	25.				
1,2-Dibromoethane	ND	ug/kg	25.				
1,3-Dichloropropane	ND	ug/kg	25.				
1,1,1,2-Tetrachloroethane	ND	ug/kg	25.				
Bromobenzene	ND	ug/kg	25.				
n-Butylbenzene	ND	ug/kg	25.				
sec-Butylbenzene	ND	ug/kg	25.				
tert-Butylbenzene	ND	ug/kg	25.				
o-Chlorotoluene	ND	ug/kg	25.				
p-Chlorotoluene	ND	ug/kg	25.				
1,2-Dibromo-3-chloropropane	ND	ug/kg	25.				
Hexachlorobutadiene	ND	ug/kg	25.				
Isopropylbenzene	ND	ug/kg	25.				
p-Isopropyltoluene	ND	ug/kg	25.				
Naphthalene	ND	ug/kg	25.				
n-Propylbenzene	ND	ug/kg	25.				
1,2,3-Trichlorobenzene	ND	ug/kg	25.				
1,2,4-Trichlorobenzene	ND	ug/kg	25.				
1,3,5-Trimethylbenzene	ND	ug/kg	25.				
1,2,4-Trimethylbenzene	ND	ug/kg	25.				
trans-1,4-Dichloro-2-butene	ND	ug/kg	25.				
Ethyl ether	ND	ug/kg	120				

Surrogate Recovery

1,2-Dichloroethane-d4	98.0	%					
Toluene-d8	98.0	%					
4-Bromofluorobenzene	95.0	%					
Dibromofluoromethane	94.0	%					

Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270				1	8270C	11-Dec 14-Dec	MK
Acenaphthene	ND	ug/kg	500				
Benzidine	ND	ug/kg	5000				

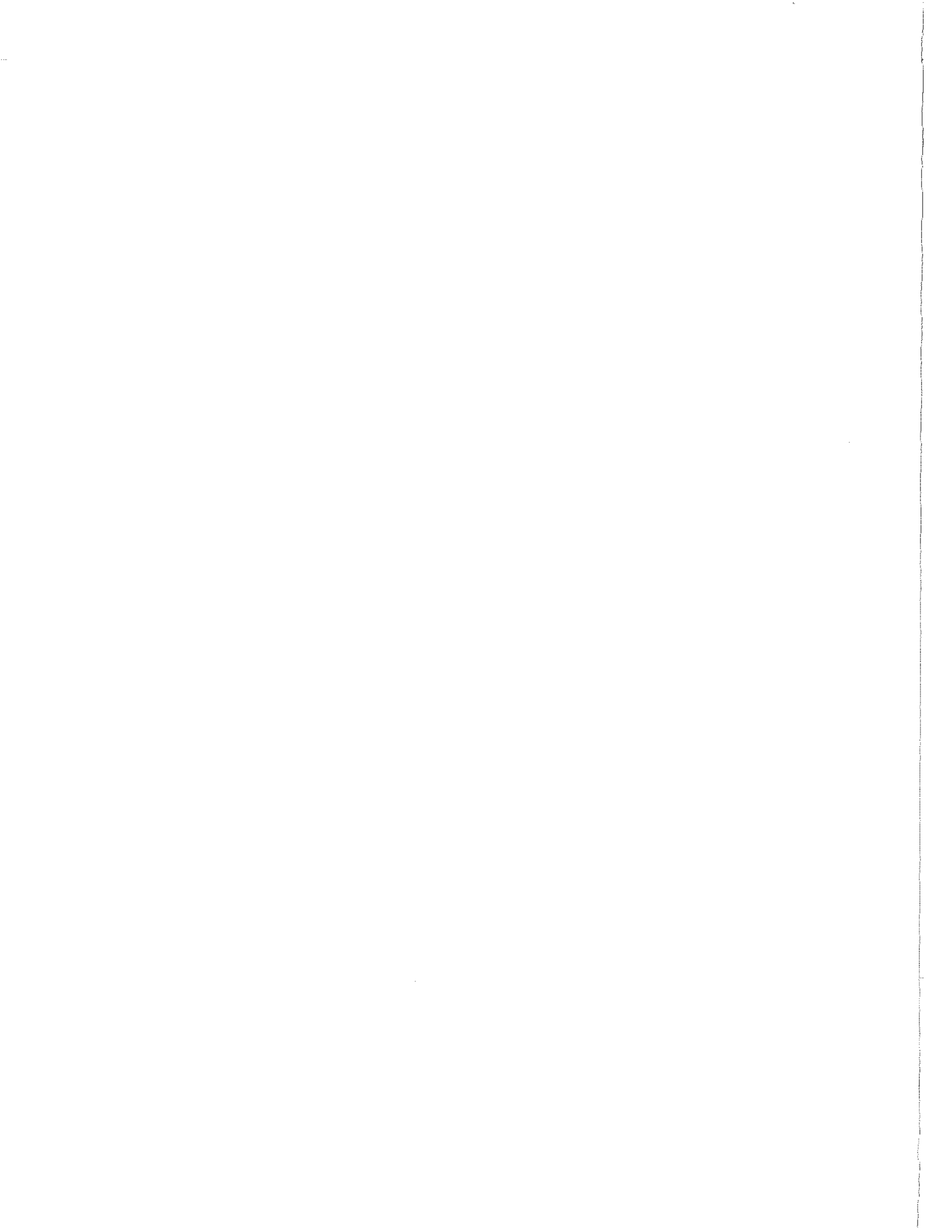


ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MK
1,2,4-Trichlorobenzene	ND	ug/kg	500				
Hexachlorobenzene	ND	ug/kg	500				
Bis(2-chloroethyl) ether	ND	ug/kg	500				
1-Chloronaphthalene	ND	ug/kg	500				
2-Chloronaphthalene	ND	ug/kg	500				
1,2-Dichlorobenzene	ND	ug/kg	500				
1,3-Dichlorobenzene	ND	ug/kg	500				
1,4-Dichlorobenzene	ND	ug/kg	500				
3,3'-Dichlorobenzidine	ND	ug/kg	5000				
2,4-Dinitrotoluene	ND	ug/kg	500				
2,6-Dinitrotoluene	ND	ug/kg	500				
Azobenzene	ND	ug/kg	500				
Fluoranthene	ND	ug/kg	500				
4-Chlorophenyl phenyl ether	ND	ug/kg	500				
4-Bromophenyl phenyl ether	ND	ug/kg	500				
Bis(2-chloroisopropyl) ether	ND	ug/kg	500				
Bis(2-chloroethoxy) methane	ND	ug/kg	500				
Hexachlorobutadiene	ND	ug/kg	1000				
Hexachlorocyclopentadiene	ND	ug/kg	1000				
Hexachloroethane	ND	ug/kg	500				
Isophorone	ND	ug/kg	500				
Naphthalene	ND	ug/kg	500				
Nitrobenzene	ND	ug/kg	500				
NDPA/DPA	ND	ug/kg	500				
n-Nitrosodi-n-propylamine	ND	ug/kg	500				
Bis(2-ethylhexyl) phthalate	ND	ug/kg	1000				
Butyl benzyl phthalate	ND	ug/kg	500				
Di-n-butylphthalate	ND	ug/kg	500				
Di-n-octylphthalate	ND	ug/kg	500				
Diethyl phthalate	ND	ug/kg	500				
Dimethyl phthalate	ND	ug/kg	500				
Benzo(a) anthracene	ND	ug/kg	500				
Benzo(a) pyrene	ND	ug/kg	500				
Benzo(b) fluoranthene	ND	ug/kg	500				
Benzo(k) fluoranthene	ND	ug/kg	500				
Chrysene	ND	ug/kg	500				
Acenaphthylene	ND	ug/kg	500				
Anthracene	ND	ug/kg	500				
Benzo(ghi)perylene	ND	ug/kg	500				
Fluorene	ND	ug/kg	500				
Phenanthrene	ND	ug/kg	500				
Dibenzo(a,h)anthracene	ND	ug/kg	500				
Indeno(1,2,3-cd)pyrene	ND	ug/kg	500				
Pyrene	ND	ug/kg	500				
Aniline	ND	ug/kg	1000				
4-Chloroaniline	ND	ug/kg	500				
1-Methylnaphthalene	ND	ug/kg	500				



ALPHA ANALYTICAL LABORATORIES
 QUALITY ASSURANCE BATCH BLANK ANALYSIS

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PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES PREP ANALYSIS	ID
Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MK
2-Nitroaniline	ND	ug/kg	500				
3-Nitroaniline	ND	ug/kg	500				
4-Nitroaniline	ND	ug/kg	500				
Dibenzofuran	ND	ug/kg	500				
a, a-Dimethylphenethylamine	ND	ug/kg	5000				
Hexachloropropene	ND	ug/kg	5000				
Nitrosodi-n-butylamine	ND	ug/kg	1000				
2-Methylnaphthalene	ND	ug/kg	500				
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	2000				
Pentachlorobenzene	ND	ug/kg	2000				
a-Naphthylamine	ND	ug/kg	2000				
b-Naphthylamine	ND	ug/kg	2000				
Phenacetin	ND	ug/kg	1000				
Dimethoate	ND	ug/kg	2000				
4-Aminobiphenyl	ND	ug/kg	1000				
Pentachloronitrobenzene	ND	ug/kg	1000				
Isodrin	ND	ug/kg	1000				
p-Dimethylaminoazobenzene	ND	ug/kg	1000				
Chlorobenzilate	ND	ug/kg	2000				
3-Methylcholanthrene	ND	ug/kg	2000				
Ethyl Methanesulfonate	ND	ug/kg	1500				
Acetophenone	ND	ug/kg	2000				
Nitrosodipiperidine	ND	ug/kg	2000				
7,12-Dimethylbenz (a) anthracene	ND	ug/kg	1000				
n-Nitrosodimethylamine	ND	ug/kg	5000				
2,4,6-Trichlorophenol	ND	ug/kg	500				
p-Chloro-m-cresol	ND	ug/kg	500				
2-Chlorophenol	ND	ug/kg	500				
2,4-Dichlorophenol	ND	ug/kg	1000				
2,4-Dimethylphenol	ND	ug/kg	1000				
2-Nitrophenol	ND	ug/kg	1000				
4-Nitrophenol	ND	ug/kg	1000				
2,4-Dinitrophenol	ND	ug/kg	2000				
4,6-Dinitro-o-cresol	ND	ug/kg	2000				
Pentachlorophenol	ND	ug/kg	2000				
Phenol	ND	ug/kg	500				
2-Methylphenol	ND	ug/kg	500				
3-Methylphenol/4-Methylphenol	ND	ug/kg	500				
2,4,5-Trichlorophenol	ND	ug/kg	500				
2,6-Dichlorophenol	ND	ug/kg	1000				
Benzoic Acid	ND	ug/kg	5000				
Benzyl Alcohol	ND	ug/kg	1000				
Carbazole	ND	ug/kg	500				
Pyridine	ND	ug/kg	5000				
2-Picoline	ND	ug/kg	2000				
Pronamide	ND	ug/kg	2000				
Methyl methanesulfonate	ND	ug/kg	2000				



ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L9809865

Continued

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATES	ID
							PREP ANALYSIS

Blank Analysis for sample(s) 07							
SVOC's by GC/MS 8270 continued				1	8270C	11-Dec 14-Dec	MK
Surrogate Recovery							

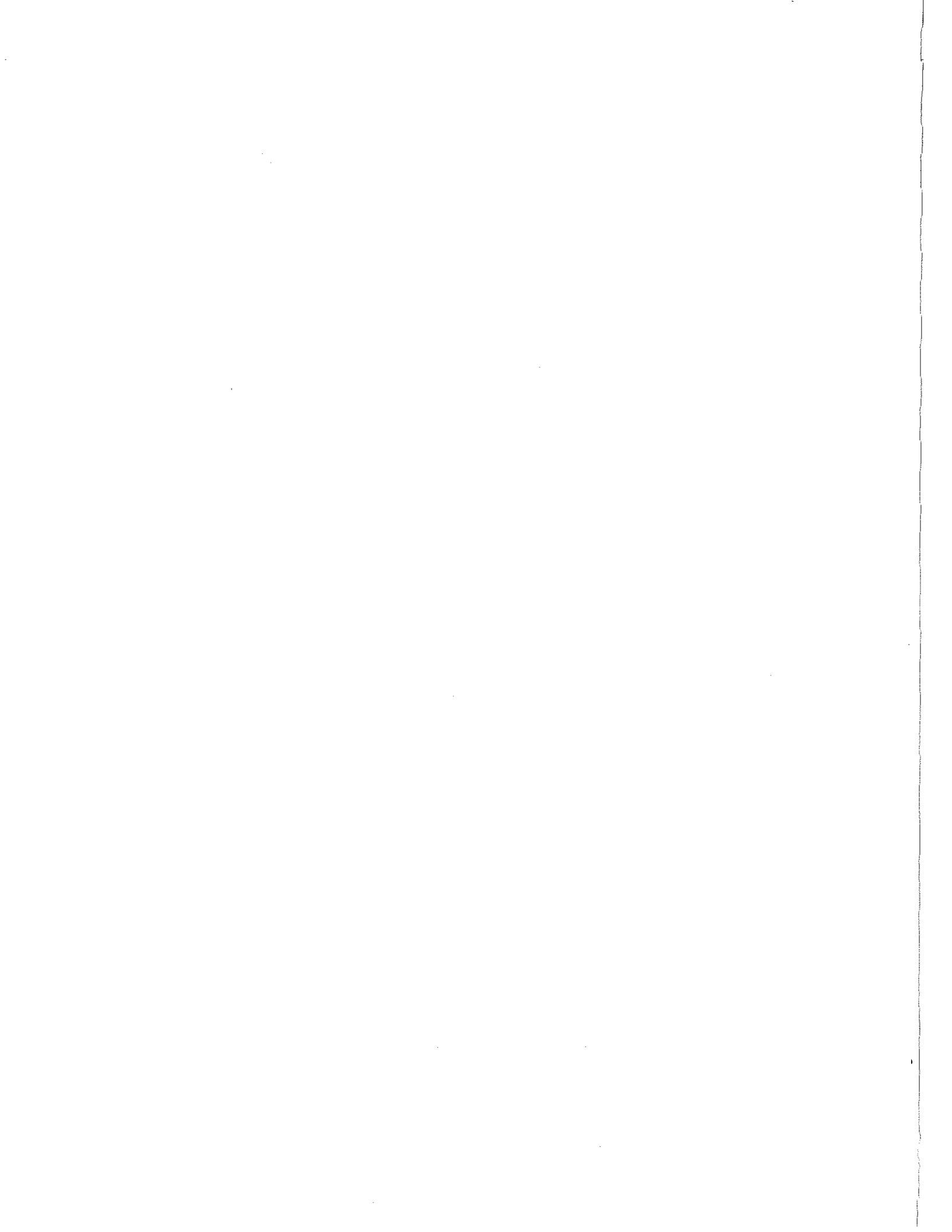
2-Fluorophenol	48.0	%					
Phenol-d6	59.0	%					
Nitrobenzene-d5	92.0	%					
2-Fluorobiphenyl	98.0	%					
2,4,6-Tribromophenol	83.0	%					
4-Terphenyl-d14	126.	%					

Blank Analysis for sample(s) 07							
PCB/Pesticides				1	8082/8081	11-Dec 16-Dec	PB

Delta-BHC	ND	ug/kg	5.00				
Lindane	ND	ug/kg	5.00				
Alpha-BHC	ND	ug/kg	5.00				
Beta-BHC	ND	ug/kg	5.00				
Heptachlor	ND	ug/kg	5.00				
Aldrin	ND	ug/kg	5.00				
Heptachlor epoxide	ND	ug/kg	5.00				
Endrin	ND	ug/kg	5.00				
Endrin aldehyde	ND	ug/kg	5.00				
Endrin ketone	ND	ug/kg	5.00				
Dieldrin	ND	ug/kg	5.00				
4,4'-DDE	ND	ug/kg	5.00				
4,4'-DDD	ND	ug/kg	5.00				
4,4'-DDT	ND	ug/kg	5.00				
Endosulfan I	ND	ug/kg	5.00				
Endosulfan II	ND	ug/kg	5.00				
Endosulfan sulfate	ND	ug/kg	5.00				
Methoxychlor	ND	ug/kg	5.00				
Toxaphene	ND	ug/kg	20.0				
Chlordane	ND	ug/kg	20.0				
cis-Chlordane	ND	ug/kg	5.00				
trans-Chlordane	ND	ug/kg	5.00				
Aroclor 1221	ND	ug/kg	25.0				
Aroclor 1232	ND	ug/kg	25.0				
Aroclor 1242/1016	ND	ug/kg	25.0				
Aroclor 1248	ND	ug/kg	25.0				
Aroclor 1254	ND	ug/kg	25.0				
Aroclor 1260	ND	ug/kg	25.0				

Surrogate Recovery

2,4,5,6-Tetrachloro-m-xylene	48.0	%					
Decachlorobiphenyl	57.0	%					



ALPHA ANALYTICAL LABORATORIES
ADDENDUM I

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Update III, 1997.
4. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-82-055. 1982.
30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.



Appendix J
Landfill Gas Screening - Atmospheric Data



WEATHER DATA FOR LOGAN AIRPORT, BOSTON, MASSACHUSETTS

Sampling Round No. 1
LFG-1 data collected May 19, 1998 at 9:00 AM

Date	Time	Temperature (F)	Wind Speed (mph)	Wind Direction	Wind Gusts (mph)	Station Pressure (in. Hg)
19-May-98	4:00	64	11.5	W	---	29.76
	5:00	63	11.5	W	---	29.76
	6:00	63	8.1	NNW	---	29.78
	7:00	66	9.2	NW	---	29.79
	8:00	70	12.7	NNW	---	29.78
	9:00	71	17.3	NW	---	29.78
	10:00	73	19.6	NNW	25.3	29.78
	11:00	63	19.6	E	27.6	29.78
	12:00	62	17.3	E	---	29.79
	13:00	62	11.5	SE	---	29.81
	14:00	62	11.5	SE	---	29.8

Sampling Round No. 1
LFG-2 data collected May 19, 1998 at 10:00 AM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
19-May-98	5:00	63	11.5	W	---	29.76
	6:00	63	8.1	NNW	---	29.78
	7:00	66	9.2	NW	---	29.79
	8:00	70	12.7	NNW	---	29.78
	9:00	71	17.3	NW	---	29.78
	10:00	73	19.6	NNW	25.3	29.78
	11:00	63	19.6	E	27.6	29.78
	12:00	62	17.3	E	---	29.79
	13:00	62	11.5	SE	---	29.81
	14:00	62	11.5	SE	---	29.8
	15:00	64	11.5	E	---	29.8

WEATHER DATA FOR LOGAN AIRPORT, BOSTON, MASSACHUSETTS

Sampling Round No. 1
LFG-3 data collected May 19, 1998 at 11:00 AM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
19-May-98	6:00	63	8.1	NNW	---	29.78
	7:00	66	9.2	NW	---	29.79
	8:00	70	12.7	NNW	---	29.78
	9:00	71	17.3	NW	---	29.78
	10:00	73	19.6	NNW	25.3	29.78
	11:00	63	19.6	E	27.6	29.78
	12:00	62	17.3	E	---	29.79
	13:00	62	11.5	SE	---	29.81
	14:00	62	11.5	SE	---	29.8
	15:00	64	11.5	E	---	29.8
	16:00	62	5.8	ESE	---	29.8

Sampling Round No. 2
LFG-1 data collected August 20, 1998 at 11:00 AM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
20-Aug-98	6:00	59	8.1	NNW	---	30.23
	7:00	63	6.9	NNW	---	30.23
	8:00	66	5.8	NNW	---	30.24
	9:00	69	4.6	NNW	---	30.24
	10:00	68	6.9	SE	---	30.24
	11:00	68	10.4	SE	---	30.23
	12:00	69	10.4	SE	---	30.21
	13:00	70	11.5	ESE	---	30.21
	14:00	71	10.4	ESE	---	30.19
	15:00	70	12.7	ESE	---	30.18
	16:00	70	12.7	ESE	---	30.17

WEATHER DATA FOR LOGAN AIRPORT, BOSTON, MASSACHUSETTS

Sampling Round No. 2
LFG-2 data collected August 20, 1998 at 10:00 AM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
20-Aug-98	5:00	57	6.9	WNW	---	30.22
	6:00	59	8.1	NNW	---	30.23
	7:00	63	6.9	NNW	---	30.23
	8:00	66	5.8	NNW	---	30.24
	9:00	69	4.6	NNW	---	30.24
	10:00	68	6.9	SE	---	30.24
	11:00	68	10.4	SE	---	30.23
	12:00	69	10.4	SE	---	30.21
	13:00	70	11.5	ESE	---	30.21
	14:00	71	10.4	ESE	---	30.19
	15:00	70	12.7	ESE	---	30.18

Sampling Round No. 2
LFG-3 data collected August 20, 1998 at 12:00 PM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
20-Aug-98	7:00	63	6.9	NNW	---	30.23
	8:00	66	5.8	NNW	---	30.24
	9:00	69	4.6	NNW	---	30.24
	10:00	68	6.9	SE	---	30.24
	11:00	68	10.4	SE	---	30.23
	12:00	69	10.4	SE	---	30.21
	13:00	70	11.5	ESE	---	30.21
	14:00	71	10.4	ESE	---	30.19
	15:00	70	12.7	ESE	---	30.18
	16:00	70	12.7	ESE	---	30.17
	17:00	68	10.4	SE	---	30.16

WEATHER DATA FOR LOGAN AIRPORT, BOSTON, MASSACHUSETTS

Sampling Round No. 3
LFG-1 data collected December 11, 1998 at 8:30 AM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
11-Dec-98	3:00	42	13.8	W	---	30.05
	4:00	42	15	WSW	---	30.03
	5:00	41	15	W	24.2	30.03
	6:00	40	12.7	W	19.6	30.04
	7:00	40	16.1	W	23	30.05
	8:00	41	12.7	W	23	30.06
	9:00	42	11.5	W	---	30.08
	10:00	43	16.1	WNW	21.9	30.09
	11:00	43	18.4	NW	25.3	30.08
	12:00	43	17.3	NW	23	30.08
	13:00	43	17.3	NW	27.6	30.08

Sampling Round No. 3
LFG-2 data collected December 9, 1998 at 3:15 PM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
9-Dec-98	10:00	39	18.4	WNW	23	30.17
	11:00	41	13.8	WNW	19.6	30.18
	12:00	43	10.4	WNW	18.4	30.17
	13:00	45	13.8	W	---	30.16
	14:00	45	10.4	W	23	30.16
	15:00	45	12.7	W	---	30.17
	16:00	43	18.4	W	---	30.2
	17:00	42	12.7	W	---	30.22
	18:00	41	11.5	WNW	---	30.23
	19:00	41	9.2	W	---	30.24
	20:00	41	11.5	WNW	---	30.26

WEATHER DATA FOR LOGAN AIRPORT, BOSTON, MASSACHUSETTS

Sampling Round No. 3
LFG-3 data collected December 11, 1998 at 9:00 AM

Date	Time	Temperature	Wind Speed (mph)	Wind Direction	Wind Gusts	Station Pressure
11-Dec-98	4:00	42	15	WSW	---	30.03
	5:00	41	15	W	24.2	30.03
	6:00	40	12.7	W	19.6	30.04
	7:00	40	16.1	W	23	30.05
	8:00	41	12.7	W	23	30.06
	9:00	42	11.5	W	---	30.08
	10:00	43	16.1	WNW	21.9	30.09
	11:00	43	18.4	NW	25.3	30.08
	12:00	43	17.3	NW	23	30.08
	13:00	43	17.3	NW	27.6	30.08
	14:00	43	16.1	WNW	26.5	30.11

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Internet mail: nrcc@cornell.edu



Date: February 9, 1999

To: Matt Mullarkey
Camp, Dresser & McKee
10 Cambridge Center
Cambridge, MA 02142

From: Janet K. Fisher
Climatologist

JKF

The enclosed information is being sent in response to your recent request for climate data. A bill is enclosed to cover the cost of these data. Please return the bottom portion of the bill with your payment. If you have any questions or need additional data, you can contact our office at the address or phone numbers listed above.

Hourly Surface Observations

Station: BOSTON WSFO AP, MA, Year: 1998

mm/dd/yyyy	hh	Temperature degF	Dewpoint degF	Wind Direction compass	Wind Speed miles/hour	Wind Gusts miles/hour	Station Pressure inch Hg	Visibility miles	Weather Conditions text	Total Sky Cover fraction	Hourly Precipitation inch
05/18/1998	00	55	50	SW	10.4	-	29.94	10.00		0.2	0.00
05/18/1998	01	55	50	SW	11.5	-	29.93	10.00		0.0	0.00
05/18/1998	02	55	50	SW	11.5	-	29.92	10.00		0.0	0.00
05/18/1998	03	54	50	SW	11.5	-	29.90	10.00		0.0	0.00
05/18/1998	04	54	50	SW	11.5	-	29.90	10.00		0.0	0.00
05/18/1998	05	55	51	WSW	9.2	-	29.90	9.00		0.0	0.00
05/18/1998	06	60	51	W	11.5	-	29.90	10.00		0.0	0.00
05/18/1998	07	63	52	W	9.2	-	29.90	10.00		0.2	0.00
05/18/1998	08	70	51	NW	11.5	-	29.89	10.00		0.0	0.00
05/18/1998	09	74	52	NW	16.1	-	29.88	10.00		0.0	0.00
05/18/1998	10	79	52	NW	11.5	-	29.87	10.00		0.0	0.00
05/18/1998	11	80	49	WNW	12.7	-	29.85	10.00		0.0	0.00
05/18/1998	12	82	39	NNW	16.1	25.3	29.84	10.00		0.0	0.00
05/18/1998	13	82	41	NW	17.3	24.2	29.83	10.00		0.0	0.00
05/18/1998	14	82	43	WNW	13.8	19.6	29.82	10.00		0.0	0.00
05/18/1998	15	82	42	NW	11.5	25.3	29.81	10.00		0.0	0.00
05/18/1998	16	82	43	N	9.2	-	29.80	10.00		0.0	0.00
05/18/1998	17	81	45	NNW	13.8	20.7	29.79	10.00		0.0	0.00
05/18/1998	18	79	44	N	12.7	-	29.80	10.00		0.0	0.00
05/18/1998	19	77	43	NNW	8.1	-	29.81	10.00		0.0	0.00
05/18/1998	20	75	44	NNW	3.5	-	29.81	10.00		0.0	0.00
05/18/1998	21	72	46	S	4.6	-	29.83	10.00		0.5	0.00
05/18/1998	22	73	49	W	9.2	-	29.82	10.00		0.0	0.00
05/18/1998	23	64	51	N	5.8	-	29.83	10.00		0.2	0.00
05/19/1998	00	68	52	WNW	9.2	-	29.82	10.00		0.8	0.00
05/19/1998	01	66	53	W	9.2	-	29.80	10.00		0.2	0.00
05/19/1998	02	65	53	W	11.5	-	29.79	10.00		0.0	0.00
05/19/1998	03	64	53	W	9.2	-	29.77	10.00		0.0	0.00
05/19/1998	04	64	52	W	11.5	-	29.76	10.00		0.0	0.00
05/19/1998	05	63	53	W	11.5	-	29.76	10.00		0.0	0.00
05/19/1998	06	63	54	NNW	8.1	-	29.78	10.00		0.0	0.00
05/19/1998	07	66	53	NW	9.2	-	29.79	10.00		0.0	0.00
05/19/1998	08	70	53	NNW	12.7	-	29.78	10.00		0.0	0.00
05/19/1998	09	71	49	NW	17.3	-	29.78	10.00		0.0	0.00
05/19/1998	10	73	45	NNW	19.6	25.3	29.78	10.00		0.0	0.00

05/19/1998	11	63	50	E	19.6	27.6	29.78	10.00	0.0	0.00
05/19/1998	12	62	50	E	17.3	-	29.79	10.00	0.2	0.00
05/19/1998	13	62	51	SE	11.5	-	29.81	10.00	0.2	0.00
05/19/1998	14	62	49	SE	11.5	-	29.80	10.00	0.0	0.00
05/19/1998	15	64	47	E	11.5	-	29.80	10.00	0.0	0.00
05/19/1998	16	62	48	ESE	5.8	-	29.80	10.00	0.0	0.00
05/19/1998	17	63	46	SE	6.9	-	29.80	10.00	0.0	0.00
05/19/1998	18	65	46	ESE	9.2	-	29.79	10.00	0.2	0.00
05/19/1998	19	62	46	SSE	4.6	-	29.80	10.00	0.5	0.00
05/19/1998	20	63	46	S	5.8	-	29.81	10.00	0.8	0.00
05/19/1998	21	61	49	SSW	5.8	-	29.81	10.00	0.5	0.00
05/19/1998	22	60	48	SSW	5.8	-	29.81	10.00	0.0	0.00
05/19/1998	23	60	48	S	6.9	-	29.82	10.00	0.0	0.00

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Cornell University
Ithaca, NY 14853-1901

Phone: (607) 255-1751
Fax: (607) 255-2106

Internet mail: nrcc@cornell.edu



Date: November 11, 1998

To: Paul Taurasi
Camp, Dresser & McKee
10 Cambridge Center
Cambridge, MA 02142

From: Janet K. Fisher
Climatologist

A handwritten signature in black ink, appearing to read 'JKF', written over the printed name 'Janet K. Fisher'.

The enclosed is a copy of the data that was recently faxed to you in response to your request for climate data. A bill is enclosed to cover the cost of these data and fax charges. Please return the bottom portion of the bill with your payment. If you have any questions or need additional data, you can contact our office at the address or phone numbers listed above.

Hourly Surface Observations

Station: BOSTON WSFO AP, MA, Year: 1998

mm/dd/yyyy	hh	Temperature	Dewpoint	Wind Direction	Wind Speed	Wind Gusts	Station Pressure	Visibility	Weather Conditions	Total Sky Cover	Hourly Precipitation
	lst	degF	degF	compass	miles/hour	miles/hour	inch_Hg	miles	text	fraction	inch
08/19/1998	00	62	57	NNE	5.8	-	29.98	10.00		1.0	0.01
08/19/1998	01	61	54	N	10.4	-	29.98	10.00		1.0	0.00
08/19/1998	02	61	53	N	9.2	-	29.97	10.00		1.0	0.00
08/19/1998	03	60	52	NNW	9.2	-	29.97	10.00		1.0	0.00
08/19/1998	04	60	50	N	12.7	-	29.98	10.00		1.0	0.00
08/19/1998	05	59	49	N	12.7	-	30.00	10.00		0.8	0.00
08/19/1998	06	59	48	N	11.5	-	30.02	10.00		0.5	0.00
08/19/1998	07	61	47	N	16.1	-	30.05	10.00		0.5	0.00
08/19/1998	08	62	47	N	18.4	-	30.06	10.00		1.0	0.00
08/19/1998	09	-	-	-	-	-	-	-		-	-
08/19/1998	10	68	48	NNE	12.7	-	30.08	10.00		0.0	0.00
08/19/1998	11	68	49	E	13.8	-	30.08	10.00		0.2	0.00
08/19/1998	12	-	-	-	-	-	-	-		-	-
08/19/1998	13	68	47	E	12.7	-	30.08	10.00		0.2	0.00
08/19/1998	14	68	48	E	12.7	-	30.08	10.00		0.2	0.00
08/19/1998	15	67	50	SE	10.4	-	30.08	10.00		0.2	0.00
08/19/1998	16	67	46	SSE	6.9	-	30.10	10.00		0.2	0.00
08/19/1998	17	67	45	SE	6.9	-	30.10	10.00		0.2	0.00
08/19/1998	18	66	44	SE	6.9	-	30.11	10.00		0.2	0.00
08/19/1998	19	63	48	SE	5.8	-	30.12	10.00		0.0	0.00
08/19/1998	20	62	50	SSE	6.9	-	30.14	10.00		0.0	0.00
08/19/1998	21	63	50	SW	6.9	-	30.16	10.00		0.0	0.00
08/19/1998	22	65	49	VNW	6.9	-	30.17	10.00		0.8	0.00
08/19/1998	23	63	48	NW	9.2	-	30.17	10.00		0.5	0.00
08/20/1998	00	62	49	NNW	9.2	-	30.17	10.00		0.5	0.00
08/20/1998	01	61	49	NW	8.1	-	30.18	10.00		0.0	0.00
08/20/1998	02	60	49	VNW	8.1	-	30.19	10.00		0.0	0.00
08/20/1998	03	59	48	NW	9.2	-	30.19	10.00		0.0	0.00
08/20/1998	04	58	49	NW	4.6	-	30.20	10.00		0.0	0.00
08/20/1998	05	57	49	VNW	6.9	-	30.22	10.00		0.0	0.00
08/20/1998	06	59	48	NNW	8.1	-	30.23	10.00		0.0	0.00
08/20/1998	07	63	48	NNW	6.9	-	30.23	10.00		0.0	0.00
08/20/1998	08	66	48	N	5.8	-	30.24	10.00		0.0	0.00
08/20/1998	09	69	49	N	4.6	-	30.24	10.00		0.0	0.00
08/20/1998	10	68	50	SE	6.9	-	30.24	10.00		0.2	0.00

08/20/1998	11	68	52	SE	10.4	-	30.23	10.00	0.5	0.00
08/20/1998	12	69	50	SE	10.4	-	30.21	10.00	0.5	0.00
08/20/1998	13	70	50	ESE	11.5	-	30.21	10.00	0.5	0.00
08/20/1998	14	71	52	ESE	10.4	-	30.19	10.00	0.5	0.00
08/20/1998	15	70	54	ESE	12.7	-	30.18	10.00	0.5	0.00
08/20/1998	16	70	53	ESE	12.7	-	30.17	10.00	0.5	0.00
08/20/1998	17	68	55	SE	10.4	-	30.16	10.00	0.5	0.00
08/20/1998	18	69	54	SSE	12.7	-	30.16	10.00	0.5	0.00
08/20/1998	19	66	53	SSE	10.4	-	30.17	10.00	0.5	0.00
08/20/1998	20	66	56	S	9.2	-	30.17	10.00	0.5	0.00
08/20/1998	21	66	55	SSW	9.2	-	30.19	10.00	0.8	0.00
08/20/1998	22	66	54	SW	12.7	-	30.19	10.00	0.8	0.00
08/20/1998	23	66	54	WSW	12.7	-	30.19	10.00	0.8	0.00

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Fax: (607) 255-2106

Internet mail: nrcc@cornell.edu



Date: January 22, 1999

To: Matt Mullarkey
Camp, Dresser & McKee
10 Cambridge Center
Cambridge, MA 02142

From: Janet K. Fisher
Climatologist

The enclosed information is being sent in response to your recent request for climate data. A bill is enclosed to cover the cost of these data. Please return the bottom portion of the bill with your payment. If you have any questions or need additional data, you can contact our office at the address or phone numbers listed above.

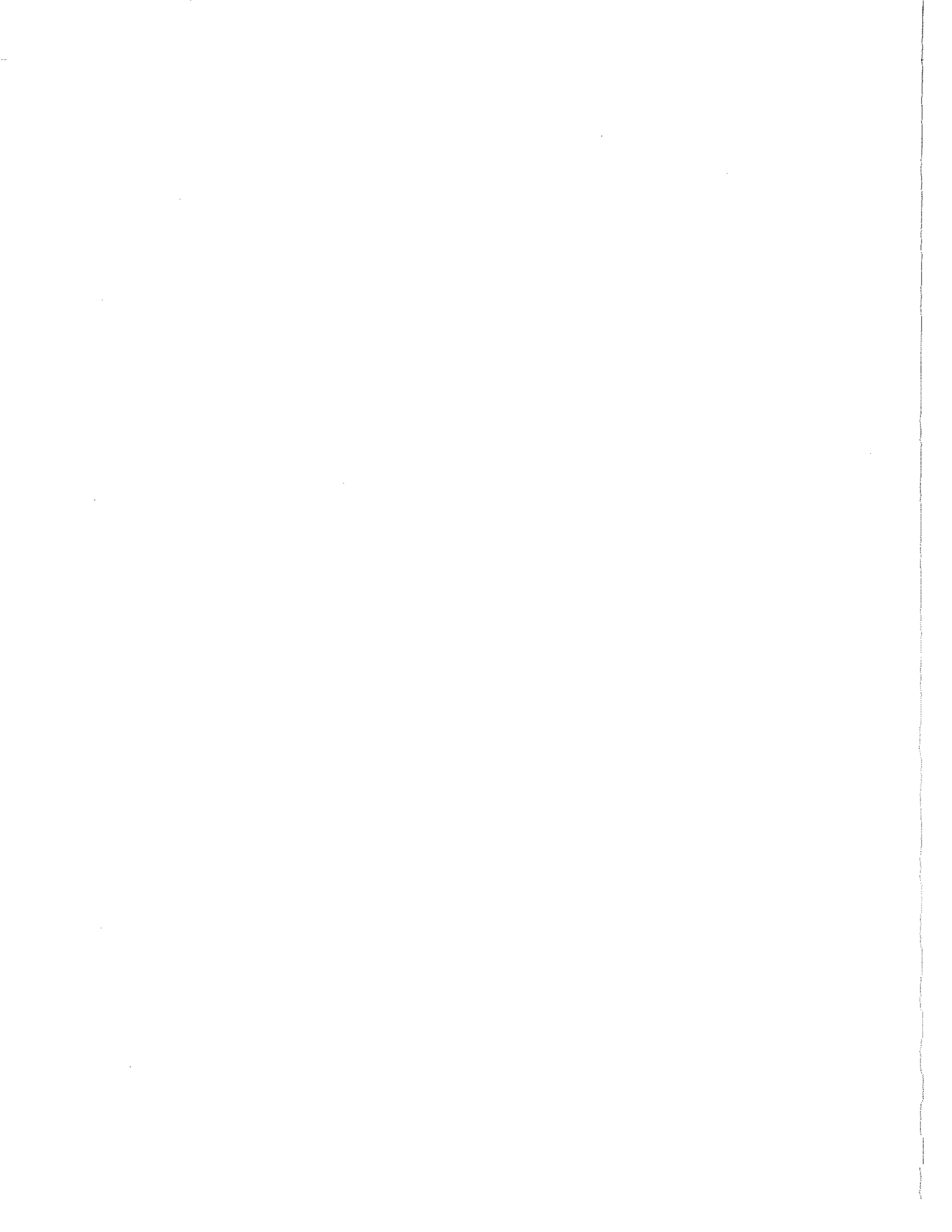
Hourly Surface Observations

Station: BOSTON WSFO AP, MA, Year: 1998

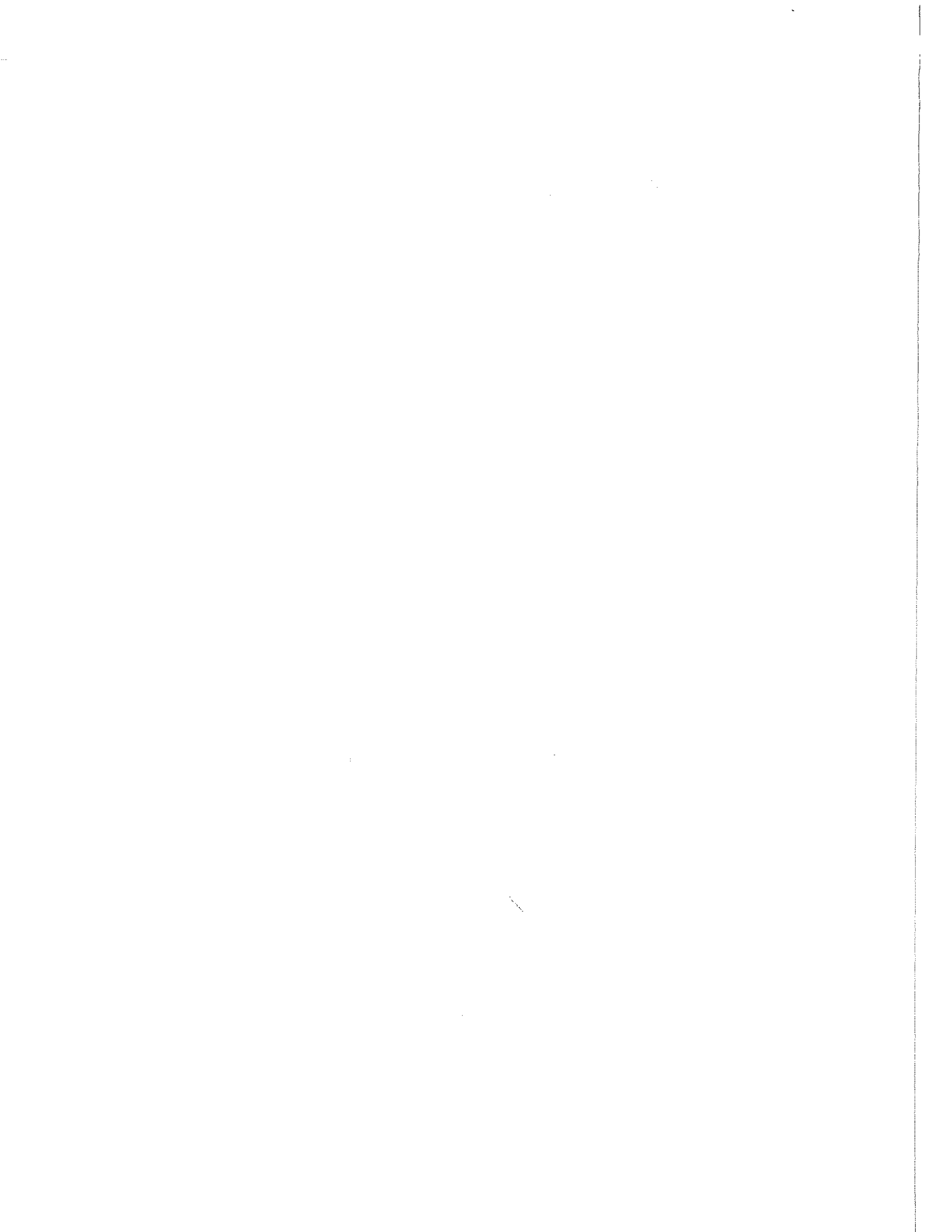
mm/dd/yyyy	hh	Temperature	Dewpoint	Wind Speed	Wind Direction	Wind Gusts	Peak Wind Speed	Peak Wind Direction	Station Pressure	Visibility	Weather Conditions	Hourly Precipitation
	lst	degF	degF	miles/hour	compass	miles/hour	miles/hour	compass	inch Hg	miles	text	inch
12/08/1998	00	45	28	12.7	NNW	-	-	-	30.15	10.00		0.00
12/08/1998	01	44	29	10.4	NNW	-	-	-	30.16	10.00		0.00
12/08/1998	02	42	29	6.9	NNW	-	-	-	30.19	10.00		0.00
12/08/1998	03	41	27	10.4	N	-	-	-	30.19	10.00		0.00
12/08/1998	04	40	28	8.1	N	-	-	-	30.20	10.00		0.00
12/08/1998	05	39	27	9.2	N	-	-	-	30.21	10.00		0.00
12/08/1998	06	37	28	5.8	NNE	-	-	-	30.22	10.00		0.00
12/08/1998	07	37	27	8.1	N	-	-	-	30.24	10.00		0.00
12/08/1998	08	38	27	6.9	N	-	-	-	30.24	10.00		0.00
12/08/1998	09	42	33	13.8	E	-	-	-	30.22	10.00		0.00
12/08/1998	10	43	36	11.5	E	-	-	-	30.24	10.00		0.00
12/08/1998	11	43	39	13.8	E	-	-	-	30.20	10.00		0.00
12/08/1998	12	43	38	16.1	ESE	-	-	-	30.15	10.00		0.00
12/08/1998	13	43	37	16.1	ESE	-	-	-	30.13	10.00	light rain	0.00
12/08/1998	14	40	39	17.3	ESE	-	-	-	30.10	4.00	moderate rain, fog/mist	0.02
12/08/1998	15	40	40	12.7	ESE	-	-	-	30.09	3.00	light rain	0.12
12/08/1998	16	41	41	15.0	E	-	-	-	30.06	3.00	light rain	0.02
12/08/1998	17	41	41	15.0	E	-	-	-	30.03	3.00	light rain, fog/mist	0.07
12/08/1998	18	42	42	10.4	NE	-	-	-	30.04	10.00	light rain	0.03
12/08/1998	19	40	42	11.5	NNE	-	-	-	30.01	2.00	light rain, fog/mist	0.03
12/08/1998	20	40	40	12.7	N	-	-	-	30.02	2.00	light rain, fog/mist	0.07
12/08/1998	21	40	40	10.4	NNE	-	-	-	30.01	4.00	light rain, fog/mist	0.04
12/08/1998	22	40	40	8.1	N	-	-	-	30.00	2.00	light rain, fog/mist	0.00
12/08/1998	23	40	40	8.1	NNW	-	-	-	30.00	5.00	moderate drizzle, fog/mist	0.00
12/09/1998	00	37	37	9.2	NNW	-	-	-	30.01	3.00	moderate drizzle, fog/mist	0.00
12/09/1998	01	36	36	8.1	NNW	-	-	-	30.01	3.00	fog/mist	0.00
12/09/1998	02	35	35	9.2	NNW	-	-	-	30.03	3.00	fog/mist	0.00
12/09/1998	03	36	36	8.1	NNW	-	-	-	30.05	1.50	fog/mist	0.00

12/09/1998	04	35	35	9.2	NNW	-	-	-	-	30.05	10.00	0.00
12/09/1998	05	34	34	9.2	NW	-	-	-	-	30.07	10.00	0.00
12/09/1998	06	34	33	9.2	NW	-	-	-	-	30.09	10.00	0.00
12/09/1998	07	34	32	9.2	NNW	-	-	-	-	30.11	10.00	0.00
12/09/1998	08	35	31	11.5	NW	-	-	-	-	30.15	10.00	0.00
12/09/1998	09	38	31	13.8	NNW	-	-	-	-	30.17	10.00	0.00
12/09/1998	10	39	29	18.4	NNW	23.0	-	-	-	30.17	10.00	0.00
12/09/1998	11	41	29	13.8	NW	19.6	-	-	-	30.18	10.00	0.00
12/09/1998	12	43	28	10.4	NW	18.4	-	-	-	30.17	10.00	0.00
12/09/1998	13	45	28	13.8	WNW	-	-	-	-	30.16	10.00	0.00
12/09/1998	14	45	28	10.4	NW	23.0	-	-	-	30.16	10.00	0.00
12/09/1998	15	45	29	12.7	WNW	-	-	-	-	30.17	10.00	0.00
12/09/1998	16	43	30	18.4	WNW	-	-	-	-	30.20	10.00	0.00
12/09/1998	17	42	30	12.7	WNW	-	-	-	-	30.22	10.00	0.00
12/09/1998	18	41	31	11.5	WNW	-	-	-	-	30.23	10.00	0.00
12/09/1998	19	41	31	9.2	W	-	-	-	-	30.24	10.00	0.00
12/09/1998	20	41	32	11.5	W	-	-	-	-	30.26	10.00	0.00
12/09/1998	21	41	32	13.8	W	-	-	-	-	30.26	10.00	0.00
12/09/1998	22	40	32	13.8	W	-	-	-	-	30.27	10.00	0.00
12/09/1998	23	40	32	11.5	W	-	-	-	-	30.28	10.00	0.00
12/10/1998	00	38	32	8.1	WNW	-	-	-	-	30.29	10.00	0.00
12/10/1998	01	37	32	9.2	W	-	-	-	-	30.30	10.00	0.00
12/10/1998	02	37	32	8.1	WNW	-	-	-	-	30.30	10.00	0.00
12/10/1998	03	-	-	-	-	-	-	-	-	-	-	-
12/10/1998	04	37	32	9.2	W	-	-	-	-	30.30	10.00	0.00
12/10/1998	05	36	32	9.2	WNW	-	-	-	-	30.30	10.00	0.00
12/10/1998	06	36	32	5.8	W	-	-	-	-	30.31	10.00	0.00
12/10/1998	07	36	32	5.8	W	-	-	-	-	30.31	10.00	0.00
12/10/1998	08	38	33	10.4	W	-	-	-	-	30.30	10.00	0.00
12/10/1998	09	40	33	9.2	W	-	-	-	-	30.31	10.00	0.00
12/10/1998	10	41	34	8.1	SW	-	-	-	-	30.30	10.00	0.00
12/10/1998	11	44	33	8.1	W	-	-	-	-	30.27	10.00	0.00
12/10/1998	12	45	32	8.1	W	-	-	-	-	30.23	10.00	0.00
12/10/1998	13	46	33	10.4	W	-	-	-	-	30.21	10.00	0.00
12/10/1998	14	47	33	6.9	W	-	-	-	-	30.18	10.00	0.00
12/10/1998	15	47	32	10.4	W	-	-	-	-	30.16	10.00	0.00
12/10/1998	16	45	32	12.7	WSW	-	-	-	-	30.13	10.00	0.00
12/10/1998	17	44	32	5.8	W	-	-	-	-	30.13	10.00	0.00
12/10/1998	18	44	32	8.1	WSW	-	-	-	-	30.14	10.00	0.00
12/10/1998	19	43	32	8.1	SW	-	-	-	-	30.14	10.00	0.00
12/10/1998	20	43	31	10.4	WSW	-	-	-	-	30.13	10.00	0.00
12/10/1998	21	42	31	10.4	WSW	-	-	-	-	30.13	10.00	0.00

12/10/1998	22	43	31	13.8	WSW	-	-	-	30.11	10.00	0.00
12/10/1998	23	42	32	12.7	WSW	-	-	-	30.10	10.00	0.00
12/11/1998	00	43	31	11.5	W	-	-	-	30.08	10.00	0.00
12/11/1998	01	43	31	11.5	W	-	-	-	30.06	10.00	0.00
12/11/1998	02	43	31	15.0	W	-	-	-	30.06	10.00	0.00
12/11/1998	03	42	31	13.8	W	-	-	-	30.05	10.00	0.00
12/11/1998	04	42	31	15.0	WSW	-	-	-	30.03	10.00	0.00
12/11/1998	05	41	31	15.0	W	24.2	-	-	30.03	10.00	0.00
12/11/1998	06	40	31	12.7	W	19.6	-	-	30.04	10.00	0.00
12/11/1998	07	40	32	16.1	W	23.0	-	-	30.05	10.00	0.00
12/11/1998	08	41	32	12.7	W	23.0	-	-	30.06	10.00	0.00
12/11/1998	09	42	33	11.5	W	-	-	-	30.08	10.00	0.00
12/11/1998	10	43	32	16.1	WNW	21.9	-	-	30.09	10.00	0.00
12/11/1998	11	43	30	18.4	NW	25.3	-	-	30.08	10.00	0.00
12/11/1998	12	43	28	17.3	NW	23.0	29.9	WNW	30.08	10.00	0.00
12/11/1998	13	43	28	17.3	NW	27.6	29.9	WNW	30.08	10.00	0.00
12/11/1998	14	43	30	16.1	WNW	26.5	-	-	30.11	10.00	0.00
12/11/1998	15	44	28	20.7	WNW	25.3	34.5	NW	30.13	10.00	0.00
12/11/1998	16	42	26	16.1	NW	24.2	31.1	NW	30.16	10.00	0.00
12/11/1998	17	40	26	18.4	WNW	24.2	-	-	30.19	10.00	0.00
12/11/1998	18	39	26	19.6	NW	27.6	-	-	30.23	10.00	0.00
12/11/1998	19	38	27	12.7	NW	20.7	-	-	30.26	10.00	0.00
12/11/1998	20	37	28	10.4	NW	-	-	-	30.28	10.00	0.00
12/11/1998	21	35	28	8.1	NW	-	-	-	30.30	10.00	0.00
12/11/1998	22	35	28	11.5	WNW	-	-	-	30.31	10.00	0.00
12/11/1998	23	34	26	9.2	NW	-	-	-	30.32	10.00	0.00



Appendix K
Landfill Gas Analytical Data



@AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9808343

Work Order Summary

CLIENT: Mr. Bill Scully
Camp, Dresser & McKee
10 Cambridge Center
Cambridge, MA 02142

BILL TO: Same

PHONE: 617-252-8363
FAX: 617-621-2565
DATE RECEIVED: 8/24/98
DATE COMPLETED: 9/8/98

P.O. # 0519-22913-rt. samp
PROJECT # Town of Waltham Woerd Ave Landfill

FRACTION #

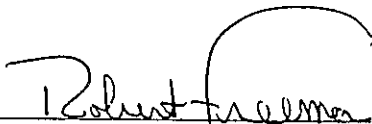
NAME

TEST

RECEIPT
VAC./PRES.

01A	LFG-1	TO-14	10.0 "Hg
02A	LFG-2	TO-14	6.0 "Hg
03A	LFG-3	TO-14	5.0 "Hg
04A	Lab Blank	TO-14	NA
04B	Lab Blank	TO-14	NA

CERTIFIED BY:


Laboratory Director

DATE: 9/8/98

Certification numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA 95630
(916) 985-1000 • (800) 985-5955 • FAX (916) 985-1020

AIR TOXICS LTD.

SAMPLE NAME : LFG-1

ID#: 9808343-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5090211	Date of Collection:	8/20/98
Dil. Factor:	1.00	Date of Analysis:	9/2/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Freon 12	0.50	Not Detected
Freon 114	0.50	Not Detected
Chloromethane	0.50	Not Detected
Vinyl Chloride	0.50	Not Detected
Bromomethane	0.50	Not Detected
Chloroethane	0.50	Not Detected
Freon 11	0.50	Not Detected
1,1-Dichloroethene	0.50	Not Detected
Freon 113	0.50	Not Detected
Methylene Chloride	0.50	Not Detected
1,1-Dichloroethane	0.50	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected
Chloroform	0.50	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected
Carbon Tetrachloride	0.50	Not Detected
Benzene	0.50	Not Detected
1,2-Dichloroethane	0.50	Not Detected
Trichloroethene	0.50	Not Detected
1,2-Dichloropropane	0.50	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected
Toluene	0.50	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected
Tetrachloroethene	0.50	Not Detected
Ethylene Dibromide	0.50	Not Detected
Chlorobenzene	0.50	Not Detected
Ethyl Benzene	0.50	Not Detected
m,p-Xylene	0.50	Not Detected
o-Xylene	0.50	Not Detected
Styrene	0.50	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected
Chlorotoluene	0.50	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected
1,2,4-Trichlorobenzene	0.50	Not Detected
Hexachlorobutadiene	0.50	Not Detected
Propylene	2.0	Not Detected
1,3-Butadiene	2.0	Not Detected
Acetone	2.0	Not Detected
Carbon Disulfide	2.0	Not Detected
2-Propanol	2.0	Not Detected
trans-1,2-Dichloroethene	2.0	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : LFG-1

ID#: 9808343-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5090211	Date of Collection:	8/20/98
Dil. Factor:	1.00	Date of Analysis:	9/ 2/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Vinyl Acetate	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected
Hexane	2.0	Not Detected
Tetrahydrofuran	2.0	Not Detected
Cyclohexane	2.0	Not Detected
1,4-Dioxane	2.0	Not Detected
Bromodichloromethane	2.0	Not Detected
4-Methyl-2-pentanone	2.0	Not Detected
2-Hexanone	2.0	Not Detected
Dibromochloromethane	2.0	Not Detected
Bromoform	2.0	Not Detected
4-Ethyltoluene	2.0	Not Detected
Ethanol	2.0	Not Detected
Methyl tert-Butyl Ether	2.0	Not Detected
Heptane	2.0	Not Detected

Container Type: 6 Liter Silco Canister

Surrogates	% Recovery	Method Limits
Octafluorotoluene	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME : LFG-2

ID#: 9808343-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5083120	Date of Collection:	8/20/98
Dil. Factor:	1.68	Date of Analysis:	9/ 1/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Freon 12	0.84	3.9
Freon 114	0.84	1.8
Chloromethane	0.84	Not Detected
Vinyl Chloride	0.84	Not Detected
Bromomethane	0.84	Not Detected
Chloroethane	0.84	Not Detected
Freon 11	0.84	Not Detected
1,1-Dichloroethene	0.84	Not Detected
Freon 113	0.84	0.93
Methylene Chloride	0.84	Not Detected
1,1-Dichloroethane	0.84	Not Detected
cis-1,2-Dichloroethene	0.84	1.3
Chloroform	0.84	Not Detected
1,1,1-Trichloroethane	0.84	Not Detected
Carbon Tetrachloride	0.84	Not Detected
Benzene	0.84	Not Detected
1,2-Dichloroethane	0.84	Not Detected
Trichloroethene	0.84	25
1,2-Dichloropropane	0.84	Not Detected
cis-1,3-Dichloropropene	0.84	Not Detected
Toluene	0.84	Not Detected
trans-1,3-Dichloropropene	0.84	Not Detected
1,1,2-Trichloroethane	0.84	Not Detected
Tetrachloroethene	0.84	14
Ethylene Dibromide	0.84	Not Detected
Chlorobenzene	0.84	Not Detected
Ethyl Benzene	0.84	Not Detected
m,p-Xylene	0.84	Not Detected
o-Xylene	0.84	Not Detected
Styrene	0.84	Not Detected
1,1,2,2-Tetrachloroethane	0.84	Not Detected
1,3,5-Trimethylbenzene	0.84	Not Detected
1,2,4-Trimethylbenzene	0.84	Not Detected
1,3-Dichlorobenzene	0.84	Not Detected
1,4-Dichlorobenzene	0.84	Not Detected
Chlorotoluene	0.84	Not Detected
1,2-Dichlorobenzene	0.84	Not Detected
1,2,4-Trichlorobenzene	0.84	Not Detected
Hexachlorobutadiene	0.84	Not Detected
Propylene	3.4	5.4
1,3-Butadiene	3.4	Not Detected
Acetone	3.4	3.9
Carbon Disulfide	3.4	Not Detected
2-Propanol	3.4	Not Detected
trans-1,2-Dichloroethene	3.4	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : LFG-2

ID#: 9808343-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5083120	Date of Collection:	8/20/98
Dil. Factor:	1.68	Date of Analysis:	9/ 1/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Vinyl Acetate	3.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.4	Not Detected
Hexane	3.4	Not Detected
Tetrahydrofuran	3.4	Not Detected
Cyclohexane	3.4	Not Detected
1,4-Dioxane	3.4	Not Detected
Bromodichloromethane	3.4	Not Detected
4-Methyl-2-pentanone	3.4	Not Detected
2-Hexanone	3.4	Not Detected
Dibromochloromethane	3.4	Not Detected
Bromoform	3.4	Not Detected
4-Ethyltoluene	3.4	Not Detected
Ethanol	3.4	8.7
Methyl tert-Butyl Ether	3.4	Not Detected
Heptane	3.4	Not Detected

Container Type: 6 Liter Silco Canister

Surrogates	% Recovery	Method Limits
Octafluorotoluene	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

SAMPLE NAME : LFG-3

ID#: 9808343-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5083121	Date of Collection:	8/20/98
Dil. Factor:	1.61	Date of Analysis:	9/ 1/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Freon 12	0.81	9.3
Freon 114	0.81	Not Detected
Chloromethane	0.81	Not Detected
Vinyl Chloride	0.81	Not Detected
Bromomethane	0.81	Not Detected
Chloroethane	0.81	Not Detected
Freon 11	0.81	13
1,1-Dichloroethene	0.81	Not Detected
Freon 113	0.81	1.6
Methylene Chloride	0.81	Not Detected
1,1-Dichloroethane	0.81	10
cis-1,2-Dichloroethene	0.81	2.1
Chloroform	0.81	2.0
1,1,1-Trichloroethane	0.81	9.8
Carbon Tetrachloride	0.81	Not Detected
Benzene	0.81	Not Detected
1,2-Dichloroethane	0.81	Not Detected
Trichloroethene	0.81	88
1,2-Dichloropropane	0.81	Not Detected
cis-1,3-Dichloropropene	0.81	Not Detected
Toluene	0.81	Not Detected
trans-1,3-Dichloropropene	0.81	Not Detected
1,1,2-Trichloroethane	0.81	Not Detected
Tetrachloroethene	0.81	180
Ethylene Dibromide	0.81	Not Detected
Chlorobenzene	0.81	Not Detected
Ethyl Benzene	0.81	Not Detected
m,p-Xylene	0.81	Not Detected
o-Xylene	0.81	Not Detected
Styrene	0.81	Not Detected
1,1,2,2-Tetrachloroethane	0.81	Not Detected
1,3,5-Trimethylbenzene	0.81	Not Detected
1,2,4-Trimethylbenzene	0.81	Not Detected
1,3-Dichlorobenzene	0.81	Not Detected
1,4-Dichlorobenzene	0.81	Not Detected
Chlorotoluene	0.81	Not Detected
1,2-Dichlorobenzene	0.81	Not Detected
1,2,4-Trichlorobenzene	0.81	Not Detected
Hexachlorobutadiene	0.81	Not Detected
Propylene	3.2	3.8
1,3-Butadiene	3.2	Not Detected
Acetone	3.2	Not Detected
Carbon Disulfide	3.2	Not Detected
2-Propanol	3.2	Not Detected
trans-1,2-Dichloroethene	3.2	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : LFG-3

ID#: 9808343-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5083121	Date of Collection:	8/20/98
Dil. Factor:	1.61	Date of Analysis:	9/ 1/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Vinyl Acetate	3.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.2	Not Detected
Hexane	3.2	Not Detected
Tetrahydrofuran	3.2	Not Detected
Cyclohexane	3.2	Not Detected
1,4-Dioxane	3.2	Not Detected
Bromodichloromethane	3.2	Not Detected
4-Methyl-2-pentanone	3.2	Not Detected
2-Hexanone	3.2	Not Detected
Dibromochloromethane	3.2	Not Detected
Bromoform	3.2	Not Detected
4-Ethyltoluene	3.2	Not Detected
Ethanol	3.2	6.2
Methyl tert-Butyl Ether	3.2	Not Detected
Heptane	3.2	Not Detected

Container Type: 6 Liter Silco Canister

Surrogates	% Recovery	Method Limits
Octafluorotoluene	98	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 9808343-04A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5083104	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 8/31/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Freon 12	0.50	Not Detected
Freon 114	0.50	Not Detected
Chloromethane	0.50	Not Detected
Vinyl Chloride	0.50	Not Detected
Bromomethane	0.50	Not Detected
Chloroethane	0.50	Not Detected
Freon 11	0.50	Not Detected
1,1-Dichloroethene	0.50	Not Detected
Freon 113	0.50	Not Detected
Methylene Chloride	0.50	Not Detected
1,1-Dichloroethane	0.50	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected
Chloroform	0.50	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected
Carbon Tetrachloride	0.50	Not Detected
Benzene	0.50	Not Detected
1,2-Dichloroethane	0.50	Not Detected
Trichloroethene	0.50	Not Detected
1,2-Dichloropropane	0.50	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected
Toluene	0.50	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected
Tetrachloroethene	0.50	Not Detected
Ethylene Dibromide	0.50	Not Detected
Chlorobenzene	0.50	Not Detected
Ethyl Benzene	0.50	Not Detected
m,p-Xylene	0.50	Not Detected
o-Xylene	0.50	Not Detected
Styrene	0.50	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected
Chlorotoluene	0.50	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected
1,2,4-Trichlorobenzene	0.50	Not Detected
Hexachlorobutadiene	0.50	Not Detected
Propylene	2.0	Not Detected
1,3-Butadiene	2.0	Not Detected
Acetone	2.0	Not Detected
Carbon Disulfide	2.0	Not Detected
2-Propanol	2.0	Not Detected
trans-1,2-Dichloroethene	2.0	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 9808343-04A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5083104	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 8/31/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Vinyl Acetate	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected
Hexane	2.0	Not Detected
Tetrahydrofuran	2.0	Not Detected
Cyclohexane	2.0	Not Detected
1,4-Dioxane	2.0	Not Detected
Bromodichloromethane	2.0	Not Detected
4-Methyl-2-pentanone	2.0	Not Detected
2-Hexanone	2.0	Not Detected
Dibromochloromethane	2.0	Not Detected
Bromoform	2.0	Not Detected
4-Ethyltoluene	2.0	Not Detected
Ethanol	2.0	Not Detected
Methyl tert-Butyl Ether	2.0	Not Detected
Heptane	2.0	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
Octafluorotoluene	97	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	101	70-130

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 9808343-04B

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5090203	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 9/ 2/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Freon 12	0.50	Not Detected
Freon 114	0.50	Not Detected
Chloromethane	0.50	Not Detected
Vinyl Chloride	0.50	Not Detected
Bromomethane	0.50	Not Detected
Chloroethane	0.50	Not Detected
Freon 11	0.50	Not Detected
1,1-Dichloroethene	0.50	Not Detected
Freon 113	0.50	Not Detected
Methylene Chloride	0.50	Not Detected
1,1-Dichloroethane	0.50	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected
Chloroform	0.50	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected
Carbon Tetrachloride	0.50	Not Detected
Benzene	0.50	Not Detected
1,2-Dichloroethane	0.50	Not Detected
Trichloroethene	0.50	Not Detected
1,2-Dichloropropane	0.50	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected
Toluene	0.50	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected
Tetrachloroethene	0.50	Not Detected
Ethylene Dibromide	0.50	Not Detected
Chlorobenzene	0.50	Not Detected
Ethyl Benzene	0.50	Not Detected
m,p-Xylene	0.50	Not Detected
o-Xylene	0.50	Not Detected
Styrene	0.50	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected
Chlorotoluene	0.50	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected
1,2,4-Trichlorobenzene	0.50	Not Detected
Hexachlorobutadiene	0.50	Not Detected
Propylene	2.0	Not Detected
1,3-Butadiene	2.0	Not Detected
Acetone	2.0	Not Detected
Carbon Disulfide	2.0	Not Detected
2-Propanol	2.0	Not Detected
trans-1,2-Dichloroethene	2.0	Not Detected

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 9808343-04B

EPA METHOD TO-14 GC/MS Full Scan

File Name:	5090203	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 9/ 2/98

Compound	Rpt. Limit (ppbv)	Amount (ppbv)
Vinyl Acetate	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected
Hexane	2.0	Not Detected
Tetrahydrofuran	2.0	Not Detected
Cyclohexane	2.0	Not Detected
1,4-Dioxane	2.0	Not Detected
Bromodichloromethane	2.0	Not Detected
4-Methyl-2-pentanone	2.0	Not Detected
2-Hexanone	2.0	Not Detected
Dibromochloromethane	2.0	Not Detected
Bromoform	2.0	Not Detected
4-Ethyltoluene	2.0	Not Detected
Ethanol	2.0	Not Detected
Methyl tert-Butyl Ether	2.0	Not Detected
Heptane	2.0	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
Octafluorotoluene	99	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

Client: Town of Waltham Address: Wood Ave. SDG#: _____
 Project Name: Wood Ave Landfill TAT: Standard

Project #: _____ TAT Approved by: _____

Contact: Lisel Webster CRB 978 371-1710 Fax #: BULLCOM # 0519-22913-AT, 500P

Report to: Paul Taurasi-CDM 617-252-8000

CLIENT SAMPLE ID	DATE Time	TIME Date	MATRIX S - Soil W - Water D - Drinking	# OF CONT.	CDM SAMPLE ID See Attached SDG DR for Aliquot #'s & CDM Bottle Id's	VOA			SEMI VOA			MISC			METALS			OTHER	
						524.2	624/8240	8260	Other	525	625/8270 AEN A2N PAH	Other	PEST / PCB	TPH 418.1	PET ID	PP13	RCRA 8		Other
LF6-1	11/18	8/21/98	Gas	1															10.8" HX
LF6-2	10:55	8/21/98	Gas	1															6.0" HX
LF6-3	12:31	8/21/98	Gas	1															5.3" HX
																			8/25/98

A - HCl	B - HNO ₃	C - H ₂ SO ₄	D - NaOH	E - NaThio	F - Other	P - Plastic	G - Glass	V - Vial	Container Type:	Preservative:	Volume:	Instructions:			Method of Shipment:			
												Fax Results	State Forms	SMART Report	Disk Deliverable	TICS	Carrier	Courier

Shipped/Arrival:	Flow Rate	Flow Rate	Fill Time	Initial Pressure	Final Pressure
LF6-1	300ml/min	300ml/min	13min 25sec	27.5	9.5
LF6-2	300ml/min	300ml/min	13min 20sec	27.2	5.5
LF6-3	300ml/min	300ml/min	13min 20sec	27.4	5.0

Chain of Custody

Received by:	Time	Date
<u>M. V. M. M. M. M. M. M.</u>	<u>8:48</u>	<u>8/25/98</u>

Received by:	Time	Date
<u>M. V. M. M. M. M. M. M.</u>	<u>8:48</u>	<u>8/25/98</u>

NOTE: All samples submitted subject to Standard Terms & Conditions

Final Pressure: 9.5
 27.5
 27.2
 27.4

Temp. Ambient

Appendix L

Toxicity Profiles



ACETONE (3)

Summary of Primary Health Effects in Humans and Experimental Animals

Overview of Acetone Related Health Effects	Health Effects by Route of Exposure and Endpoint of Interest							
	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Very little information can be located regarding acetone's overall effects.	No information was provided.	Red blood cell parameters were significantly increased after oral consumption. Increased liver weights, and marked increase in the severity of tubular degeneration of the kidney. Inhalation of vapors has been known to cause transient eye and nose irritation.	No information was provided.	No information was provided.	Acetone did not show mutagenic activity when tested in a variety of strains.	No information was provided.	No information was provided.	Conclusions could not be drawn based on the lack of data concerning carcinogenicity in humans or in animals.

Notes:

- (1): Refer to original source (EPA-jns, 1999) for details.
- (2): "No information provided" indicates no information was provided by original source.
- (3): "No studies were located" indicates no studies were located by original source.

ARSENIC

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Arsenic Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Chronic exposure is associated with polynuropathy and skin lesions.	No information provided.	Known to cause non-carcinous possibly pre-carcinous skin changes in exposed individuals.	Known to cause increased incidence of multiple malformations among children born to women occupationally exposed.	Known to result in adverse reproductive effects in animals. Known to be fetotoxic and embryotoxic.	Causes chromosomal damage in humans and animals. Elevated incidence of chromosome aberrations.	Causes progressive polynuropathy involving motor and sensory nerves particularly affecting the extremities and myelinated long-axon neurons.	No information was provided.	Causes skin cancer when ingested. Causes lung tumors when it is inhaled.

Notes:

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Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Intent								
Overview of Barium Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Small amounts of barium can produce difficulties in pressure, changes in heart rhythm, changes in nerve reflexes.	<p>I: No studies were located regarding lethality in humans or in animals.</p> <p>O: Acute oral LD50 ranges from 132 to 277 mg/kg/day (rat). Indicates that barium is toxic by acute oral gavage exposure.</p>	<p>I: Minor respiratory effects, GI effects, hematological effects.</p> <p>O: Respiratory effects, cardiovascular, gastrointestinal, hematological, musculoskeletal, renal, and minor hepatic effects.</p> <p>D: No conclusive information was available regarding systemic effects.</p>	<p>I: Reduced survival, underdevelopment, lowered, weight gain, and various hematological alterations (rats).</p> <p>O: Limited information was available regarding developmental effects in humans or in animals.</p> <p>D: No studies were located regarding developmental effects in humans or in animals.</p>	<p>I: Disturbance in spermatogenesis, decreased number of sperm (rat).</p> <p>O: No adverse effects were noted at doses as high as 135 mg/kg/day.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>E: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxicity in humans or in animals.</p> <p>D: No studies were located regarding genotoxic effects in humans or in animals.</p>	<p>I: Limited information is available. Absence of deep tendon reflexes was observed.</p> <p>O: Numbness and tingling around the mouth and neck.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: Limited data is available. Acute gavage exposure of rats to doses less than 198 mg/kg/day was not associated with changes in thymus weight.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: No studies were located regarding cancer in humans or in animals.</p> <p>O: No conclusive information was provided regarding carcinogenic effects.</p> <p>D: No adequate human or animal data were available for evaluating carcinogenicity.</p>

Notes:

- (1): Refer to original source (0990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
- (5): "No information provided" indicates no information was provided by original source.
- (6): "No studies were located" indicates no studies were located by original source.

BENZO(A)ANTHRACENE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Benzo(a)anthracene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
	<p>I: No studies were located regarding lethality in humans or animals.</p> <p>O: No studies were located regarding lethality in humans.</p> <p>D: No studies were located regarding lethality in humans or animals.</p>	<p>I: No studies were located regarding systemic effects in humans or animals.</p> <p>O: Enzyme alterations in the mucosa of the G.I. tract.</p> <p>D: Can cause skin disorders.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No studies were located regarding developmental effects in humans.</p> <p>D: No studies were located regarding developmental effects in humans.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: No studies were located regarding reproductive effects in humans.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans.</p> <p>D: No studies were located regarding genotoxic effects in humans.</p>	<p>I: No studies were located regarding neurological effects in humans or in animals.</p> <p>O: No studies were located regarding neurological effects in humans or in animals.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: No studies were located regarding carcinogenic effects in humans or in animals.</p> <p>O: Increased incidence of hepatomas and pulmonary adenomas.</p> <p>D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
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- (3): Oral route of exposure.
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BENZO(A)PYRENE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest

Overview of Benzo(a)pyrene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Can cause harm to your health.	I: No studies were located regarding lethality in humans or animals. O: No studies were located regarding lethality in humans or animals. D: No studies were located regarding lethality in humans or animals.	I: No studies were located regarding systemic effects in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Minimal information is available regarding systemic effects in humans or animals.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans. D: No studies were located regarding developmental effects in humans.	I: No studies were located regarding reproductive effects in humans or in animals. O: No studies were located regarding reproductive effects in humans. D: No studies were located regarding reproductive effects in humans or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans. D: No studies were located regarding genotoxic effects in humans or in animals.	I: No studies were located regarding neurological effects in humans or in animals. O: No studies were located regarding neurological effects in humans or in animals. D: 30 mg was reported to bind to DNA in CD-1 mouse.	I: No studies were located regarding immunological effects in humans or in animals. O: No studies were located regarding immunological effects in humans or in animals. D: Immunogenic when applied dermally.	O: Limited studies were located regarding carcinogenic effects in humans or in animals. I: Limited studies were located regarding carcinogenic effects in humans. D: Studies were located that gave evidence of a direct association between dermal exposure and cancer induction.

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
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- (S): "No studies were located" indicates no studies were located by original source.

BENZO(B)FLUORANTHENE⁰

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Intent								
Overview of Benzo(b)fluoranthene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
	<p>I: No studies were located regarding lethality in humans or animals.</p> <p>O: No studies were located regarding lethality in humans.</p> <p>D: No studies were located regarding lethality in humans or animals.</p>	<p>I: No studies were located regarding systemic effects in humans or animals.</p> <p>O: Minimal information is available regarding systemic effects in humans or animals.</p> <p>D: Can cause skin disorders.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No studies were located regarding developmental effects in humans.</p> <p>D: No studies were located regarding developmental effects in humans.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: No studies were located regarding reproductive effects in humans.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans.</p> <p>D: Single topical application of 30 mg was reported to bind to DNA in CD-1 mouse skin.</p>	<p>I: No studies were located regarding neurological effects in humans or in animals.</p> <p>O: No studies were located regarding neurological effects in humans or in animals.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: No studies were located regarding carcinogenic effects in humans or in animals.</p> <p>O: No studies were located regarding carcinogenic effects in humans.</p> <p>D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
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- (6): "No studies were located" indicates no studies were located by original source.

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Benzo(G,H,I)Perylene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
I: No studies were located regarding lethality in humans or animals. O: No studies were located regarding lethality in humans.	I: No studies were located regarding systemic effects in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Can cause skin disorders.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans. D: No studies were located regarding developmental effects in humans.	I: No studies were located regarding reproductive effects in humans or in animals. O: No studies were located regarding reproductive effects in humans. D: No studies were located regarding reproductive effects in humans or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans. D: No studies were located regarding genotoxic effects in humans.	I: No studies were located regarding neurological effects in humans or in animals. O: No studies were located regarding neurological effects in humans or in animals. D: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals. O: No studies were located regarding immunological effects in humans or in animals. D: No studies were located regarding immunological effects in humans or in animals.	I: No studies were located regarding carcinogenic effects in humans or in animals. O: No studies were located regarding carcinogenic effects in humans. D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.	

Notes:
 (1): Refer to original source (1990 ATSDR) for details.
 (2): Inhalation route of exposure.
 (3): Oral route of exposure.
 (4): Dermal route of exposure.
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 (6): "No studies were located" indicates no studies were located by original source.

BENZO(a)FLUORANTHENE⁽³⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Benzo(a)fluoranthene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
	<p>I: No studies were located regarding lethality in humans or animals.</p> <p>O: No studies were located regarding lethality in humans.</p> <p>D: No studies were located regarding lethality in humans or animals.</p>	<p>I: No studies were located regarding systemic effects in humans or animals.</p> <p>O: Minimal information is available regarding systemic effects in humans or animals.</p> <p>D: Can cause skin disorders.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No studies were located regarding developmental effects in humans.</p> <p>D: No studies were located regarding developmental effects in humans.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: No studies were located regarding reproductive effects in humans.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans.</p> <p>D: Single topical application of 100 mg was reported to bind to DNA in CD-mouse skin.</p>	<p>I: No studies were located regarding neurological effects in humans or in animals.</p> <p>O: No studies were located regarding neurological effects in humans or in animals.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: No studies were located regarding carcinogenic effects in humans or in animals.</p> <p>O: No studies were located regarding carcinogenic effects in humans.</p> <p>D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
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CADMIUM⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest									
Overview of Cadmium Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer	
I: No studies were located regarding lethality in humans or animals. O: No studies were located regarding lethality in humans.	I: No studies were located regarding systemic effects in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Minimal information is available regarding systemic effects in humans or animals.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans. D: No studies were located regarding developmental effects in humans.	I: No studies were located regarding reproductive effects in humans or in animals. O: No studies were located regarding reproductive effects in humans. D: No studies were located regarding reproductive effects in humans or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans. D: No studies were located regarding genotoxic effects in humans.	I: No studies were located regarding neurological effects in humans or in animals. O: No studies were located regarding neurological effects in humans or in animals. D: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals. O: No studies were located regarding immunological effects in humans or in animals. D: No studies were located regarding immunological effects in humans or in animals.	I: Limited studies were located regarding carcinogenic effects in humans or in animals. O: No studies were located regarding carcinogenic effects in humans. D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.		

Notes:

- (1): Refer to original source (1990 ATSDR) for details.
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
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CHLOROFORM (1)

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Intent								
Overview of Chloroform Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Chloroform affects the central nervous system, liver, and kidney.	I: Data regarding inhalation exposure levels in humans were not available. An LC50 of 10,000 ppm for 4 hours was reported for rats.	I: Target organs are liver, kidney and central nervous system. Liver and kidney are the most sensitive. O: The liver and kidney are target organs of oral exposure to chloroform. D: Application of 100 mg/kg for 24 hour caused degenerative changes in the kidney tubules (rabbits).	I: No data regarding developmental effects in humans. In animals exposure of pregnant rats to 30 ppm 7 hours/day on days 6-15 of gestation resulted in no effects on the offspring. O: In animals no effects occurred at a dose of 20 mg/kg/day. No fetal effects occurred at 50 mg/kg/day.	I: No data regarding reproductive effects in humans was available. Exposure of male mice to 400 or 800 ppm 4 hours/day for 5 days caused a significant increase in the percentage of abnormal sperm. O: Rats administered 410 mg/kg/day, but not 150 mg/kg/day 6 days/week for 13 weeks had gonadal atrophy. D: Pertinent data regarding reproductive effects due to dermal exposure.	I: Chloroform gains access to germinal tissue and may pose a mutagenic risk. O: No significant data was available for adverse effects after oral exposure. D: No information was provided.	I: No data regarding neurotoxic effects in humans or animals were available. O: No information was provided. D: No information was provided.	I: No data regarding immunological effects in humans or animals were available. O: No information was provided. D: No information was provided.	I: No data were available regarding cancer in humans or animals following inhalation of chloroform. O: Studies in animals indicate that chloroform is carcinogenic. D: Pertinent data regarding the carcinogenicity of chloroform after dermal exposure.

Notes:

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CHROMIUM (3)

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Chromium Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>Chromium III is one form considered to be an essential nutrient that helps to maintain metabolism of glucose, fat, and cholesterol.</p> <p>Chromium VI may cause adverse effects at the site of contact. Chromium VI may also cause kidney and liver effects.</p>	<p>I: LC50 ranges from 33 to 65 mg/m³ (4 hr) (Chromium VI intermediate and chronic inhalation exposure (Chromium VI)).</p> <p>O: LD50 for Chromium VI 16.7 -22.5 mg/kg. LD50s for Chromium III compounds 3.25 g/kg and 11.26 g/kg were calculated.</p> <p>D: No information was provided.</p>	<p>I: Respiratory tract is the target of Chromium VI intermediate and chronic inhalation exposure (Chromium VI).</p> <p>O: Chronic oral studies of Chromium compounds have not identified any adverse effects.</p> <p>D: No information was provided.</p>	<p>I: Parental administration of Chromium III or Chromium VI resulted in adverse developmental effects.</p> <p>O: Parental administration of Chromium III or Chromium VI resulted in adverse developmental effects.</p> <p>D: No information was provided.</p>	<p>I: Parental administration of Chromium III or Chromium VI resulted in adverse reproductive effects.</p> <p>O: Parental administration of Chromium III or Chromium VI resulted in adverse reproductive effects.</p> <p>D: No information was provided.</p>	<p>I: Chromium VI is a more active genotoxin than Chromium III.</p> <p>O: Chromium VI is a more active genotoxin than Chromium III.</p> <p>D: No information was provided.</p>	<p>I: No information was provided.</p> <p>O: No information was provided.</p> <p>D: No information was provided.</p>	<p>I: Case studies indicate that occupational exposure to chromium compounds is associated with respiratory cancer.</p> <p>O: Chronic oral administration of chromium III has not resulted in significantly increased tumor incidences. Inadequate data for Chromium VI.</p> <p>D: No information was provided.</p>	<p>Cancer</p>

Notes:

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CHRYSENE (1)

Summary of Primary Health Effects in Humans and Experimental Animals

Overview of Chrysene Related Health Effects	Health Effects by Route of Exposure and Endpoint of Interest							
	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Chrysene has been reported to be a toxic chemical that causes cancer in laboratory animals when applied via the dermal route.	I: No information is available regarding lethality. O: No information is available regarding lethality. D: No information is available regarding lethality.	I: No information is available regarding systemic effects. O: No information is available regarding systemic effects. D: No information is available regarding systemic effects.	I: No information is available regarding developmental effects. O: No information is available regarding developmental effects. D: No information is available regarding developmental effects.	I: No information is available regarding reproductive effects. O: No information is available regarding reproductive effects. D: No information is available regarding reproductive effects.	I: No information is available regarding genotoxic effects. O: No information is available regarding genotoxic effects. D: No information is available regarding genotoxic effects.	I: No information was provided regarding neurological effects. O: No information was provided regarding neurological effects. D: No information was provided regarding neurological effects.	I: No information was provided regarding immunological effects. O: No information was provided regarding immunological effects. D: No information was provided regarding immunological effects.	I: No reports directly correlating inhalation of chrysene and the induction of cancer are available. O: No information was provided regarding carcinogenic effects. D: A dose of 1.2 mg/kg/day applied to the skin of mice for 17 months developed benign and malignant skin tumors.

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Intent								
Overview of Copper Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>Copper is necessary for good health. In large single or daily intakes can harm your health. Long-term exposure to copper dust can irritate your nose, mouth and eyes, and cause headaches, dizziness, nausea, and diarrhea. High intakes can cause liver and kidney damage.</p>	<p>I: No studies were located regarding lethality in humans or animals following exposure.</p> <p>O: Thirteen of 53 patients died after ingesting 6-57 mg/kg/d copper. Increased mortality was observed in rats fed a diet containing 4000 ppm of copper for 1 week.</p> <p>D: No studies were located regarding lethality in humans or animals following exposure.</p>	<p>I: In humans copper is a respiratory irritant. Factory workers exposed to copper dust experienced mucosal irritation of the mouth, eyes, and nose.</p> <p>O: Gastrointestinal, hepatic, and renal effects have been observed in humans following the consumption of contaminated water or copper sulfate in suicide attempts.</p> <p>D: Hemolytic anemia was observed in a severely burned and dehydrated child in whom copper sulfate crystals were being applied to granulation tissue.</p>	<p>I: No studies were located regarding developmental effects in humans or animals.</p> <p>O: No studies were located regarding developmental effects in humans. In animals increased fetal mortality was observed in fetuses of mice fed > 104 mg/kg/d copper as copper sulfate.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: Sexual impotence was reported in 16% of examined factory workers exposed to copper dust.</p> <p>O: No studies were located regarding reproductive effects in humans. In animals, no adverse effects were observed.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in experimental animals.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: Headaches, vertigo, and drowsiness were reported by factory workers exposed to copper dust.</p> <p>O: No studies were located regarding neurological effects in humans or animals.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: No studies were located regarding immunological effects in humans or animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: In some individuals exposure to copper produces pruritic dermatitis.</p>	<p>I: No studies were located regarding cancer effects in humans or in animals.</p> <p>O: No studies were located regarding carcinogenic effects in humans. In animals, cancer was not observed in rats or mice exposed to copper at various concentrations.</p> <p>D: No studies were located in the literature reviewed.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
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DIBENZO(A,H)ANTHRACENE (1)

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Dibenz(a,h)anthracene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
	I: No studies were located regarding lethality in humans or animals.	I: No studies were located regarding systemic effects in humans or animals.	I: No studies were located regarding developmental effects in humans or animals.	I: No studies were located regarding reproductive effects in humans or animals.	I: No studies were located regarding genotoxic effects in humans or animals.	I: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals.	I: No studies were located regarding carcinogenicity in humans or in animals.
	O: No studies were located regarding lethality in humans.	O: Minimal information is available regarding systemic effects in humans or animals.	O: No studies were located regarding developmental effects in humans.	O: No studies were located regarding reproductive effects in humans.	O: No studies were located regarding genotoxic effects in humans or in animals.	O: No studies were located regarding neurological effects in humans or in animals.	O: No studies were located regarding immunological effects in humans or in animals.	O: Limited studies were located regarding carcinogenicity in humans or in animals.
	D: No studies were located regarding lethality in humans or in animals.	D: Minimal information is available regarding systemic effects in humans or animals.	D: No studies were located regarding developmental effects in humans.	D: No studies were located regarding reproductive effects in humans or in animals.	D: No studies were located regarding genotoxic effects in humans or in animals.	D: No studies were located regarding neurological effects in humans or in animals.	D: No studies were located regarding immunological effects in humans or in animals.	D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.

Notes:

- (1): Refer to original source (1990 ATSDR) for details.
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
- (2): "No information provided" indicates no information was provided by original source.
- (3): "No studies were located" indicates no studies were located by original source.

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest

Overview of Rhoanthrene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
I: No studies were located regarding lethality in humans or animals. O: No studies were located regarding lethality in humans. D: No studies were located regarding lethality in humans or animals.	I: No studies were located regarding systemic effects in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Minimal information is available regarding systemic effects in humans or animals.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans. D: No studies were located regarding developmental effects in humans.	I: No studies were located regarding reproductive effects in humans or in animals. O: No studies were located regarding reproductive effects in humans. D: No studies were located regarding reproductive effects or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans. D: No studies were located regarding genotoxic effects in humans.	I: No studies were located regarding neurological effects in humans or in animals. O: No studies were located regarding neurological effects in humans or in animals. D: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals. O: No studies were located regarding immunological effects in humans or in animals. D: No studies were located regarding immunological effects in humans or in animals.	I: No studies were located regarding carcinogenic effects in humans or in animals. O: No studies were located regarding carcinogenic effects in humans. D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.	

Notes:

- (1): Refer to original source (1590 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
- (5): "No information provided" indicates no information was provided by original source.
- (6): "No studies were located" indicates no studies were located by original source.

FLUORENE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Intent								
Overview of Fluorene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
	<p>I: No studies were located regarding lethality in humans or animals.</p> <p>O: No studies were located regarding lethality in humans.</p> <p>D: No studies were located regarding lethality in humans or animals.</p>	<p>I: No studies were located regarding systemic effects in humans or animals.</p> <p>O: Minimal information is available regarding systemic effects in humans or animals.</p> <p>D: Minimal information is available regarding systemic effects in humans or animals.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No studies were located regarding developmental effects in humans.</p> <p>D: No studies were located regarding developmental effects in humans.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: No studies were located regarding reproductive effects in humans.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans.</p> <p>D: No studies were located regarding genotoxic effects in humans.</p>	<p>I: No studies were located regarding neurological effects in humans or in animals.</p> <p>O: No studies were located regarding neurological effects in humans or in animals.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: No studies were located regarding carcinogenic effects in humans or in animals.</p> <p>O: No studies were located regarding carcinogenic effects in humans.</p> <p>D: No studies were located that give evidence of a direct association between dermal exposure and cancer induction.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
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- (6): "No studies were located" indicates no studies were located by original source.

INDENO(1,2,3-CD)PYRENE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Indeno(1,2,3-cd)pyrene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
I: No studies were located regarding lethality in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Minimal information is available regarding systemic effects in humans or animals.	I: No studies were located regarding lethality in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Minimal information is available regarding systemic effects in humans or animals.	I: No studies were located regarding systemic effects in humans or animals. O: Minimal information is available regarding systemic effects in humans or animals. D: Minimal information is available regarding systemic effects in humans or animals.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans. D: No studies were located regarding developmental effects in humans.	I: No studies were located regarding reproductive effects in humans or in animals. O: No studies were located regarding reproductive effects in humans. D: No studies were located regarding reproductive effects in humans or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans. D: Single topical application of 100 mg was reported to bind to DNA in CD-1 mouse skin.	I: No studies were located regarding neurological effects in humans or in animals. O: No studies were located regarding neurological effects in humans or in animals. D: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals. O: No studies were located regarding immunological effects in humans or in animals. D: No studies were located regarding immunological effects in humans or in animals.	I: No studies were located regarding carcinogenic effects in humans or in animals. O: No studies were located regarding carcinogenic effects in humans. D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
- (3): "No studies were located" indicates no information was provided by original source.

LEAD (2)

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Intent								
Overview of Lead Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
Lead is especially dangerous to unborn children. More of the lead swallowed by children enters their bodies and they are more sensitive to its effects.	Lethality data for oral exposure is limited to LDLO values. The lowest LDLO value for a dog is 191 mg/kg.	The end points of greatest concern for human health after oral exposure are heme synthesis, and erythropoiesis, cardiovascular toxicity, and vitamin D metabolism and growth.	Studies provide no evidence that oral exposure to lead results in malformations.	Caused irregular estrous cycles in females, testicular damage was seen in male rats.	Conflicting information is available, a clastogenic effect has been suggested.	Nerve conduction velocity is slowed. In children effects such as lower IQ levels have been associated with lead exposure.	No information is provided.	Statistically increased incidences of kidney tumors.

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): "No information provided" indicates no information was provided by original source.
- (3): "No studies were located;" indicates no studies were located by original source.

Summary of Primary Health Effects in Humans and Experimental Animals

Overview of Manganese Related Health Effects	Health Effects by Route of Exposure and Endpoint of Interest							
	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>A small amount of manganese each day is believed to be important in maintaining your health. However, too much manganese can cause serious illness. Manganese miners or steel workers exposed to high levels of manganese dust may have mental and emotional disturbances.</p>	<p>I: No studies were located regarding lethality in humans or animals following exposure.</p> <p>O: No studies were located regarding lethality in humans or animals following exposure.</p> <p>D: No studies were located regarding lethality in humans or animals following exposure.</p>	<p>I: May cause respiratory, hematological, hepatic, and renal effects.</p> <p>O: Studies in animals provide data regarding the effects on systemic target tissue following ingestion.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: Very little information is available on the developmental effects.</p> <p>O: The incidence of birth defects has been investigated but the data available are too limited to judge if the incidence is higher than expected.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: Sexual impotence was reported in males suffering from "manganism".</p> <p>O: No studies were located regarding reproductive effects in humans. In animals, the principal effect seems to be decreased testosterone production.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans. In male rats, repeated oral doses of 0.014 mg/kg/d for 80 days did not produce any significant chromosomal damage.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: Exposure to high levels may cause a disabling syndrome of neurological effects termed "manganism".</p> <p>O: Limited evidence suggests that oral exposure leads to neurological effects in humans.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: No studies were located regarding immunological effects in humans or animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: No studies were located in the literature reviewed.</p>	<p>I: No studies were located regarding cancer effects in humans or in animals.</p> <p>O: No studies were located regarding carcinogenic effects in humans. In animals, chronic feeding studies have yielded equivocal evidence of a carcinogenic potential.</p> <p>D: No studies were located in the literature reviewed.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
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MERCURY (3)

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Mercury Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>Long term exposure to organic or inorganic mercury can irreversibly damage the brain, kidneys, or developing fetuses.</p> <p>The form of mercury and the way people are exposed to it influence which of these health effects will be more severe.</p>	<p>I: Following acute exposure to high concentrations death was attributed to loss of respiratory function as a result of severe damage to pulmonary tissue.</p> <p>O: The lethal doses ranged from 29 to at least 50 mg/kg.</p> <p>D: No studies were located regarding lethality in humans or experimental animals.</p>	<p>I: Serious cardiovascular and pulmonary effects in humans. Gastrointestinal, hepatic and renal effects.</p> <p>O: Kidney and central nervous system effects.</p> <p>D: Studies report the occurrence of neurotoxic and nephrotoxic effects following dermal exposure.</p>	<p>I: Studies in humans following prenatal exposure to mercury suggest chronic exposure results in increased frequencies of menstrual disturbances and spontaneous abortions.</p> <p>O: No studies were located regarding developmental effects in humans. In animals, increased percentage of fetal resorptions were observed (humans).</p> <p>D: No studies were located regarding developmental effects in humans or experimental animals.</p>	<p>I: Exposure to metallic mercury causes prolongation of estrus cycles.</p> <p>O: No studies were located regarding developmental effects in humans. In animals 1 mg /kg/day affected male fertility.</p> <p>D: No studies were located regarding reproductive effects in humans or experimental animals.</p>	<p>I: Increased incidence of structural chromosomal anomalies.</p> <p>O: A positive correlation between blood mercury levels and increased frequencies of chromosomal aberrations was reported.</p> <p>D: No studies were located regarding genotoxic effects in humans or experimental animals.</p>	<p>I: Central nervous system is critical system for elemental mercury.</p> <p>O: Studies failed to reveal any evidence of neurotoxicity in mice administered 1 or 3 mg/kg/day of HgCl₂.</p> <p>D: Exposure via the dermal route is one of the most common routes of exposure, therefore symptoms such as ataxia may be related to the dermal route of exposure.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: Evidence indicates immune system is affected.</p> <p>D: Contact allergies have been reported however results are not conclusive.</p>	<p>I: There were no reliable studies indicating that inorganic or organic mercury are carcinogenic.</p> <p>O: There were no reliable studies indicating that inorganic or organic mercury are carcinogenic.</p> <p>D: No studies were located regarding carcinogenic effects in humans or in animals.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
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METHYLENE CHLORIDE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Methylene Chloride Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>I: Exposure to exceedingly high human fatalities.</p> <p>LC50 value ranges from 11,000 to 16,000 ppm.</p> <p>Methylene chloride can affect the eyes, nose and throat.</p> <p>Methylene chloride can affect the central nervous system. May cause symptoms similar to those of alcohol.</p>	<p>I: Exposure to exceedingly high human fatalities.</p> <p>LC50 value ranges from 11,000 to 16,000 ppm.</p> <p>O: Oral LD50 ranges from 1,000 to 2,000 mg/kg.</p> <p>D: No studies were located.</p>	<p>I: Central nervous system, hepatic effects, renal effects.</p> <p>O: Hepatic effects.</p> <p>D: No studies were located.</p>	<p>I: Evidence does currently exist to conclusively characterize the developmentally toxic potential of methylene chloride in humans.</p> <p>O: Evidence does currently exist to conclusively characterize the developmentally toxic potential of methylene chloride in humans.</p> <p>D: No studies were located.</p>	<p>I: Methylene chloride did not adversely affect reproduction in rats at 0, 100, 500, or 1,500 ppm.</p> <p>O: No information was provided regarding reproductive effects.</p> <p>D: No studies were located.</p>	<p>I: Evidence of mutagenicity in mammalian cells is lacking.</p> <p>O: Evidence of mutagenicity in mammalian cells is lacking.</p> <p>D: No studies were located.</p>	<p>I: No information was provided.</p> <p>O: No information was provided.</p> <p>D: No studies were located.</p>	<p>I: No information was provided.</p> <p>O: No information was provided.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: A dose dependent increase in liver and lung adenomas and carcinomas occurred after exposure to 2,000 or 4,000 ppm (methylene) (rat).</p> <p>O: An increase in liver tumors was noted at 50 and 250 mg/kg/day.</p> <p>D: No studies were located regarding carcinogenic effects in experimental animals.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
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NAPHTHALENE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Naphthalene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>I: Studies show that at the highest level that could be generated in inhalation chambers no deaths occurred.</p> <p>The primary health concern for humans exposed is that of hemolytic anemia.</p> <p>Other effects include nausea, vomiting, kidney damage, and liver damage.</p>	<p>I: Studies show that at the highest level that could be generated in inhalation chambers no deaths occurred.</p> <p>O: Oral LD50 ranges from 2,200 and 2,400 mg/kg for male and female rats respectively.</p> <p>D: No deaths occurred within a 14-day observation period when naphthalene was applied at 2,500 mg/kg to the skin (rats)</p>	<p>I: Hematological effects, G.I. effects, renal effects.</p> <p>O: Hematological effects.</p> <p>D: Hematological effects.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No congenital effects were seen after administration of 300 mg/kg/day.</p> <p>D: No studies were located regarding developmental effects in humans or in animals.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: Doses up to 400 mg/kg/day resulted in no apparent adverse reproductive effects.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>D: No studies were located regarding genotoxic effects in humans or in animals.</p>	<p>I: Occurrence of nausea, headache, malaise, and confusion.</p> <p>O: Neurological symptoms produced are confusion, and lethargy.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: Oral doses as high as 267 mg/kg/day for 14 days showed no effects on humoral immune responses.</p> <p>D: No studies were located regarding immunological effects in humans</p>	<p>I: Pulmonary adenomas at exposure levels of 10 or 30 ppm (inhalation).</p> <p>O: Rats receiving 41 mg/kg/day revealed no tumor development.</p> <p>D: No conclusive studies were located regarding carcinogenic effects in humans or in animals.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
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PHENANTHRENE⁽³⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Phenanthrene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
I: No studies were located regarding lethality in humans or animals. O: No studies were located regarding lethality in humans.	I: No studies were located regarding systemic effects in humans or animals. O: Enzyme alterations in the mucosa of the G.I. tract. D: Can cause skin disorders.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans. D: No studies were located regarding developmental effects in humans.	I: No studies were located regarding reproductive effects in humans or in animals. O: No studies were located regarding reproductive effects in humans. D: No studies were located regarding reproductive effects in humans or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans. D: No studies were located regarding genotoxic effects in humans.	I: No studies were located regarding neurological effects in humans or in animals. O: No studies were located regarding neurological effects in humans or in animals. D: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals. O: No studies were located regarding immunological effects in humans or in animals. D: No studies were located regarding immunological effects in humans or in animals.	I: No studies were located regarding carcinogenic effects in humans or in animals. O: No studies were located regarding carcinogenic effects in humans or in animals. D: No studies were located that gave evidence of a direct association between dermal exposure and cancer induction.	

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
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PYRENE⁽²⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Pyrene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
	<p>I: No studies were located regarding lethality in humans or animals.</p> <p>O: No studies were located regarding lethality in humans.</p> <p>D: No studies were located regarding lethality in humans or animals.</p>	<p>I: No studies were located regarding systemic effects in humans or animals.</p> <p>O: Minimal information is available regarding systemic effects in humans or animals.</p> <p>D: Can cause skin disorders.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No studies were located regarding developmental effects in humans.</p> <p>D: No studies were located regarding developmental effects in humans.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: No studies were located regarding reproductive effects in humans.</p> <p>D: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans.</p> <p>D: No studies were located regarding genotoxic effects in humans.</p>	<p>I: No studies were located regarding neurological effects in humans or in animals.</p> <p>O: No studies were located regarding neurological effects in humans or in animals.</p> <p>D: No studies were located regarding neurological effects in humans or in animals.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: No studies were located regarding immunological effects in humans or in animals.</p> <p>D: No studies were located regarding immunological effects in humans or in animals.</p>	<p>I: No studies were located regarding carcinogenic effects in humans or in animals.</p> <p>O: No studies were located regarding carcinogenic effects in humans.</p> <p>D: No studies were located that give evidence of a direct association between dermal exposure and cancer induction.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
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Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Selenium Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>Selenium can be toxic at levels only moderately higher than the nutritional requirement. Severity of the toxic effects depends on how much was ingested.</p>	<p>I: No studies were located regarding lethality in humans. In animals, LC50 values for 1.4 or 8 hour exposures were 12.7 mg/m³, 5mg/m³, and 1.4 mg/m³ respectively (Guinea pig (hydrogen selenide))</p> <p>O: No cases of death in humans in the U.S. have been attributable intermediate or chronic oral exposures.</p>	<p>I: Respiratory tract is the primary site of injury following exposure to selenium dust - gastrointestinal and cardiovascular effects also occur.</p> <p>O: Tachycardia has been reported as a result of acute oral exposure in humans.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p> <p>O: No studies have demonstrated that selenium is teratogenic in humans.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p> <p>O: No studies were located regarding reproductive effects in humans. In animals selenium administered in the diet or drinking water does not appear to affect the fertility of females, unless the intake is sufficiently high enough to cause general toxicity.</p>	<p>I: No studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No studies were located regarding genotoxic effects in humans.</p>	<p>I. Occupational: Headaches, dizziness, and malaise were reported by workers following acute occupational exposure.</p> <p>O: Following acute oral exposure to selenium compounds in humans irritability, chills, and tremors were reported.</p>	<p>I: No studies were located regarding immunological effects in humans or in animals.</p> <p>O: No studies were located regarding immunological effects in humans. In animals, rats administered sodium selenite in drinking water at a dose of 0.75mg/kg/day for 10 weeks exhibited reduced humoral antibody.</p>	<p>I: There are no epidemiologic data that support a causal association between the inhalation of elemental selenium dusts or selenium compounds and the induction of cancer in humans.</p> <p>O: In humans studies have revealed either no association between selenium and the incidence of cancer or a negative association.</p> <p>D: The results of animal studies have not indicated that elemental selenium or selenium compounds are carcinogenic when topically applied.</p>

D: No studies were located regarding the health effects associated with the dermal route of exposure in humans or in animals.

Notes:

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- (O): Oral route of exposure.
- (D): Dermal route of exposure.
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SILVER⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Silver Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
No adverse health effect have been reported in humans. Some areas of the skin and other body tissues may turn gray after many exposures.	I: No studies were located regarding lethality in humans or in animals. O: Death was reported in rats receiving 222.2 mg/kg/day of silver nitrate over a longer duration. D: No significant studies were located regarding lethality in humans or in animals.	I: Respiratory effects have been observed infrequently in humans. O: Gray discoloration of the skin has been observed. D: Exposure to silver for extended periods of time or repeated exposure can lead to local skin discoloration.	I: No studies were located regarding developmental effects in humans or in animals. O: No studies were located regarding developmental effects in humans or in animals. D: No studies were located regarding developmental effects in humans or in animals.	I: No studies were located regarding reproductive effects in humans or in animals. O: No significant studies were located regarding reproductive effects in humans or in animals. D: No studies were located regarding reproductive effects in humans or in animals.	I: No studies were located regarding genotoxic effects in humans or in animals. O: No studies were located regarding genotoxic effects in humans or in animals. D: No studies were located regarding genotoxic effects in humans or in animals.	I: No studies were located regarding neurological effects in humans or in animals. O: Direct correlation between the exposure to silver and neurological effects has not been determined. D: No studies were located regarding neurological effects in humans or in animals.	I: No studies were located regarding immunological effects in humans or in animals. O: No information was provided. D: Medical case histories describe mild allergic responses. Sensitization has been observed.	I: No studies were located regarding the carcinogenicity of silver. O: No studies were located regarding the carcinogenicity of silver. D: No studies were located regarding the carcinogenicity of silver.

Notes:

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TETRACHLOROETHYLENE⁽¹⁾

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Tetrachloroethylene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>In high concentrations in air single exposures can cause CNS effects. In amounts much higher than typical environmental levels tetrachloroethylene has been shown to cause liver and kidney cancers, and leukemia.</p>	<p>I: LC50 of 5,200 ppm for 4 hr for mice was reported.</p> <p>O: LD50s of 3,835 and 3,005 mg/kg were determined for male and female rats.</p> <p>D: Pertinent data regarding lethality due to dermal exposure were not found in the available literature.</p>	<p>I: The CNS, liver, and kidney are the main target organs of inhalation exposure.</p> <p>O: The CNS, liver, and kidney are the main target organs of oral exposure.</p> <p>D: Pertinent data regarding systemic effects due to dermal exposure were not found in the available literature.</p>	<p>I: No studies were located regarding developmental effects in humans. In animals, mice exposed to 300 ppm for 7 h/day on days 16 to 15 of gestation had increased embryotoxic effects.</p> <p>O: Pertinent data regarding developmental toxicity due to oral exposure were not found in the available literature.</p> <p>D: Pertinent data regarding developmental toxicity due to dermal exposure were not found in the available literature.</p>	<p>I: An increased frequency of abnormal sperm was observed in mice exposed to 500 but not to 100 ppm for 7 h/day on 5 consecutive days.</p> <p>O: Pertinent data regarding reproductive toxicity due to oral exposure were not found in the available literature.</p> <p>D: Pertinent data regarding developmental toxicity due to dermal exposure were not found in the available literature.</p>	<p>I: No substantial studies were located regarding genotoxic effects in humans or in animals.</p> <p>O: No substantial studies were located regarding genotoxic effects in humans or in animals.</p> <p>D: Pertinent data regarding developmental toxicity due to dermal exposure were not found in the available literature.</p>	<p>I: No information was provided.</p> <p>O: No information was provided.</p> <p>D: No information was provided.</p>	<p>I: No information was provided.</p> <p>O: No information was provided.</p> <p>D: No information was provided.</p>	<p>I: Exposure to 100 or 200 ppm showed significantly increased incidences of hepatocellular carcinomas at both concentrations.</p> <p>O: Increased incidences of hepatocellular carcinomas in mice treated by gavage.</p> <p>D: No papillomas or carcinomas of the skin or tumors at any distal sites following dermal application of the compound.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
- (5): "No information provided" indicates no information was provided by original source.
- (6): "No studies were located" indicates no studies were located by original source.

TRICHLOROETHYLENE (1)

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest

Overview of Trichloroethylene Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>Dizziness, headache, slowed reaction time, sleepiness, and facial numbness occurred in workers breathing trichloroethylene.</p> <p>Central nervous effects have also been seen after ingestion.</p> <p>After long-term exposure liver, kidney, hematological effects occur.</p>	<p>I: Four-hour inhalation LC50 of 12,500 ppm for rats has been calculated.</p> <p>O: A single dose of 7,000 mg/kg is lethal to humans.</p> <p>D: Dermal LD50 is ≥ 29 g/kg</p>	<p>I: Principal targets for inhaled trichloroethylene are the central nervous system, liver, kidney, and hematological system.</p> <p>O: Animal studies indicate that the liver and kidney are the principal target organs of oral exposure.</p> <p>D: Pertinent data regarding systemic effects were not available.</p>	<p>I: Studies suggest trichloroethylene is fetotoxic and has developmental effects.</p> <p>O: A reduction in the number of live pups occurred in rats.</p> <p>D: Pertinent data developmental effects were not available.</p>	<p>I: A significant increase in sperm abnormalities in mice that were exposed to 2,000 ppm, but not 200 ppm.</p> <p>O: Impaired copulatory behavior was observed at 1,000 mg/kg/day.</p> <p>D: Pertinent data reproductive effects were not available.</p>	<p>I: No conclusive information was available regarding genotoxic effects.</p> <p>O: No conclusive information was available regarding genotoxic effects.</p> <p>D: Pertinent data genotoxic effects were not available.</p>	<p>I: No information was provided.</p> <p>O: No information was provided.</p> <p>D: No information was provided.</p>	<p>I: No information was provided regarding immunological effects in humans or in animals.</p> <p>O: No information was provided regarding immunological effects in humans or in animals.</p> <p>D: No information was provided regarding immunological effects in humans or in animals.</p>	<p>I: Increased incidences of tumors have been observed in animals.</p> <p>O: Several studies have indicated that an association may exist between leukemia in humans and exposure to trichloroethylene.</p> <p>D: Topical application of 1 mg 3 times per week for 581 days was not tumorigenic in female mice.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (2): Inhalation route of exposure.
- (3): Oral route of exposure.
- (4): Dermal route of exposure.
- (5): "No information provided" indicates no information was provided by original source.
- (6): "No studies were located" indicates no studies were located by original source.

Summary of Primary Health Effects in Humans and Experimental Animals

Health Effects by Route of Exposure and Endpoint of Interest								
Overview of Zinc Related Health Effects	Death	Systemic Effects	Developmental Effects	Reproductive Effects	Genotoxic Effects	Neurological Effects	Immunological Effects	Cancer
<p>Eating or drinking too much zinc is known to affect health in humans. The major effect of over exposure to zinc is that of anemia or "iron poor blood" and digestive problems.</p>	<p>I: In humans death has resulted from acute high dose inhalation of zinc chloride smoke.</p>	<p>I: Respiratory and hematological effects may occur following exposure by inhalation.</p>	<p>I: No studies were located regarding developmental effects in humans or in animals.</p>	<p>I: No studies were located regarding reproductive effects in humans or in animals.</p>	<p>I: No studies were located regarding genotoxic effects in humans. Mice exposed to zinc oxide had an increase in chromosomal aberrations in bone marrow cells.</p>	<p>I: Nonspecific neurological effects such as headaches and malaise have been reported in humans.</p>	<p>I: No studies were located regarding immunological effects in humans or animals.</p>	<p>I: No relationship between the occurrence of cancer in humans and occupational exposure to zinc has been demonstrated.</p>
	<p>O: 850 mg/kg/d as zinc oxide in the diet for between 3 and 13 days was lethal to ferrets.</p>	<p>O: Ingestion may result in a variety of systemic effects in the gastrointestinal and hematopoietic systems of humans and animals.</p>	<p>O: Fetal health risks may result from zinc deficiency. No teratogenic effects were reported in animals.</p>	<p>O: No studies were located regarding reproductive effects in humans. In animals, total cessation of reproduction was observed in female rats ingesting zinc in a diet containing 500 mg/kg/d.</p>	<p>O: No studies were located regarding genotoxic effects in humans. In animals chromosomal aberrations have been observed in mice following oral exposure to zinc at 650 mg/kg/d.</p>	<p>O: Light-headedness, lethargy, staggering, and difficulty in walking may occur following exposure.</p>	<p>O: Exposure has been reported to impair immune and inflammatory responses.</p>	<p>O: Very limited data were found regarding cancer in humans and animals.</p>
	<p>D: No studies were located regarding lethality in humans or animals following exposure.</p>	<p>D: Zinc has been reported to promote the healing of wounds when applied dermally.</p>	<p>D: No studies were located in the literature reviewed.</p>	<p>D: No studies were located in the literature reviewed.</p>	<p>D: No studies were located in the literature reviewed.</p>	<p>D: No studies were located in the literature reviewed.</p>	<p>D: No studies were located in the literature reviewed.</p>	<p>D: No studies were located in the literature reviewed.</p>

Notes:

- (1): Refer to original source (1990 ATSDR) for details
- (I): Inhalation route of exposure.
- (O): Oral route of exposure.
- (D): Dermal route of exposure.
- (2): "No information provided" indicates no information was provided by original source.
- (3): "No studies were located" indicates no studies were located by original source.



Appendix M
Landfill Gas Model



Input

Woerd Avenue Landfill Site Human Health Risk Assessment
Landfill Gas Dispersion Modeling Results

Prepared by: VRT
Date: 2/16/99
Checked by: _____
Date: _____

Input Information:

NMOC concentration in landfill gas: 595 ppmdv expressed as hexane with MW of: 86.18
Equivalent mass/volume conc. is: 2095636.228 $\mu\text{g}/\text{m}^3$ [$\mu\text{g}/\text{m}^3 = (\text{ppm})40.87(\text{MW})$]
LANDFILL Maximum NMOC em. rate: 0.114 Mg/yr
0.0036 g/s

Area Sources 100% % of total Landfill Gas
Area source: 8.69 Acres
35167.561 m^2
Total Area: 35167.561 Total m^2
Area sources NMOC em. rate: 0.0036 g/s
1.028E-07 $\text{g}/(\text{s} * \text{m}^2)$

Point Sources 0% % of total Landfill Gas
Point sources are capped and opened only for sampling
Point sources NMOC em. rate: 0.0000 g/s
Number of point Sources emitting Landfill Gas 3
Individual Point Source NMOC em. Rate: 0.0000 g/s

NMOC Concentrations
Highest One-Hour Average - ISCST3 using 36-Directional Screening Meteorology

Case	Maximum Concentrations				
	1-Hour Conc. ($\mu\text{g}/\text{m}^3$)	3-Hour Conc. ($\mu\text{g}/\text{m}^3$)	8-Hour Conc. ($\mu\text{g}/\text{m}^3$)	24-Hour Conc. ($\mu\text{g}/\text{m}^3$)	Annual Conc. ($\mu\text{g}/\text{m}^3$)
Area Sources	5.481	4.933	3.837	2.193	0.439
Total	5.481	4.933	3.837	2.193	0.439

Samples

Woerd Avenue Landfill Site Human Health Risk Assessment
Landfill Gas Dispersion Modeling Results

Prepared by: VRT
Date: 2/16/99
Checked by: _____
Date: _____

Landfill Gas Speciated VOC Content (in ppbv)

Pollutant	Sample Identification				Molecular Weight
	LFG-1 (ppbv)	LFG-2 (ppbv)	LFG-3 (ppbv)	Maximum (ppbv)	
Freon 12	0.25	3.9	9.3	9.3	120.91
Freon 114	0.25	1.8	0.405	1.8	170.93
Chloromethane	0.25	0.42	0.405	0.42	50.49
Vinyl Chloride	0.25	0.42	0.405	0.42	62.5
Bromomethane	0.25	0.42	0.405	0.42	94.94
Chloroethane	0.25	0.42	0.405	0.42	64.52
Freon 11	0.25	0.42	13	13	137.4
1,1-Dichloroethene	0.25	0.42	0.405	0.42	96.94
Freon 113	0.25	0.93	1.6	1.6	187.38
Methylene Chloride	0.25	0.42	0.405	0.42	84.93
1,1-Dichloroethane	0.25	0.42	10	10	98.96
cis-1,2-Dichloroethene	0.25	1.3	2.1	2.1	96.94
Chloroform	0.25	0.42	2.0	2	119.39
1,1,1-Trichloroethane	0.25	0.42	9.8	9.8	133.41
Carbon Tetrachloride	0.25	0.42	0.405	0.42	153.82
Benzene	0.25	0.42	0.405	0.42	78.11
1,2-Dichloroethane	0.25	0.42	0.405	0.42	98.96
Trichloroethane	0.25	25	88	88	133.41
1,2-Dichloropropane	0.25	0.42	0.405	0.42	112.99
cis-1,3-Dichloropropene	0.25	0.42	0.405	0.42	110.97
Toluene	0.25	0.42	0.405	0.42	92.14
trans-1,3-Dichloropropene	0.25	0.42	0.405	0.42	110.97
1,1,2-Trichloroethane	0.25	0.42	0.405	0.42	133.41
Tetrachloroethene	0.25	14	180	180	165.83
Ethylene Dibromide	0.25	0.42	0.405	0.42	187.87
Chlorobenzene	0.25	0.42	0.405	0.42	112.56
Ethyl Benzene	0.25	0.42	0.405	0.42	106.17
m,p-Xylene	0.25	0.42	0.405	0.42	106.17
o-Xylene	0.25	0.42	0.405	0.42	106.17
Styrene	0.25	0.42	0.405	0.42	104.15
1,1,2,2-Tetrachloroethane	0.25	0.42	0.405	0.42	167.85
1,3,5-Trimethylbenzene	0.25	0.42	0.405	0.42	120.2
1,2,4-Trimethylbenzene	0.25	0.42	0.405	0.42	120.2
1,3-Dichlorobenzene	0.25	0.42	0.405	0.42	147.01
1,4-Dichlorobenzene	0.25	0.42	0.405	0.42	147.01
Chlorotoluene	0.25	0.42	0.405	0.42	126.59
1,2-Dichlorobenzene	0.25	0.42	0.405	0.42	147.01
1,2,4-Trichlorobenzene	0.25	0.42	0.405	0.42	181.45
Hexachlorobutadiene	0.25	0.42	0.405	0.42	260.76
Propylene	1.0	5.4	3.8	5.4	42.08
1,3-Butadiene	1.0	1.7	1.6	1.7	54.09
Acetone	1.0	3.9	1.6	3.9	58.08
Carbon Disulfide	1.0	1.7	1.6	1.7	76.14
2-Propanol	1.0	1.7	1.6	1.7	60.1
trans-1,2-Dichloroethene	1.0	1.7	1.6	1.7	96.94
Vinyl Acetate	1.0	1.7	1.6	1.7	86.09
2-Butanone (MEK)	1.0	1.7	1.6	1.7	72.11
Hexane	1.0	1.7	1.6	1.7	86.18
Tetrahydrofuran	1.0	1.7	1.6	1.7	72.11
Cyclohexane	1.0	1.7	1.6	1.7	84.16

Samples

Woerd Avenue Landfill Site Human Health Risk Assessment
Landfill Gas Dispersion Modeling Results

Prepared by: VRT

Date: 2/16/99

Checked by: _____

Date: _____

Landfill Gas Speciated VOC Content (in ppbv)

Pollutant	Sample Identification				Molecular Weight
	LFG-1 (ppbv)	LFG-2 (ppbv)	LFG-3 (ppbv)	Maximum (ppbv)	
1,4-Dioxane	1.0	1.7	1.6	1.7	88.1
Bromodichloromethane	1.0	1.7	1.6	1.7	163.83
Bromoform	1.0	1.7	1.6	1.7	252.77
4-Ethyltoluene	1.0	1.7	1.6	1.7	200.26
Ethanol	1.0	8.7	6.2	8.7	46.07
Methyl tert-Butyl Ether	1.0	1.7	1.6	1.7	88.15
Heptane	1.0	1.7	1.6	1.7	100.21

Not Detected - Half of Detection Level Used

Results

**Woerd Avenue Landfill Site Human Health Risk Assessment
Landfill Gas Dispersion Modeling Results**

Prepared by: VRT
Date: 2/16/99
Checked by: _____
Date: _____

Individual Carcinogenic VOC Predicted Ambient Concentrations

<i>Compound</i>	<i>Molecular Weight (g/mole)</i>	<i>Maximum Concentration in Landfill Gas (ppbv)</i>	<i>Maximum Concentration in Landfill Gas (µg/m³)</i>	<i>Ratio of VOC to NMOC Concentration in Landfill Gas</i>	<i>Annual Concentration Maximum (µg/m³)</i>
Freon 12	120.91	9.3	46.0	2.19E-05	9.62E-06
Freon 114	170.93	1.8	12.6	6.00E-06	2.63E-06
Chloromethane	50.49	0.4	0.9	4.14E-07	1.81E-07
Vinyl Chloride	62.5	0.4	1.1	5.12E-07	2.24E-07
Bromomethane	94.94	0.4	1.6	7.78E-07	3.41E-07
Chloroethane	64.52	0.4	1.1	5.28E-07	2.32E-07
Freon 11	137.4	13.0	73.0	3.48E-05	1.53E-05
1,1-Dichloroethene	96.94	0.4	1.7	7.94E-07	3.48E-07
Freon 113	187.38	1.6	12.3	5.85E-06	2.56E-06
Methylene Chloride	84.93	0.4	1.5	6.96E-07	3.05E-07
1,1-Dichloroethane	98.96	10.0	40.4	1.93E-05	8.46E-06
cis-1,2-Dichloroethene	96.94	2.1	8.3	3.97E-06	1.74E-06
Chloroform	119.39	2.0	9.8	4.66E-06	2.04E-06
1,1,1-Trichloroethane	133.41	9.8	53.4	2.55E-05	1.12E-05
Carbon Tetrachloride	153.82	0.4	2.6	1.26E-06	5.52E-07
Benzene	78.11	0.4	1.3	6.40E-07	2.81E-07
1,2-Dichloroethane	98.96	0.4	1.7	8.11E-07	3.55E-07
Trichloroethane	133.41	88.0	479.8	2.29E-04	1.00E-04
1,2-Dichloropropane	112.99	0.4	1.9	9.26E-07	4.06E-07
cis-1,3-Dichloropropene	110.97	0.4	1.9	9.09E-07	3.99E-07
Toluene	92.14	0.4	1.6	7.55E-07	3.31E-07
trans-1,3-Dichloropropene	110.97	0.4	1.9	9.09E-07	3.99E-07
1,1,2-Trichloroethane	133.41	0.4	2.3	1.09E-06	4.79E-07
Tetrachloroethene	165.83	180.0	1219.9	5.82E-04	2.55E-04
Ethylene Dibromide	187.87	0.4	3.2	1.54E-06	6.75E-07
Chlorobenzene	112.56	0.4	1.9	9.22E-07	4.04E-07
Ethyl Benzene	106.17	0.4	1.8	8.70E-07	3.81E-07
m,p-Xylene	106.17	0.4	1.8	8.70E-07	3.81E-07
o-Xylene	106.17	0.4	1.8	8.70E-07	3.81E-07
Styrene	104.15	0.4	1.8	8.53E-07	3.74E-07
1,1,2,2-Tetrachloroethane	167.85	0.4	2.9	1.37E-06	6.03E-07
1,3,5-Trimethylbenzene	120.2	0.4	2.1	9.85E-07	4.32E-07
1,2,4-Trimethylbenzene	120.2	0.4	2.1	9.85E-07	4.32E-07
1,3-Dichlorobenzene	147.01	0.4	2.5	1.20E-06	5.28E-07
1,4-Dichlorobenzene	147.01	0.4	2.5	1.20E-06	5.28E-07
Chlorotoluene	126.59	0.4	2.2	1.04E-06	4.55E-07
1,2-Dichlorobenzene	147.01	0.4	2.5	1.20E-06	5.28E-07
1,2,4-Trichlorobenzene	181.45	0.4	3.1	1.49E-06	6.52E-07
Hexachlorobutadiene	260.76	0.4	4.5	2.14E-06	9.37E-07
Propylene	42.08	5.4	9.3	4.43E-06	1.94E-06
1,3-Butadiene	54.09	1.7	3.8	1.79E-06	7.86E-07
Acetone	58.08	3.9	9.3	4.42E-06	1.94E-06
Carbon Disulfide	76.14	1.7	5.3	2.52E-06	1.11E-06
2-Propanol	60.1	1.7	4.2	1.99E-06	8.74E-07
trans-1,2-Dichloroethene	96.94	1.7	6.7	3.21E-06	1.41E-06
Vinyl Acetate	86.09	1.7	6.0	2.85E-06	1.25E-06

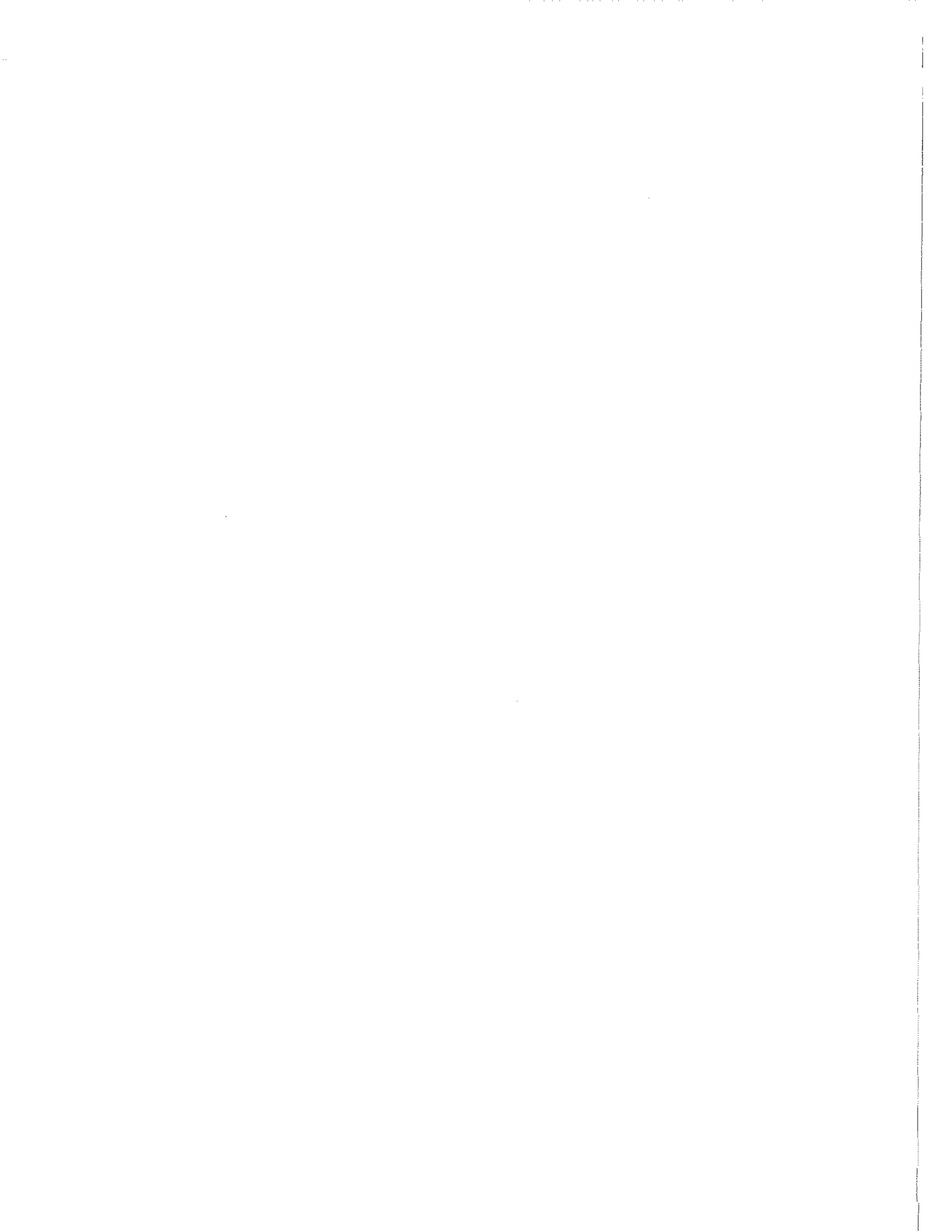
Results

Woerd Avenue Landfill Site Human Health Risk Assessment
Landfill Gas Dispersion Modeling Results

Prepared by: VRT
Date: 2/16/99
Checked by: _____
Date: _____

Individual Carcinogenic VOC Predicted Ambient Concentrations

<i>Compound</i>	<i>Molecular Weight (g/mole)</i>	<i>Maximum Concentration in Landfill Gas (ppbv)</i>	<i>Maximum Concentration in Landfill Gas (µg/m³)</i>	<i>Ratio of VOC to NMOC Concentration in Landfill Gas</i>	<i>Annual Concentration Maximum (µg/m³)</i>
2-Butanone (MEK)	72.11	1.7	5.0	2.39E-06	1.05E-06
Hexane	86.18	1.7	6.0	2.86E-06	1.25E-06
Tetrahydrofuran	72.11	1.7	5.0	2.39E-06	1.05E-06
Cyclohexane	84.16	1.7	5.8	2.79E-06	1.22E-06
1,4-Dioxane	88.1	1.7	6.1	2.92E-06	1.28E-06
Bromodichloromethane	163.83	1.7	11.4	5.43E-06	2.38E-06
Bromoform	252.77	1.7	17.6	8.38E-06	3.67E-06
4-Ethyltoluene	200.26	1.7	13.9	6.64E-06	2.91E-06
Ethanol	46.07	8.7	16.4	7.82E-06	3.43E-06
Methyl tert-Butyl Ether	88.15	1.7	6.1	2.92E-06	1.28E-06
Heptane	100.21	1.7	7.0	3.32E-06	1.46E-06



Appendix N

Risk Calculations

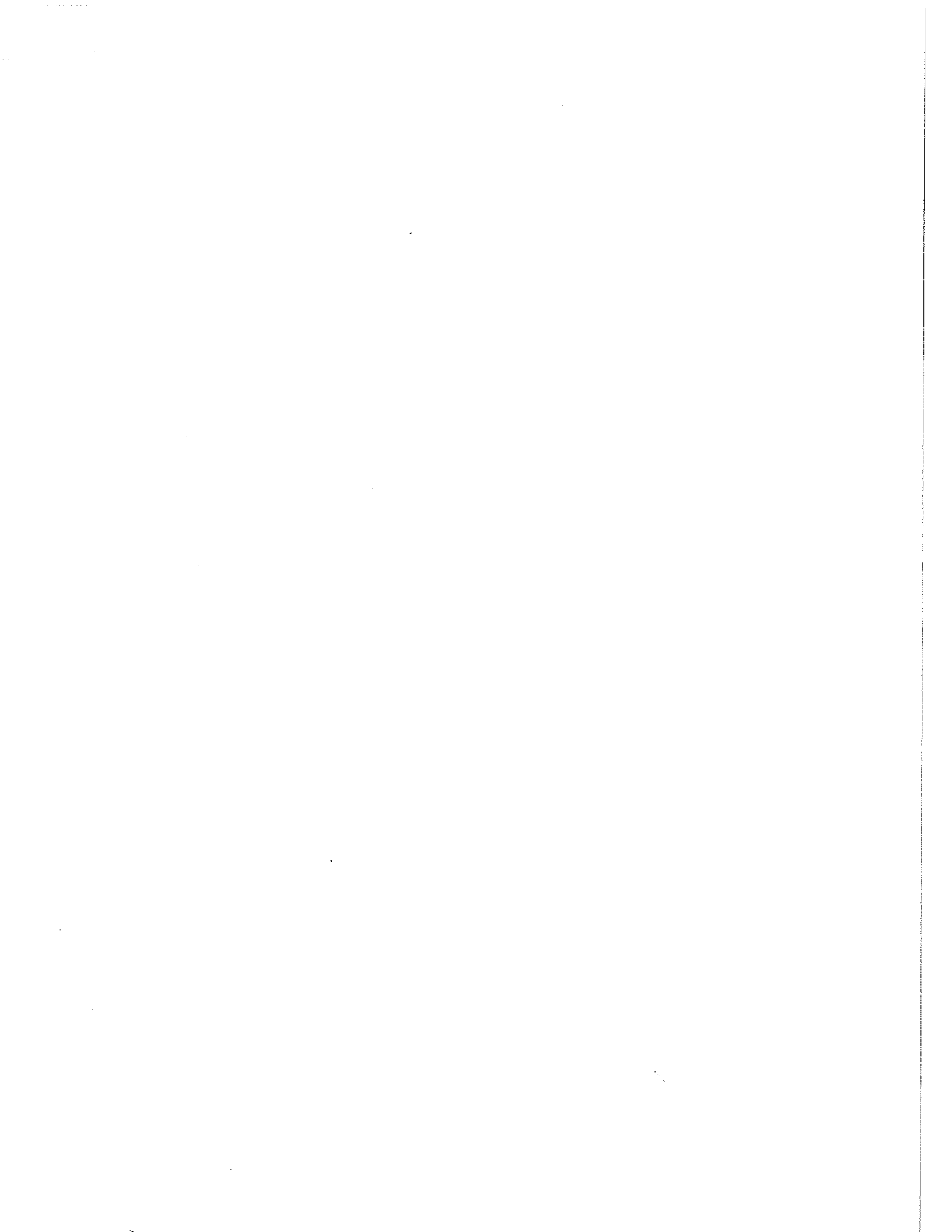


TABLE 1
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF NONCANCER RISK FROM INCIDENTAL INGESTION OF SEDIMENT - HOT SPOT LOCATION COVE-2

ADD_{sed} = [OHM]_{sed} * I * RAF * EF * ED * EP * C₁ / BW * AP
 where:
 OHM_{sed} = representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)
 I = daily sediment ingestion rate on days exposed during the exposure period (mg/day)
 RAF = relative absorption factor (unitless)
 EF = exposure frequency; the number of exposure events during the exposure period divided by the number of days in the exposure period (event/day)
 ED = exposure duration; the typical duration of each exposure event (day/event)
 EP = duration of exposure period; the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (years)
 C₁ = conversion factor (mass) (kg/mg)

Chemical	OHM _{sed} (mg/kg)	I Ingestion Rate ⁽²⁾	RAF Relative Absorption Factor ⁽³⁾	EF Exposure Frequency ⁽⁴⁾	ED Exposure Duration	EP Exposure Period	C ₁ Conv. Factor (mass)	BW Body Weight ⁽⁵⁾	AP Averaging Period For Noncarcinogens	ADD _{sed} Average Daily Dose	Chronic Oral RfD	Hazard Quotient	Distribution of Risk by Chemical
	(mg/kg)	(mg/day)	(unitless)	(event/day)	(day/event)	(years)	(kg/mg)	(kg)	(years)	(mg/kg-day)	(mg/kg-day)		(%)
PAHs													
Benzo(a)anthracene	1.4	50	0.91	1.7E-01	1	7	1.0E-06	31	7	3.5E-07	3.0E-01	1.2E-06	0%
Benzo(a)pyrene	1.3	50	0.91	1.7E-01	1	7	1.0E-06	31	7	3.2E-07	3.0E-02	1.1E-05	0%
Chrysene	1.5	50	0.91	1.7E-01	1	7	1.0E-06	31	7	3.7E-07	3.0E+00	1.2E-07	0%
Fluoranthene	3.0	50	1	1.7E-01	1	7	1.0E-06	31	7	8.2E-07	4.0E-02	2.1E-05	0%
Phenanthrene	2.3	50	0.91	1.7E-01	1	7	1.0E-06	31	7	5.7E-07	3.0E-01	1.9E-06	0%
Pyrene	2.3	50	1	1.7E-01	1	7	1.0E-06	31	7	6.3E-07	3.0E-02	2.1E-05	0%
Metals													
Arsenic	14	50	1	1.7E-01	1	7	1.0E-06	31	7	3.8E-06	3.0E-04	1.3E-02	0%
Barium	170	50	1	1.7E-01	1	7	1.0E-06	31	7	4.7E-05	7.0E-02	6.7E-04	0%
Cadmium	14	50	1	1.7E-01	1	7	1.0E-06	31	7	3.8E-06	1.5E-03	2.6E-03	0%
Chromium	74	50	1	1.7E-01	1	7	1.0E-06	31	7	2.0E-05	1.0E+00	2.0E-03	0%
Lead	110,000	50	0.5	1.7E-01	1	7	1.0E-06	31	7	1.5E-02	7.5E-04	2.0E+01	100%
Manganese	190	50	1	1.7E-01	1	7	1.0E-06	31	7	5.2E-05	1.4E-01	3.7E-04	0%
Zinc	600	50	1	1.7E-01	1	7	1.0E-06	31	7	1.6E-04	3.0E-01	5.5E-04	0%
ECBs/Pesticides													
Dieldrin	0.0217	50	1	1.7E-01	1	7	1.0E-06	31	7	5.9E-09	5.0E-05	1.2E-04	0%
Aroclor 1254	0.136	50	0.85	1.7E-01	1	7	1.0E-06	31	7	3.2E-08	2.0E-05	1.6E-03	0%
											Hazard Index =	2.0E+01	100%

Notes:

- (1): Detected concentration from Hot-Spot location Cove-2.
- (2): MDEP, 1995.
- (3): MDEP, 1994.
- (4): Frequency based on 62 events/365 days (2 days per week, months of April through October).
- (5): Median body weight for a male child 6-13 years old.

TABLE 2
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF CANCER RISK FROM INCIDENTAL INGESTION OF SEDIMENT - HOT SPOT LOCATION COVE-2

$ADD_{sed} = [OHM]_{sed} * I * RAF * EF * ED * EP * C_1 / BW * AP$
 where:
 OHM_{sed} = representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)
 I = daily sediment ingestion rate on days exposed during the exposure period (mg/day)
 RAF = relative absorption factor (unitless)
 EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (event/day)
 ED = exposure duration: the typical duration of each exposure event (day/event)
 EP = duration of exposure period: the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (days)
 C_1 = conversion factor (mass) (kg/mg)

Chemical	OHM_{sed} (mg/kg)	I (mg/day)	RAF (unitless)	EF (event/day)	ED (day/event)	EP (years)	C_1 (kg/mg)	BW (kg)	AP (years)	ADD_{sed} (mg/kg-day)	Oral Cancer Slope Factor	Chemical Specific Cancer Risk	Distribution of Risk by Chemical
PAHs													
Benzo(a)anthracene	1.4	50	1	1.7E-01	1	7	1.0E-06	31	75	3.6E-08	7.3E-01	2.6E-08	3%
Benzo(a)pyrene	1.3	50	1	1.7E-01	1	7	1.0E-06	31	75	3.3E-08	7.3E+00	2.4E-07	29%
Chrysene	1.5	50	1	1.7E-01	1	7	1.0E-06	31	75	3.8E-08	7.3E-02	2.8E-09	0%
Metals													
Arsenic	14	50	1	1.7E-01	1	7	1.0E-06	31	75	3.6E-07	1.5E+00	5.4E-07	65%
PCBs/Pesticides													
4,4'-DDD	0.012	50	1	1.7E-01	1	7	1.0E-06	31	75	3.0E-10	2.4E-01	7.2E-11	0%
Dieldrin	0.022	50	1	1.7E-01	1	7	1.0E-06	31	75	5.5E-10	1.6E+01	8.9E-09	1%
Aroclor 1260	0.12	50	0.85	1.7E-01	1	7	1.0E-06	31	75	2.6E-09	2.0E+00	5.2E-09	1%
										Excess Lifetime Cancer Risk	8.E-07	100%	

- Notes:
- (1): Detected concentrations from Hot-Spot location Cove-2.
 - (2): MDEP, 1995.
 - (3): Frequency based on 62 events / 365 days (2 days per week, months of April through October).
 - (4): Receptor is a child between the ages of 6 and 13 years of age.
 - (5): Median body weight, ages 6-13 years.

TABLE 3
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF NONCANCER RISK FROM DERMAL CONTACT WITH SEDIMENT - HOT SPOT LOCATION COVE-2

ADD_{red} = [OHM]_{red} * SA * MS * RAF * EF * ED * EP * C_i / BW * AP

where:

OHM_{red} = representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)

SA = skin surface area in contact with sediment on days exposed (cm²/day)

MS = mass of sediment in contact with the unit surface area of skin (mg/cm²)

RAF = relative absorption factor (unitless)

EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (events/day)

ED = exposure duration: the typical duration of each exposure event (days/event)

EP = exposure period: the period of time over which exposure may occur (years)

BW = body weight (kg)

AP = averaging period (years)

C_i = conversion factor (mass) (kg/mg)

Chemical	OHM _{red} Conc. in Sediment ⁽¹⁾ (mg/kg)	SA Skin Surface Area ⁽²⁾ (cm ² /day)	MS Mass of Sediment Adhered ⁽³⁾ (mg/cm ²)	RAF Relative Absorption Factor ⁽⁴⁾ (unitless)	EF Exposure Frequency ⁽⁵⁾ (event/day)	ED Exposure Duration (day/event)	EP Exposure Period (years)	C _i Conv. Factor (mass) (kg/mg)	BW Body Weight ⁽⁶⁾ (kg)	AP Averaging Period for Non Carcinogens (years)	ADD _{red} Average Daily Dose (mg/kg-day)	Chronic Oral RfD (mg/kg-day)	Hazard Quotient (mg/kg-day)	Distribution of Risk by Chemical (%)
PAHs														
Benz(a)anthracene	1.4	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	2.3E-06	3.0E-01	7.7E-06	0%
Benz(a)pyrene	1.3	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	2.2E-06	3.0E-02	7.2E-05	0%
Chrysene	1.5	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	2.5E-06	3.0E+00	8.3E-07	0%
Fluoranthene	3.0	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	7	5.5E-06	4.0E-02	1.4E-04	0%
Phenanthrene	2.3	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	3.8E-06	3.0E-01	1.3E-05	0%
Pyrene	2.3	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	7	4.2E-06	3.0E-02	1.4E-04	0%
Metals														
Arsenic	14	3,296	0.51	0.03	1.7E-01	1	7	1.0E-06	31	7	3.9E-06	3.0E-04	1.3E-02	0%
Barium	170	3,296	0.51	1	1.7E-01	1	7	1.0E-06	31	7	1.6E-03	7.0E-02	2.2E-02	0%
Cadmium	14	3,296	0.51	0.14	1.7E-01	1	7	1.0E-06	31	7	1.8E-05	1.5E-03	1.2E-02	0%
Chromium	74	3,296	0.51	0.04	1.7E-01	1	7	1.0E-06	31	7	2.7E-05	1.0E+00	2.7E-05	0%
Lead	110,000	3,296	0.51	0.006	1.7E-01	1	7	1.0E-06	31	7	6.1E-03	7.5E-04	8.1E+00	99%
Manganese	190	3,296	0.51	1	1.7E-01	1	7	1.0E-06	31	7	1.8E-03	1.4E-01	1.3E-02	0%
Zinc	600	3,296	0.51	0.02	1.7E-01	1	7	1.0E-06	31	7	1.1E-04	3.0E-01	3.7E-04	0%
PCBs/Pesticides														
Dieldrin	0.0217	3,296	0.51	0.25	1.7E-01	1	7	1.0E-06	31	7	5.0E-08	5.0E-05	1.0E-03	0%
Aroclor 1254	0.136	3,296	0.51	0.067	1.7E-01	1	7	1.0E-06	31	7	8.4E-08	2.0E-05	4.2E-03	0%
												Hazard Index	8.2E+00	100%

Notes:
 (1): Detected concentration from Hot-Spot location Cove-2.
 (2): Median skin surface area of a child (average male and female) for hands, forearms, lower legs and feet for age group.
 (3): MDER, 1995.
 (4): MDER, 1994.
 (5): Frequency based on 62 events/ 365 days (2 days per week, months of April through October).
 (6): Median body weight for a child 6-13 years old.

TABLE 4
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF CANCER RISK FROM DERMAL CONTACT WITH SEDIMENT - HOT SPOT LOCATION COVE-2

$ADD_{sed} = [OHM]_{sed} * SA * MS * RAF * EF * ED * EP * C_1 / BW * AP$
where:
OHM_{sed} = representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)
SA = skin surface area in contact with sediment on days exposed (cm²/day)
MS = mass of sediment in contact with the unit surface area of skin (mg/cm²)
RAF = relative absorption factor (unitless)
EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (hours/day)
ED = exposure duration: the typical duration of each exposure event (day/year)
EP = exposure period: the period of time over which exposure may occur (years)
BW = body weight (kg)
AP = averaging period (days)
C₁ = conversion factor (mass) (kg/mg)

Chemical	OHM _{sed} Conc. in Sediment ⁽¹⁾ (mg/kg)	SA Skin Surface Area ⁽²⁾ (cm ² /day)	MS Mass of Soil Adhered ⁽³⁾ (mg/cm ²)	RAF Relative Absorption Factor ⁽⁴⁾ (unitless)	EF Exposure Frequency ⁽⁵⁾ (event/day)	ED Exposure Duration (day/event)	EP Exposure Period (years)	C ₁ Conv. Factor (mass) (kg/mg)	BW Body Weight ⁽⁶⁾ (kg)	AP Averaging Period (years)	ADD _{sed} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	Chemical Specific Cancer Risk	Distribution of Risk by Chemical (%)
PAHs														
Benzof(a)anthracene	1.4	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	2.4E-07	7.3E-01	1.8E-07	7%
Benzof(a)pyrene	1.3	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	2.2E-07	7.3E+00	1.6E-06	66%
Chrysene	1.5	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	2.6E-07	7.2E-02	1.9E-08	1%
Metals														
Arsenic	14	3,296	0.51	0.03	1.7E-01	1	7	1.0E-06	31	75	3.6E-07	1.5E+00	5.4E-07	22%
PCBs/pesticides														
4,4'-DDD	0.012	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	2.0E-09	2.4E-01	4.8E-10	0%
Dieldrin	0.022	3,296	0.51	0.25	1.7E-01	1	7	1.0E-06	31	75	4.7E-09	1.6E+01	7.5E-08	3%
Aroclor 1260	0.12	3,296	0.51	0.067	1.7E-01	1	7	1.0E-06	31	75	6.9E-09	2.0E+00	1.4E-08	1%

Excess Lifetime Cancer Risk 2.E-06 100%

- Notes:
(1): Detected concentration from Hot-Spot location Cove-2.
(2): Median skin surface area of a child (average male and female) for hands, forearms, lower legs and feet for age group.
(3): MDER, 1995.
(4): MDER, 1994.
(5): Frequency based on 62 events/365 days (2 days per week, months of April through October).
(6): Median body weight for a child 6-13 years old.

TABLE 5
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF NONCANCER HEALTH EFFECTS FROM INCIDENTAL INGESTION OF SURFACE WATER - HOT SPOT LOCATION COVE-2

$$ADD_{sw} = [OHM]_{sw} * I * RAF * EF * ED * EP / BW * AP$$

where:

- OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
- I = daily surface water ingestion rate on days exposed during the exposure period (L/day)
- RAF = relative absorption factor (unitless)
- EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (event/year)
- ED = exposure duration: the typical duration of each exposure event (day/event)
- EP = duration of exposure period: the period of time over which exposure may occur (years)
- BW = body weight (kg)
- AP = averaging period (years)

Chemical	OHM _{sw} (mg/L)	I (L/day)	RAF (unitless)	EF (event/day)	ED (day/event)	EP (years)	BW (kg)	AP Noncarcinogens (years)	ADD _{sw} Average Daily Dose (mg/kg-day)	Chronic Oral RfD (mg/kg-day)	Hazard Quotient	Distribution of Risk by Chemical
<i>Metals</i>												
Manganese	0.057	0.05	1	1.7E-01	1	7	31	7	1.6E-05	1.4E-01	1.1E-04	26%
Silver	0.0057	0.05	1	1.7E-01	1	7	31	7	1.6E-06	5.0E-03	3.1E-04	74%

Hazard Index = 4.2E-04 100%

Notes:

- (1): Concentration from surface water sample at hot spot location Cove 2.
- (2): MDER, 1995.
- (3): MDER, 1994.
- (4): Frequency based on 62 events / 365 days (2 days per week, months of April through October).
- (5): Receptor is a child between the ages of 6 and 13 years of age.
- (6): Median body weight, ages 6-13 years.

TABLE 6
 WOEHD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESSPASSER SCENARIO
 ESTIMATION OF CANCER RISK FROM INCIDENTAL INGESTION OF SURFACE WATER - HOT SPOT LOCATION COVE-2

$$ADD_{sw} = [OHM]_{sw} * I * RAF * EF * ED * EP / BW * AP$$

where:

- OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
- I = daily surface water ingestion rate on days exposed during the exposure period (L/day)
- RAF = relative absorption factor (unitless)
- EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (event/year)
- ED = exposure duration: the typical duration of each exposure event (day/event)
- EP = duration of exposure period: the period of time over which exposure may occur (years)
- BW = body weight (kg)
- AP = averaging period (years)

Chemical	OHM _{sw} (mg/L)	I Ingestion Rate (L/day)	RAF Relative Absorption Factor (unitless)	EF Exposure Frequency (event/year)	ED Duration of Exposure Event (day/event)	EP Duration of Exposure Period (years)	BW Body Weight (kg)	AP Averaging Period (years)	ADD _{sw} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	Chemical Specific Cancer Risk	Distribution of Risk by Chemical (%)
Surface Water												

No Carcinogenic Chemicals for this Pathway

TABLE 7
READING LANDFILL
READING, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESPASSER SCENARIO
ESTIMATION OF NONCANCER HEALTH EFFECTS FROM DERMAL CONTACT WITH SURFACE WATER - HOT SPOT LOCATION COVE-2

$$ADD_{sw} = [OHM]_{sw} * SA * KP * RAF * EF * ED * EP * C_1 * C_2 / BW * AP$$

- where:
 OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
 SA = skin surface area in contact with surface water on days exposed (cm²)
 K_p = Permeability Constant (cm/hr)
 RAF = relative absorption factor (unitless)
 EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (events/day)
 ED = exposure duration: the typical duration of each exposure event (days/event)
 EP = exposure period: the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (years)
 C_1 = conversion factor (mass) (L/cm³)
 C_2 = conversion factor (time) (hrs/day)
 C_3 = conversion factor (time) (hrs/day)

Chemical	OHM_{sw} Average Conc. in Surface Water ⁽¹⁾ (mg/L)	SA Skin Surface Area ⁽²⁾ (cm ²)	K_p Permeability Constant ⁽³⁾ (cm/hr)	RAF Relative Absorption Factor ⁽⁴⁾ (unitless)	EF Exposure Frequency ⁽⁵⁾ (events/day)	ED Exposure Duration (day/event)	EP Exposure Period ⁽⁶⁾ (years)	C_1 Conv. Factor (L/cm ³) (mass)	C_2 Conv. Factor (time) (hrs/day)	BW Body Weight ⁽⁷⁾ (kg)	AP Averaging Period for Non- Carcinogens (years)	ADD_{sw} Average Daily Dose (mg/kg-day)	Chronic Oral RfD (mg/kg-day)	Hazard Quotient	Distribution of Risk by Chemical (%)
Manganese	0.057	3,296	1.0E-03	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	2.5E-05	1.4E-01	1.8E-04	57%
Silver	0.0057	3,296	6.0E-04	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	1.5E-06	5.0E-03	3.0E-04	63%

Hazard Index = 4.7E-04

100%

- Notes:
 (1): Concentration from surface water sample COVE-2.
 (2): Assumes hands, forearms, lower legs, and feet of a child between the ages of 6 and 13 is exposed to surface water during wading.
 (3): Dermal Exposure Assessment: Principles and Applications, (EPA, 1992).
 (4): MDER, 1994.
 (5): Frequency based on 62 events / 365 days (2 days per week, months of April through October).
 (6): Receptor is a child between the ages of 6 and 13 years of age
 (7): Median body weight, ages 6-13 years.

TABLE 8
 WOERD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESPASSER SCENARIO
 ESTIMATION OF CANCER RISK FROM DERMAL CONTACT WITH SURFACE WATER - HOT SPOT LOCATION COVE 2

$$ADD_{2w} = [OHM]_{sw} \cdot SA \cdot KP \cdot RAF \cdot EF \cdot ED \cdot EP \cdot C_1 \cdot C_2 / BW \cdot AP$$

where:

- OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
- SA = skin surface area in contact with surface water on days exposed (cm²)
- K_p = Permeability Constant (cm/hr)
- RAF = relative absorption factor (unitless)
- EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (events/year)
- ED = exposure duration: the typical duration of each exposure event (days/event)
- EP = exposure period: the period of time over which exposure may occur (years)
- BW = body weight (kg)
- AP = averaging period (years)
- C₁ = conversion factor (mass) (L/cm³)
- C₂ = conversion factor (time) (hrs/day)

Chemical	OHM _{sw} Average Conc. in Surface Water (mg/L)	SA Skin Surface Area (cm ²)	K _p Permeability Constant (cm/hr)	RAF Relative Absorption Factor (unitless)	EF Exposure Frequency (events/year)	ED Exposure Duration (day/event)	EP Exposure Period (years)	C ₁ Conv. Factor (mass) (L/cm ³)	C ₂ Conv. Factor (time) (hrs/day)	BW Body Weight (kg)	AP Averaging Period (years)	ADD _{sw} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	Chemical Specific Cancer Risk	Distribution of Risk by Chemical (%)

No Carcinogenic Chemicals for this Pathway

TABLE 9
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

POTENTIAL CURRENT/FUTURE CHILD TRASPASSING SCENARIO
ESTIMATION OF NONCANCER RISK FROM INCIDENTAL INGESTION OF SEDIMENT

Chemical	OHM _{sed} (mg/kg)	I Ingestion Rate ⁽²⁾	RAF Relative Absorption Factor ⁽³⁾	EF Exposure Frequency ⁽⁴⁾	ED Exposure Duration	EP Exposure Period	C _i Conc. Factor	BW Body Weight ⁽⁵⁾	AP Averaging Period	ADD _{sed} Average Daily Dose	Chronic Oral RfD	Hazard Quotient	Distribution of Risk by Chemical	Noncarcinogens		
														(mg/day)	(unitless)	(event/day)
PAHs																
Acenaphthene	2.9	50	1	1.7E-01	1	7	1.0E-06	31	7	7.9E-07	6.0E-02	1.3E-05	0%			
Anthracene	4.5	50	1	1.7E-01	1	7	1.0E-06	31	7	1.2E-06	3.0E-01	4.1E-06	0%			
Benzofluoranthene	5.0	50	0.91	1.7E-01	1	7	1.0E-06	31	7	1.2E-06	3.0E-01	4.2E-06	0%			
Benzofluoranthene	3.7	50	0.91	1.7E-01	1	7	1.0E-06	31	7	9.2E-07	4.0E-02	2.3E-05	0%			
Benzofluoranthene	4.1	50	0.91	1.7E-01	1	7	1.0E-06	31	7	1.0E-06	4.0E-02	2.6E-05	0%			
Benzofluoranthene	3.2	50	0.91	1.7E-01	1	7	1.0E-06	31	7	8.0E-07	3.0E-02	2.7E-05	0%			
Benzofluoranthene	4.6	50	0.91	1.7E-01	1	7	1.0E-06	31	7	1.1E-06	3.0E-02	3.8E-05	0%			
Chrysene	5.1	50	0.91	1.7E-01	1	7	1.0E-06	31	7	1.3E-06	3.0E+00	4.2E-07	0%			
Fluoranthene	9.2	50	1	1.7E-01	1	7	1.0E-06	31	7	2.5E-06	4.0E-02	6.3E-05	0%			
Fluoranthene	3.1	50	1	1.7E-01	1	7	1.0E-06	31	7	8.5E-07	4.0E-02	2.1E-05	0%			
Indeno(1,2,3-cd)pyrene	2.9	50	0.91	1.7E-01	1	7	1.0E-06	31	7	7.2E-07	4.0E-02	1.8E-05	0%			
Naphthalene	2.6	50	1	1.7E-01	1	7	1.0E-06	31	7	7.1E-07	2.0E-02	3.6E-05	0%			
Phenanthrene	10	50	0.91	1.7E-01	1	7	1.0E-06	31	7	2.5E-06	3.0E-01	8.3E-06	0%			
Pyrene	8.0	50	1	1.7E-01	1	7	1.0E-06	31	7	2.2E-06	3.0E-02	7.3E-05	0%			
Metals																
Arsenic	13	50	1	1.7E-01	1	7	1.0E-06	31	7	3.6E-06	3.0E-04	1.2E-02	9%			
Barium	395	50	1	1.7E-01	1	7	1.0E-06	31	7	1.1E-04	7.0E-02	1.5E-03	1%			
Cadmium	10	50	1	1.7E-01	1	7	1.0E-06	31	7	2.7E-06	1.5E-03	1.8E-03	1%			
Chromium	61	50	1	1.7E-01	1	7	1.0E-06	31	7	1.7E-05	1.0E+00	1.7E-05	0%			
Lead	638	50	0.5	1.7E-01	1	7	1.0E-06	31	7	8.7E-05	7.5E-04	1.2E-01	84%			
Manganese	239	50	1	1.7E-01	1	7	1.0E-06	31	7	6.5E-05	1.4E-01	4.7E-04	0%			
Mercury	0.54	50	1	1.7E-01	1	7	1.0E-06	31	7	1.5E-07	3.0E-04	4.9E-04	0%			
Zinc	885	50	1	1.7E-01	1	7	1.0E-06	31	7	2.4E-04	3.0E-01	8.1E-04	1%			
PCBs/Pesticides																
Chlordane	0.23	50	1	1.7E-01	1	7	1.0E-06	31	7	6.4E-08	5.0E-04	1.3E-04	0%			
Dieldrin	0.04	50	1	1.7E-01	1	7	1.0E-06	31	7	1.2E-08	5.0E-05	2.4E-04	0%			
Aroclor 1254	0.45	50	0.85	1.7E-01	1	7	1.0E-06	31	7	1.0E-07	2.0E-05	5.2E-03	4%			

Hazard Index = 1.4E-01 100%

- Notes:
 (1) Average concentration calculated using one-half the detection limit.
 (2) MDER, 1995.
 (3) MDER, 1994.
 (4) Frequency based on 62 events/ 365 days (2 days per week, months of April through October).
 (5) Median body weight for a male child 6-13 years old.

TABLE 10
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

POTENTIAL CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF CANCER RISK FROM INCIDENTAL INGESTION OF SEDIMENT

Chemical	OHM _{sed} (mg/kg)	I Ingestion Rate ⁽²⁾ (mg/day)	RAF Relative Absorption Factor (unitless)	EF Exposure Frequency ⁽³⁾ (event/day)	ED Duration of Exposure Event (day/event)	EP Duration of Exposure Period ⁽⁴⁾ (years)	C ₁ Conv. Factor (mass) (kg/mg)	BW Body Weight ⁽⁵⁾ (kg)	AP Averaging Period (years)	ADD _{sed} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	Chemical Specific Cancer Risk	Distribution of Risk by Chemical (%)
PAHs													
Benzo(a)anthracene	5	50	1	1.7E-01	1	7	1.0E-06	31	75	1.3E-07	7.3E-01	9.3E-08	6%
Benzo(b)fluoranthene	3.7	50	1	1.7E-01	1	7	1.0E-06	31	75	9.5E-08	7.3E-01	6.9E-08	4%
Benzo(k)fluoranthene	4.1	50	1	1.7E-01	1	7	1.0E-06	31	75	1.0E-07	7.3E-02	7.7E-09	0%
Benzo(a)pyrene	4.6	50	1	1.7E-01	1	7	1.0E-06	31	75	1.2E-07	7.3E+00	8.6E-07	53%
Chrysene	5.1	50	1	1.7E-01	1	7	1.0E-06	31	75	1.3E-07	7.3E-02	9.5E-09	1%
Indeno(1,2,3-cd)pyrene	2.9	50	1	1.7E-01	1	7	1.0E-06	31	75	7.4E-08	7.3E-01	5.4E-08	3%
Metals													
Arsenic	13	50	1	1.7E-01	1	7	1.0E-06	31	75	3.3E-07	1.5E+00	5.0E-07	31%
PCBs/Estroicdes													
Chlordane	0.23	50	1	1.7E-01	1	7	1.0E-06	31	75	5.9E-09	3.5E-01	2.1E-09	0%
4,4'-DDE	0.08	50	1	1.7E-01	1	7	1.0E-06	31	75	2.0E-09	2.4E-01	4.9E-10	0%
Dieldrin	0.04	50	1	1.7E-01	1	7	1.0E-06	31	75	1.0E-09	1.6E+01	1.6E-08	1%
Aroclor 1260	0.25	50	0.85	1.7E-01	1	7	1.0E-06	31	75	5.4E-09	2.0E+00	1.1E-08	1%
										Excess Lifetime Cancer Risk =	1.6E-06	100%	

ADD_{sed} = [OHM]_{sed} * I * RAF * EF * ED * EP * C₁ / BW * AP

where:

OHM_{sed}

= representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)

I = daily sediment ingestion rate on days exposed during the exposure period (mg/day)

RAF = relative absorption factor (unitless)

EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (event/day)

ED = exposure duration: the typical duration of each exposure event (day/event)

EP = duration of exposure period: the period of time over which exposure may occur (years)

BW = body weight (kg)

AP = averaging period (days)

C₁ = conversion factor (mass) (kg/mg)

Notes:

(1): Average concentration calculated using one-half the detection limit.

(2): MDEP, 1995.

(3): Frequency based on 62 events / 365 days (2 days per week, months of April through October).

(4): Receptor is a child between the ages of 6 and 13 years of age.

(5): Median body weight, ages 6-13 years.

WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

POTENTIAL CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF NONCANCER RISK FROM DERMAL CONTACT WITH SEDIMENT

ADD_{der} = [OHM]_{der} * SA * MS * RAF * EF * ED * EP * C₁ / BW * AP
 where:
 OHM_{der} = representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)
 SA = skin surface area in contact with sediment on days exposed (cm²/day)
 MS = mass of sediment in contact with the unit surface area of skin (mg/cm²)
 RAF = relative absorption factor (unitless)
 EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (events/day)
 ED = exposure duration: the typical duration of each exposure event (days/event)
 EP = exposure period: the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (years)
 C₁ = conversion factor (mass) (kg/mg)

Chemical	OHM _{der} Average Conc. in Sediment ⁽¹⁾ (mg/kg)	SA Skin Surface Area ⁽²⁾ (cm ² /day)	MS Mass of Sediment ⁽³⁾ Adhered ⁽⁴⁾ (mg/cm ²)	RAF Relative Absorption Factor ⁽⁵⁾ (unitless)	EF Exposure Frequency ⁽⁶⁾ (events/day)	ED Exposure Duration (days/event)	EP Exposure Period (years)	C ₁ Conv. Factor (mass) (kg/mg)	BW Body Weight ⁽⁷⁾ (kg)	AP Averaging Period for Non- Carcinogens (years)	ADD _{der} Average Daily Dose (mg/kg-day)	Chronic Oral RfD (mg/kg-day)	Hazard Quotient	Distribution of Risk by Chemical (%)
PAHs														
Acenaphthene	2.9	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	7	5.3E-06	6.0E-02	8.9E-05	0%
Anthracene	4.5	3,296	0.51	0.29	1.7E-01	1	7	1.0E-06	31	7	1.2E-05	3.0E-01	4.0E-05	0%
Benz(a)anthracene	5.0	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	8.3E-06	3.0E-01	2.8E-05	0%
Benz(b)fluoranthene	3.7	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	6.1E-06	4.0E-02	1.5E-04	0%
Benz(k)fluoranthene	4.1	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	6.8E-06	4.0E-02	1.7E-04	0%
Benz(a)pyrene	3.2	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	5.3E-06	3.0E-02	1.8E-04	0%
Benz(b)pyrene	4.6	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	7.6E-06	3.0E-02	2.5E-04	0%
Chrysene	5.1	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	8.5E-06	3.0E+00	2.8E-06	0%
Fluoranthene	9.2	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	7	1.7E-05	4.0E-02	4.2E-04	0%
Fluorene	3.1	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	7	5.7E-06	4.0E-02	1.4E-04	0%
Indeno(1,2,3-cd)pyrene	2.9	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	4.8E-06	4.0E-02	1.2E-04	0%
Naphthalene	2.6	3,296	0.51	0.1	1.7E-01	1	7	1.0E-06	31	7	2.4E-06	2.0E-02	1.2E-04	0%
Phenanthrene	10	3,296	0.51	0.18	1.7E-01	1	7	1.0E-06	31	7	1.7E-05	3.0E-01	5.5E-05	0%
Pyrene	8.0	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	7	1.5E-05	3.0E-02	4.9E-04	0%
Metals														
Arsenic	13	3,296	0.51	0.03	1.7E-01	1	7	1.0E-06	31	7	3.6E-06	3.0E-04	1.2E-02	8%
Barium	395	3,296	0.51	1	1.7E-01	1	7	1.0E-06	31	7	3.6E-03	7.0E-02	5.2E-02	34%
Calcium	10	3,296	0.51	0.14	1.7E-01	1	7	1.0E-06	31	7	1.3E-05	8.6E-03	8.6E-03	6%
Chromium	61	3,296	0.51	0.04	1.7E-01	1	7	1.0E-06	31	7	2.2E-05	1.0E+00	2.2E-05	0%
Lead	638	3,296	0.51	0.006	1.7E-01	1	7	1.0E-06	31	7	3.5E-05	7.5E-04	4.7E-02	30%
Manganese	239	3,296	0.51	1	1.7E-01	1	7	1.0E-06	31	7	2.2E-03	1.4E-01	1.6E-02	10%
Mercury	0.54	3,296	0.51	0.05	1.7E-01	1	7	1.0E-06	31	7	2.5E-07	3.0E-04	8.3E-04	1%
Zinc	885	3,296	0.51	0.02	1.7E-01	1	7	1.0E-06	31	7	1.6E-04	3.0E-01	5.4E-04	0%
PCBs/Pesticides														
Chlordane	0.23	3,296	0.51	0.05	1.7E-01	1	7	1.0E-06	31	7	1.1E-07	5.0E-04	2.1E-04	0%
Dieldrin	0.04	3,296	0.51	0.25	1.7E-01	1	7	1.0E-06	31	7	9.9E-08	5.0E-05	2.0E-03	1%
Aroclor 1254	0.45	3,296	0.51	0.067	1.7E-01	1	7	1.0E-06	31	7	2.8E-07	2.0E-05	1.4E-02	9%
												Hazard Index =	1.6E-01	100%

Notes:
 (1) Average concentration calculated using one-half the detection limit.
 (2) Median skin surface area of a child (average male and female) for hands, forearms, lower legs and feet for age group.
 (3) MDER, 1995.
 (4) MDER, 1994.
 (5) Frequency based on 62 events/365 days (2 days per week, months of April through October).
 (6) Median body weight for a child 6-13 years old.

TABLE 12
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

POTENTIAL CURRENT/FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF CANCER RISK FROM DERMAL CONTACT WITH SEDIMENT

$ADD_{add} = [OHM]_{add} * SA * MS * RAF * EF * ED * EP * C_1 / BW * AP$
 where:
 OHM_{add} = representative concentration of OHM in the sediment at the exposure point during the period of exposure (mg/kg)
 SA = skin surface area in contact with sediment on days exposed (cm²/day)
 MS = mass of sediment in contact with the unit surface area of skin (mg/cm²)
 RAF = relative absorption factor (unitless)
 EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (hours/day)
 ED = exposure duration: the typical duration of each exposure event (day/year)
 EP = exposure period: the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (days)
 C₁ = conversion factor (mass) (kg/mg)

Chemical	OHM _{add} Conc. in Sediment ⁽¹⁾ (mg/kg)	SA Skin Surface Area ⁽²⁾ (cm ² /day)	MS Mass of Soil Adhered ⁽³⁾ (mg/cm ²)	RAF Relative Absorption Factor ⁽⁴⁾ (unitless)	EF Exposure Frequency ⁽⁵⁾ (event/day)	ED Exposure Duration (day/event)	EP Exposure Period (years)	C ₁ Conv. Factor (mass) (kg/mg)	BW Body Weight ⁽⁶⁾ (kg)	AP Averaging Period (years)	ADD _{add} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor ⁽⁷⁾ (mg/kg-day) ⁻¹	Chemical Specific Cancer Risk	Distribution of Risk by Chemical (%)
PAHs														
Benzo(a)anthracene	5	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	8.6E-07	7.3E-01	6.3E-07	8%
Benzo(b)fluoranthene	3.7	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	6.4E-07	7.3E-01	4.6E-07	6%
Benzo(k)fluoranthene	4.1	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	7.0E-07	7.3E-02	7.3E-02	1%
Benzo(a)pyrene	4.6	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	7.9E-07	7.3E+00	5.8E-06	72%
Chrysene	5.1	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	8.8E-07	7.3E-02	6.4E-08	1%
Indeno(1,2,3-cd)pyrene	2.9	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	5.0E-07	7.3E-01	3.6E-07	5%
Metals														
Arsenic	13	3,296	0.51	0.03	1.7E-01	1	7	1.0E-06	31	75	3.4E-07	1.5E+00	5.0E-07	6%
PCBs/Pesticides														
Chlordane	0.23	3,296	0.51	0.05	1.7E-01	1	7	1.0E-06	31	75	9.9E-09	3.5E-01	3.5E-09	0%
4,4'-DDD	0.08	3,296	0.51	0.2	1.7E-01	1	7	1.0E-06	31	75	1.4E-08	2.4E-01	3.3E-09	0%
Dieldrin	0.04	3,296	0.51	0.25	1.7E-01	1	7	1.0E-06	31	75	8.6E-09	1.6E+01	1.4E-07	2%
Aroclor 1260	0.25	3,296	0.51	0.067	1.7E-01	1	7	1.0E-06	31	75	1.4E-08	2.0E+00	2.9E-08	0%

Excess Lifetime Cancer Risk = 8.0E-06 100%

- Notes:
- (1): Average concentration calculated using one-half the detection limit.
 - (2): Median skin surface area of a child (average male and female) for hands, forearms, lower legs and feet for age group.
 - (3): MDER, 1995.
 - (4): MDER, 1994.
 - (5): Frequency based on 62 events/365 days (2 days per week, months of April through October).
 - (6): Median body weight for a child 6-13 years old.

TABLE 13
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESPASSING SCENARIO
ESTIMATION OF NONCANCER HEALTH EFFECTS FROM INCIDENTAL INGESTION OF SURFACE WATER

$$ADD_{sw} = [OHM]_{sw} * I * RAF * EF * ED * EP / BW * AP$$

where:

- OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
- I = daily surface water ingestion rate on days exposed during the exposure period (L/day)
- RAF = relative absorption factor (unitless)
- EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (event/year)
- ED = exposure duration: the typical duration of each exposure event (day/event)
- EP = duration of exposure period: the period of time over which exposure may occur (years)
- BW = body weight (kg)
- AP = averaging period (years)

Chemical	OHM_{sw} (mg/L)	I (L/day)	RAF (unitless)	EF (event/day)	ED (day/event)	EP (years)	BW (kg)	AP (years)	ADD_{sw} (mg/kg-day)	Chronic Oral RfD	Hazard Quotient	Distribution of Risk by Chemical
<i>Metals</i>												
Arsenic	0.004	0.05	1	1.7E-01	1	7	31	7	1.2E-06	3.0E-04	4.0E-03	50%
Barium	0.36	0.05	1	1.7E-01	1	7	31	7	9.8E-05	7.0E-02	1.4E-03	17%
Chromium	0.008	0.05	1	1.7E-01	1	7	31	7	2.1E-06	1.0E+00	2.1E-06	0%
Lead	0.009	0.05	0.5	1.7E-01	1	7	31	7	1.2E-06	7.5E-04	1.6E-03	20%
Manganese	0.25	0.05	1	1.7E-01	1	7	31	7	7.0E-05	1.4E-01	5.0E-04	6%
Selenium	0.009	0.05	1	1.7E-01	1	7	31	7	2.5E-06	5.0E-03	4.9E-04	6%
Zinc	0.059	0.05	1	1.7E-01	1	7	31	7	1.6E-05	3.0E-01	5.4E-05	1%

Notes:

- (1): Average concentration calculated using half the detection limit
- (2): MDER, 1995.
- (3): MDER, 1994.
- (4): Frequency based on 62 events / 365 days (2 days per week, months of April through October).
- (5): Receptor is a child between the ages of 6 and 13 years of age.
- (6): Median body weight, ages 6-13 years.

Hazard Index = 8.1E-03

100%

TABLE 14
 WOERD AVENUE LANDELL
 WALTHAM, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESSPASSER SCENARIO
 ESTIMATION OF CANCER RISK FROM INCIDENTAL INGESTION OF SURFACE WATER

$$ADD_{sw} = [OHM]_{sw} * I * RAF * EF * ED * EP / BW * AP$$

where:

- OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
- I = daily surface water ingestion rate on days exposed during the exposure period (L/day)
- RAF = relative absorption factor (unitless)
- EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (event/year)
- ED = exposure duration: the typical duration of each exposure event (day/event)
- EP = duration of exposure period: the period of time over which exposure may occur (years)
- BW = body weight (kg)
- AP = averaging period (years)

Chemical	OHM _{sw} Average Conc. in Surface Water (1)	I Ingestion Rate (2)	RAF Relative Absorption Factor (3)	EF Exposure Frequency (4)	ED Duration of Exposure Event	EP Duration of Exposure Period (5)	BW Body Weight (6)	AP Averaging Period Carcinogens (years)	ADD _{sw} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	Chemical Specific Cancer Risk	Distribution of Risk by Chemical Risk (%)
<i>Metals</i>												
Arsenic	0.004	0.05	1	1.70E-01	1	7	31	75	1.1E-07	1.5E+00	1.7E-07	100%

$$\text{Excess Lifetime Cancer Risk} = 1.7E-07 \quad 100\%$$

- Notes:
- (1): Average concentration calculated using one half the detection limit.
 - (2): MDEP, 1995.
 - (3): MDEP, 1995.
 - (4): Frequency based on 62 events / 365 days (2 days per week, months of April through October).
 - (5): Receptor is a child between the ages of 6 and 13 years of age.
 - (6): Median body weight, ages 6-13 years.

TABLE 15
WOERD AVENUE LANDFILL
WALTHAM, MASSACHUSETTS

CURRENT / FUTURE CHILD TRESPASSER SCENARIO
ESTIMATION OF NONCANCER HEALTH EFFECTS FROM DERMAL CONTACT WITH SURFACE WATER

ADD_{ms} = [OHM]_{ms} * SA * KP * RAF * EP * ED * C₁ * C₂ / BW * AP
 where:
 OHM_{ms} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
 SA = skin surface area in contact with surface water on days exposed (cm²)
 K_p = Permeability Constant (cm/hr)
 RAF = relative absorption factor (unitless)
 EP = exposure frequency; the number of exposure events during the exposure period divided by the number of days in the exposure period (events/day)
 ED = exposure duration; the typical duration of each exposure event (days/event)
 EP = exposure period; the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (years)
 C₁ = conversion factor (mass) (L/cm³)
 C₂ = conversion factor (time) (hrs/day)

Chemical	OHM _{ms} Average Conc. in Surface Water ⁽¹⁾ (mg/L)	SA Skin Surface Area ⁽²⁾ (cm ²)	K _p Permeability Constant ⁽³⁾ (cm/hr)	RAF Relative Absorption Factor ⁽⁴⁾ (unitless)	EP Exposure Frequency ⁽⁵⁾ (events/day)	ED Exposure Duration (day/event)	EP Exposure Period ⁽⁶⁾ (years)	C ₁ Conv. Factor (mass) (L/cm ³)	C ₂ Conv. Factor (time) (hrs/day)	BW Body Weight ⁽⁷⁾ (kg)	AP Averaging Period for Non- Carcinogens (years)	ADD _{ms} Average Daily Dose (mg/kg-day)	Chronic Oral RfD (mg/kg-day)	Hazard Quotient	Distribution of Risk by Chemical (%)
Metals															
Arsenic	0.004	3,296	1.0E-03	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	1.9E-06	3.0E-04	6.3E-03	62%
Barium	0.36	3,296	1.0E-03	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	1.5E-04	7.0E-02	2.2E-03	22%
Chromium	0.008	3,296	2.0E-03	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	6.7E-06	1.0E+00	6.7E-06	0%
Lead	0.009	3,296	4.0E-06	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	1.5E-08	7.5E-04	2.0E-05	0%
Manganese	0.25	3,296	1.0E-03	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	1.1E-04	1.4E-01	7.9E-04	8%
Selenium	0.009	3,296	1.0E-03	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	3.9E-06	5.0E-03	7.8E-04	8%
Zinc	0.059	3,296	6.0E-04	1	1.7E-01	1	7	1.0E-03	2.4E+01	31	7	1.5E-05	3.0E-01	5.1E-05	0%

Hazard Index = 1.0E-02 100%

- Notes:
 (1): Average concentration calculated using one half the detection limit.
 (2): Assumes hands, forearms, lower legs, and feet of a child between the ages of 6 and 13 is exposed to surface water during wading.
 (3): Dermal Exposure Assessment: Principles and Applications, (EPA, 1992).
 (4): MDEP, 1994.
 (5): Frequency based on 62 events / 365 days (2 days per week, months of April through October).
 (6): Receptor is a child between the ages of 6 and 13 years of age
 (7): Median body weight, ages 6-13 years.

TABLE 16
 WOERD AVENUE LANDFILL
 WALTHAM, MASSACHUSETTS
 CURRENT / FUTURE CHILD TRESPASSER SCENARIO
 ESTIMATION OF CANCER RISK FROM DERMAL CONTACT WITH SURFACE WATER

$ADD_{av} = [OHM]_{sw} * SA * KP * RAF * EF * ED * EP * C_1 * C_2 / BW * AP$
 where:
 OHM_{sw} = representative concentration of OHM in the surface water at the exposure point during the period of exposure (mg/L)
 SA = skin surface area in contact with surface water on days exposed (cm²)
 K_p = Permeability Constant (cm/hr)
 RAF = relative absorption factor (unitless)
 EF = exposure frequency: the number of exposure events during the exposure period divided by the number of days in the exposure period (events/year)
 ED = exposure duration: the typical duration of each exposure event (days/event)
 EP = exposure period: the period of time over which exposure may occur (years)
 BW = body weight (kg)
 AP = averaging period (years)
 C_1 = conversion factor (mass) (L/cm³)
 C_2 = conversion factor (time) (hrs/day)

Chemical	OHM_{sw} Average Conc. in Surface Water (1) (mg/L)	SA Skin Surface Area (2) (cm ²)	K_p Permeability Constant (3) (cm/hr)	RAF Relative Absorption Factor (4) (unitless)	EF Exposure Frequency (5) (events/year)	ED Exposure Duration (day/event)	EP Exposure Period (6) (years)	C_1 Conv. Factor (mass) (L/cm ³)	C_2 Conv. Factor (time) (hrs/day)	BW Body Weight (7) (kg)	AP Averaging Period Carcinogens (8) (years)	ADD_{av} Average Daily Dose (mg/kg-day)	Oral Cancer Slope Factor	Chemical Specific Cancer Risk	Distribution of Risk by Chemical (%)
----------	--	---	--	---	--	---	---	--	---	------------------------------------	---	---	-----------------------------------	--	---

<i>Metals</i>															
Arsenic	0.004	3,296	1.0E-03	1	1.7E+01	1	7	1.0E-03	2.4E+01	31	75	1.8E-07	1.5E+00	2.7E-07	100%

Excess Lifetime Cancer Risk = 2.7E-07 100%

- Notes:
- (1): Average concentration calculated using one half the detection limit.
 - (2): Assumes hands, forearms, lower legs, and feet of a child between the ages of 6 and 13 is exposed to surface water during wading.
 - (3): Dermal Exposure Assessment Principles and Applications, (EPA, 1992).
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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Metropolitan Boston – Northeast Regional Office

JANE SWIFT
Governor

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Secretary

LAUREN A. LISS
Commissioner

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APR 05 2002

MAR 29 2002

PLANNING

Ronald G. Vokey, Planning Director
City of Waltham
Planning Department
119 School Street
Waltham, MA 02451

RE: WALTHAM – SWM
Woerd Ave Landfill
Technical Review of Permit Application
Application for: BWPSW23 – Comprehensive Site Assessment
Transmittal Number: W008254

Dear Mr. Vokey:

The Department of Environmental Protection, Bureau of Waste Prevention (The Department) has performed a Technical Review of the document titled Comprehensive Site Assessment for Woerd Avenue Landfill in Waltham Massachusetts. The October 1999 report, prepared by the consulting firm Camp Dresser & McKee of Cambridge, Massachusetts was forwarded to the Department with a cover letter dated June 13, 2001.


The 8.7-acre landfill site has been used for waste disposal since 1912 and stopped accepting waste in 1973. The City of Waltham proposes to use the site, which is currently heavily wooded, as a recreation site. Considering the age and history of the site the Department has determined that the main issue at this site is to ensure proper closure and capping of the landfill to ensure that the proposed post-closure use does not have adverse impacts on residents (particularly children) who would use the proposed facility.

The Department has determined that the document is acceptable with the following conditions:

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

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1. It is still unclear whether the exact aerial limits of waste at the site have been accurately delineated. Previous reports (e.g. TWM Northeast, 1990) have indicated that waste may be present outside the property boundary of the landfill including under the parking lot at the eastern portion of the adjacent Parker Hannifin property. This issue was emphasized in Condition #3 of the Department's September 11, 1997 Conditional Approval of the Initial Site Assessment of the site. The condition stated that the limits of the waste must be adequately determined and physically confirmed using "test pit evacuation, borings, and other suitable methods" and reported in the CSA.

The CSA describes a test pit excavation exercise involving twenty-three (23) pits along the perimeter of the site that does not result in determining the limits of waste. All test pits excavated contained waste. A satisfactory test pit program would normally involve excavation of a number of pits in a relatively straight line beginning in an area known to contain waste and continuing away from the waste until pits excavated do not contain waste. The Department required that a more satisfactory program of waste limit delineation be included in the final closure plans so that the proposed cap properly covers all of the waste.

It is also unclear whether the lateral and vertical extent of the waste along Cram Cove has been adequately determined. In addition, the CSA reports very high levels of lead in sediments in the Cove. The Department requires that final closure plans and discussions include waste delineation in the area and methods of addressing potential eminent hazard conditions of lead in the area.

2. The Department concurs with the CSA recommendation (#1) that the final closure plans for the landfill be designed to include all the requirements of the Department's regulations describing a standard landfill cap. The City's proposed post-closure use of the landfill site and its close proximity to residential homes and industrial properties make it necessary that a standard cap be the minimum requirement for the site. Additional measures may also be necessary during the post closure period to protect the environment and potential users of the site. The Department emphasizes that should post closure conditions make it necessary it will be the City's responsibility to make modifications or implement actions at the site to avert and remediate adverse impacts of the landfill on users and potential users of the site.
3. The Department has previously (9/11/1999 letter) required that groundwater monitoring be extended to include information from existing monitoring wells at adjacent properties including the Parker Hannifin property "to better understand groundwater flow direction in the area." The Department will require that this condition be included in the post-closure monitoring plan for the site.
4. Section 6, Conclusions and Recommendations, of the CSA unilaterally determined that surface water samples would not be analyzed for VOCs. The Department requires that sampling schedules and analytes of all media be coordinated with Department staff before decisions are made on eliminating constituents to be tested. In that regard, the Department will require that immediately following final closure of the site all media be

tested for the complete suite of constituents indicated by Department regulations and guidance documents for, at least, two rounds of sampling. Based on the results of those samples the Department will determine the constituents to be dropped after a petition is submitted to the Department to drop such constituents.

Comments on the CSA, particularly Section 5: Human Health Characterization, are included in Attachment 1. You will note that the comments are very detailed and raise many specific issues. For example, they include comments on very high lead concentrations in sediments in Cram Cove, groundwater discharge from the landfill into the cove, and landfill gas questions after the landfill is capped. The Department requires that, in addition to the comments above, the comments and issues raised in Attachment 1 be addressed before or in the next stages of the landfill assessment and closure process. These will be considered in light of the City's proposed post closure use of the landfill site for expansion of the playgrounds currently located adjacent to the landfill.

If you have any questions regarding the items discussed above contact Mr. Abdul Turay of our Boston office at 617-292-5522 or call me at 978-661-7609.

Sincerely,



Heidi M. O'Brien
DRD, NERO

HMO/jhc/at: w/Attachment

Cc: Bruce Haskell, CDM

Ted Fields, Principal Planner
Waltham Planning Dept.

Jeff Chormann, BWP Boston

ATTACHMENT 1

Review of the Comprehensive Site Assessment, Waltham Landfill, Volume I: Appendices A through E, October 1999

INTRODUCTION

The Department has reviewed the *Comprehensive Site Assessment, Waltham Landfill, Volume I: Appendices A through E, October 1999* heretofore known as the CSA. The report was reviewed for consistency with Massachusetts DEP policy BWSC/ORS-95-141, *Guidance for Disposal Site Risk Characterization* (April 1996) and the risk characterization requirements of the Massachusetts Contingency Plan, 310 CMR 40.0000 as it applies to landfills pursuant to 310 CMR 40.0114. Camp Dresser & McKee, Inc. prepared the report.

CONCLUSIONS

- The CSA recommends further evaluation of the extent of sediment contamination in Cram's Cove and the vicinity. The Department concurs with this assessment but would go even further: given the very high concentrations of contaminants in the sediment, strong consideration should be given to either capping or removing this localized area of contamination once the contamination has been delineated.
- Based on its review of the CSA, the Department agrees with the conclusions that there is a significant risk of harm to human health for the trespasser. Despite agreement on this point, there are a number of critical aspects to the human health risk assessment that are currently not addressed. For instance, the current child trespasser scenario does not incorporate exposure to ambient air, nor surface soil as the site is uncapped.
- The groundwater elevations all depict a subsurface geology where groundwater flows from the landfill to the river. Despite this evidence, the CSA failed to evaluate the discharge of contaminated groundwater to Cram's Cove and the Charles River for effects to fish and other wildlife.

RECOMMENDATIONS

The Department has the following recommendations:

1. Investigate the vertical and horizontal extent of sediment contamination in Cram's Cove.
2. Investigate the true extent of waste along the landfill borders.
3. Discuss the potential for landfill gas to be transported via preferential migration pathways to the homes located adjacent to the landfill.
4. Provide the rationale for omitting PCBs and pesticides from the suite of analyses.

5. Evaluate the discharge of contaminated groundwater to Cram's Cove.
6. Use the recommended criteria when comparing the surface water and sediment concentrations to determine the potential for ecological risk.
7. Incorporate the detected non-methane organic compounds (NMOCs) from the landfill gas into the current exposure scenario for the trespasser.
8. Expand the exposure scenarios to include subchronic as well as a recreational exposure scenario.
9. Utilize dose-response values according to the hierarchy listed below.
10. Discuss and consider landfill gas behavior under the cap if a gas collection system is not utilized at the site.

BACKGROUND

The site is located in Waltham, Massachusetts and is bordered by the streets of Rumford Avenue, Woerd Avenue, Crescent Street, and Moody Street. The landfill is uncapped on about 8 acres of land. Refuse is no longer visible as the landfill is heavily wooded with large deciduous trees such as quaking aspen interspersed with sumac. Nearby are the former Rumford Avenue incinerator, Cram's Cove that is part of the Charles River, the industrial property formerly owned by Parker Hannafin, Norumbega Terrace to the northwest, and the Moody Street playground to the east.

About 1912 the landfill began accepting significant amounts of coal ash along with old cars. The landfill also accepted incinerator residue and other non-combustible waste. Operations ceased in 1973, but two years previous the landfill was ordered to address several complaints including inadequate daily cover, maintenance, improper disposal of refuse, and a general lack of cleanliness. In 1971, the Massachusetts Water Resources Commission required the city to remove debris from Cram's Cove and extend the existing storm drain.

The City of Waltham plans to cap the landfill and build additional soccer fields and a passive recreational area.

DISCUSSION

Lead was detected in sediment at very high concentrations at Cove-2 during the August 1998 sampling round. Composite sediment sampling was subsequently conducted in December 1998 presumably to delineate the extent of the hot spot. It should be noted that composite sampling will not delineate the hot spot but rather will dilute the higher concentrations with relatively cleaner sediment. Nevertheless, the lead and zinc sediment concentrations were *still* elevated above the probable effect concentration (PEC). This is the concentration likely to cause significant mortality for benthic macroinvertebrates in sediment. In other words it is a strong indication of very poor sediment quality.

The report's conclusions and recommendations state that the source for the lead is likely other industries located in the general vicinity. Industrial parks and residential

neighborhoods do exist around the perimeter of the old landfill, but refuse at one time extended into Cram's Cove. Page 1-3, first bullet, states the following: "These steps involved removal of debris from Cram's Cove, extending the storm drain, and submission of final plans and specifications for covering the dump with cover material." Based on this information, there seems to be a direct connection between the presence of lead in the sediment with the source as the landfill.

Residential homes are located within 500 feet of the landfill and landfill gas has been detected in a monitoring location nearby. The report fails, however, to address the potential for landfill gas to be transported via utility conduits to the homes in the neighborhood.

As noted in the report (page 2-1), the true size of the landfill has yet to be determined as none of the 23 test pits were able to delineate the horizontal and vertical extent of the waste. The Department recommends that the full extent of the waste be properly delineated prior to any cap installation.

The site history notes that incinerator ash and other non-combustibles were land filled at the site. During the sampling only VOCs, SVOCs, and inorganics were investigated while PCBs and pesticides were not. At a minimum, the report should provide the rationale for excluding certain contaminants from the sampling strategy.

Several of the wells had high concentrations of contaminants. The Department would recommend an expanded discussion on the migration of landfill-related constituents into the wells.

Table 4-1, page 4-6 of the CSA, compares metals in surface water against Maximum Contaminant Levels (MCLs). Please note that the MCLs are applicable when the water resource is used as a drinking water source. Rather, the report should conduct an Environmental Risk Screening by comparing the concentrations in surface water versus EPA's *National Recommended Water Quality Criteria-Correction April 1999*. The proximity of Cram's Cove and Charles River necessitate an evaluation of this sort.

The surface water sampling was conducted in August and December 1998. The results from the Cove 1 and 2 locations were generally undetected during the August 1998 sampling round, but noticeable for the elevated concentrations of iron, barium, and manganese during the December 1998 sampling round. Often iron, barium, and manganese are associated with leachate discharging to a water body when groundwater levels and runoff are more pronounced. For this reason, the Department recommends that the discussion on the fate and transport of groundwater to Cram's Cove and the Charles River be expanded.

Several dose response values for COCs (e.g., Reference Concentrations and Unit Risk Factors) are not consistent with DEP policy. Dose response values should be obtained using the methods described in Chapter 7 of the Guidance. In brief, values should be obtained from the following sources listed in order of priority:

Non-Cancer Effects

- US EPA's Integrated Risk Information System (IRIS)
- US EPA's Health Effects Assessment Summary Tables (HEAST)
- Other dose-response values developed by ORS (<http://www.state.ma.us/dep/ors/files/chemical.htm>).
- Allowable Threshold Concentrations (ATCs) as described in the Draft Indoor Air Sampling and Evaluation Guide (<http://www.state.ma.us/dep/ors/files/indair01.pdf>)
- Minimum Risk Levels from the Agency for Toxic Substances and Disease Registry
- Calculation of a dose-response value using toxicity information from the literature

Cancer Effects

- U.S. EPA's Integrated Risk Information System (IRIS)
- U.S. EPA's Health Effects Assessment Summary Tables (HEAST)
- Dose-response values developed by ORS (<http://www.state.ma.us/dep/ors/files/chemical.htm>).
- Cancer Potency Factors from California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA)

The ATCs are currently available on the DEP website: <http://mass.gov/dep/ors/files/atcs1995.doc>

The future child recreational scenario incorporates an air model to calculate the expected landfill gas emissions. The findings show No Significant Risk from inhalation due to landfill gas. This was not done, however, for the current trespasser based on the actual or measured landfill gas concentrations. The Department recommends that the current risk to the child trespasser be calculated.

The Department has two general comments with respect to the air model used to predict landfill gas concentrations and inhalation by future receptors.

- The determination of future landfill gas emissions is based on an air model with a default parameter of a cap without a gas collection system in place. This is contrary to Massachusetts regulations for gas control as per 310 CMR 19.117(3).
- Sampling for non-methane organic compounds (NMOCs) was completed for one round of sampling only, August 1998. Based on this small data set, caution is advised when drawing *any* definitive conclusions about the quantity and potency of landfill gas emissions over time.

SPECIFIC COMMENTS

Comment #1:

Page 4-8, Section 4.7.4, *Landfill Gas*

The fourth paragraph in the section states that NMOCs were not detected in the field survey during the second sampling round. This is accurate for location LFG-1 but inaccurate for the other two locations, LFG-2 and LFG-3, where there were 9 and 11 compounds detected, respectively.

Comment #2:

Page 4-6, Section 4.7.2, *Surface Water Quality*

The surface water concentrations are compared versus the MCLs in Table 3-4 of the report. Surface water samples, when considering ecological risk, should be compared and discussed versus the *National Recommended Water Quality Criteria-Correction* (EPA 1999).

Comment #3:

Page 4-6, Section 4.7.3, *Sediment Quality*

Cram Cove was sampled for metals in the sediments and lead was detected at very high levels. Risks to both ecological and human receptors are tripped based on lead detected at 110,000 mg/Kg in the sediments. Since this report was issued in 1998, the MA DEP now recommends using the sediment criteria values as published in MacDonald et al. (2000). The Cove-2 lead concentration is nearly 10 times greater than the probable effect concentration (128 mg/kg) developed by the authors. Concentrations greater than the PEC are likely to see adverse effects on sediment-dwelling organisms. The CSA should, therefore, conclude that Significant Risk exists in the environment.

Comment #4:

Page 4-9, Section 4.8, *Contamination Migration Pathways*

The CSA reports that landfill gas migration is not a "problem" according to the data interpretations section. Yet the discussion fails to put the concentrations of methane in any sort of context by comparing it to known standards or literature values. Moreover, it is difficult to draw any conclusions about the prevalence of emissions of NMOCs since only one sampling round was conducted. The Department recommends at least four quarters of sampling for NMOCs before any definitive conclusions can be drawn.

Comment #5:

Page 5-3, Section 5.2.1, *Current and Foreseeable Land Use*

The section states that activity at the landfill is limited to use by trespassers for "various recreational activities". During a recent site visit, several walking trails were evident through the landfill in addition there appeared to be several encampments where homeless men and women were living. The landfill lies adjacent to the Moody Street playground and there is no fencing or signs around the perimeter of the landfill. Consequently, this allows unimpeded access to the site. In addition, the risk assessment did not collect surface soil samples. In light of this, the report should make special note

of the shortcomings of the site investigation and discuss the potential risk to receptors, which may come in contact with surface soil and possibly refuse.

Comment #6:

Page 5-4, Section 5.2.2, *Soil and Groundwater Categories*, first paragraph on page

The section states that the groundwater is not considered GW-2 since there are no buildings on site or is expected to be constructed on site in the future. While this is true, it does not take into account that there are residential homes not more than 500 feet away. Some discussion is recommended regarding the homes nearby and whether they might be impacted by landfill gas transport.

Comment #7:

Page 5-12, *Exposure Point Concentrations*

The first paragraph discusses the calculation of the sediment exposure point concentration (EPC) for Cove-2. This location was designated as a "hot spot" and the EPC was based on the concentrations in that one sample. The calculation of the other sediment EPC is based on the other sediment sampling locations but how the individual chemical concentrations were calculated is not clear. Please provide the method for calculating EPCs

Comment #8:

Page 5-12, *Exposure Point Concentrations*, 4th paragraph

The paragraphs at the end of this section describe how the EPCs for ambient air were derived. The future scenario is determined by using the third generation Industrial Source Complex-Short term model (ISCST3). Depending on the size of the landfill and meteorological conditions the landfill gas emissions can be predicted. While the model is acceptable for determining future risk, the risk assessment fails to address the risk to current residents who live adjacent to the facility. In other words, the one round of landfill gas sampling collected in August 1998 was used to identify the ambient air COCs but not used in the risk evaluation. Consequently, the current risk potential has not been addressed. Furthermore, in the uncertainty section, the risk assessment needs to discuss the shortcomings of collecting just one round of samples for non-methane organic compounds (NMOCs), which will tend to drive the risk assessment more so than the other constituents of landfill gas, i.e. methane, hydrogen sulfide, and carbon dioxide.

Comment #9:

Page 5-12, *Exposure Point Concentrations*, 5th paragraph

The ISCST3 model assumed that since there was no gas collection system in place, that, "all gas produced would be emitted through the surface of the capped landfill." The Department contends that this assumption may be faulty and may underestimate the concentrations of NMOCs of landfill gas emissions from the site. When the collection system is instituted, the landfill gas will be concentrated at a finite number of exhaust

ports around the perimeter of the landfill and thus the NMOCs concentrations will rise from their current levels. For this reason, The Department believes that the risk may be under estimated to the local population in the area.

Comment #10:

Page 5-13, Table 5-6, *Summary of Assumptions for Each Exposure Scenario*

The Department has several comments regarding the exposure assumptions presented in the report.

- The risk assessment fails to look at subchronic exposures for any of the scenarios. The recommended exposure and averaging period is 210 days and should be applied, at a minimum, to the Current/Future Child Trespasser
- The current exposure of those neighbors nearby to ambient air landfill gas emissions has not been addressed.
- The recreational scenario does not address that receptors may use Cram's Cove for canoeing and kayaking and fishing. There is a Metropolitan District Commission (MDC) boat ramp close to Cram's Cove yet the risk assessment fails to address this potential scenario.
- The age range, 6 to 13 years old, for the Future Child Recreational Scenario may overestimate the youngest age range likely to visit and use the soccer and baseball fields.

Comment #11:

Page 6-3, Section 6.2, *Recommendations*, item #2

Waltham Landfill is proposed to receive a standard DEP cap in accordance with the requirements of 310 CMR 19.140. The Department recommends that along with this cap that a landfill gas collection system be installed because of the paucity of air sampling data for NMOCs (August 1998 only); and also because of the cancer potency of two of the known chemicals detected in air. Moreover, due to the close proximity of residences and the future heavy use by sports enthusiasts, once the gas collection system is implemented the emissions should be filtered through a carbon canister to reduce the toxicity of the gas emissions.

Comment #12:

Page 6-3, Section 6.2, *Recommendations*, item #3

The section states that if public access is allowed the area will have to be either fenced off or somehow secluded. While a fence may restrict access to humans, it does not address the continuing source of contamination to ecological receptors. Furthermore, since the hot spot location is in the cove, a fence might restrict access on the landside but will do little to address access to persons recreating in the Charles River.

The conclusions of the report are that there is a Significant Risk (HI=28) to the "Current/Future Child Trespasser" based on dermal exposure and ingestion of sediment

from the hot spot area. The Department recommends that during the landfill capping that consideration be given to dredging or capping this area in some way to prevent future exposure. There clearly is a risk to both human and ecological receptors from the "hot spot".

REFERENCES

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environmental Contamination Toxicology* 39: 20-31.



One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

October 30, 2003

Mr. John Carrigan
Section Chief - Solid Waste
Massachusetts Department of Environmental Protection
Northeast Regional Office
One Winter Street
Boston, Massachusetts 02109

Subject: Response to Comments on Comprehensive Site Assessment
Woerd Avenue Landfill Site, Waltham, Massachusetts
Transmittal Number: W008254

Dear Mr. Carrigan:

Camp Dresser & McKee Inc. (CDM) has prepared this letter in response to the comments contained in the approval letter dated March 29, 2002 from your office on the Comprehensive Site Assessment (CSA) for the Woerd Avenue landfill in Waltham. In providing responses to the Department of Environmental Protection's (DEP) comments, CDM has consolidated the issues into following significant comments provided both in the approval letter and its attachment.

In summary, CDM will provide information on the historic filling in the vicinity of the landfill and a proposed program for delineating any landfilled waste beyond the City's property. CDM will also collect additional samples of sediments for lead in Cram Cove near where the sediment sample with a high lead concentration was previously collected. Based on the results of this subsequent sampling program, CDM will make recommendations on the need for an immediate removal action. Finally, CDM will collect samples from the existing groundwater and landfill gas monitoring wells as well as those on the adjacent Parker Hannifan site, if they can be accessed, and provide an interim environmental monitoring plan for the site.

The City is currently reviewing potential post-closure uses of the site. The results of the subsequent investigations outlined below will have an impact on the viability of the site use. If the City elects to use the site for a recreational facility, CDM will update the risk assessment specific to the proposed use. Otherwise, the proposed capping plan will incorporate a standard DEP cap as outlined in the Solid Waste Management Regulations (310 CMR 19.000).



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The following are CDM's specific responses to the issues raised in the approval letter:

- **Delineation of the Edge of Landfilled Waste.** Historically, this area of Waltham and Newton was wetlands and floodplains associated with the Charles River. These expansive low-lying areas were historically filled with materials such as ash from residential coal burning and municipal solid waste incinerators and non-combustible materials. These waste materials are similar to the types of materials that were historically landfilled at the Woerd Avenue site. This condition has been confirmed by a review of historic documents including aerial photographs and maps.

The issues of delineating the edge of landfilled materials in this area is significantly more difficult than obtaining access onto abutting properties to conduct the "satisfactory test pit program" described in the DEP letter. The materials in the general vicinity will visually be very similar to those that were part of the landfill operations. This similarity has been documented in a variety of reports filed by property owners around the landfill site under the Massachusetts Contingency Plan (MCP, 310 CMR 40.000).

To address the DEP's comment that the City properly delineates the edge of waste, CDM proposes a two step process. As an initial step, CDM will review and summarize information generated on this area since the completion of the CSA report in 1999. This information will include MCP report filings for abutting properties including the former Parker Hannifan site and the Rumford Avenue Incinerator in Newton. CDM will also work with the City to collect historic maps and aerial photographs of the area available through the cities of Newton and Waltham and a detailed review of the ownership including subdivisions of the properties directly abutting the City-owned properties. This information will be summarized in a letter report to the DEP with recommendations on locations where the landfill operations conducted by the City of Waltham were historically conducted.

Based on this review, the City will contact abutting property owners to obtain access to conduct further subsurface explorations on their property where it is suspected that the City may have landfilled historically. If permission is granted, CDM will provide the DEP with a site-specific approach for the field program on the properties for review and approval. It should be noted that test pits may not be appropriate given the paved and developed areas that surround the site and that CDM may recommend Geoprobos or conventional drilling depending on the situation. The proposed scope of work will also address the need for sampling of the surficial soils to determine imminent hazard



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Page 3

conditions. The decision to sample will be based on the current site use and the depth of landfilled materials found during the field investigation program.

The review of background information and subsequent field program will include the delineation of any historical landfilling that may now be under water in Cram Cove.

The City will keep the DEP aware of the status of this process and anticipates finishing the initial phase by March 1, 2004. At that time, CDM will submit the proposed field program and request access from the abutting property owners. The timing of the completion of the field program will be based on weather and the cooperation of the property owners.

- **Delineation of Wetland Sediment Contamination in Cram Cove.** During the CSA, CDM collected a sample with an extremely high concentration of lead in sediments from Cram Cove. Subsequent sampling found lower levels in composite samples. CDM understands that high lead in sediments has been identified at other locations in the Cove that may not be linked to the landfill site. Therefore, CDM will review filings made under the MCP for sites surrounding the Cove and provide a summary of the historic site uses as well as any analytical testing of wetland sediments. CDM will also obtain copies of any ecological risk assessments conducted as part of these projects based on the concentrations of contaminants found in Cove sediments.

CDM will collect up to ten discrete samples of wetland sediments in the Cove adjacent to the landfill site. These samples will be forwarded to a laboratory for analysis of total lead only and the results will be reported to the DEP along with a discussion of the need for further sampling or an immediate action.

- **Post-Closure Use of the Landfill Site.** At this time, the City is reviewing the proposal to utilize the landfill site for a recreational field. Based on the ultimate final use of the site including the final extent of landfilled materials delineated above. If appropriate, a revised quantitative risk assessment will be provided to the DEP along with the post-closure use permit application for the landfill site.
- **Further Water Quality and Landfill Gas Sampling.** As part of this subsequent program, CDM will collect one round of samples from all the existing groundwater monitoring wells and surface water locations on the City's property and have them analyzed for the standard solid waste parameters found in section 19.132 of the Solid Waste Management Regulations, including volatile organic compounds. CDM will also collect landfill gas samples from the well locations installed around the site perimeter as part of the CSA.



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Page 4

As part of this program, CDM will attempt to access the monitoring wells located on the former Parker Hannifan property. If access can be obtained, the wells located adjacent to the landfill will be analyzed for the standard solid waste parameters.

Following completion of this round, CDM will provide the DEP with a summary letter report with a proposed ongoing environmental monitoring program for the site.

- Human Health Risk Assessment - Soil Sampling. The CSA scope of work approved by the DEP for the site did not include surficial soil sampling to assess a potential exposure to trespassers prior to final capping. This pathway is not typically assessed as part of the landfill assessment process under the Solid Waste Management Regulations (310 CMR 19.000). Therefore, CDM did not collect any surficial soil samples or analyze them in the risk assessment. CDM does not propose to conduct any soil sampling at the site.
- PCB and Pesticide Sampling. The attachment to the comment letter asks why PCBs and pesticides were deleted from the sampling program. These parameters are not the standard parameters included required for CSA's under the DEP regulations and were not part of the approved scope of work. They are also not typically associated with landfills that were primarily for ash materials such as the Woerd Avenue site. Following review of the MCP documents described above, CDM may recommend further sampling of sediments or water quality for these parameters.

We are available to meet with you and your staff to discuss our responses and proposed approach to completing the closure process for the site. Please do not hesitate to contact me at (617) 452-6541 if you have any questions or require anything further.

Very truly yours,

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

c: Abdul Turay, DEP-Boston
Ronald Vokey, Waltham ✓
Ted Fields, Waltham
Cheryl Waddick, Waltham



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
METROPOLITAN BOSTON – NORTHEAST REGIONAL OFFICE

MITT ROMNEY
Governor

ELLEN ROY HERZFELDER
Secretary

KERRY HEALEY
Lieutenant Governor

ROBERT W. GOLLEDGE, Jr.
Commissioner

MAR 30 2004

Ronald G. Vokey, Planning Director
City of Waltham
Planning Department
119 School Street
Waltham, MA 02451

RE: Woerd Avenue Landfill - Waltham
Application for: BWPSW23 – Comprehensive Site Assessment
Transmittal Number: W008254
Approval with Conditions – Supplemental CSA Scope

Dear Mr. Vokey:

The Metropolitan Boston/Northeast Regional Office of the Department of Environmental Protection, Solid Waste Management Section (the "Department") has reviewed the October 30, 2003 response to the Department's March 29, 2002 conditional approval of the Comprehensive Site Assessment (CSA) for the Woerd Avenue landfill in Waltham, Massachusetts. The response was prepared and submitted on behalf of the Town of Waltham (the "Town") by Camp Dresser & McKee, Inc. of Cambridge, Massachusetts. It details the tasks to be undertaken to satisfy the conditions of the Department's May 29, 2002 approval of the CSA.

The Department approves the tasks described in the October 30, 2003 response subject to the following conditions:

1. The Town shall within thirty (30) days of the date of this letter provide to the Department a schedule for conducting the tasks described in the October 30, 2003 response and for submitting an addendum to the CSA for the Department's review and approval.

This information is available in alternate format. Call Debra Doherty, ADA Coordinator, at 1-617-292-5565. TDD Service - 1-800-298-2207.

One Winter Street, Boston, MA 02108 • Phone (617) 654-6500 • Fax (617) 556-1049 • TDD # (800) 298-2207

DEP on the World Wide Web: <http://www.state.ma.us/dep>

Printed on Recycled Paper

2. The addendum to the CSA shall summarize the results of the additional investigations and address the issues identified in the Department's October 30, 2003 approval of the CSA. In addition, the addendum to the CSA shall include a schedule for submittal of a Corrective Action Alternatives Analysis pursuant to 310 CMR 19.150(6).

If you have any questions regarding the items discussed above contact Mr. Abdul Turay of our Boston office at 617-292-5522.

Sincerely,



John Carrigan, Section Chief
Solid Waste Section

Cc: Walter Sweder, Jr., Dir
119 School Street
Waltham, Ma 02154

Bruce Haskell
1 Cambridge Place
50 Hampshire Street
Cambridge, MA 02139



One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

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APR 5 1 2004

PLANNING

April 9, 2004

Mr. John Carrigan
Section Chief - Solid Waste
Northeast Regional Office
One Winter Street
Boston, Massachusetts 02108

Subject: Schedule for Completion of Supplemental Comprehensive
Site Assessment Tasks - Woerd Avenue Landfill, Waltham

Dear Mr. Carrigan:

As requested in the letter from the Department dated March 30, 2004, Camp Dresser & McKee Inc. (CDM) has developed the following anticipated schedule for completion of the Supplemental Comprehensive Site Assessment (CSA) tasks at the Woerd Avenue Landfill site. This letter is sent on behalf of the City of Waltham and includes the work required to satisfy the conditions of the Department's May 29, 2002 approval of the CSA.

The City has already begun the appropriation process for the necessary funds to complete the Supplemental CSA work. It is anticipated that the appropriation will be finalized in mid-May with a contract being prepared and signed by July 1, 2004.

CDM estimates that the work will require four months to complete including sample collection and analysis and review of historic and recent information on the landfill site and surrounding areas. CDM will also need to meet with the City after the information and data has been compiled to discuss the next steps and overall approach that will be presented to the DEP as part of the supplemental CSA. Therefore, we anticipate submitting the Supplemental CSA report to your office by November 1, 2004.

Please do not hesitate to contact me at (617) 452-6541 if you have any questions or require anything further.



Mr. John Carrigan
April 9, 2004
Page 2

Very truly yours,

A handwritten signature in black ink that reads "Bruce W. Haskell". The signature is written in a cursive style with a large, prominent 'B' and 'H'.

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

c: Ronald Vokey, Waltham
Ted Fields, Waltham
Sheryl Waddick, Waltham



One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

January 5, 2005

Mr. John Carrigan
Department of Environmental Protection
Northeast Regional Office
One Winter Street
Boston, Massachusetts 02108

Subject: Summary of Groundwater, Surface Water, Sediment and
Gas Sampling Results
Town of Waltham, Massachusetts
Woerd Avenue Landfill - November 2004

Dear Mr. Carrigan:

On November 15-16, 2004, Camp Dresser & McKee Inc. (CDM) personnel collected groundwater, surface water, and sediment samples and field analyzed landfill gas samples at the Woerd Avenue Landfill in Waltham, Massachusetts. The sampling was performed in accordance with the Massachusetts Department of Environmental Protection (DEP) protocol.

Appendix A contains a site plan that shows each sampling location. Appendix B contains tables that summarize field and laboratory sampling results. Table 1 summarizes the analytical results for conventional parameters (alkalinity, total dissolved solids (TDS), nitrate-nitrogen, cyanide, sulfate, chloride, and chemical oxygen demand (COD) and dissolved metals (arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, and zinc) for groundwater and surface water samples. Table 2 summarizes the analytical results of volatile organic compounds (VOCs) for groundwater and surface water samples. Table 3 summarizes the results of groundwater and surface water parameters measured in the field (pH, temperature, dissolved oxygen, specific conductance, depth to groundwater, and groundwater elevation). Table 4 summarizes the analytical results for lead for sediment samples. Table 5 summarizes the results of the landfill gas monitoring. Analytical values that exceed applicable standards appear shaded in each table. Appendix C contains a copy of the laboratory data sheets.

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Mr. John Carrigan
January 5, 2005
Page 2

This sampling work was completed as part of ongoing Supplemental Comprehensive Site Assessment activities approved by DEP. The following is an analysis of the results collected in this round of sampling:

Groundwater Sampling

CDM collected groundwater samples from the following monitoring well locations: CDM-1A, CDM-2, CDM-2A, CDM-3A, CDM-4, and CDM-4A. Monitoring wells CDM-1 and CDM-3 were dry and could not be sampled this round. Massachusetts Solid Waste Regulations (310 CMR 19.000) requires that sampling results be compared to the established Primary Maximum Contaminant Levels (MCL) Regulation and the Secondary MCLs for each parameter. The Primary MCLs were not exceeded in any of the groundwater samples this round.

Massachusetts Secondary Maximum Contaminant Levels (SMCLs) were exceeded in the following groundwater samples:

- Manganese exceeded the SMCL in all sampling locations at levels ranging from 87.5 ug/l to 3,920 ug/l. The SMCL for manganese is 50 ug/l.
- Iron exceeded the SMCL in CDM-2, CDM-3A, and CDM-4 at concentrations ranging from 897 ug/l to 33,900 ug/l. The SMCL for iron is 300 ug/l.
- TDS exceeded the SMCL in CDM-2, CDM-4, and CDM-4A at concentrations ranging from 633 mg/l to 871 mg/l. The SMCL for TDS is 500 mg/l.
- Chloride exceeded the SMCL in CDM-4A at a concentration of 349.89 mg/l. The SMCL for chloride is 250 mg/l.

Secondary standards are established for aesthetics and taste of a public drinking supply and are not health based.

There were no VOCs exceedances for MCLs or SCMLs detected in the groundwater samples this round.

Surface Water Sampling

CDM collected surface water samples from two locations (COVE-1 and COVE-2) from Cram's Cove as shown on the attached plan.



Mr. John Carrigan
January 5, 2005
Page 3

The Primary MCLs were not exceeded in any of the surface water samples this round.

Massachusetts Secondary Maximum Contaminant Levels (SMCLs) were exceeded in the following surface water samples:

- Manganese exceeded the SMCL in both COVE-1 and COVE-2 at concentrations of 650 ug/l and 463 ug/l, respectively. The SMCL for manganese is 50 ug/l.
- Iron exceeded the SMCL in both COVE-1 and COVE-2 at concentrations of 28,100 ug/l and 15,700 ug/l, respectively. The SMCL for iron is 300 ug/l.
- TDS exceeded the SMCL in both COVE-1 and COVE-2 at concentrations of 1,061 mg/l and 1,150 mg/l, respectively. The SMCL for TDS is 500 mg/l.
- Chloride exceeded the SMCL in COVE-1 at a concentration of 362.39 mg/l. The SMCL for chloride is 250 mg/l.

Sediment Sampling

CDM collected ten sediment samples (SED-1 through SED-10) from the banks of Cram's Cove. SED-1 was taken from the same location as COVE-1, from which point a new sample was taken every twenty feet moving north along the bank finishing with SED-10 in the location of COVE-2. The samples were tested for lead concentration and compared to three standards including the Massachusetts DEP Sediment Guidelines, the Urban Fill Background Criteria - "Natural Soil", and the MCP S-1 Standards.

- Lead exceeded the MADEP Sediment Guidelines in every sediment sample. The standard limit lead is 35.8 mg/kg.
- Lead exceeded the Urban Fill Background Criteria in every sediment sample. The standard limit for lead is 100 mg/Kg.
- Lead exceeds the MCP S-1 standard in every sediment sample except SED-2, SED-3, SED-9, and SED-10 at concentrations ranging from 313 mg/Kg to 673 mg/Kg. The MCP S-1 standard for lead is 300 mg/Kg.

Landfill Gas Sampling

During the November 2004 monitoring event, three landfill gas-monitoring wells (LFG-1 through LFG-3) were sampled for the presence of landfill gas. Concentrations of methane



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Mr. John Carrigan
January 5, 2005
Page 4

(CH₄), carbon dioxide (CO₂), oxygen (O₂), and a Lower Explosive Limit (LEL) reading were obtained using a Landtec GEM 500 Gas Analyzer. Hydrogen Sulfide (H₂S) concentrations were obtained using a tritector. VOC concentration was obtained using an organic vapor meter (OVM).

- CH₄ was detected in landfill gas monitoring location LFG-1 at a concentration to 3.0% by volume of methane. This corresponds to an LEL of 60%, over the regulatory limit of 25% of the LEL.
- CO₂ was detected in all gas monitoring locations at concentrations ranging 11.8% to 18.0% by volume carbon dioxide.
- H₂S was not detected in any landfill gas monitoring locations this round.
- VOCs were detected in landfill gas monitoring locations LFG-2 and LFG-3 at concentrations of 0.9 ppm and 6.5 ppm respectively.

Please do not hesitate to call me at (617) 452-6541 if you have any questions.

Very truly yours,

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

c: Ronald Vokey, Waltham
Ted Fields, Waltham

TABLE 1
WORLD AVENUE LANDFILL, WALTHAM, MASSACHUSETTS
NOVEMBER 2004 - GROUNDWATER SAMPLING SUMMARY

SAMPLE NUMBER	DRINKING WATER REGULATIONS	UNITS	0411-215-01 11/15/04 CDM-1A	0411-215-02 11/15/04 CDM-2	0411-215-03 11/15/04 CDM-2A	NA	0411-215-01 11/16/04 CDM-3A	0411-215-04 11/15/04 CDM-4	0411-215-06 11/15/04 DUP-1	0411-215-05 11/15/04 CDM-4A	0411-215-03 11/16/04 COVE-1	0411-215-04 11/16/04 COVE-2
CONVENTIONAL PARAMETERS												
ALKALINITY	NL	mg/l	119.48	612.85	70.56	NS	180.87	566.50	661.26	901.58	571.65	783.83
TDS (TOT DISSOLVED SOLIDS)	500 (3.5)	mg/l	169	692	97	NS	299	633	613	971	1,061	1,150
NITRATE-NITROGEN	10 (2.4)	mg/l	3.2	3.1	1.1	NS	<0.005	3.0	3.1	1.2	2.1	<0.950
CYANIDE, TOTAL	0.2(4)	mg/l	<0.005	<0.005	<0.005	NS	<0.005	0.02	<0.005	<0.005	<0.005	<0.005
SULFATE	250(3.5)	mg/l	17.59	<2.00	3.79	NS	17.15	<2.00	<2.00	<2.00	<2.00	<2.00
CHLORIDE	250(6)	mg/l	9.75	70.88	4.25	NS	28.14	71.48	69.18	34.93	34.93	247.42
COD (CHEMICAL OXYGEN DEMAND)	NL	mg/l	<20	53	<20	NS	<20	105	51	50	51	101
METALS												
ARSENIC	50(2.6)	ug/l	<10.0	<10.0	<10.0	NS	<10.0	<10.0	<10.0	<10.0	13.2	<10.0
BARIUM	2,000(2.4)	ug/l	39.3	1,830	<10.0	NS	196	1,370	1,380	116	927	886
CADMIUM	5(2.4)	ug/l	<1.0	<1.0	<1.0	NS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CHROMIUM	1,000(2.4)	ug/l	<5.00	<5.00	<5.00	NS	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
COPPER	1,300(2.4)	ug/l	<10.0	<10.0	<10.0	NS	164	<5.00	<5.00	<5.00	<5.00	<5.00
IRON	300(3.5)	ug/l	<10.0	23,300	<10.0	NS	397	33,400	34,300	278	28,100	15,700
LEAD	15(2.4)	ug/l	<3.00	<3.00	<3.00	NS	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
MANGANESE	50(3.5)	ug/l	35.4	151	87.5	NS	491	245	169	320	650	143
MERCURY	2(2.4)	ug/l	<2.00	<2.00	<2.00	NS	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
SELENIUM	50(2.4)	ug/l	<5.00	<5.00	<5.00	NS	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
SILVER	100(3.5)	ug/l	<5.00	<5.00	<5.00	NS	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ZINC	5,000(3.5)	ug/l	<20.0	<20.0	<20.0	NS	132	<20.0	<20.0	<20.0	52.9	<20.0

FOOTNOTES:

- (1) HIGHLIGHTED AREAS: CONCENTRATION EQUALS OR EXCEEDS MASSACHUSETTS OR EPA DRINKING WATER STANDARDS OR GUIDELINES
 - (2) MASSACHUSETTS DRINKING WATER STANDARD OR MAXIMUM CONTAMINANT LEVEL (MCL)
 - (3) MASSACHUSETTS DRINKING WATER GUIDELINE OR SECONDARY MAXIMUM CONTAMINANT LEVEL (SMCL)
 - (4) EPA PRIMARY DRINKING WATER STANDARD
 - (5) EPA SECONDARY DRINKING WATER STANDARD
 - (6) THE US ENVIRONMENTAL PROTECTION AGENCY HAS LOWERED ITS MCL FOR ARSENIC FROM 50 TO 10 UG/L. THE MASSACHUSETTS DEP HAS STATED THAT IT WILL NOT BE ADOPTING THE NEW EPA STANDARD UNTIL JANUARY 23, 2006. UNTIL THEN, THE MASSACHUSETTS DRINKING WATER STANDARD WILL REMAIN 50 UG/L.
- <# # NOT DETECTED TO THE LIMIT INDICATED
DUP-1 TAKEN AT CDM-4
NOT APPLICABLE
NL NO LIMIT
NS NOT SAMPLED

TABLE 4
 WOOD AVENUE LANDFILL, WALTHAM, MASSACHUSETTS
 SEDIMENT QUALITY SAMPLING- NOVEMBER 2004
 SUMMARY OF FIELD MEASUREMENTS

SAMPLE NUMBER SAMPLING DATE LOCATION ID	UNITS	MADEP Sediment Guidelines	Urban Fill Background Criteria- "Natural Soil"	MCP S-1 Standard	0411-251-06		0411-251-07		0411-251-08		0411-251-09		0411-251-10		0411-251-11		0411-251-12		0411-251-13		0411-251-14		0411-251-15	
					11/16/04	SED-1	11/16/04	SED-2	11/16/04	SED-3	11/16/04	SED-4	11/16/04	SED-5	11/16/04	SED-6	11/16/04	SED-7	11/16/04	SED-8	11/16/04	SED-9	11/16/04	SED-10
Lead	mg/Kg	35.8	100	300	112	114	164	52	451	673	332	313	238	102										

Notes:

1. Bolding indicates exceedance of MADEP Sediment Guidelines
2. Italics indicates exceedance of Urban Fill Background Criteria for "Natural Soil"
3. Shading indicates exceedance of the MCP S-1 Standard

TABLE 5
WOERD AVENUE LANDFILL, WALTHAM, MASSACHUSETTS
NOVEMBER 2004 - LANDFILL GAS SAMPLING SUMMARY

Sample Location	Date	Sample Point	Methane ² (% vol.)	% LEL (% vol.)	CO ₂ (% vol.)	O ₂ (% vol.)	OVM (ppm)	H ₂ S (ppm)
LFG-1	11/16/2004	Well	3.0	60.0	18.0	2.0	0.0	0.0
LFG-2	11/16/2004	Well	0.0	0.0	16.8	2.6	0.9	0.0
LFG-3	11/16/2004	Well	0.0	0.0	11.8	9.7	6.5	0.0

Notes:

1. Wells and probes were purged for approximately 10 minutes before final readings were recorded.
2. Methane measured with combustible gas indicator.



AmeriSci Boston
Eight School Street
Weymouth, MA 02189
781-337-9334

Laboratory Report

Report Date 12/08/2004
Workorder No. 0411-00215

Customer: Camp Dresser & McKee
One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139

Attention: Mr. Vin Recchia

Subject: WALTHAM LF

Sample: 001 CDM-MW-1A
Date: 11/16/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	

Certifications: MA: MA089 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 001 CDM-MW-1A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tri-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0118 RI:A451 CA:2050 NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 001 CDM-MW-1A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		114	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		104	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		102	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	ND	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/835.3	ND	mg/L	0.005	SUB	11/23/2004	
Alkalinity	2320B SM 18TH, 1992	119.48	mg/L	20	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	169	mg/L	3	PJS	11/16/2004	
Sulfate	EPA 375.4	17.59	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	3.2	mg/L	0.950	PJS	11/16/2004	
Chloride	SM 4500 CL(-)-B	9.75	mg/L	3.00	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	JRH	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	0.0393	mg/L	0.0100	JRH	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/24/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/29/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	JRH	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	ND	mg/L	0.100	JRH	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.0854	mg/L	0.00700	JRH	11/17/2004	

Sample: 002 CDM-MW-2

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 002 CDM-MW-2
(Continued)Date: 11/15/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 002 CDM-MW-2
(Continued)

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropane	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5874A
 ND = Not Detected PQL = Practical Quantitation Limit

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Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 002 CDM-MW-2
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		106	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		104	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		95.2	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	53	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/23/2004	
Alkalinity	2320B SM 18TH, 1992	612.85	mg/L	50	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	692	mg/L	3	PJS	11/16/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	3.1	mg/L	0.950	PJS	11/16/2004	
Chloride	SM 4500 CL(-)-B	70.98	mg/L	6.0	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	JRH	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	1.83	mg/L	0.0100	JRH	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/24/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/29/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	JRH	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	33.9	mg/L	0.100	JRH	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.131	mg/L	0.00700	JRH	11/17/2004	

Sample: 003 CDM-MW-2A
Date: 11/16/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 003 CDM-MW-2A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA089 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974

ND = Not Detected PQL = Practical Quantitation Limit

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Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 003 CDM-MW-2A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		108	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGAT)		104	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		93.7	%		NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974

ND = Not Detected PQL = Practical Quantitation Limit

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Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 003 CDM-MW-2A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Chemical Oxygen Demand	5220D SM 18TH, 1992	ND	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/23/2004	
Alkalinity	2320B SM 18TH, 1992	70.56	mg/L	5	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	97	mg/L	3	PJS	11/18/2004	
Sulfate	EPA 375.4	3.79	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	1.1	mg/L	0.950	PJS	11/18/2004	
Chloride	SM 4500 CL(-)-B	4.25	mg/L	3.00	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	JRH	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	ND	mg/L	0.0100	JRH	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/24/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/29/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	JRH	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	ND	mg/L	0.100	JRH	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.0875	mg/L	0.00700	JRH	11/17/2004	

Sample: 004 CDM-MW-4
Date: 11/15/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 004 CDM-MW-4
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl Vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit

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Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 004 CDM-MW-4
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHANE		109	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATE)		104	%		NAC	11/22/2004	
4-BROMOFLUOROBENZENE		95.1	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	105	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	0.02	mg/L	0.005	SUB	11/23/2004	
Alkalinity	2320B SM 18TH, 1992	566.50	mg/L	50	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	633	mg/L	3	PJS	11/18/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 004 CDM-MW-4
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	3.0	mg/L	0.950	PJS	11/16/2004	
Chloride	SM 4500 CL(-)-B	71.48	mg/L	6.0	PJS	11/22/2004	
RCRA 8 Metals, Dissolved							00/00/0000
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	JRH	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	1.37	mg/L	0.0100	JRH	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/24/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/29/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	JRH	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	33.4	mg/L	0.100	JRH	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.209	mg/L	0.00700	JRH	11/17/2004	

Sample: 005 CDM-MW-4A
Date: 11/15/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260							
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 005 CDM-MW-4A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 005 CDM-MW-4A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		109	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		103	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		99.2	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	30	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/23/2004	
Alkalinity	2320B SM 18TH, 1992	301.58	mg/L	20	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	871	mg/L	3	PJS	11/16/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	1.2	mg/L	0.950	PJS	11/16/2004	
Chloride	SM 4500 CL(-)-B	349.89	mg/L	30.0	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	JRH	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 005 CDM-MW-4A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Barium, Dissolved	EPA 200.7	0.116	mg/L	0.0100	JRH	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/24/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/29/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	JRH	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	0.278	mg/L	0.100	JRH	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	3.92	mg/L	0.00700	JRH	11/17/2004	

Sample: 006 DUP-1
Date: 11/15/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 006 DUP-1
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 59744
 ND = Not Detected PQL = Practical Quantitation Limit

Page: 16 of 20



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 006 DUP-1
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHANE		113	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGAT)		107	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		101	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	51	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/23/2004	
Alkalinity	2320B SM 18TH, 1992	661.26	mg/L	50	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	613	mg/L	3	PJS	11/16/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	3.1	mg/L	0.950	PJS	11/16/2004	
Chloride	SM 4500 CL(-)-B	69.18	mg/L	6.0	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	JRH	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	1.38	mg/L	0.0100	JRH	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/24/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/29/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205(NJ: 5974(

ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 006 DUP-1
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	JRH	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	34.3	mg/L	0.100	JRH	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.193	mg/L	0.00700	JRH	11/17/2004	

Sample: 007 TRIP BLANK
Date: 11/15/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

Sample: 007 TRIP BLANK
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromofom	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10962 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00215

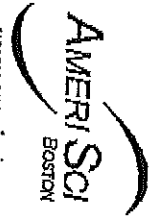
Sample: 007 TRIP BLANK
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		115	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGAT)		109	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		103	%		NAC	11/22/2004	

To the best of my knowledge this report is true and accurate.

Authorized By:

John J. Sulkowski, Lab Director



CHAIN OF CUSTODY RECORD

AMERISCI BOSTON
 8 School Street - Weymouth, MA 02189
 888.724.5221 Toll Free
 781.387.9334 Phone ~ 781.387.7642 Fax

AMERISCI JOB NO: _____
 DUE DATE: 1 DAY 2 DAY 3 DAY 5 DAY 7 DAY 10 DAY
 DATA PACKAGES: _____
 PAGE 1 OF 1
 TEMP UPON RECEIPT: 11.4°C
 PO.# _____

COMPANY: CDM		ADDRESS: 20 Houshnee ST, Cambridge MA 02139	
PHONE: (617) 452-6000	FAX 1: (617) 452-8576	FAX 2: _____	_____
CLIENT: Ww Recora	EMAIL: _____	PROJECT NUMBER: _____	PROJECT SYM: MA
CONTRACT: W/H/Pharm L.P	PROJECT NAME: MATRIX A-WATER S-SOL/SOLIDS SL-SLUDGE OIL-OIL CH-CHIPS	CONTAINER: P-PLASTIC G-GLASS V-VIOA	SYNOPSIS: _____
LAB ID: _____	CHAIN SAMPLE IDENTIFICATION: _____	CONTAINER INFORMATION: _____	PRESERVATIVES: _____
1 CDM-HW-1A	A	9/12/04	15/04
2 CDM-HW-2	1	11/15/04	8
3 CDM-HW-2A	1	11/15/04	8
4 CDM-HW-4	1	11/15/04	8
5 CDM-HW-4A	1	11/15/04	8
6 Dup-1	1	11/15/04	8
7 TRIOBlanks	1	11/15/04	8

SAMPLED BY: (PRINT) **FRED SANTORO** DATE: **11/15/04** RECEIVED BY: (PRINT) _____ DATE: _____
 (SIGN) **Fred Santoro** TIME: _____ RECEIVED BY: (PRINT) _____ DATE: _____
 REQUISISHED BY: (PRINT) **RESORCE A Santoro** DATE: **11/15/04** RECEIVED BY: (PRINT) _____ DATE: _____
 (SIGN) **RESORCE A Santoro** TIME: **18:30** RECEIVED BY: (PRINT) _____ DATE: _____
 REQUISISHED BY: (PRINT) _____ DATE: _____ RECEIVED BY: (PRINT) _____ DATE: _____
 (SIGN) _____ TIME: _____ RECEIVED BY: (PRINT) _____ DATE: **11/15/04**
18:30

VOC's 8260
COD's
TEN
WATCHER:
ALKIDS, SO4, ND's, Ch
METHS (Field Filtered)
PCRA 844

Notes: _____



AmeriSci Boston
 Eight School Street
 Weymouth, MA 02189
 781-337-9334

Laboratory Report

Report Date 12/07/2004
 Workorder No. 0411-00251

Customer: Camp Dresser & McKee
 One Cambridge Place
 50 Hampshire Street
 Cambridge, MA 02139

Attention: Mr. Vin Recchia

Subject: WALTHAM LF

Sample: 001 MW-3A
 Date: 11/16/2004
 Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromo-chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 001 MW-3A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL= Practical Quantification Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 001 MW-3A
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		119	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		104	%		NAC	11/22/2004	
4-BROMOFLUOROENZEN		102	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	ND	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/30/2004	
Alkalinity	2320B SM 18TH, 1992	180.87	mg/L	20	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	299	mg/L	3	PJS	11/18/2004	
Sulfate	EPA 375.4	17.15	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	ND	mg/L	0.950	PJS	11/18/2004	
Chloride	SM 4500 CL(-)-B	29.14	mg/L	3.00	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	VEN	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	0.196	mg/L	0.0100	VEN	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/30/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	VEN	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/30/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	VEN	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	0.132	mg/L	0.0300	VEN	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	0.164	mg/L	0.00500	VEN	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	0.897	mg/L	0.100	VEN	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.490	mg/L	0.00700	JRH	11/30/2004	

Sample: 002 FB-1

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 002 FB-1
(Continued)

Date: 11/16/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 002 FB-1
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 002 FB-1
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		114	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		103	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		102	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	ND	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/30/2004	
Alkalinity	2320B SM 18TH, 1992	7.73	mg/L	5	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	96	mg/L	3	PJS	11/18/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	ND	mg/L	0.950	PJS	11/18/2004	
Chloride	SM 4500 CL(-)-B	9.75	mg/L	3.00	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	VEN	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	ND	mg/L	0.0100	VEN	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/30/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	VEN	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/30/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	VEN	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	VEN	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	VEN	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	ND	mg/L	0.100	VEN	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	ND	mg/L	0.00700	VEN	11/17/2004	

Sample: 003 SW-(COVE-1)
Date: 11/16/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205(NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 003 SW-(COVE-1)
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 003 SW-(COVE-1)
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		116	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		103	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		96.4	%		NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 003 SW-(COVE-1)
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Chemical Oxygen Demand	5220D SM 18TH, 1992	51	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/30/2004	
Alkalinity	2320B SM 18TH, 1992	571.65	mg/L	50	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	1061	mg/L	3	PJS	11/18/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	2.1	mg/L	0.950	PJS	11/18/2004	
Chloride	SM 4500 CL(-)-B	362.39	mg/L	30.0	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	0.0132	mg/L	0.0100	JRH	11/22/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	0.927	mg/L	0.0100	JRH	11/22/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	RPL	11/30/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/22/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	JRH	11/22/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/30/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/22/2004	
Zinc, Dissolved	200.7, EPA 1987	0.0529	mg/L	0.0300	JRH	11/22/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	JRH	11/22/2004	
Iron, Dissolved	200.7, EPA 1987	28.1	mg/L	0.100	JRH	11/22/2004	
Manganese, Dissolved	200.7, EPA 1987	0.650	mg/L	0.00700	JRH	11/22/2004	

Sample: 004 SW-(COVE-2)
Date: 11/16/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 004 SW-(COVE-2)
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	ND	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 004 SW-(COVE-2)
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHANE		118	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATE)		106	%		NAC	11/22/2004	
4-BROMOFLUOROBENZENE		107	%		NAC	11/22/2004	
Chemical Oxygen Demand	5220D SM 18TH, 1992	101	mg/L	20	PJS	11/19/2004	
Total Cyanide	9010/335.3	ND	mg/L	0.005	SUB	11/30/2004	
Alkalinity	2320B SM 18TH, 1992	783.83	mg/L	50	PJS	11/18/2004	
Total Dissolved Solids	2540C SM 18TH, 1992	1150	mg/L	3	PJS	11/18/2004	
Sulfate	EPA 375.4	ND	mg/L	2.00	EEH	11/18/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 004 SW-(COVE-2)
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Nitrogen, Nitrate	SM 18-20 4500-NO3 D	ND	mg/L	0.950	PJS	11/18/2004	
Chloride	SM 4500 CL(-)-B	247.42	mg/L	30.0	PJS	11/22/2004	
RCRA 8 Metals, Dissolved						00/00/0000	
Arsenic, Dissolved	200.7, EPA 1987	ND	mg/L	0.0100	VEN	11/17/2004	
Selenium Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00500	NAP	11/24/2004	
Barium, Dissolved	EPA 200.7	0.886	mg/L	0.0100	VEN	11/17/2004	
Lead, Dissolved, Furnace	EPA 200.9	ND	mg/L	0.00300	NAP	11/19/2004	
Cadmium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00110	JRH	11/30/2004	
Chromium, Dissolved	200.7, EPA 1987	ND	mg/L	0.00600	VEN	11/17/2004	
Mercury, Dissolved	EPA 245.2	ND	mg/L	0.000200	NAP	11/30/2004	
Silver, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	VEN	11/17/2004	
Zinc, Dissolved	200.7, EPA 1987	ND	mg/L	0.0300	VEN	11/17/2004	
Copper, Dissolved	200.7, EPA 1987	ND	mg/L	0.00500	VEN	11/17/2004	
Iron, Dissolved	200.7, EPA 1987	15.7	mg/L	0.100	VEN	11/17/2004	
Manganese, Dissolved	200.7, EPA 1987	0.463	mg/L	0.00700	JRH	11/30/2004	

Sample: 005 TRIP BLANK
Date: 11/16/2004
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Organics 8260					NAC	11/22/2004	
Dichlorodifluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Chloride	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
Chloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichlorofluoromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Acrolein	EPA 8260B	ND	ug/L	20	NAC	11/22/2004	
Acetone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,1-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Iodomethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Disulfide	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methylene Chloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 005 TRIP BLANK
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Acrylonitrile	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
Methyl-Tert-Butyl-Ether	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Vinyl Acetate	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Butanone-(MEK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
cis-1,2-Dichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chloroform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1-Dichloropropene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Carbon Tetrachloride	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Benzene	EPA 8260B	4.92	ug/L	0.7	NAC	11/22/2004	
1,2-Dichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Trichloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Methyl-2-Pentanone (MIBK)	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
2-Chloroethyl vinyl ether	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
cis-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Toluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
trans-1,3-Dichloropropene	EPA 8260B	ND	ug/L	1.0	NAC	11/22/2004	
Bromodichloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2-Trichloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dibromoethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Hexanone	EPA 8260B	ND	ug/L	25	NAC	11/22/2004	
1,3-Dichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Tetrachloroethylene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Dibromochloromethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Chlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,1,2-Tetrachloroethane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Ethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
O-XYLENE	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
M & P-XYLENE	EPA 8260B	ND	ug/L	10	NAC	11/22/2004	
Styrene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
 ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 005 TRIP BLANK
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Bromoform	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Isopropylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,1,2,2-Tetrachloroethane	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2,3-Trichloropropane	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Propylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Bromobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
2-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3,5-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Chlorotoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
tert-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,4-Trimethylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
sec-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
4-Isopropyltoluene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,3-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,4-Dichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
n-Butylbenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2-Dichlorobenzene	EPA 8260B	ND	ug/L	2.0	NAC	11/22/2004	
1,2-Dibromo-3-Chloropropan	EPA 8260B	ND	ug/L	0.2	NAC	11/22/2004	
1,2,4-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Hexachlorobutadiene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
Naphthalene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
1,2,3-Trichlorobenzene	EPA 8260B	ND	ug/L	5.0	NAC	11/22/2004	
DIBROMOFLUOROMETHAN		111	%		NAC	11/22/2004	
TOLUENE-D8 (SURROGATI		104	%		NAC	11/22/2004	
4-BROMOFLUOROBENZEN		99.1	%		NAC	11/22/2004	

Sample: 006 SED-1
Date: 11/16/2004
Matrix: SEDIMENT

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Lead	6010B, SW-846	412	mg/Kg	7.68	JRH	11/18/2004	
Percent Solids		35.5	%		TLL	11/18/2004	



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 007 SED-2
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	114	mg/Kg	3.74	JRH	11/18/2004	
Percent Solids		76.3	%		TLL	11/18/2004	

Sample: 008 SED-3
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	164	mg/Kg	6.28	JRH	11/18/2004	
Percent Solids		45.1	%		TLL	11/18/2004	

Sample: 009 SED-4
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	552	mg/Kg	2.30	JRH	11/18/2004	
Percent Solids		26.0	%		TLL	11/18/2004	

Sample: 010 SED-5
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	481	mg/Kg	4.13	JRH	11/18/2004	
Percent Solids		66.7	%		TLL	11/18/2004	

Sample: 011 SED-6

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:205C NJ: 5974
ND = Not Detected PQL= Practical Quantitation Limit



Customer: Camp Dresser & McKee

Workorder No. 0411-00251

Sample: 011 SED-6
(Continued)

Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	673	mg/Kg	2.88	JRH	11/18/2004	
Percent Solids		20.6	%		TLL	11/18/2004	

Sample: 012 SED-7
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	332	mg/Kg	3.24	JRH	11/18/2004	
Percent Solids		18.5	%		TLL	11/18/2004	

Sample: 013 SED-8
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	313	mg/Kg	3.48	JRH	11/18/2004	
Percent Solids		17.2	%		TLL	11/18/2004	

Sample: 014 SED-9
Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	238	mg/Kg	3.46	JRH	11/18/2004	
Percent Solids		17.1	%		TLL	11/18/2004	

Sample: 015 SED-10

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 5974
ND = Not Detected PQL = Practical Quantitation Limit



Customer: Camp Dresser & McKee

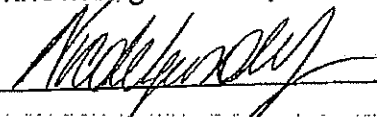
Workorder No. 0411-00251

Sample: 015 SED-10
(Continued)

Date: 11/16/2004
Matrix: SEDIMENT

<u>Parameter</u>	<u>Method</u>	<u>Results</u>	<u>Units</u>	<u>PQL</u>	<u>Analyst</u>	<u>Analysis Date</u>	<u>Qual</u>
Lead	6010B, SW-846	102	mg/Kg	7.44	JRH	11/18/2004	
Percent Solids		36.0	%		TLL	11/18/2004	

To the best of my knowledge this report is true and accurate.

Authorized By: 
John J. Sulkowski, Lab Director



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COMPANY: COM

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PHONE: 617-452-6000 FAX 1: 617-452-8576 FAX 2: _____

CLIENT CONTACT: VIN REGALIA EMAIL: _____

PROJECT NUMBER: _____ PROJECT STATE: _____

MATRIX: A-WATER S-SOIL/SOLIDS SL-SLUDGE OIL-OIL CH-CHIPS
 WIP-WIPES C-CASSETTES W-WASTE O-OTHER

CONTAINER: P-PLASTIC
 G-GLASS V-VOA

LAB ID	CLIENT SAMPLE IDENTIFICATION	MATRIX	CONTAINER			SAMPLING INFORMATION		
			SIZE	TYPE	#	DATE	TIME	TECH
1	NW-3A	A	P/V	4/2	4/16/04	F/P/A		
2	FB-1							
3	SWI-(CONC-1)							
4	SWI-(CONC-2)							
5	TRIP/BLACK							

LAB ID	CLIENT SAMPLE IDENTIFICATION	MATRIX	SIZE	TYPE	#	DATE	TIME	TECH	PRESERVATIVES	GRAB (G) OR COMPOSITE (C)	SAMPLE PH AT LOGIN	Notes:
2	FB-1											
3	SWI-(CONC-1)											
4	SWI-(CONC-2)											
5	TRIP/BLACK											

Vols 8960
 LOD'S
 TEN
 WET CHEM
 MTK TDS, SOY, NDB, CH
 MEMS (FIELD P. ITEMS)
 PLANT 844

SAMPLED BY: (PRINT)	DATE:	TIME:	RECEIVED BY: (PRINT)	DATE:	TIME:
(Sign) <u>Fred Santero</u>	11/16/04		(Sign) _____		
RELINQUISHED BY: (PRINT)	DATE:	TIME:	RECEIVED BY: (PRINT)	DATE:	TIME:
(Sign) <u>Fred Santero</u>	11/16/04	1850	(Sign) _____		
RELINQUISHED BY: (PRINT)	DATE:	TIME:	RECEIVED FOR LABORATORY BY: (PRINT)	DATE:	TIME:
(Sign) <u>Fred Santero</u>			(Sign) <u>Angela Maguire</u>	11/16/04	18:55

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COMPANY: **CDM**

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FAX 1: **(617) 452-8576**

FAX 2:

CLIENT: **UN Recycle**

EMAIL:

PROJECT NAME: **Waltham LTR**

PROJECT NUMBER:

PROJECT STATE: **MA**

MATRIX: **A-WATER S-SOIL/SOLIDS SL-SLUDGE OIL-OIL CH-CHIPS**

CONTAINER: **P-PLASTIC G-GLASS V-VOA**

CONTAINER INFORMATION:

LAB ID	CLIENT SAMPLE IDENTIFICATION	MATRIX	CONTAINER		SAMPLING INFORMATION			PRESERVATIVES	GRAB (G) OR COMPOSITE (C)	SAMPLER PH AT LOG IN	Notes:
			SIZE	TYPE	#	DATE	TIME				
6	SED-1	S	G	1	11/14/04	FS/PA	G				
7	SED-2										
8	SED-3										
9	SED-4										
10	SED-5										
11	SED-6										
12	SED-7										
13	SED-8										
14	SED-9										
15	SED-10										

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PAGE **2** OF **7**

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(SIGN) **[Signature]** TIME

RELINQUISHED BY: (PRINT) **FRED SANTORO** DATE: **11/16/04** RECEIVED BY: (PRINT)

(SIGN) **[Signature]** TIME **1850**

RELINQUISHED BY: (PRINT) **[Signature]** DATE: RECEIVED FOR LABORATORY BY: (PRINT)

(SIGN) **[Signature]** TIME

DATE **11/16/04** TIME **18 55**

CLIENT: <u>CDM</u>	WORKORDER: <u>0411-251</u>
CLIENTS JOB: <u>Waltham L.F.</u>	RECEIVED BY: <u>[Signature]</u>
RECEIVED DATE: <u>11/16/07</u>	SHIPPING METHOD: <u>Dropoff</u>
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"No" responses must be explained in the comment section below.

Checklist	YES	NO	NA
Were custody seals on shipping container(s) intact? Check "NA" if no seals, or if containers were hand delivered.			X
Were Chain of Custody Forms included with the samples?	X		
Were Chain of Custody Forms properly filled out (ink, signed, etc.)	X		
Were all containers received in good condition (Check for breakage/leaks)?	X		
Were all containers labeled with required information(Sample Id, date, signed, analysis, preservation)?	X		
Were the correct containers used for the tests indicated?	X		
Were proper preservation techniques indicated?	X		
Were samples received within holding times? If "NO" nonconformance form is required.	X		
Were all VOA bottles checked for the presence of air bubbles? If bubbles were found please note in the comment section.	X		
Were samples in direct contact with wet ice? If "NO" check one: <input type="checkbox"/> Blue Ice <input checked="" type="checkbox"/> No Ice		X	
Is sample temperature recorded? If "NO" check one: <input type="checkbox"/> Unable to record <input checked="" type="checkbox"/> Temp taken near samples	X		
Were pHs of samples checked and recorded on the COC forms?	X		
Did the laboratory accept samples?	X		
Will samples be subcontracted? If "yes" list subcontractor and tests in specified sections below.	X		
Subcontractor: <u>Phoenix</u>	Date Sent Out: <u>11/18/07</u>		
Analyses Sent: <u>EN</u>			

Login Technician: <u>(MP)</u>	Login Review:
Comments:	

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February 27, 2006

Mr. John Carrigan
Section Chief, Solid Waste Section
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01851

Subject: Woerd Avenue Landfill
Waltham, Massachusetts
Addendum to Comprehensive Site Assessment
Transmittal No. W008254

Dear Mr. Carrigan:

On behalf of the City of Waltham, Camp Dresser & McKee Inc. (CDM) has prepared this Addendum to the Comprehensive Site Assessment (CSA) for the Woerd Avenue Landfill located in Waltham, Massachusetts. CDM prepared and submitted the CSA Report for the Woerd Avenue Landfill in October 1999. The CSA summarized information gathered during field investigations, identified potential contamination pathways, and provided a quantitative risk assessment and recommendations for environmental monitoring and post-closure uses for the site. The Massachusetts Department of Environmental Protection (MassDEP) issued comments on the CSA in a letter dated March 29, 2002. The letter conditionally approved the CSA, provided that issues identified in the letter were addressed and an addendum to the CSA was submitted. CDM responded to MassDEP's comments in a letter dated October 30, 2003, and proposed additional tasks to be undertaken to satisfy the conditions of MassDEP's approval of the CSA. MassDEP subsequently approved CDM's proposal for addressing MassDEP's comments in a letter dated March 30, 2004.

The scope of work outlined in CDM's response to comments included the following activities:

- Review of documents filed with the MassDEP under the Massachusetts Contingency Plan (MCP) for nearby parcels.
- Review of historical plans, aerial photographs, and interviews related to the historic filling operations in the vicinity of the landfill in Waltham and in Newton to complete a



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preliminary estimate of the approximate limit of landfilled waste at the Woerd Avenue Landfill.

- If necessary, preparation of a sampling and analysis plan for a field program on abutting properties to confirm the extent of landfilled waste.
- Collection of an additional round of groundwater samples from on-site monitoring wells and surface water samples for laboratory analysis.
- Analysis of landfill gas in existing wells located along the perimeter of the Woerd Avenue Landfill.
- Collection of ten sediment samples from locations within Cram's Cove immediately adjacent to the landfill for laboratory analysis.
- Preparation of a report summarizing the findings of the additional field investigations.

The tasks outlined in the scope of work have been completed. This letter report has been prepared to summarize the findings of the document reviews and the results of the additional field investigations.

Site Description

The Woerd Avenue Landfill, a property owned by the City of Waltham, is located in southern Waltham adjacent to the Waltham/Newton municipal boundary as shown on the Site Locus Plan provided as Figure 1. The landfill is located on a parcel of land surrounded by Rumford Avenue, Woerd Avenue, Crescent Street, and Moody Street. The site encompasses approximately 8.7 acres and abuts the former Rumford Avenue Incinerator site (currently an office building) to the south, Cram's Cove to the west, the industrial property formerly owned by Parker Hannifin to the north, Norumbega Terrace to the northeast, and the Moody Street Playground (also owned by the City) directly to the east.

The landfill is heavily wooded except for several paths and a small clearing near the center of the site. The landfill has fairly uniform slopes that range between 20 and 25 percent to grade. In proximity to the Woerd Avenue Landfill, there are two solid waste landfills in Newton: the Rumford Avenue and Pine Street landfills. The Pine Street Landfill ceased operation in the early 1960s and is not subject to the Solid Waste Management Regulations. The Rumford Avenue Landfill was capped by the City of Newton in 1997.



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MassDEP File Review

CDM reviewed documents filed with MassDEP for properties located in the vicinity of the Woerd Avenue Landfill that are listed as confirmed disposal sites in accordance with the MCP. The intent of this work was to determine if abutting properties have been adequately evaluated and assessed and that any necessary remedial actions have been implemented. The sites reviewed included 48 Woerd Avenue, 74 Rumford Avenue, 77 Rumford Avenue, 845 Moody Street, and 945 Moody Street. According to MassDEP's files, the Release Tracking Numbers (RTNs) for the sites have been closed with the submittals of Response Action Outcomes (RAOs) at each of the sites with the exception of 74 Rumford Avenue. The locations of the sites reviewed are presented on Figure 2. As shown on the figure, three sites abut the Woerd Avenue Landfill; 48 Woerd Avenue to the northwest, 74 Rumford Avenue to the west and 945 Moody Street to the east. A description of the investigative and remedial activities conducted for these three sites is presented in detail below.

The summaries presented below are based solely on documents contained in the MassDEP's files.

48 Woerd Avenue

The former Parker Hannifin facility located at 48 Woerd Avenue abuts the Woerd Avenue Landfill to the north. The property consists of approximately 11.5 acres of land and is bound by residential properties to the north, Cram's Cove to the south, and Woerd Avenue to the southeast. The Charles River is located directly west of the site. A site plan of the property is presented as Figure 3.

From 1913 to 1984 the property was owned by the W.H. Nichols Company, a manufacturer of machine parts. The original manufacturing facility included the complex of buildings on the northeast portion of the property and two former buildings located south of Cove Street. The property was purchased in 1984 by the Parker Hannifin Corporation, a manufacturer of metal parts for commercial, computer, and aerospace industries. Currently, on-site buildings are used for light manufacturing and commercial office space.

Historic records indicate that the following materials were used in manufacturing operations and stored at the site: metals for etching; polychlorinated biphenyls (PCBs); anhydrous ammonia; hydrochloric acid; nitric acid; sodium hydroxide; mineral spirits; lubricating oils; No. 2 fuel oil; machine oil; waste oil; propane; miscellaneous cleaners; parts cleaning solvents; and water based coolants.



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Oil and hazardous material were formerly stored in one aboveground storage tank (AST) and ten underground storage tanks (USTs). The AST was 500 gallons in size and contained anhydrous ammonia. The USTs contained the following materials: mineral spirits (one 1,000-gallon UST); No. 2 fuel oil (one 1,000-gallon UST, one 8,000-gallon UST, one 15,000-gallon UST); heating oil (two 10,000-gallon USTs); waste machine oil (two USTs of unknown quantity); water based coolants (one 1,000-gallon UST); and waste oil (one 3,000-gallon UST). According to the documents reviewed, all tanks were removed as of 1991.

The Parker Hannifin property was first identified by the MassDEP as a Location to be Investigated on July 12, 1990, based on the discovery of volatile organic compounds (VOCs), metals, and polycyclic aromatic hydrocarbons (PAHs) detected in soil and shallow groundwater. MassDEP Case Number 3-3260 was assigned. A Release Abatement Measure (RAM) was completed that consisted of the excavation and disposal of 40 cubic yards of total petroleum hydrocarbon-impacted soil.

A No. 2 fuel oil release was discovered during the removal of an UST in April 1994; RTN 3-10944 was assigned. Historic reports indicated that remedial actions were undertaken and a RAO statement for RTN 3-10944 was filed in August 1994. The nature of the remedial actions was not documented.

According to the MassDEP's Bureau of Waste Site Cleanup (BWSC) site list database, RTN 3-14572 was assigned in December 1996 for another release of hazardous material. Further description of the nature and extent of this release was not presented in any of the historic reports reviewed. In April 1996, Parker Hannifin filed a downgradient property status (DPS) for this RTN based on concentrations of dissolved silver in groundwater samples collected from monitoring wells located near the southeast property boundary that abuts the Woerd Avenue Landfill. A hydrogeologic study was conducted by TWM Northeast/Normandeau, Inc. (TWM) for Parker Hannifin in 1990 that determined that the Parker Hannifin property is located hydraulically downgradient of the Woerd Avenue Landfill.

In August 1996, a Class A-3 RAO was submitted to the MassDEP for Case Number 3-3260, along with an Activity and Use Limitation (AUL). The AUL was applied to two portions of the property, and prevents future site development for residential, outdoor recreational, child care, and other use restrictions.

On August 13, 1998, the MassDEP was notified of a release of 15 gallons of oil. RTN 3-17156 was assigned to this release. According to the MassDEP BWSC site list database, a RAO was



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submitted for RTN 3-17156; however, the historic reports reviewed did not indicate the nature of the remedial actions.

In December 1998, RTN, 3-18026 was assigned to the site. Vinyl chloride was detected in on-site monitoring well MW-11 at a concentration of 424 ug/L during sampling conducted for a real estate transfer assessment. A confirmatory groundwater sample collected on December 29, 1998, contained vinyl chloride at a concentration of 2,640 ug/L which is above the Reportable Concentration of 2 ug/L. As shown on Figure 3, MW-11 is located in proximity to a former UST that contained mineral spirits. Vinyl chloride was not detected in groundwater samples collected from MW-11 prior to December 1998.

In 1999, a soil vapor extraction (SVE) and air sparge (AS) system was installed to prevent the volatilization and migration of vinyl chloride and associated compounds into the indoor air of the on-site buildings located on the northern portion of the property. The SVE/AS system was installed under a RAM and was also the remedy selected in the Phase III Remedial Action Plan. The system was started on April 19, 1999 and operated until December 6, 1999.

A Class A-2 RAO and Method 3 Risk Assessment were submitted for RTN 3-18026 in May 2000. The RAO and Risk Assessment concluded that the SVE/AS system was successful in reducing the concentrations of VOCs in groundwater. While the most recent groundwater data collected in 2000 indicated that vinyl chloride was present in excess of GW-2 standards, it did not exceed the MCP Upper Concentration Limits (UCLs) and data indicated a decreasing trend. Institutional controls that limit the use of impacted soil at the property have been established by the AUL that was implemented in 1996, restricting land use to industrial/commercial purposes. The Risk Assessment concluded that a condition of No Significant Risk was achieved for the site.

74 Rumford Avenue

The property located at 74 Rumford Avenue abuts the Woerd Avenue Landfill to the west. The site is approximately 1.3 acres and consists of a vacant three-story brick building and a small paved area to the north of the building. The remainder of the property is heavily vegetated. A site plan of 74 Rumford Avenue is presented as Figure 4. The site is abutted by a residence to the northwest, Cram's Cove to the northeast, Woerd Avenue Landfill to the east, and manufacturing companies to the southwest and southeast of the site.

The property has been developed for manufacturing purposes since 1897. O'Hara Waltham Dial Company, a manufacturer of dials and enameled novelties occupied the property from approximately 1903 to the 1950s. From the 1950s to the 1980s, the property was occupied by



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R.W. LeBaron, Inc., manufacturers of traffic signal lights. Most recently the property was occupied by Pantos Corporation, manufacturers of canvas bags and other canvas products.

Bulk quantities of oil or hazardous materials are not currently used or stored at the site. Two USTs previously existed on the site, including one 3,000-gallon No. 2 fuel oil UST and one 2,000-gallon UST of unknown contents.

Two RTNs have been assigned to the site, RTN 3-15884 and 3-16699. On January 7, 1998, the MassDEP was notified of the detection of arsenic, lead, and antimony in soil above Reportable Concentrations during a subsurface investigation. RTN 3-15884 was assigned. On April 14, 1998, the MassDEP was notified of a release of petroleum hydrocarbons to soil and groundwater during the removal of the No. 2 fuel oil UST. Approximately 21 cubic yards of impacted soil were excavated and disposed of off site. RTN 3-16699 was assigned.

Two notices of non-compliance (NONs) were issued by MassDEP dated October 13, 1999 and October 28, 1999 for failure to meet MCP reporting requirements. According to the MassDEP file review, the violations were addressed. On April 21, 2000, MassDEP issued a Tier IB Permit for RTN 3-15884 based on a numerical ranking score of 490. The permit has an effective date of May 12, 2000 and expired on May 12, 2005. The site has also been designated as a Public Involvement Plan (PIP) site.

Phase I and Phase II investigations conducted at the site determined that metals and petroleum compounds were present in fill materials encountered throughout the site. The extent of petroleum impacts associated with the UST was confined to a limited area. Metals concentrations in groundwater were generally below applicable standards, with the exception of monitoring well MW-1, located closest to Cram's Cove, which exhibited a lead concentration above the GW-3 standard. Petroleum impacts to groundwater are limited to the former UST area. The area of the property located along Rumford Avenue has not been impacted by metals or petroleum compounds.

As part of Phase I and II investigations, eleven sediment samples were collected from the 74 Rumford Avenue property at the edge of Cram's Cove. A Method 3 Risk Assessment prepared for the site as part of the Phase II Investigation determined that metals concentrations in sediment on the 74 Rumford Avenue property are similar to upgradient samples within the cove and adjacent to the Woerd Avenue Landfill. Because metals concentrations in sediment on the 74 Rumford Avenue property are consistent with local conditions, further environmental risk characterization could not distinguish between impacts due to site contamination due to local conditions. Therefore the Risk Assessment



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determined that remedial actions to address sediment and surface water were not required because the 74 Rumford Avenue property did not pose a discernible incremental increased risk. Sediment quality in Cram's Cove is discussed in further detail below under the heading Sediment Sampling.

During May, June, and August 2003 a supplemental site investigation was performed to further evaluate the extent of metals impacts including the advancement of three soil borings and excavation of one test pit within the footprint of the on-site building, and the excavation of ten test pits throughout the remainder of the property. Soil samples collected from the soil borings and test pits were analyzed for lead, arsenic, and antimony.

The results of the supplemental investigation combined with the results of the Phase I and Phase II investigations were used to define the nature and extent of contamination at the site. Impacts to soil at the site are limited to the fill material encountered throughout the property. Analytical results of soil samples collected from the naturally deposited soil encountered beneath the fill indicates that naturally deposited soils have not been impacted. Lead, arsenic, and antimony have been detected in soil samples collected from the fill material with the highest metals concentrations located adjacent to Cram's Cove, where concentrations exceeded UCLs. Lower concentrations of these metals, but typically in excess of the MCP Method 1 standards, were detected in soil samples collected from the central portions of the site, while soil samples collected from the southern portion of the site did not exceed MCP Method 1 standards.

The selected remedy for addressing the metals contaminants found in site soils was an engineered barrier with an AUL to ensure the continued integrity of the engineered barrier and pavement. The Phase IV report (McPhail Associates, Inc., draft August 2003) detailed the proposed installation of the selected remedy as shown on Figure 4. The engineered barrier was planned to be implemented as part of site redevelopment into a multi-residential community. At the time of the Phase IV submittal, redevelopment plans included renovation of the existing three-story building into a multi-unit residence and construction of two new multi-unit residences. Other areas of the site were proposed to be redeveloped to include a swimming pool and patio and paved parking areas. A one level, below grade parking garage was also proposed. CDM conducted a site visit on May 9, 2005. There were no indications that the engineered barrier had been installed or any redevelopment of the property had been completed.



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945 Moody Street

The property located at 945 Moody Street is currently occupied by Sun Auto Sales, Inc., West End Auto Body, and a towing operation. The property encompasses an area of approximately 65,580 square feet and consists of a 15,879 square foot commercial building/auto repair garage and associated paved and unpaved parking areas. A site plan is provided as Figure 5. Reports contained in the MassDEP file indicate that bulk storage of oil or hazardous materials at the site consisted of the following: two 330-gallon No. 2 fuel oil ASTs located in the basement of the site building, one 55-gallon drum of used antifreeze located within the garage, one 200-gallon used motor oil AST in the oil changing area, and one 350-gallon bulk motor oil AST. A 1,000-gallon No. 2 fuel oil UST was formerly located in the eastern portion of the site and a 1,000-gallon gasoline UST was located in the northern portion of the site. The No. 2 fuel oil UST was reportedly removed in 1996 and post-excavation soil samples did not contain total petroleum hydrocarbon (TPH) compounds above laboratory detection limits. The reports contained in the MassDEP file did not provide a date of the removal of the gasoline UST.

Phase I and supplemental soil investigations indicated that TPH concentrations in excess of the Reportable Concentration of 500 mg/kg are present in the vicinity of the former 1,000-gallon gasoline UST, in soils adjacent to a hydraulic lift located within the building, and in surficial soil located in the western automobile storage area. A Method I Risk Characterization prepared for the site concluded that the TPH concentrations pose No Significant Risk of harm to safety, public health and welfare, or the environment for current uses of the site. A Class B-2 RAO and an AUL were filed on February 12, 1997. The AUL prohibits the disturbance of TPH impacted soil at the site. No analytical data for groundwater was available in the MassDEP file.

Extent of Landfilled Waste

Woerd Avenue Landfill

A preliminary evaluation of the extent of landfilled waste was conducted by reviewing historic aerial photographs, historic United States Geologic Survey (USGS) quadrangle maps, and test pit and soil boring logs from the Woerd Avenue Landfill and surrounding properties. The Woerd Avenue Landfill originally began as a small dump for disposal of coal ash from home heating furnaces around 1912. By 1935, approximately 35,000 tons of ash were dumped there annually as well as old cars. When the Waltham incinerator opened in 1946, the Woerd Avenue Landfill began accepting incinerator residue and other non-combustible waste. In the early 1970s, the City began to receive complaints about the condition of the landfill including vector problems, inadequate daily cover, improper disposal of refuse, inadequate



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maintenance, and general lack of cleanliness. On April 21, 1973, the City met the regulatory requirements in accordance with the State Department of Public Health and ceased operation of the landfill.

Historic USGS Quadrangle maps of the area of the Woerd Avenue Landfill were also reviewed. Two online images of historic maps were obtained from the University of New Hampshire's Dimond Library's Government Documents Department. Figure 6 is a portion of the 1903 Boston South Quadrangle and Figure 7 is a portion of the 1946 Newton Quadrangle. As shown on the maps, in 1903 the area immediately surrounding Cram's Cove to the north, east, and south is shown as wetlands. The current location of Norumbega Terrace appear to be in-place. The 1946 map illustrates that by this time, the area immediately to the northeast of Crams Cove is no longer designated as wetlands, indicating that the area had been filled. Note also that the area to the south of the Cove is still designated as wetlands and that the length of the Cove itself extends across the town boundary into the City of Newton; however, the width of the Cove appears smaller. Figure 8 presents a portion of the current (1987) USGS Boston South Quadrangle. This map illustrates that at the time this survey was conducted the overall size of the Cove is considerably smaller and the area immediately to the south of the Cove is no longer designated as wetlands. This map also illustrates contours designating the location of the landfill.

Review of the historic maps suggests that filling of the area immediately surrounding Cram's Cove likely occurred in the early 1900s. By 1946, the wetlands area to the northeast of the cove had been filled and by 1987 the area to the southwest and a portion of the Cove itself had been filled. Historic records indicate that the Woerd Avenue Landfill began accepting waste in 1912 though contour lines defining the edge of the landfill are not visible on the 1946 USGS quadrangle. The 1987 survey presents the limits of the landfill as they are currently observed.

Aerial photographs for the Woerd Avenue Landfill and surrounding area were reviewed for the years 1954, 1969, 1987, and 1995. As discussed, the landfill received waste from 1912 until the early 1970s. Although aerial photographs prior to the 1950s were not available, the landfill appears to retain the same general footprint throughout the years reviewed. The aerial photographs are included as Attachment A for reference.

In May 1998, CDM excavated a total of 23 test pits (TP-1 through TP-23) to determine the horizontal and vertical extent of landfilled waste. The locations of the test pits are shown on Figure 9. The test pits were excavated to depths ranging from 4 to 12 feet below ground surface (bgs) at approximately 100 foot intervals along the perimeter of the site. The extent of waste could not be determined. The test pits were performed as close to the property line as



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access would allow through the dense vegetation and steep slopes in this area. Heavy vegetation in the area surrounding the landfill perimeter precluded the excavation of additional test pits. The material encountered during the test pit excavations consisted of scrap metal, wood, asphalt, brick, concrete, ash, burned materials, and miscellaneous debris.

74 Rumford Avenue

Soil boring and test pits logs generated for the 74 Rumford Avenue property show fill materials consistent with the types of historic manufacturing operations conducted in the area. A total of 30 soil borings (B-1 through B-27 and B-A1, B-A3 and B-A4) and ten test pit (TP-1 through TP-10) logs were reviewed. The locations of the soil borings are shown on Figure 10 and the locations of the test pits are shown on Figure 11. The soil boring and test pit logs are included as Attachment B to this letter report. The soil boring logs describe the greatest thickness of fill as being observed in soil borings located on the eastern portion of the property, closest to the landfill. Fill material was described as glass, rubber, pottery, ash, enamel, and clinkers to a depth of 10 feet bgs.

Three soil borings (B-A1, B-A3, and B-A4) and one test pit (HTP-2) were advanced within the building footprint as shown on Figure 11. The fill material varies in thickness from approximately 4 feet beneath the basement floor in B-A1 to approximately 12 feet in thickness within the areas of the building that do not contain a basement. Within the building footprint, the fill material was typically described as containing varying amounts of silt, ash, and cinders. According to historic records, a portion of the existing building has been located on the site since at least 1897. Subsequent additions to the building were constructed between 1903 and 1918. Based on the age of the building located at 74 Rumford Avenue, fill materials located beneath this building are likely a result of historic filling of the area for development and not encroachment of waste from the Woerd Avenue Landfill which began as a small dump in 1912. The 1903 USGS quadrangle confirms that the area surrounding the 74 Rumford Avenue property had been developed prior to the construction of the Woerd Avenue Landfill.

As discussed previously, the selected remedial action for addressing elevated concentrations of metals in site soils is an engineered barrier with an AUL. The location of the engineered barrier, shown on Figure 4, corresponds to the area with the greatest fill layer, located adjacent to the Cove that would remain as accessible soil following development. The majority of fill located beneath the building will be removed or become inaccessible during development. Fill materials and metals-impacted soil at the 74 Rumford Avenue property are adequately regulated under the MCP and will be addressed with the installation of the engineered barrier. Therefore, additional sampling and analysis at the 74 Rumford Avenue property is not proposed.



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48 Woerd Avenue

The MassDEP file for 48 Woerd Avenue did not contain a complete record of soil boring logs for the property. Logs were only available for soil borings advanced in the northern portion of the property in the vicinity of the SVE/AS system and are attached to this letter report. Several logs indicate the presence of ash at thicknesses up to 8 feet. However, the absence of waste materials such as brick, glass, or metal suggests that the ash is related to historic filling activities rather than an extension of landfilled waste. The historic USGS quadrangles indicate that this area was originally designated as wetlands before it was developed. During a site visit conducted by CDM, the parking area on the southern portion of the property that is located adjacent to the landfill was observed to be in poor condition with numerous cracks in the pavement that appeared to be a result of settled, heterogeneous, subsurface material. No logs for soil borings or monitoring wells advanced in this area were available in the MassDEP file; however, the condition of the pavement and a review of aerial photographs suggest that it might be overlying waste material. This portion of the parking lot was completed at a grade approximately 5 feet higher than the remainder of the property which also suggests that waste material may have been used to build up the area. The approximate extent of waste based on field observations is shown on Figure 12. As discussed previously, an AUL was placed on two portions of the property that prevents future site development for residential, outdoor recreational, child care, and other use restrictions. Therefore, the 48 Woerd Avenue property is adequately regulated under the MCP and additional sampling and analysis is not proposed.

945 Moody Street

Although no borings were available in the documents contained in the 945 Moody Street file, a description of soils encountered during subsurface investigations described fill materials to contain glass, brick, asphalt, concrete, metal, coal, and wood. An AUL was placed on the site in 1997. Therefore the 945 Moody Street property is adequately regulated under the MCP and no additional sampling and analysis is proposed.

Water Quality Sampling

Groundwater samples were collected from on-site monitoring wells CDM-1A, CDM-2, CDM-2A, CDM-3A, and CDM-4 on November 11, 2004. The locations of the monitoring wells are shown on Figure 9. One duplicate sample was also collected. Monitoring wells CDM-1 and CDM-3 were not sampled because gauging of the wells determined that they were dry. Prior to purging, groundwater elevations were measured and recorded. Three well volumes were then purged from each well using a whale pump to provide a representative sample of the surrounding aquifer. Upon completion of purging, field measurements including



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temperature, dissolved oxygen, and specific conductance were measured and recorded. Table 1 presents a summary of groundwater elevations and water quality parameters. Metals samples were field filtered.

Two surface water samples were collected from locations around the landfill site identified as Cove-1 and Cove-2 as shown on Figure 9. Cove-1 is located at the edge of water at the southeast edge of Cram's Cove. Cove-2 is located approximately 100 feet north of Cove-1 also within Cram's Cove.

Groundwater and surface water samples were submitted to the laboratory for analysis for the following parameters:

- VOCs by EPA Method 8260 including 2-butanone (MEK), 4-methyl-2-pentanone (MIBK), acetone, and total xylenes.
- Dissolved Metals by RCRA 8 plus copper, iron, manganese, and zinc
- Chloride
- Alkalinity
- Sulfate
- Total Dissolved Solids (TDS)
- Nitrate as Nitrogen
- Total Cyanide
- Chemical Oxygen Demand

The analytical results for samples collected during the monitoring event are provided in Tables 2 and 3. Analytical results are compared to Environmental Protection Agency (EPA) and MassDEP primary drinking water standards known as Maximum Contaminant Levels (MCLs) and secondary standards known as Secondary Maximum Contaminant Levels (SMCLs). Primary standards are based on concentrations which are known to cause human health effects and secondary standards are based on aesthetic qualities such as color, odor, and taste of a public water supply. Any parameter that exceeds the value of a primary standard has been shaded for distinction.



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VOCs

VOCs were not detected in any of the groundwater samples or surface water samples above the laboratory detection limits.

Metals

Several metals were detected above the laboratory detection limits in the groundwater and surface water samples including arsenic, barium, copper, iron, manganese, and zinc. Of the metals detected, only iron and manganese were detected above drinking water standards. Iron was detected above the SMCL of 300 ug/L in groundwater samples collected from three of the monitoring wells at concentrations ranging from 897 ug/L (CDM-3A) to 34,300 ug/L (CDM-4), and in the surface water samples at 28,100 ug/L (Cove-1) and 15,700 ug/L (Cove-2). Manganese was detected above the SMCL of 50 ug/L in groundwater samples collected from each of the monitoring wells at concentrations ranging from 87.5 ug/L (CDM-2A) to 3,920 ug/L (CDM-4A) and in the surface water samples at 650 ug/L (Cove-1) and 463 ug/L (Cove-2).

Conventional Parameters

The SMCL of 500 mg/L for TDS was exceeded in groundwater samples collected from CDM-2 (692 mg/L), CDM-4 (633/613 mg/L, duplicate pair) and CDM-4A (871 mg/L) and in surface water samples Cove-1 (1,061 mg/L) and Cove-2 (1,150 mg/L). Chloride was also detected above the SMCL of 250 mg/L in the groundwater sample collected from CDM-4A at a concentration of 350 mg/L and in surface water sample Cove-1 at a concentration of 362 mg/L. The standards for nitrate-nitrogen, cyanide, and sulfate were not exceeded in any of the groundwater or surface water samples.

The analytical results of the November 2004 water quality sampling are consistent with previous sampling rounds. During the CSA, three rounds of water quality sampling were conducted in May, August, and December 1998. The complete results of the sampling are presented in the CSA.

Landfill Gas Sampling

Landfill gas screening was conducted on November 16, 2004 and April 16, 2005. During each of the sampling rounds, landfill gas samples were screened for methane (CH₄), carbon dioxide (CO₂), oxygen (O₂), Lower Explosive Limit (LEL), hydrogen sulfide (H₂S), and total VOCs. A Landtec GEM 500 Gas Analyzer was used to detect CH₄, CO₂, O₂, and LEL; a Bacharach "Sentinel 44" was used to monitor H₂S; and an organic vapor monitor (OVM) was



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used to measure concentrations of total VOCs. The results of the November 2004 and April 2005 landfill gas screening are presented below.

On November 16, 2004, landfill gas was screened at the three permanent landfill gas monitoring wells (LFG-1 through LFG-3). The results of the monitoring are presented in Table 4. As shown in the table, CH₄ was detected in landfill gas monitoring location LFG-1 at a concentration of 3.0 percent by volume of methane. This corresponds to a LEL of 60 percent, over the regulatory limit of 25 percent of the LEL. CO₂ was detected at each of the gas monitoring locations at concentrations ranging from 11.8 percent to 18.0 percent by volume carbon dioxide. H₂S was not detected in any landfill gas monitoring locations during the November 2004 sampling round. VOCs were detected in landfill gas monitoring locations LFG-2 and LFG-3 at concentrations of 0.9 ppmv and 6.5 ppmv, respectively.

On April 16, 2005, landfill gas screening was performed at the three permanent gas monitoring wells LFG-1, LFG-2, and LFG-3. Based on the historic presence of methane in LFG-1, ten temporary gas probes were also installed and monitored. The locations of the gas wells and the temporary gas probes are shown on Figure 9. The permanent gas wells and temporary probes were field screened for concentrations of CH₄, CO₂, O₂, H₂S, and VOCs. The results of the April 2005 landfill gas monitoring are presented in Table 5.

CH₄ was detected in landfill gas monitoring location LFG-1 at a concentration of 2.7 percent by volume of methane. This corresponds to an LEL of 54 percent, over the regulatory limit of 25 percent of the LEL. CH₄ was detected in temporary gas probe locations GP-1 through GP-4 at concentrations ranging from 0.1 percent to 3.8 percent. The highest CH₄ concentrations were observed in GP-1 (3.8 percent) and GP-2 (3.4 percent) which were advanced 25 feet and 50 feet east of LFG-1, respectively. CH₄ was not detected in permanent landfill gas wells LFG-2 or LFG-3.

O₂ was detected in the landfill gas monitoring locations at concentrations ranging from 0.2 percent (LFG-1) to 20.3 percent (GP-5). In general, O₂ concentrations increased with distance from the landfill.

CO₂ was detected in the permanent landfill gas monitoring locations at concentrations ranging from 0.4 percent (GP-6) to 13.7 percent (LFG-1) by volume carbon dioxide. In general CO₂ concentrations decreased with distance from the landfill.

H₂S and VOCs were not detected in any permanent landfill gas monitoring locations or in any of the temporary gas monitoring locations during this sampling round.



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Sediment Sampling

Several sediment samples have been collected from Cram's Cove and submitted for total lead analysis. The results of the sampling are presented in Table 6. This table, obtained from the MassDEP file for the 74 Rumford Avenue property, includes data collected by CDM for the Woerd Avenue Landfill, Nelson and Klein for the Charles River Lakes District, and by various consultants for the 74 Rumford Avenue property.

During the CSA, two rounds of sediment samples were collected in August and December 1998. In August 1998, sediment samples were collected from two locations within Cram's Cove (Cove-1 and Cove-2), a stream located to the southeast of the landfill (Stream-1) and a drainage swale located at the southern corner of the site (Swale-1). Sediment samples were collected at a depth interval of zero to six inches and submitted for laboratory analysis for total metals, pesticides, PCBs, VOCs, PAHs, and TPH. The sediment sampling locations are shown on Figure 9. The complete results of this sampling are presented in the CSA Report and are described in detail therein; however, the sampling results indicated that elevated concentrations of metals were present in the sediment samples. In the samples collected from Cram's Cove, total lead was measured at a concentration of 1,000 mg/kg in sediment sample Cove-1 and 110,000 mg/kg in sediment sample Cove-2. Due to the unusually high lead concentrations measured in sediment sample Cove-2, this location was re-sampled in December 1998 to confirm the elevated lead concentration. The confirmatory sample was collected as a composite of three locations spaced at five foot horizontal increments around the Cove-2 location. Total lead was detected at a concentration of 490 mg/kg in the confirmatory sample. The initial Cove-2 sample was determined to be an anomaly and not representative of the overall sediment quality in the Cove.

While the confirmatory sample detected lead at a substantially lower concentration, additional evaluation of sediment quality in Cram's Cove was warranted. On November 16, 2004, ten sediment samples were collected from Cram's Cove immediately adjacent to the landfill as shown on Figure 9. The sediment samples were submitted for laboratory analysis for total lead. The analytical results are summarized in Table 7 and are compared to the MassDEP Threshold Effects Concentration (TEC) for lead. Total lead exceeded the TEC of 35.8 mg/kg in all samples at concentrations ranging from 102 mg/kg (SED-10) to 673 mg/kg (SED-6).

As shown in the tables, elevated concentrations of arsenic and lead are present in sediments located throughout Cram's Cove. Concentrations of metals detected in samples collected immediately adjacent to the Woerd Avenue Landfill are no higher than those collected from



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the opposite side of the cove along the 74 Rumford Avenue property. In general, the concentrations of lead observed in samples collected by CDM from portions of Cram's Cove closest to the Woerd Avenue Landfill are lower compared to historical samples collected by others.

Conclusions and Recommendations

The purpose of the supplemental CSA was to further evaluate the extent of landfilled waste at the Woerd Avenue landfill. The following tasks were performed to accomplish this objective:

- Review of documents filed with the MassDEP under the Massachusetts Contingency Plan (MCP) for nearby parcels.
- Review of historical plans, aerial photographs, and interviews related to the historic filling operations in the vicinity of the landfill in Waltham and in Newton to complete a preliminary estimate of the approximate limit of landfilled waste at the Woerd Avenue Landfill.
- Collection of groundwater samples from on-site monitoring wells and surface water samples for laboratory analysis.
- Analysis of landfill gas in existing wells located along the perimeter of the Woerd Avenue Landfill.
- Collection of ten sediment samples from locations within Cram's Cove immediately adjacent to the landfill for laboratory analysis.

Upon completion of the activities listed above, CDM has concluded the following:

- • Properties immediately surrounding the Woerd Avenue Landfill are adequately regulated under the MCP. According to the MassDEP file review, the RTNs for the properties, with the exception of one RTN for 74 Rumford Avenue, have been addressed by the completion of a RAO and/or an AUL. The proposed remedy for the 74 Rumford Avenue includes the implementation of an AUL for the property.
- Review of historic USGS quadrangle maps indicated that filling of wetlands immediately surrounding Cram's Coves as well as portions of the cove itself occurred in the early 1900s. Soil boring logs from 74 Rumford Avenue and 48 Woerd Avenue indicate that the majority of fill materials are a result of historic filling of the area for development and not



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encroachment of waste from the Woerd Avenue Landfill. While test pits excavated along the perimeter of the Woerd Avenue Landfill did not delineate the extent of landfilled waste, available information reviewed indicates that waste materials may extend onto the southeastern portion of 48 Woerd Avenue. As discussed, the estimated extent of waste at 48 Woerd Avenue is covered by pavement.

- Groundwater and surface water samples collected from locations along the perimeter of the Woerd Avenue Landfill did not contain VOCs above the laboratory detection limits. Several metals were detected above the laboratory detection limits in the groundwater and surface water samples including arsenic, barium, copper, iron, manganese, and zinc. Of the metals detected, only iron and manganese were detected above drinking water standards. The analytical results of the November 2004 water quality sampling are consistent with previous sampling rounds.
- Landfill gas screening indicated that elevated concentrations of CH₄ were present in landfill gas well LFG-1 and temporary soil gas probes.
- Elevated concentrations of arsenic and lead are present in sediments located throughout Cram's Cove. However, concentrations of metals detected in samples collected immediately adjacent to the Woerd Avenue Landfill are no higher than those collected from the opposite side of the Cove along the 74 Rumford Avenue property. In general, the concentrations of lead observed in samples collected by CDM in November 2004 from portions of Cram's Cove closest to the Woerd Avenue Landfill are lower compared to the results of historical samples collected by others.

Historic documents for the area indicate that this area has been utilized for light manufacturing since the early 1900s. Subsurface investigations conducted at the landfill and surrounding properties shows extensive filling for development purposes with materials consistent with the type of manufacturing operations that occurred in the area. Concentrations of metals, specifically lead, are elevated in samples of sediment collected from the Cove. Given the past land uses in this area; it is not likely that a source of the elevated concentrations can be definitively identified.



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If you have any questions on this matter please do not hesitate to contact me at 617-452-6541.

Very truly yours,

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

cc: Ronald Vokey, Waltham
Ted Fields, Waltham
Carole Kaslick, CDM
Mary Barry, CDM

Attachments

Figures
Tables
Attachment A – Aerial Photographs
Attachment B – Historic Soil Boring and Test Pit Logs