BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF AUTHORIZING THE EXECUTIVE OFFICER TO ENTER INTO A CONTRACT WITH AMTEST INC. FOR LABORATORY SERVICES FOR ST. JOHNS LANDFILL	)))))	RESOLUTION NO. 93-1850 Introduced by Rena Cusma Executive Officer

WHEREAS, It is in the public interest for the St. Johns Landfill closure process to move forward in an expeditious manner; and

WHEREAS, Water quality monitoring is required by the Oregon Department of Environmental Quality (DEQ), the Revised Closure and Financial Assurance Plan for St. Johns Landfill, and the Smith and Bybee Lakes Management Plan; and,

WHEREAS, On July 22, 1993 the Metro Council authorized issuance of a Request for Proposals (RFP) for laboratory services as required to implement the Water Quality Monitoring Plan for St. Johns Landfill; and

WHEREAS, Amtest Inc. has been determined to be the most qualified and responsible proposer responding to the competitive proposal process; and,

WHEREAS, This resolution, authorizing the Executive Officer to enter into a contract with Amtest Inc. was submitted to the Executive Officer for consideration and was forwarded to the Council for approval; now, therefore,

BE IT RESOLVED,

That the Metro Council authorizes the Executive Officer to enter into a contract with Amtest Inc. in an amount not-to-exceed $534,411.00 for laboratory services for St. Johns Landfill.

ADOPTED by the Metro Council this 14th day of October, 1993.

Judy Wyers, Presiding Officer

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Project: Laboratory Services for St. Johns Landfill
Contract No: 903339

PERSONAL SERVICES AGREEMENT

THIS AGREEMENT is between Metro, a metropolitan service district organized under the laws of the State of Oregon and the 1992 Metro Charter, located at 600 NE Grand Avenue, Portland, OR 97232, and Amtest Inc., referred to herein as "Contractor," located at 14603 NE 87th St., Redmond, WA 98052.

In exchange for the promises and other consideration set forth below, the parties agree as follows:

1. Duration. This personal services agreement shall be effective October 14, 1993, and shall remain in effect until and including December 31, 1996, unless terminated or extended as provided in this Agreement.

2. Scope of Work. Contractor shall provide all services and materials specified in Attachment 3 -- Scope of Work," which is incorporated into this Agreement by reference. All services and materials shall be provided by Contractor in accordance with the Scope of Work, in a competent and professional manner. To the extent that the Scope of Work contains additional contract provisions or waives any provision in the body of this Agreement, the Scope of Work shall control.

3. Payment. Metro shall pay Contractor for services performed and materials delivered in the amount(s), manner and at the time(s) specified in the Scope of Work for a maximum sum not to exceed FIVE THIRTY FOUR THOUSAND AND FOUR HUNDRED ELEVEN, AND NO/100THS DOLLARS ($534,411.00).

4. Insurance.

a. Contractor shall purchase and maintain at the Contractor's expense, the following types of insurance, covering the Contractor, its employees, and agents:

(1) Broad form comprehensive general liability insurance covering bodily injury and property damage, with automatic coverage for premises, operations, and product liability. The policy must be endorsed with contractual liability coverage; and

(2) Automobile bodily injury and property damage liability insurance.

b. Insurance coverage shall be a minimum of $500,000 per occurrence. If coverage is written with an annual aggregate limit, the aggregate limit shall not be less than $1,000,000.

c. Metro, its elected officials, departments, employees, and agents shall be named as ADDITIONAL INSUREDS. Notice of any material change or policy cancellation shall be provided to Metro 30 days prior to the change or cancellation.

d. Contractor, its subcontractors, if any, and all employers working under this Agreement that are subject employers under the Oregon Workers' Compensation Law shall comply with ORS 656.017, which requires them to provide Workers' Compensation coverage for all their subject workers. Contractor shall provide Metro with certification of Workers' Compensation insurance including employer's liability. If Contractor has no employees and will perform the work without the assistance of others, a certificate to that effect may be attached, as Exhibit B, in lieu of the certificate showing current Workers' Compensation.

e. If required by the Scope of Work, Contractor shall maintain for the duration of this Agreement professional liability insurance covering personal injury and property damage arising from errors, omissions, or malpractice. Coverage shall be in the minimum amount of $500,000. Contractor shall provide to Metro a certificate of this insurance, and 30 days' advance notice of material change or cancellation.

5. Indemnification. Contractor shall indemnify and hold Metro, its agents, employees and elected officials harmless from any and all claims, demands, damages, actions, losses and expenses, including attorney's fees, arising out of or in any way connected with its performance of this Agreement, or with any patent infringement or copyright claims arising out of the use of Contractor's designs or other materials by Metro and for any claims or disputes involving subcontractors.

6. Maintenance of Records. Contractor shall maintain all of its records relating to the Scope of Work on a generally recognized accounting basis and allow Metro the opportunity to inspect and/or copy such records at a convenient place during normal business hours. All required records shall be maintained by Contractor for three years after Metro makes final payment and all other pending matters are closed.

7. Ownership of Documents. All documents of any nature including, but not limited to, reports, drawings, works of art and photographs, produced by Contractor pursuant to this Agreement are the property of Metro, and it is agreed by the parties that such documents are works made for hire. Contractor hereby conveys, transfers, and grants to Metro all rights of reproduction and the copyright to all such documents.

8. Project Information. Contractor shall share all project information and fully cooperate with Metro, informing Metro of all aspects of the project including actual or potential problems or defects. Contractor shall abstain from releasing any information or project news without the prior and specific written approval of Metro.

9. Independent Contractor Status. Contractor shall be an independent contractor for all purposes and shall be entitled only to the compensation provided for in this Agreement. Under no circumstances shall Contractor be considered an employee of Metro. Contractor shall provide all tools or equipment necessary to carry out this Agreement, and shall exercise complete control in achieving the results specified in the Scope of Work. Contractor is solely responsible for its performance under this Agreement and the quality of its work; for obtaining and maintaining all licenses and certifications necessary to carry out this Agreement; for payment of any fees, taxes, royalties, or other expenses necessary to complete the work except as otherwise specified in the Scope of Work; and for meeting all other requirements of law in carrying out this Agreement. Contractor shall identify and certify tax status and identification number through execution of IRS form W-9 prior to submitting any request for payment to Metro.

10. Right to Withhold Payments. Metro shall have the right to withhold from payments due to Contractor such sums as necessary, in Metro's sole opinion, to protect Metro against any loss, damage, or claim which may result from Contractor's performance or failure to perform under this Agreement or the failure of Contractor to make proper payment to any suppliers or subcontractors.

11. State and Federal Law Constraints. Both parties shall comply with the public contracting provisions of ORS chapter 279, and the recycling provisions of ORS 279.545 - 279.650, to the extent those provisions apply to this Agreement. All such provisions required to be included in this Agreement are incorporated herein by reference. Contractor shall comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations including those of the Americans with Disabilities Act.

12. Situs. The situs of this Agreement is Portland, Oregon. Any litigation over this agreement shall be governed by the laws of the state of Oregon and shall be conducted in the circuit court of the state of Oregon, for Multnomah County, or, if jurisdiction is proper, in the U.S. District Court for the District of Oregon.

13. Assignment. This Agreement is binding on each party, its successors, assigns, and legal representatives and may not, under any circumstance, be assigned or transferred by either party.

14. Termination. This Agreement may be terminated by mutual consent of the parties. In addition, Metro may terminate this Agreement by giving Contractor five days prior written notice of intent to terminate, without waiving any claims or remedies it may have against Contractor. Termination shall not excuse payment for expenses properly incurred prior to notice of termination, but neither party shall be liable for indirect or consequential damages arising from termination under this section.

15. No Waiver of Claims. The failure to enforce any provision of this Agreement shall not constitute a waiver by Metro of that or any other provision.

16. Modification. Notwithstanding and succeeding any and all prior agreement(s) or practice(s), this Agreement constitutes the entire Agreement between the parties, and may only be expressly modified in writing(s), signed by both parties.

AMTEST INC.	METRO
By: _____	By: _____
_____	_____
Print name and title	Print name and title
Date: _____	Date: _____

ATTACHMENT 3. SCOPE OF WORK
LABORATORY SERVICES FOR ST. JOHNS LANDFILL (1993-1996)

Contractor shall perform services and deliver the products described in the Request for Proposals (RFP) dated July 1993 attached below relating to the testing of samples collected in connection with St. Johns Landfill. The landfill is located in North Portland at 9363 N. Columbia Boulevard.

The Contractor shall identify a single person as project manager to work with Metro. The Contractor shall be responsible for any subcontractor work and shall be responsible for the day-to-day direction and internal management of the Contractor and subcontractor effort. Contractor shall use subcontractors for laboratory testing only after prior written approval by Metro.

The Contractor shall provide professional liability insurance, as discussed in Section 4e of the Personal Services Agreement.

Contractor shall begin the work in the early fall of 1993, and continue through the end of 1996. Metro will collect all samples to be analyzed.

TASK 1: Contractor shall adhere to Metro's Sampling and Analysis Plan (Appendix B) unless a plan modification has been approved in writing by Metro, which specifies the following: cleaning of sampling containers, use of a laboratory logbook, and laboratory quality assurance/quality control (QA/QC).

All records of testing must be available for inspection if required by Metro. Lab shall provide Metro a copy of its QA/QC plan and shall provide any amendments thereof within 30 days of adoption.

The quality control (QC) tests shall be performed at a minimum frequency of 10% each. The tests will include blanks, matrix spikes, a duplicate (metals and nutrients), matrix spike duplicates (MSDs) for organics, and standard reference materials (SRM's) where available (conventionals, nutrients, and metals) as presented in Amtest's 8/13/93 transmittal letter.

TASK 2: Contractor shall test parameters, as shown in Appendices A1 (Sampling Parameters) and A2 (TTO's). The unshaded portions of the Sampling Parameters table (Appendix A1) are pertinent to the Contractor; other portions will be Metro's responsibility. Metro shall include field duplicates (one per ten samples) which will be billable samples, as well as transport blanks (non-billable samples) as shown in the Sampling Parameters table (Appendix A1). Note that the number of stormwater monitoring locations decreases from 5 to 4 in 1996.

Sampling parameters or frequency may change, due to sampling results or regulatory requirements. The Contractor shall be notified by Metro at least twenty four hours before each sampling event, of what tests and how many will be required.

Actual dates of sample collection may vary within 30 days of the month listed in the Sampling Parameters table (Appendix A1). The fall 1993 sampling will take place as soon as possible following contract award.

When doing any scan using gas chromatography/mass spectroscopy (GC/MS), Contractor shall report the quantitative results for listed parameters. Also, Contractor shall

tentatively identify (but not quantify) other observed significant peaks. (Significant peak is defined as 20% of the Internal Standard (IS).)

Contractor shall submit all EPA Water Supply (WS) and Water Pollution (WP) Performance Evaluations and state certifications to Metro within 30 days of receipt. For all parameters Contractor is certified for at the beginning of this contract, Contractor shall test only at the laboratory site which is certified for that parameter, unless Metro has given prior written approval.

The Phase II parameters (Appendix A3) will be tested, only if required by regulators. A regulatory contingency shall be established for the cost of this testing. This contingency money, if not required in full for Phase II testing, shall be available for other testing, if requested by Metro. During the term of this contract costs for all services and products provided by Contractor - including but not limited to transportation, testing, administration, and reporting - shall be at the unit costs listed in Appendix C. Except for Phase II, listed unit costs shall apply to sample quantities which may vary up to ±20%.

TASK 3: Lab shall provide properly prepared sample containers. These containers shall be delivered to St. Johns Landfill within 24 hours of a request. Contractor shall pick up and transport samples from the landfill.

TASK 4: Lab report shall specify each test method and minimum detection limits or practical quantitation limits achieved. The lab report shall contain an explanation of any deviation from the minimum detection limits or practical quantitation limits set forth in the proposal. The lab report shall include results of matrix spiked samples and either duplicate samples or duplicate matrix spike samples, when appropriate.

TASK 5: All sampling results, including QA/QC, shall be reported to Metro within thirty (30) days of the date samples are submitted by Metro. An ASCII file (or file compatible with Metro's software) of the sampling results, as well as hard copy, shall ~~also~~ be provided to Metro.

Payment Provisions

Contractor shall invoice Metro for services in the amounts indicated by Contractor in the Cost Schedule Proposal Form (Appendix C) included in Metro's RFP and in Contractor's proposal, all of which are incorporated into this Agreement by this reference.

Metro shall pay Contractor for services performed and materials delivered in the maximum sum of FIVE HUNDRED THIRTY FOUR THOUSAND ~~AND~~ FOUR HUNDRED ELEVEN AND NO/100THS DOLLARS ($534,411). This maximum sum includes all fees, costs, and expenses of whatever nature. Contractor's billing statements shall include an itemized statement of the work done during the billing period, and will not be submitted more frequently than once per month. Metro shall pay Contractor within 30 days of receipt of a Metro approved invoice/billing statement.

Invoices shall be sent to: Joanna Karl, Metro, 600 NE Grand Ave., Portland, OR 97232-2736.

EVALUATION OF
RFPs for LAB SERVICES FOR ST. JOHNS LANDFILL

Seventeen proposals were received. A list of the labs who proposed is on the following page.

After shortlisting, the following ranking was used to compare the remaining four proposers. The four members of the selection committee (Joanna Karl, Senior Engineer, Metro; Dennis O'Neil, Senior Solid Waste Planner, Metro; Jim Quinn, Associate Program Supervisor, Metro; and Ron McCartney, DEQ's Inorganic Lab Manager), each individually ranked the first two categories (Project Work Plan and Project Staffing Experience). These four scores were then averaged. The budget/cost proposal ranking was a cost efficiency, and its computation is shown below.

	CENTURY	AMTEST	COFFEY	NORTH CREEK
PROJECT WORK PLAN* (35%)	(30+31+30+30)/4 =30	(35+34+30+35)/4 =34	(25+22+24+20)/4 =23	(25+27+27+25)/4 =26
PROJECT STAFFING EXPERIENCE** (35%)	(15+33+29+25)/4 =25	(33+34+31+35)/4 =33	(16+32+25+25)/4 =25	(25+34+29+30)/4 =30
BUDGET/COST PROPOSAL*** (30%)	29	30	28	27
TOTAL	84	97	76	83

*This category includes: Clarity, understandability, and completeness of proposal; Demonstration of understanding of the project objectives; Responsiveness of proposal to project objectives; Understanding of work schedule deadlines; and Quality assurance/quality control.

**This category includes: Project organization: project management and assignment of personnel, project manager clearly designated, and use of subconsultants clearly described; Qualifications and favorable references indicating the directly relevant experience of the project manager, project team, and subconsultants; certified drinking water sample test lab; current or past membership in EPA Contract Laboratory Program (CLP); Demonstrated knowledge of similar services; and Work schedule deadlines adequately met in previous jobs.

***Budge/cost proposal was determined as follows: The total points for the first two categories (Project Work Plan and Project Staffing Expaerience) were added together and divided by a normalized cost (i.e., the lowest cost was 1.0, and the highest cost was 1.29). A multiplier was then found such that the highest score equaled 30.

CENTURY:

$$\frac{55}{\left(\frac{\$450,168}{\$417,117}\right)}=\frac{55}{1.08}=50.9$$

AMTEST:

$$\frac{67}{\left(\frac{\$535,811}{\$417,117}\right)}=\frac{67}{1.29}=51.9$$

COFFEY:

$$\frac{48}{\left(\frac{\$417,117}{\$417,117}\right)}=\frac{48}{1.0}=48.0$$

NORTH CREEK ANALYTICAL:

$$\frac{56}{\left(\frac{\$496,569}{\$417,117}\right)}=\frac{56}{1.19}=47.0$$

The final calculation involves finding a multiplier (30/51.9=.578), such that the highest score is 30.

SHORTLISTING

The following table indicates whether the proposers met the cut-offs established for shortlisting (see below) for proficiency, cost, and responsiveness.

LAB	PROFICIENCY	COST (<$550,000)	RESPONSIVE	COMMENTS
1. Chester Labnet-Portland	NO	NO	YES	
2. Century Testing Laboratories	YES	YES	YES	They were ranked.
3. Columbia Inspection Inc.	NO	YES	YES	
4. Analytical Technologies, Inc.	YES	NO	YES	Barely met proficiency, and cost was high.
5. Pacific Environmental Lab	?	NO	?	Two performance evaluations referenced, but not included. Provided upon request. The WP met our requirements, but the other (from Analytical Product Group) didn't test relevant analytes.
6. Water Food and Resources	NO	YES	YES	
7. Amtest Inc.	YES	YES	YES	
8. Columbia Analytical	?	NO	?	Performance evaluations summarized. Upon request for PE's, they provided latest two (one WS and one WP). Only one met our requirements.
9. Coffey Laboratories Inc.	YES	YES	YES	
10. Sound Analytical Services, Inc.	?	YES	NO	Have been certified by the WA DOE for past 3 years, and WA Dept. of Health for the past 2 years. Considered non-responsive because they did not include performance evaluations with their proposals.
11. Oregon Analytical Lab	YES	NO	YES	
12. National Environmental Testing	NO	YES	YES	
13. North Creek Analytical	YES	YES	YES	
14. Anatek Labs	NO	YES	YES	
15. Pacific Northern Analytical, Inc.	?	NO	?	Certified WA DOE and WA Dept. of Health in May 1993. No performance evaluations to provide.
16. Analytical Resources	?	YES	NO	Certified by WA Dept. of Health in August 1992, and WA DOE from April 1990. Considered non-responsive because they did not include performance evaluations with their proposals.
17. Professional Services Industries	NO	NO	YES	

Proficiency. The criteria for proficiency was generally based on EPA'S Water Supply (WS) and Water Pollution (WP) tests, if provided. In a few cases, other tests were provided and they were evaluated in the same manner. The cutoff was:

(1) having tested at least 75% of the analytes in a given test, and
(2) having achieved at least 80% proficiency (i.e., #"ACCEPT"s + 1/2(# "CHECK"s)/# ANALYTES TESTED) of those analytes, and
(3) to meet this criteria on at least two tests.

Cost. For the purpose of shortlisting, the cost cutoff was set at $550,000. Ten of the seventeen proposals were under this amount.

Responsive. Firms which were certified (for any period over the past three years such that performance evaluations would have been required) were considered non-responsive if they had not provided the performance evaluations with their proposals. A few proposers had referenced the pereformance evaluations or provided only summaries. In each of these cases, the proposers were shortlisted based on cost.

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STAFF REPORT

IN CONSIDERATION OF RESOLUTION NO. 93-1850 FOR THE PURPOSE OF AUTHORIZING THE EXECUTIVE OFFICER TO ENTER INTO A CONTRACT WITH AMTEST INC. FOR LABORATORY SERVICES FOR ST. JOHNS LANDFILL

Date: September 21, 1993 Presented by: Jim Watkins

PROPOSED ACTION

Adopt Resolution No. 93-1850 which authorizes the Executive Officer to execute a contract with Amtest Inc., the most qualified and responsible proposer of laboratory services for St. Johns Landfill.

FACTUAL BACKGROUND AND ANALYSIS

Water quality monitoring is required at St. Johns Landfill by the Oregon Department of Environmental Quality's (DEQ's) Solid Waste Disposal Site Closure Permit (#116, issued July 19, 1988). As part of the closure of St. Johns Landfill, a draft water quality monitoring plan was submitted to DEQ. After reviewing DEQ comments, Metro developed a final water quality monitoring plan for the next several years. This contract will provide laboratory services, required to implement the Water Quality Monitoring Plan. The contract will provide for routine testing, as well as a contingency to provide for additional testing if required by regulators.

Following Council approval on July 22, 1993, a Request for Proposals was issued. Advertisements were published in Portland-area newspapers, including The Skanner, a minority-owned newspaper. One addendum to the Requst for Proposals document was issued. The addendum clarified how to fill out the cost/budget form, required technical information in regard to certification, and changed some of the required method numbers for sampling.

Seventeen proposals were received. The proposals were reviewed by a selection committee consisting of Joanna Karl (Senior Engineer), Jim Quinn (Associate Program Supervisor) and Dennis O'Neil (Senior Solid Waste Planner) of Metro's Solid Waste Department, as well as Ron McCartney, DEQ's Inorganic Lab Manager. The selection committee determined that Amtest Inc. was the most qualified and responsible proposer.

BUDGET IMPACT

$200,000 is budgeted within the Operations Division for groundwater monitoring at St. Johns Landfill, $27,007 for surface water and sediment monitoring at the landfill, and $16,500 for stormwater monitoring at the landfill in the 1993-94 fiscal year.

The contract is for 3-1/2 years, from the fall of 1993 through the end of 1996. The contract is for approximately $120,000 in 1993, and approximately $140,000 per calendar year in 1994, 1995, and 1996. The total contract cost is not-to-exceed $534,411.

EXECUTIVE OFFICER'S RECOMMENDATION

The Executive Officer recommends Council approval of Resolution No. 93-1850.

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Appendix A. PARAMETER LISTS

Appendix A1. SAMPLING PARAMETERS

GROUNDWATER MONITORING WELLS

#Sampl'g Points	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq/Yr
32* 5*	N/A	N/A	N/A	N/A	**VISUAL INSPECTION** Visual inspection of well: Evidence of disturbance: Cracking or lifting of the concrete base: Change in vertical orientation: Other changes Does the lock need treating with penetrating lubricant? If the lock requires treating, was it done? H-wells only: Distance (within 1/4") between the top of the 2" stainless steel well casing and the top of the 4-1/2" steel surface monument casing:	Metro	Feb, Aug Feb,May Aug, Nov	2 4
32* 5*	2 4	N/A	N/A	N/A	**WATER LEVEL** Depth to water: Measuring point elevation (ft) ---from survey Water level elevation (ft)	Metro	Feb, Aug Feb,May Aug, Nov (H-wells)	2 4 (Hwells)
31*	3	N/A	34		**LEACHATE INDICATOR PARAMETERS**		Feb, Aug	2
					FIELD PARAMETERS Conductivity Dissolved Oxygen (DO) pH Temperature	DEQ		N/A
				310.1	Alkalinity, Total (CaCO3)	DEQ		
				350.3	Ammonium (HN4-N)	DEQ		
				SM 232OB	Bicarbonate (HCO3) - FIELD FILTERED	Ph I, DEQ		
				6010	Calcium - FIELD FILTERED	Ph I, DEQ		
				SM 232OB	Carbonate (CO3) - FIELD FILTERED	DEQ		
				410.2	Chemical Oxygen Demand (COD)	Ph I, DEQ		
				300.0 or 325.3	Chloride - FIELD FILTERED	Ph I, DEQ		
				120.1	Conductance, specific (lab)	DEQ		
				6010	Hardness (CaCO2)	DEQ		
				6010	Iron - FIELD FILTERED	Ph I, DEQ		
				6010	Magnesium - FIELD FILTERED	Ph I, DEQ		
				6010	Manganese, dissolved - FIELD FILTERED	Ph I, DEQ		
				300.0 or 353.3	Nitrate (as N) - FIELD FILTERED	Ph I, DEQ		
				365.3	Phosphurus, dissolved - FIELD FILTERED	Metro		
				6010	Potassium - FIELD FILTERED	Ph I, DEQ		
				6010	Sodium - FIELD FILTERED	Ph I, DEQ		
				300.0 or 375.4	Sulfate (SO4) - FIELD FILTERED	Ph I, DEQ		
				160.1	Solids, total dissolved (TDS)	Ph I DEQ		
				160.2	Solids, total suspended (TSS)	DEQ		
				415.1	Total Organic Carbon (TOC)	Ph I DEQ		

*32 wells include: D-wells, F-well, G-wells, K-wells, and SEA B-4.100
31 wells include: D-wells, F-well, G-wells, K-wells.
5 wells include: H-wells

Table 2a. GROUNDWATER MONITORING WELLS
(cont.)

#Sampl'g Points	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq./Yr
					CRITICAL PARAMETERS			
31*	3	N/A	34	EPA 6010, 7470, 7421, 7061, 7741	TRACE METALS (Total Recoverable - Unfiltered)	App I, DEQ	Feb, Aug	2
					Antimony (Sb) Arsenic (As) Barium (Ba) Beryllium (Be) Cadmium (Cd) Chromium (Cr) Cobalt (Co) Copper (Cu) Lead (Pb) Nickel (Ni) Selenium (Se) Silver (Ag) Thallium (Tl) Vanadium (V) Zinc (Zn)			

*32 wells include: D-wells, F-well, G-wells, K-wells, and SEA B-4.100
31 wells include: D-wells, F-well, G-wells, K-wells.
5 wells include: H-wells

GROUNDWATER MONITORING WELLS
(cont.)

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Date.	Freq./ Yr.
31*	3	1	35	EPA 8260	VOLATILE ORGANIC COMPOUNDS	App I (Fed.Reg)	Feb, Aug	2
					APPENDIX I (Federal Register) Acetone Acrylonitrile Benzene Bromochloromethane Bromodichloromethane Bromoform (Tribromomethane) Carbon disulfide Carbon tetrachloride Chlorobenzene Chloroethane (Ethyl chloride) Chloroform (Trichloromethane) Dibromochloromethane (Chlorodibromomethane) 1,2,-Dibromo-3-chloropropane (DBCP) 1,2-Dibromoethane (Ethylene dibromide; EDB) o-Dichlorobenzene (1,2-Dichlorobenzene) p-Dichlorobenzene (1,4-Dichlorobenzene) trans-1,4-Dichloro-2-butene 1,1-Dichloroethane (Ethylidene chloride) 1,2-Dichlorethane (Ethylene dichloride) 1,1-Dichloroethylene (1,1-Dichloroethene; Vinylidene chloride) cis-1,2-Dichloroethylene (cis-1,2-Dichloroethene) trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene) 1,2-Dichloropropane (Propylene dichloride) cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene 2-Hexanone (Methyl butyl ketone) Methyl bromide (Bromomethane) Methyl chloride (Chloromethane) Methylene bromide (Dibromomethane) Methylene chloride (Dichoromethane) Methyl ethyl ketone (MEK; 2-Butanone) Methyl iodide (Iodomethane) 4-Methyl-2-pentanone (Methyl isobutyl ketone) Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2,-Tetrachloroethane Tetrachloroethylene (Tetrachloroethene; Perchloroethylene) Toluene 1,1,1-Trichloroethane (Methylchloroform) 1,1,2-Trichloroethane Trichloroethylene (Trichloroethene) Trichlorofluoromethane (CFC-11) 1,2,3-Trichloropropane Vinyl acetate Vinyl chloride Xylenes			
					OTHER VOC's (p.51075, Federal Register) 1,2-dibromo-3-chloropropane 1,2-dibromoethane o-dichlorobenzene p-dichlorobenzene 1,2-dichloropropane 1,1,1,2-tetrachloroethane tetrachloroethylene cis-1,2-dichloroethylen			

*32 wells include: D-wells, F-well, G-wells, K-wells, and SEA B-4.100
31 wells include: D-wells, F-well, G-wells, K-wells.
5 wells include: H-wells

GROUNDWATER MONITORING WELLS
(cont.)

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq./ Yr.
9**	1	1	11	EPA 8150	**HERBICIDES**	SE/E	Aug.	
					Dalapon Diacamba MCPA MCPP Dichloroprop 2,4-D Silvex (2,4,5-TP) 2,4,5-T 2.4-DB Dinoseb Picloram			
9**	1	1	11	EPA 8080	**PESTICIDES/PCBs**	SE/E	Aug.	1
					Pesticides Aldrin Alpha--BHC Beta-VHC Delta-BHC Gamma-BHC (Lindane) Chlordane 4,4-DDD' 4,4'-DDE 4,4'-DDT Dieldrin Endosulfan I Endosulfan II Endosulfan Sulfate Endrin Endrin aldehyde Heptachlor Heptachlor epoxide Methoxychlor Toxaphene Aroclor 1016 Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260			
5				420.1/ 9065	Phenols, total			

**9 wells include the 2 onsite sells with the highest concentrations of leachate indicator parameters, 2 offsite upgradient wells, and the offsite floodplain sediments well and sand and gravel well with the highest concentrations of leachate indicator parameters.

GROUNDWATER MONITORING WELLS
(cont.)

#Sampl'g Points*	Dupl.	Blanks	Samples/Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Date	Freq./ Yr.
9**	1	1	11	EPA 8270	**EPA ACID/BASE NEUTRAL PRIORITY POLLUTANTS**	SE/E	Aug.	1
					N-Nitrosodimethylamine			
					Aniline			
					Bis(2-chloroethyl) ether			
					1,3-Dichlorobenzene			
					1,4-Dichlorobenzene			
					1,2-Dichlorobenzene			
					Bis(2-chloroisopropyl) ether			
					N-Nitrososdi-n-propyl anine			
					Hexachloroethane			
					Nitrobenzene			
					Isophorone			
					Bis(2-Chloroethoxy)methane			
					1,2,4-Trichlorobenzen			
					Napthalene			
					4-Chloraniline			
					Hexachlorobutadiene			
					2-Methylnapthalene			
					Hexachlorocyclopentadiene			
					2-Chloronaphthalene			
					2-Nitroaniline			
					Dimethylphthalate			
					Acenaphthylene			
					3-Nitroaniline			
					Acenaphthene			
					Dibenzofuran			
					2,4-Dinitrotoluene			
					2,6-Dinitrotoluene			
					Diethylphthalate			
					4-Chlorophenyl phenyl ether			
					Fluorene			
					4-Nitroaniline			
					N-Nitrosodiphenylamine			
					4-Bromophenyl phenyl ether			
					Hexachlorobenzene			
					Phenanthrene			
					Anthracene			
					Dibutylphthalate			
					Fluoranthene			
					Pyrene			
					Butyl benzyl phthalate			
					3,3'-Dichlorobenzidine			
					Benzo(a)anthracene			
					Bis(2-ethylhexyl)phthalate			
					Chrysene			
					Di-n-octyl phthalate			
					Benzo(b)fluoranthene			
					Benzo(k)fluoranthene			
					Benzo(a)pyrene			
					Indeno(1,2,3-c,d)pyrene			
					Dibenzo(a,h)anthracene			
					Benzo(g,h,i)perylene			
					Phenol			
					2-Chlorophenol			
					Benzyl Alcohol			
					2-Methylphenol.			
					4-Methylphenol			
					2-Nitrophenol			
					2,4-Dimethylphenol			
					Benzoic Acid			
					2,4-Dichlorophenol			
					4-Chloro-3-methylphenol			
					2,4,6-Trichlorophenol			
					2,4,5-Trichlorophenol			
					2,4-Dinitrophenol			
					4-Nitrophenol			
					2-Methyl-4,6-dinitrophenol			
					Pentachlorophenol			

**9 wells include the 2 onsite sells with the highest concentrations of leachate indicator parameters, 2 offsite upgradient wells, and the offsite floodplain sediments well and sand and gravel well with the highest concentrations of leachate indicator parameters.

Table 2b. SURFACE WATER MONITORING

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq./ Yr.
			9		**BASICS**		Feb, Aug.	2
8	N/A	N/A	8		FIELD PARAMETERS Conductivity Dissolved Oxygen pH Temperature Water Level (required by DEQ only)	S/B, DEQ		
8	1	N/A	9	405.1	BOD	DEQ	Feb, Aug	2
					NUTRIENTS		Feb, Aug	2
8	1	N/A	9		NO2-NO3-N	S/B		
8	1	N/A	9		Total Kjeldahl Nitorgen (TKN)	S/B, DEQ		
8	1	N/A	9		Total Phosphorus	TMDL, S/B		
8	1	N/A	9		Dissolved Phosphorus (Available Phosphorus)	DEQ		
					BACTERIA		Feb, Aug	2
8	1	N/A	9	SM 9230B, 9230C	Enteroccocci Bacteria	TMDL, DEQ		
8	1	N/A	9	SM 9221C, 9222D	Fecal Coliform Bacteria	TMDL, DEQ		
					TOXINS			
8	1	N/A	9	9020	Total Halogenated Organics (TOX)	DEQ	Feb, Aug.	2
8	????	???	???	???	????*	TMDL	????	????
8	1	N/A	9		**LEACHATE INDICATOR PARAMETERS**		Feb, Aug.	2
					Same parameters as groundwater			
				160.3	Solids, Total	S/B		
					CRITICAL PARAMETERS			
8	1	N/A	9	EPA 6010, 7420, 7421, 7061, 7741	TRACE METALS (Total Recoverable - Unfiltered) Same parameters as groundwater	DEQ	Aug.	1
8	1	1	10	EPA 8260	VOLATILE ORGANIC CONSTITUENTS Same parameters as groundwater	DEQ	Aug.	1

*Subject to DEQ requirements

SEDIMENT SAMPLING

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq/Yr
4	1	N/A	5	6010, 7470, 7421, 7061, 7741	**TOTAL METALS - 1/yr**		Aug.	1
					Arsenic Cadmium Chromium Copper Lead Mercury Zinc			
4	1	1	6	8100	**PAH's - 1/yr** Acenaphthene Acenaphthylene Anthracene Benzo(a) pyrene Benzo(b+k)fluoranthene Benzo(g,h,i)perylene Chrysene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene and Dibenz(a,h)anthracene Naphthalene Phenanthrene Pyrene	DEQ	Aug.	1
4	1	1	6	8080	**PESTICIDES and PCBs** (listed in EPA, Method 8080) Same parameters as groundwater		Aug.	1
					OTHER			
4	1	1	6	8150	2,4-D		Aug.	1
4	1	N/A	5	4129-82-M	Total Organic Carbon		Aug.	1
4	1	N/A	5	8/91 EPA Draft	Acid Volatile Sulfides (cold acid soluble)		Aug.	1

BIOLOGICAL SAMPLING

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq/Yr
1	1	N/A	2	EPA 7131	INVERTEBRATE - Cadmium, Total		Aug.	1
1	1	N/A	2	EPA 7421	INVERTEBRATE - Lead, Total		Aug.	1
1	1	N/A	2	EPA 7471	INVERTEBRATE - Mercury, Total		Aug.	1
1	1	1	3	EPA 8100	INVERTEBRATE - PAH's	DEQ	Aug.	1
1	1	1	3	EPA 8080 and 3540	INVERTEBRATE - Pesticides and PCBs		Aug.	1
1	1	N/A	2	EPA 7131	FISH TISSUE - Cadmium, Total		Aug.	1
1	1	N/A	2	EPA 7421	FISH TISSUE - Lead, Total		Aug.	1
1	1	N/A	2	EPA 7421	FISH TISSUE - Mercury, Total		Aug.	1
1	1	1	3	EPA 8100	FISH TISSUE - PAH's	DEQ	Aug.	1
1	1	1	3	EPA 8080 and 3540	FISH TISSUE - Pesticides and PCBs		Aug.	1

*Invertebrate will be crayfish or penned Asian clams (Corbicula fluminea)
Fish from prefereably five specimens, from each of three species.

STORMWATER MONITORING

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq/Yr
20	N/A	N/A	N/A		**VISUAL OBSERVATIONS** - Monthly (when at least one storm event occurs which produces runoff)		Monthly	12
					Color			
					Foam			
					Oil & grease sheen			
5	1	N/A	6	6010, 7470, 7421, 7061, 7741	**METALS** (Grab Samples) - 2/yr (plus whenever leachate seepage is detected or sewage sludge is disposed of at the site)		Aug.	2
					Arsenic Cadmium Chromium Copper Iron Lead Manganese Mercury Nickel Zinc			
5	1	N/A	6		**OTHER** - 2/yr (plus oil & grease whenever a visible oil sheen is detected in a stormwater discharge)		Aug.	2
				410.2	Chemical Oxygen Demand (COD) (mg/l)			
				120.1	Conductance, specific (uMHO/cm)			
				SM 9230B, 9230C	Enteroccocci (#/100 ml)			
				SM 9221C, 9222D	Fecal Coliform (#100 ml)			
				413.1	Oil & Grease (mg/l)			
				365.3	Ortho Phosphorus, dissolved (mg/l)			
				365.3	Phosphorus, total (mg/l)			
				150.1	pH			
				415.1	TOC (mg/l)			
				160.2	Solids, total suspended (TSS) (mg/l)			

*Initial number of sampling points. See attached table for changes over time.

LEACHATE COLLECTION SYSTEM MONITORING

#Sampl'g Points*	Dupl.	Blanks	Samples/ Event	Method #	PARAMETER TO BE SAMPLED	Source	Sampling Dates	Freq./Yr
1	N/A	N/A	1	376.2	Sulfide (Grab)	City Permit	Monthly	12
1	N/A	N/A	1	150.1	pH (Grab)	City Permit	Monthly	12
1	N/A	N/A	1	350.3	Ammonia (Grab)	IQ	Monthly.	12
1	N/A	N/A	1	6010	Cadmium (composite)	City Permit	Mar, June, Sept, Dec.	4
1	N/A	N/A	1	6010	Chromium, total (composite)	City Permit	Mar, June, Sept, Dec.	4
1	N/A	N/A	1	6010	Copper (composite)	City Permit	Mar, June, Sept, Dec.	4
1	N/A	N/A	1	7421	Lead (composite)	City Permit	Mar, June, Sept, Dec.	4
1	N/A	N/A	1	6010	Nickel (composite)	City Permit	Mar, June, Sept, Dec.	4
1	N/A	N/A	1	6010	Zinc (zinc)	City Permit	Mar, June, Sept, Dec.	4
1	N/A	N/A	1	300.0	Sulfate (composite)	City Permit	June, Dec.	2
1	N/A	N/A	1	7470	Mercury (composite)	City Permit	June, Dec.	2
1	N/A	N/A	1	413.1	Fats, Oils, and Grease (grab)	City Permit	June, Dec.	2
1	N/A	1	2	608/624/ 625	TTO (grab) - See attached list of parameters	City Permit	Mar, June, Sept, Dec.	4
1	N/A	1	2		Acetone	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Aniline	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Butyl Acetate	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Formaldehyde	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Methyl Ethyl Ketone	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Methyl IsoButyl Ketone	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Pyridine	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Styrene	BES	Mar, June, Sept, Dec.	4
1	N/A	1	2		Xylene(s)	BES	Mar, June, Sept, Dec.	4
1	N/A	N/A	N/A		Flow (metered)	City Permit	Cont.	Cont.

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Appendix A2. TTO's

Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis(2-chloroethyl) ether
2-chloroethyl vinyl ether (mixed)
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane
1,3-dichloropropylene(1,3-dichloropropene)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis(2-chloroisopropyl) ether
Bis(2-chloroethoxy) methane
Methylene chloride (dichloromethane)
Methyl chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorodibromomethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenolthylamine
4-nitrophenolenylamine
2,4-dinitrophenol
4,6-dinitro-o-cresol
N-nitrosodimethylamine
N-nitroxodiphenylamine
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis(2-ethylhexyl)phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene
(benzo(a)anthracene)
Benzo(a)pyrene(3,4-benzopyrene)
3,4-Benzofluoranthene
(benzo(b)fluoranthene)
11,12-benzofluoranthene
(benzo(k)fluoranthene)
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene
(benzo(ghi)perylene)
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene
(dibenzo(a,h)anthracene)
Indeno(1,2,3-cd pyrene
(2,3-o-phenylene pyrene)
Pyrene
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride (chloroethylene)
Aldrin
Dieldrin
Chlordane (technical mixture
and metabolites)
4,4-DDT
4,4-DDE(p,p-DEX)
4,4-DDD(p,p-TDE)
Alpha-endosulfan
Beta-endolulfan

TOTAL TOXIC ORGANICS (cont)

Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
(BHC-hexachlorocyclohexane)
- Alpha-BHC
- Beta-BHC
- Gamma-BHC
- Delta-BHC

(PCB-polychlorinated biphenyls)
- PCB-1242 (Arochlor 1242)
- PCB-1254 (Arochlor 1254)
- PCB-1221 (Arochlor 1221)
- PCB-1232 (Arochlor 1232)
- PCB-1248 (Arochlor 1248)
- PCB-1260 (Arochlor 1260)
- PCB-1016 (Arochlor 1016)

Toxaphene
2,3,7,8-tetrachlorodibenxo-p-dioxin (TCDD)

Appendix A3. PHASE II PARAMETERS

Appendix II to this Part 258—List of Hazardous Inorganic and Organic Constituents [1]

Common Name [2]	CAS RN [3]	Chemical abstracts service index name [4]	Suggested methods [5]	PQL (µg/L) [6]
Acenaphthene	83-32-9	Acenaphthylene, 1,2-dihydro-	8100	200
			8270	10
Acenaphthylene	208-96-8	Acenaphthylene	8100	200
			8270	10
Acetone	67-64-1	2-Propanone	8260	100
Acetonitrile; Methyl cyanide	75-05-8	Acetonitrile	8015	100
Acetophenone	98-86-2	Ethanone, 1-phenyl-	8270	10
2-Acetylaminofluorene; 2-AAF	53-96-3	Acetamide, N-9H-fluoren-2-yl-	8270	20
Acrolein	107-02-8	2-Propenal	8030	5
			8260	100
Acrylonitrile	107-13-1	2-Propenenitrile	8030	5
			8260	200
Aldrin	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro- (1α,4α,4aβ,5α,8α,8aβ)-	8080	0.05
			8270	10
Allyl chloride	107-05-1	1-Propene, 3-chloro-	8010	5
			8260	10
4-Aminobiphenyl	92-67-1	[1,1'-Biphenyl]-4-amine	8270	20
Anthracene	120-12-7	Anthracene	8100	200
			8270	10
Antimony	(Total)	Antimony	6010	300
			7040	2000
			7041	30
Arsenic	(Total)	Arsenic	6010	500
			7060	10
			7061	20
Barium	(Total)	Barium	6010	20
			7080	1000
Benzene	71-43-2	Benzene	8020	2
			8021	0.1
			8260	5
Benzo[a]anthracene; Benzanthracene	56-55-3	Benz[a]anthracene	8100	200
			8270	10
Benzo[b]fluoranthene	205-99-2	Benz[e]acephenanthrylene	8100	200
			8270	10
Benzo[k]fluoranthene	207-08-9	Benzo[k]fluoranthene	8100	200
			8270	10
Benzo[ghi]perylene	191-24-2	Benzo[ghi]perylene	8100	200
			8270	10
Benzo[a]pyrene	50-32-8	Benzo[a]pyrene	8100	200
			8270	10
Benzyl alcohol	100-51-6	Benzenemethanol	8270	20
Beryllium	(Total)	Beryllium	6010	3
			7090	50
			7091	2
alpha-BHC	319-84-6	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3β,4α,5β,6β)-	8080	0.05
			8270	10
beta-BHC	319-85-7	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2β,3α,4β,5α,6β)-	8080	0.05
			8270	20
delta-BHC	319-86-8	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3α,4β,5α,6β)-	8080	0.1
			8270	20

Common Name [2]	CAS RN [3]	Chemical abstracts service index name [4]	Suggested methods [6]	POL (µg/L) [6]
gamma-BHC; Lindane	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3β,4α,5α,6β)-	8080	0.05
			8270	20
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	8110	5
			8270	10
Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4	Ethane, 1,1'-oxybis[2-chloro-	8110	3
			8270	10
Bis-(2-chloro-1-methylethyl) ether; 2,2'-Dichlorodiisopropyl ether; DCIP, See note 7	108-60-1	Propane, 2,2'-oxybis[1-chloro-	8110	10
			8270	10
Bis(2-ethylhexyl) phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	8060	20
Bromochloromethane; Chlorobromomethane	74-97-5	Methane, bromochloro-	8021	0.1
			8260	5
Bromodichloromethane; Dibromochloromethane	75-27-4	Methane, bromodichloro-	8010	1
			8021	0.2
			8250	5
Bromoform; Tribromomethane	75-25-2	Methane, tribromo-	8010	2
			8021	15
			8260	5
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-	8110	25
			8270	10
Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	8060	5
			8270	10
Cadmium	(Total)	Cadmium	6010	40
			7130	50
			7131	1
Carbon disulfide	75-15-0	Carbon disulfide	8260	100
Carbon tetrachloride	56-23-5	Methane, tetrachloro-	8010	1
			8021	0.1
Chlordane	See Note 8	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	8260	10
			8080	0.1
p-Chloroaniline	106-47-8	Benzenamine, 4-chloro-	8270	50
Chlorobenzene	108-90-7	Benzene, chloro-	8270	20
			8010	2
			8020	2
			8021	0.1
			8260	5
Chlorobenzilate	510-15-6	Benzeneacetic acid, 4-chloro-α-(4-chlorophenyl)-α-hydroxy-, ethyl ester.	8270	10
p-Chloro-m-cresol; 4-Chloro-3-methylphenol	59-50-7	Phenol, 4-chloro-3-methyl-	8040	5
			8270	20
Chloroethane; Ethyl chloride	75-00-3	Ethane, chloro-	8010	5
			8021	1
			8260	10
Chloroform; Trichloromethane	67-66-3	Methane, trichloro-	8010	0.5
			8021	0.2
			8260	5
2-Chloronaphthalene	91-58-7	Naphthalene, 2-chloro-	8120	10
			8270	10
2-Chlorophenol	95-57-8	Phenol, 2-chloro-	8040	5
			8270	10
4-Chlorophenyl phenyl ether	7005-72-3	Benzene, 1-chloro-4-phenoxy-	8110	40
			8270	10
Chloroprene	126-99-8	1,3-Butadiene, 2-chloro-	8010	50
			8260	20
Chromium	(Total)	Chromium	6010	70
			7190	500
			7191	10
Chrysene	218-01-9	Chrysene	8100	200
			8270	10
Cobalt	(Total)	Cobalt	6010	70
			7200	500
			7201	10
Copper	(Total)	Copper	6010	60
			7210	200
			7211	10
m-Cresol; 3-methylphenol	108-39-4	Phenol, 3-methyl-	8270	10
o-Cresol; 2-methylphenol	95-48-7	Phenol, 2-methyl-	8270	10
p-Cresol; 4-methylphenol	106-44-5	Phenol, 4-methyl-	8270	10
Cyanide	57-12-5	Cyanide	9010	200
2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-	8150	10
4,4'-DDD	72-54-8	Benzene 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	8080	0.1
			8270	10
4,4'-DDE	72-55-9	Benzene, 1,1'-(dichloroethyenylidene)bis[4-chloro-	8080	0.05
			8270	10
4,4'-DDT	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	8080	0.1
			8270	10
Diallate	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-,S-(2,3-dichloro-2-propenyl) ester.	8270	10

Common Name [2]	CAS RN [3]	Chemical abstracts service index name [4]	Suggested methods [5]	PQL (µg/L) [6]
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene	8100	200
			8270	10
Dibenzofuran	132-64-9	Dibenzofuran	8270	10
Dibromochloromethane; Chlorodibromomethane	124-48-1	Methane, dibromochloro-	8010	1
			8021	0.3
			8260	5
1,2-Dibromo-3-chloropropane; DBCP	96-12-8	Propane, 1,2-dibromo-3-chloro-	8011	0.1
			8021	30
			8260	25
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4	Ethane, 1,2-dibromo-	8011	0.1
			8021	10
			8260	5
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester	8060	5
			8270	10
o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-	8010	2
			8020	5
			8021	0.5
			8120	10
			8260	5
			8270	10
m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1	Benzene, 1,3-Dichloro-	8010	5
			8020	5
			8021	0.2
			8120	10
			8260	5
			8270	10
p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	8010	2
			8020	5
			8021	0.1
			8120	15
			8260	5
			8270	10
3,3[1]-Dichlorobenzidine	91-94-1	[1,1[1]-Biphenyl]-4,4[1]-diamine, 3,3[1]-dichloro-	8270	20
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-	8260	100
Dichlorodifluoromethane; CFC 12;	75-71-8	Methane, dichlorodifluoro-	8021	0.5
			8260	5
1,1-Dichloroethane; Ethylidene chloride	75-34-3	Ethane, 1,1-dichloro-	8010	1
			8021	0.5
			8260	5
1,2-Dichloroethane; Ethylene dichloride	107-06-2	Ethane, 1,1-dichloro-	8010	0.5
			8021	0.3
			8260	5
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4	Ethene, 1,1-dichloro-	8010	1
			8021	0.5
			8260	5
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2	Ethene, 1,2-dichloro-, (Z)-	8021	0.2
			8260	5
trans-1,2-Dichloroethylene trans-1,2-Dichloroethene	156-60-5	Ethene, 1,2-dichloro-, (E)-	8010	1
			8021	0.5
			8260	5
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-	8040	5
			8270	10
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-	8270	10
1,2-Dichloropropane; Propylene dichloride	78-87-5	Propane, 1,2-dichloro-	8010	0.5
			8021	0.05
			8260	5
1,3-Dichloropropane; Trimethylene dichloride	142-28-9	Propane, 1,3-dichloro-	8021	0.3
			8260	5
2,2-Dichloropropane; Isopropylidene chloride	594-20-7	Propane, 2,2-dichloro-	8021	0.5
			8260	15
1,1-Dichloropropene	563-58-6	1-Propene, 1,1-dichloro-	8021	0.2
			8260	5
cis-1,3-Dichloropropene	10061-01-5	1-Propene, 1,3-dichloro-, (Z)-	8010	20
			8260	10
trans-1,3-Dichloropropene	10061-02-6	1-Propene, 1,3-dichloro-, (E)-	8010	5
			8260	10
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aα,2β,2aα,3β,6β,6aα,7β,7aα)-.	8060	0.05
			8270	10
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	8060	5
			8270	10
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	297-97-2	Phosphorothioic acid, 0,0-diethyl 0-pyrazinyl ester	8141	5
			8270	20
Dimethoate	60-51-5	Phosphorodithioic acid, 0,0-dimethyl S-[2-(methylamino)-2-oxoethyl] ester.	8141	3
			8270	20
p-(Dimethylamino)azobenzene	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-	8270	10
7,12-Dimethylbenz[a]anthracene	57-97-6	Benz[a]anthracene, 7,12-dimethyl-	8270	10

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Common Name [2]	CAS RN [3]	Chemical abstracts service index name [4]	Suggested methods [5]	POL (µg/L) [6]
3,3¹-Dimethylbenzidine	119-93-7	[1,1¹-Biphenyl]-4,4¹-diamine, 3,3¹-dimethyl-	8270	10
2,4-Dimethylphenol; m-Xylenol	105-67-9	Phenol, 2,4-dimethyl-	8040	5
			8270	10
Dimethyl phthalate	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester	8060	5
			8270	10
m-Dinitrobenzene	99-65-0	Benzene, 1,3-dinitro-	8270	20
4,6-Dinitro-o-cresol 4,6-Dinitro-2-methylphenol	534-52-1	Phenol, 2-methyl-4,6-dinitro	8040	150
			8270	50
2,4-Dinitrophenol;	51-28-5	Phenol, 2,4-dinitro-	8040	150
			8270	50
2,4-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-	8090	0.2
			8270	10
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-	8090	0.1
			8270	10
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-	8150	1
			8270	20
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester	8060	30
			8270	10
Diphenylamine	122-39-4	Benzenamine, N-phenyl-	8270	10
Disulfoton	298-04-4	Phosphorodithioic acid, 0,0-diethyl S-[2-(ethylthio)ethyl] ester	8140	2
			8141	0.5
			8270	10
Endosulfan I	959-98-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide,	8080	0.1
			8270	20
Endosulfan II	33213-65-9	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3 oxide, (3α,5aα,6β,9β,9aα)-.	8080	0.05
			8270	20
Endosulfan sulfate	1031-07-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-,3-3-dioxide.	8080	0.5
			8270	10
Endrin	72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aα, 2β,2aβ,3α,6α, 6aβ,7β,7aα)-.	8080	0.1
			8270	20
Endrin aldehyde	7421-93-4	1,2,4-Methenocyclopenta[cd]pentalene-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-, (1α,2β,2aβ,4β, 4aβ,5β,6aβ,6bβ,7R*)-.	8080	0.2
			8270	10
Ethylbenzene	100-41-4	Benzene, ethyl-	8020	2
			8221	0.05
			8260	5
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester	8015	5
			8260	10
			8270	10
Ethyl methanesulfonate	62-50-0	Methanesulfonic acid, ethyl ester	8270	20
Famphur	52-85-7	Phosphorothioic acid, 0-[4-[(dimethylamino)sulfonyl]phenyl] 0,0-dimethyl ester.	8270	20
Fluoranthene	206-44-0	Fluoranthene	8100	200
			8270	10
Fluorene	86-73-7	9H-Fluorene	8100	200
			8270	10
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-.	8080	0.05
			8270	10
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1aα, 1bβ, 2α, 5α, 5aβ, 6β, 6aα).	8080	1
			8270	10
Hexachlorobenzene	118-74-1	Benzene, hexachloro-	8120	0.5
			8270	10
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	8021	0.5
			8120	5
			8260	10
			8270	10
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	8120	5
			8270	10
Hexachloroethane	67-72-1	Ethane, hexachloro-	8120	0.5
			8260	10
			8270	10
Hexachloropropene	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-	8270	10
2-Hexanone; Methyl butyl ketone	591-78-6	2-Hexanone	8260	50
Indeno(1,2,3-cd)pyrene	193-39-5	Indeno(1,2,3-cd)pyrene	8100	200
			8270	10
Isobutyl alcohol	78-83-1	1-Propanol, 2-methyl-	8015	50
			8240	100
Isodrin	465-73-6	1,4,5,8-Dimethanonaphthalene,1,2,3,4,10,10- hexachloro-1,4,4a,5,8,8a hexahydro- (1α,4α,4aβ,5β,8β,8aβ)-.	8270	20
			8260	10
Isophorone	78-59-1	2-Cyclohexen-1-one, 3,5,5-trimethyl-	8090	60
			8270	10
Isosafrole	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-	8270	10
Kepone	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-.	8270	20

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Common Name [2]	CAS RN [3]	Chemical abstracts service index name [4]	Suggested methods [5]	POL (µg/L) [6]
Lead	(Total)	Lead	6010	400
			7420	1000
			7421	10
Mercury	(Total)	Mercury	7470	2
Methacrylonitrile	126-98-7	2-Propenenitrile, 2-methyl-	8015	5
			8260	100
Methapyrilene	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N1/2-thienylmethyl)-.	8270	100
Methoxychlor	72-43-5	Benzene,1,1'-(2,2,2,trichloroethylidene)bis[4-methoxy-	8080	2
			8270	10
Methyl bromide; Bromomethane	74-83-9	Methane, bromo-	8010	20
			8021	10
Methyl chloride; Chloromethane	74-87-3	Methane, chloro-	8010	1
			8021	0.3
3-Methylcholanthrene	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	8270	10
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3	2-Butanone	8015	10
			8260	100
Methyl iodide; Iodomethane	74-88-4	Methane, iodo-	8010	40
			8260	10
Methyl methacrylate	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester	8015	2
			8260	30
Methyl methanesulfonate	66-27-3	Methanesulfonic acid, methyl ester	8270	10
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-	8270	10
Methyl parathion; Parathion methyl	298-00-0	Phosphorothioic acid, 0,0-dimethyl 0-(4-nitrophenyl) ester	8140	0.5
			8141	1
			8270	10
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1	2-Pentanone, 4-methyl-	8015	5
			8260	100
Methylene bromide; Dibromomethane	74-95-3	Methane, dibromo-	8010	15
			8021	20
			8260	10
Methylene chloride; Dichloromethane	75-09-2	Methane, dichloro-	8010	5
			8021	0.2
			8260	10
Naphthalene	91-20-3	Naphthalene	8021	0.5
			8100	200
			8260	5
			8270	10
1,4-Naphthoquinone	130-15-4	1,4-Naphthalenedione	8270	10
1-Naphthylamine	134-32-7	1-Naphthalenamine	8270	10
2-Naphthylamine	91-59-8	2-Naphthalenamine	8270	10
Nickel	(Total)	Nickel	6010	150
			7520	400
o-Nitroaniline; 2-Nitroaniline	88-74-4	Benzenamine, 2-nitro-	8270	50
m-Nitroaniline; 3-Nitroanile	99-09-2	Benzenamine, 3-nitro-	8270	50
p-Nitroaniline; 4-Nitroaniline	100-01-6	Benzenamine, 4-nitro	8270	20
Nitrobenzene	98-95-3	Benzene, nitro-	8090	40
			8270	10
o-Nitrophenol; 2-Nitrophenol	88-75-5	Phenol, 2-nitro-	8040	5
			8270	10
p-Nitrophenol; 4-Nitrophenol	100-02-7	Phenol, 4-nitro-	8040	10
			8270	50
N-Nitrosodi-n-butylamine	924-16-3	1-Butanamine, N-butyl-N-nitroso-	8270	10
N-Nitrosodiethylamine	55-18-5	Ethanamine, N-ethyl-N-nitroso-	8270	20
N-Nitrosodimethylamine	62-75-9	Methanamine, N-methyl-N-nitroso-	8070	2
N-Nitrosodiphenylamine	86-30-6	Benzenamine, N-nitroso-N-phenyl-	8070	5
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine.	621-64-7	1-Propanamine, N-nitroso-N-propyl-	8070	10
N-Nitrosomethylethalamine	10595-95-6	Ethanamine, N-methyl-N-nitroso-	8270	10
N-Nitrosopiperidine	100-75-4	Piperidine, 1-nitroso-	8270	20
N-Nitrosopyrrolidine	930-55-2	Pyrrolidine, 1-nitroso-	8270	40
5-Nitro-o-toluidine	99-55-8	Benzenamine, 2-methyl-5-nitro-	8270	10
Parathion	56-38-2	Phosphorothioic acid, 0,0-diethyl 0-(4-nitrophenyl) ester	8141	0.5
			8270	10
Pentachlorobenzene	608-93-5	Benzene, pentachloro-	8270	10
Pentachloronitrobenzene	82-68-8	Benzene, pentachloronitro-	8270	20
Pentachlorophenol	87-86-5	Phenol, pentachloro-	8040	5
			8270	50
Phenacetin	62-44-2	Acetamide, N-(4-ethoxyphenl)	8270	20
Phenanthrene	85-01-8	Phenanthrene	8100	200
			8270	10
Phenol	108-95-2	Phenol	8040	1
p-Phenylenediamine	106-50-3	1,4-Benzenediamine	8270	10
Phorate	298-02-2	Phosphorodithioic acid, 0,0-diethyl S-[(ethylthio)methyl] ester	8140	2
			8141	0.5
			8270	10

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Common Name [3]	CAS RN [3]	Chemical abstracts service index name [4]	Suggested methods [5]	PQL (µg/L) [6]
Polychlorinated biphenyls; PCBs; Aroclors	See Note 9	1,1'-Biphenyl, chloro derivatives	8080	50
			8270	200
Pronamide	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	8270	10
Propionitrile; Ethyl cyanide	107-12-0	Propanenitrile	8015	60
			8260	150
Pyrene	129-00-0	Pyrene	8100	200
			8270	10
Safrole	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-	8270	10
Selenium	(Total)	Selenium	6010	750
			7740	20
			7741	20
Silver	(Total)	Silver	6010	70
			7760	100
			7761	10
Silvex; 2,4,5-TP	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	8150	2
Styrene	100-42-5	Benzene, ethenyl-	8020	1
			8021	0.1
			8260	10
Sulfide	18496-25-8	Sulfide	9030	4000
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-	8150	2
1,2,4,5-Tetrachlorobenzene	95-94-3	Benzene, 1,2,4,5-tetrachloro-	8270	10
1,1,1,2-Tetrachloroethane	630-20-6	Ethane, 1,1,1,2-tetrachloro-	8010	5
			8021	0.05
			8260	5
1,1,2,2-Tetrachloroethane	79-34-5	Ethane, 1,1,2,2-tetrachloro-	8010	0.5
			8021	0.1
			8260	5
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4	Ethene, tetrachloro-	8010	0.5
			8021	0.5
			8260	5
2,3,4,6-Tetrachlorophenol	58-90-2	Phenol, 2,3,4,6-tetrachloro-	8270	10
Thallium	(Total)	Thallium	6010	400
			7840	1000
			7841	10
Tin	(Total)	Tin	6010	40
Toluene	108-88-3	Benzene, methyl-	8020	2
			8021	0.1
			8260	5
o-Toluidine	95-53-4	Benzenamine, 2-methyl-	8270	10
Toxaphene	See Note 10	Toxaphene	8080	2
1,2,4-Trichlorobenzene	120-82-1	Benzene, 1,2,4-trichloro-	8021	0.3
			8120	0.5
			8260	10
			8270	10
1,1,1-Trichloroethane; Methylchloroform	71-55-6	Ethane, 1,1,1-trichloro-	8010	0.3
			8021	0.3
			8260	5
1,1,2-Trichloroethane	79-00-5	Ethane, 1,1,2-trichloro-	8010	0.2
			8260	5
Trichloroethylene; Trichloroethene	79-01-6	Ethene, trichloro-	8010	1
			8021	0.2
			8260	5
Trichlorofluoromethane; CFC-11	75-69-4	Methane, trichlorofluoro-	8010	10
			8021	0.3
			8260	5
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-	8270	10
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-	8040	5
			8270	10
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-	8010	10
			8021	5
			8260	15
0,0,0-Triethyl phosphorothioate	126-68-1	Phosphorothioic acid, 0,0,0-triethylester	8270	10
sym-Trinitrobenzene	99-35-4	Benzene, 1,3,5-trinitro-	8270	10
Vanadium	(Total)	Vanadium	6010	8
			7910	2000
			7911	40
Vinyl acetate	108-05-4	Acetic acid, ethenyl ester	8260	50
Vinyl chloride; Chloroethene	75-01-4	Ethene, chloro-	8010	2
			8021	0.4
Xylene (total)	See Note 11	Benzene, dimethyl-	8260	10
			8020	5
			8021	0.2
			8260	5
Zinc	(Total)	Zinc	6010	20
			7950	50
			7951	0.5

Notes

[1] The regulatory requirements pertain only to the list of substances; the right hand columns (Methods and PQL) are given for informational purposes only. See also footnotes 5 and 6.

[2] Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

[3] Chemical Abstracts Service registry number. Where "Total" is entered, all species in the ground water that contain this element are included.

[4] CAS index are those used in the 9th Collective Index.

[5] Suggested Methods refer to analytical procedure numbers used in EPA Report SW-846 "Test Methods for Evaluating Solid Waste", third edition, November 1986, as revised, December 1987. Analytical details can be found in SW-846 and in documentation on file at the agency. CAUTION: The methods listed are representative SW-846 procedures and may not always be the most suitable method(s) for monitoring an analyte under the regulations.

[6] Practical Quantitation Limits (PQLs) are the lowest concentrations of analytes in ground waters that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQLs listed are generally stated to one significant figure. PQLs are based on 5 mL samples for volatile organics and 1 L samples for semivolatile organics. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for individual compounds; PQLs are not a part of the regulation.

[7] This substance is often called Bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, Propane, 2,2'-oxybis[2-chloro- (CAS RN 39638-32-9).

[8] Chlordane: This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6). PQL shown is for technical chlordane. PQLs of specific isomers are about 20 μg/L by method 8270.

[9] Polychlorinated biphenyls (CAS RN 1336-36-3); this category contains congener chemicals, including constituents of Aroclor 1016 (CAS RN 12674-11-2), Aroclor 1221 (CAS RN 11104-28-2), Aroclor 1232 (CAS RN 11141-16-5), Aroclor 1242 (CAS RN 53469-21-9), Aroclor 1248 (CAS RN 12672-29-6), Aroclor 1254 (CAS RN 11097-69-1), and Aroclor 1260 (CAS RN 11096-82-5). The PQL shown is an average value for PCB congeners.

[10] Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), i.e., chlorinated camphene.

[11] Xylene (total): This entry includes o-xylene (CAS RN 95-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7). PQLs for method 8021 are 0.2 for o-xylene and 0.1 for m- or p-xylene. The PQL for m-xylene is 2.0 μg/L by method 8020 or 8260.

TABLE 1.—ADDITIONS TO APPENDIX II

Common name	CAS RN
2-Chloroethyl ethyl ether	628-34-2
m-Cresol; 3-Methylphenol	108-39-4
Diallate	2303-16-4
cis-1,2-Dichloroethylene	156-59-2
1,3-Dichloropropene; Trimethylene dichloride	142-28-9
2,2-Dichloropropane; Isopropylidene chloride	594-20-7
1,1-Dichloropropene	563-58-6
Dimethoate	60-51-5
Endosulfan sulfate	1031-07-8
Ethyl methanesulfonate	62-50-0
p-Phenylenediamine	106-50-3
o-Toluidine	95-53-4
O,O,O-Triethyl phosphorothioate	126-68-1
sym-Trinitrobenzene	99-35-4

TABLE 2.—DELETIONS FROM APPENDIX II

Common name	CAS RN
Allyl alcohol	107-18-6
Aluminum	7429-90-5
Aniline	62-53-3
Benzidine	92-87-5
Benzoic acid	65-85-0
p-Benzoquinone	106-51-4
Calcium	7440-43-9
2-Chloroethyl vinyl ether	110-75-8
3-Chloropropionitrile	542-76-7
Dibenzo[a,j]pyrene	189-55-9
Dibenzo[a,e]pyrene	192-65-4
Dibenzo[a,h]pyrene	189-64-0
Dibenzofurans (tetra-, penta-, and hexachlorodibenzofurans)	132-64-9
1,4-Dioxane	123-91-1
3,3'-Dimethoxybenzidine	119-90-4
alpha,alpha-Dimethylphenethylamine	122-09-8
1,2-Diphenylhydrazine	122-66-7
Ethylene oxide	75-21-8
Fluoride	16984-48-8
Hexachlorophene	70-30-4
Iron	7439-89-6
Magnesium	7439-39-4
Malononitrile	109-77-3
Manganese	7439-96-5

TABLE 2.—DELETIONS FROM APPENDIX II—Continued

Common name	CAS RN
4,4'-Methylenebis(2-chloroaniline)	101-14-4
N-Nitrosomorpholine	59-89-2
Osmium	7440-04-2
Pentachloroethane	76-01-7
2-Picoline	109-06-8
Potassium	7440-09-7
2-Propyn-1-ol; Propargyl alcohol	107-19-7
Pyridine	110-86-1
Resorcinol	108-46-3
Sodium	7440-23-5
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6
Tetraethyl dithiopyrophosphate; Sulfotepp	3689-24-5
Thiophenol; Benzenethiol	108-98-5
Trichloromethanethiol	75-70-7
Tris(2,3-dibromopropyl) phosphate	126-72-7

Appendix B. SAMPLING AND ANALYSIS PLAN

A sampling and analysis plan is included to insure that the water monitoring plan is carried out in a prudent manner. The purpose of this plan is to optimize the accuracy and validity of the collected samples and resulting analysis. The elements of this plan include: presampling procedures; monitoring well purging; sample collection procedures and preservation; chain-of-custody control; and both field and laboratory quality assurance/quality control. The personnel who will implement the water monitoring plan for Metro shall, at a minimum, be required to adhere to the program described in this sampling and analysis plan.

LEACHATE AND GROUND WATER MONITORING WELLS

I. Presampling Procedures.

Several processes shall be undertaken and information collected prior to purging and sampling of a monitoring well.

A. Decontamination of Equipment

1. All equipment that will be placed within the well casing will be cleaned prior to use on the site and after use at each monitoring well.

2. Decontamination of non-dedicated sampling and monitoring equipment shall use the following procedure: wash with a non-phosphate laboratory grade detergent; rinse with tap water and distilled water; and let air dry.

3. Sample containers shall be decontaminated according to Section III.B.10.

B. Static Water Level Elevation

1. Measurements shall be taken from an established reference point on the well. The reference point shall be:

   a. established by licensed surveyor to an established National Geodetic Vertical Datum (NGVD);

   b. periodically re-surveyed;

   c. permanent and easily identified; and

   d. located on the top of the well casing with the locking cap removed.

2. Measurements in all wells for each hydrogeological unit shall be performed as close to low tide as is feasible, and the time of day of each measurement will be recorded.

3. Equipment used shall be sufficiently sensitive so that a measurement to $\pm$ 0.01 foot can be obtained reliably. The equipment shall:

   a. be constructed of inert materials;
   b. be the same water level indicator used to measure levels in all wells; and
   c. be a steel tape or preferably be a electronic device, which has been decontaminated.

C. Total Depth of the Well

1. Measurements shall be taken from an established reference point on the well. The reference point shall be located as described above for static water level elevations.

2. Equipment used shall be sufficiently sensitive so that a measurement to ± 0.01 foot can be obtained reliably. The equipment shall:

   a. be constructed of inert materials;
   b. be the same depth level indicator used to measure depths in all wells; and
   c. preferably be a project-dedicated steel tape.

D. Air Monitoring

1. If needed, the air above the well head shall be monitored for an explosive and toxic environment including but not limited to, methane, hydrogen sulfide, and carbon monoxide.

2. Personal protective equipment and safety procedures shall be suitable to meet health and safety regulations.

E. Documentation

1. A field logbook shall be maintained. Field measurements, procedures, and observations shall be recorded. Copies shall be submitted to Metro with laboratory sample analysis results.

II. Monitoring Well Purging

Standing water in the well and filter pack shall be removed so that formation water can replace the stagnant well water. The equipment used for purging the monitoring wells shall minimize the introduction of contamination into the well. Adherence to a proper procedure should allow for the extraction of a water quality sample representative of the in-situ groundwater.

A. Purging Equipment

1. The equipment used will be:

   a. a positive-gas-displacement, fluorocarbon resin bladder pump; or
   b. a fluorocarbon resin or stainless steel bottom-emptying bailer.
   c. Where the use of the above devices is not feasible, a peristaltic pump, gas-lift pump, centrifugal pump, or venture pump will be utilized.

2. Twenty-four (24) hours will be allowed for the well water to stabilize prior to sampling.

3. Measures will be taken to prevent contact between surface soils and the purging equipment and lines.

4. The equipment and methods used for purging the individual wells shall be consistently used for each well for the life of the monitoring plan.

B. Purging Procedure

1. Well Volume Calculation

   Prior to purging, the volume of water in the well shall be calculated using the following formula:

   CASING VOLUME = D^2 x 0.0055 x (TD - DTW), where:
   D = Diameter of the well casing (in),
   TD = Total Depth of Well (ft) from top of casing, and
   DTW = Depth To Water (ft) from top of casing

2. Purging of Low Yielding Wells (incapable of yielding three casing volumes with continuous bailing)

   a. Purge the well dry once, at a rate that does not cause recharge water to be excessively agitated.

   b. The procedure and all readings shall be recorded in the field logbook.

3. Purging of High Yielding Wells (wells capable of yielding three casing volumes with continuous bailing).

   a. Purge the well of a minimum of three casing volumes prior to sampling at a rate that does not cause recharge water to be excessively agitated.

   b. The procedure and all readings shall be recorded in the field logbook.

4. Disposal of Purged Monitoring Well Water.

   a. Water removed from landfill perimeter and offsite groundwater monitoring wells may be disposed of on the surrounding ground unless the well water has been previously shown to contain toxic substances at concentrations above the Maximum Contaminant Levels for drinking water.

   b. Water removed from interior leachate monitoring wells and from monitoring wells previously shown to contain toxic substances at concentration above the Maximum Contaminant Levels shall be deposited in the leachate pump station wet well.

C. Documentation

1. A field logbook shall be maintained. Measurements and procedures shall be recorded. Copies shall be submitted to Metro with laboratory sample analysis results.

III. Sample Collection Procedures and Preservation.

Alteration of the physical and chemical characteristics of the water sample shall be minimized during the sampling process. Adherence to proper protocol should result in delivery to the laboratory of a water quality sample representative of the *in situ* ground water. Sampling of wells shall occur at least 24 hours after purging of wells to allow the wells to stabilize.

A. Sampling Equipment

1. Sampling bailers dedicated to each individual monitoring well will be used. The bailers will be either PVC, fluorocarbon resin, or stainless steel and have bottom emptying valves. Currently, dedicated PVC bailers are being used for purging and sampling.

2. The chain/cable used to lower and raise the bailers will be an inert material. (e.g., polypropylene cord, fluorocarbon resin-coated wire, single strand stainless steel wire, monofilament). Currently, dedicated polypropylene cord is being used.

B. Sample Collection

1. The sampling bailer shall be slowly immersed into the well water;

2. Contents of the bailer shall be slowly emptied directly into the sample container in a manner that minimizes agitation and aeration of the sample;

3. Containers are filled with zero headspace to minimize loss of volatiles. Containers of samples for heavy metal analysis shall not be allowed to overflow;

4. Samples will be collected and containerized in the order of the decreasing volatilization sensitivity of the parameters of interest. In general, the order is as listed below:

   Volatile organics (VOA)
   Purgeable organic carbon (POC)
   Purgeable organic halogens (POX)
   Total organic halogens (TOX)
   Total organic carbon (TOC)
   Extractable organics
   Total recoverable metals
   Dissolved metals
   Phenols
   Cyanide
   Sulfate and chloride
   Turbidity
   Nitrate and ammonia
   Radionuclides

5. Types of sample containers used are dependent on the parameters of interest and are listed in Table 1.

6. Preservation procedures that will be observed are dependent on the parameters of interest and are listed in Table 1. In most cases samples should be immediately stored in a chest of ice.

7. Dissolved metals samples shall be filtered and preserved immediately in the field.

   a. Use a separate 0.45 micron membrane filter for each sample; and

   b. Develop a standard written procedure and equipment list.

8. The sample containers shall be:

   a. cleaned in the laboratory based on the analyte of interest.

      (1) Metals - wash with nonphosphate detergent and tap water; rinse with (1:1) nitric acid, tap water, (1:1) hydrochloric acid, tap water, and Type II water

      (2) Organics - wash with nonphosphate detergent in hot water, rinse with tap water, distilled water, acetone, and pesticide-quality hexane

   b. verified in the laboratory for cleanliness.

9. Chemically unstable parameters will only be determined in the field using a test probe or a field test kit as soon as possible after the sample is collected.

   a. These parameters include:

      (1) temperature
      (2) specific conductance
      (3) pH
      (4) dissolved oxygen

   b. A sample not intended for laboratory analysis shall be used for field readings.

   c. Calibration of any *in situ* or field test probes will be performed twice each day of use according to the manufacturers' specifications and in accordance with EPA, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, SW-846. A log book shall be used to document all calibration results.

10. Decontamination of Equipment

   a. Prior to use at each well, all test probes that will be placed within the well casing will be cleaned initially and after each use.

   b. Non-dedicated equipment shall be decontaminated using the following procedure: wash with a non-phosphate detergent; rinse with tap water and distilled water; and let air dry.

C. Documentation

1. A field logbook shall be maintained as specified in Section IV. Measurements and procedures shall be recorded. Copies shall be submitted to Metro with laboratory sample analysis results.

IV. Chain of Custody Control

The tracing of the sampling methodologies, the sample possession and sample handling from the time of field laboratory analysis shall be possible with the proper documentation.

A. Field Log

A field logbook will be maintained, including the following information:

- Identification of well
- Well depth
- Static water level depth and measurement technique
- Purge volume and pumping rate, if applicable
- Time well purged
- Well evacuation procedure/equipment, if varies from the sampling/analysis plan
- Sample withdrawal procedure/equipment, if varies from the sampling/analysis plan
- Date and time of collection
- Sampling sequence of samples per well, if varies from the sampling/analysis plan
- Preservative(s) used, if varies from the sampling/analysis plan
- Field analysis data
- Sample distribution and transporter, if unusual
- Field observations on sampling event, including:
  - Unusual well recharge rates
  - Equipment malfunction(s)
  - Possible sample contamination
- Name(s) of collector(s)
- Climatic conditions
- Documentation of date, procedure, and maintenance for equipment calibration
- Documentation of any deviations from plan approved procedures due to differing or unanticipated site conditions

B. Sample Labels

1. Sample labels shall include a unique sample identification for each sample and provide the following information:

   a. location is St. Johns Landfill
   b. date & time of collection
   c. collector's name
   d. sample test parameter

2. The sample label shall not provide an indication of whether the sample is a quality assurance/quality control sample such as a field blank or duplicate sample.

3. The sample labels shall be marked with permanent waterproof ink.

C. Sample seals shall be placed on the shipping or individual sample containers, if directed by Metro.

D. Chain-of-Custody Record

1. Shall accompany each sample.

2. Shall include the identification number for each sample and provide the following information:

   a. date & time of collection
   b. sample matrix type
   c. number of containers
   d. sample test parameters requested
   e. signatures of all persons involved in the chain-ofpossession, including field, office, and laboratory personnel
   f. inclusive dates of possession

E. Sample Analysis Request Sheet

1. Shall accompany each sample delivered to the laboratory

2. Shall provide the following information:
   a. name of person receiving the sample
   b. date of sample receipt
   c. laboratory sample identification number (may be different than field identification number)
   d. analysis to be performed

F. Laboratory Logbook

1. Shall be maintained a minimum of three (3) years to document the sample processing steps

2. Shall provide the following information:

   a. sample preparation technique (e.g., extraction)
   b. analytical procedures/instrumental methods
   c. experimental conditions

3. Shall be available for review and duplication by Metro representatives for a reasonable period after testing per a written agreement with Metro

V. Field Quality Assurance/Quality Control

The field QA/QC program helps to insure the reliability and validity of the gathered field samples and data. The field QA/QC program consists of carefully following all of the procedures above and recording any unavailable changes. QA/QC samples help assess the validity of the information gained from the field samples. All QA/QC samples shall be coded such that their identity as QA/QC samples is unknown to the analytical laboratory.

A. If a sampling contractor is used, a field quality assurance plan shall be submitted to Metro by the sampling contractor prior to start of the field sampling program.

B. Transport Blanks

1. Transport blanks shall be prepared and analyzed per sampling event if volatile or extractable organics are to be tested;

2. Containers shall be filled at the laboratory with Type II reagent grade water transported and stored with the sample containers, and transported from the sampling site to the laboratory with the sample containers. At no time are these trip blank containers opened or exposed.

3. Transport blanks shall be given a unique identification number, transported, processed, and analyzed at the laboratory like a sample

C. Equipment (Field) Blanks

1. Equipment (field) blanks shall be collected when non-dedicated sampling equipment is used. Date, time, location, and exact procedure used to prepare the equipment blank shall be recorded in the log book.

2. Collection frequency shall be at least one per day or one per ten samples.

3. Equipment (field) blanks shall uniquely identified, transported, processed, and analyzed at the laboratory like a sample.

D. Field Duplicates

1. Field duplicates shall be two samples collected simultaneously or collected one after the other (co-sampled) and shall be analyzed for all parameters;

2. Collection frequency shall be at least one per ten sample locations; and

3. Field duplicates shall be given a unique identification number, transported, processed, and analyzed at the laboratory like a sample

E. Field Measurement Equipment

1. Field measurement equipment shall be calibrated prior to field use; and
2. Field measurement equipment shall be recalibrated in the field twice per day

VI. Laboratory Quality Assurance/Quality Control

The laboratory QA/QC program shall insure the reliability and validity of the sample data. The results from the laboratory QC samples shall be used as a measure of performance or as an indicator of potential sources of cross-contamination. They will be submitted to Metro with the monitoring test results. At a minimum the following shall be included:

A. Laboratory Quality Assurance Plan

1. Shall be submitted in writing to Metro by the laboratory that will perform the sample analysis prior to the start of the field sampling program.

2. Shall include routine equipment calibration procedures to standards of known concentration on a schedule appropriate for the analytes of concern and analytical methods used.

3. Shall include sample analytical methods and results, of laboratory QC samples including blanks,

duplicates, and matrix spikes on a schedule appropriate for the analytes of concern. Water samples shall be spiked to a concentration not more than 10 times the drinking water standard (MCL).

4. Shall report percent recovery of surrogate spikes and matrix spikes in each sample analyzed for organic analytes.

5. Shall include the methods for preparing all sample containers and trip blanks. These shall be of equal or better quality to those listed in this water monitoring sampling and analysis plan.

B. Analytical Laboratory

1. Shall analyze all samples within the specified holding time limit of the analyte(s) of concern. Date of receipt and date of test will be noted on report.

2. Shall report the analytical method(s) used and the method detection limits (MDLs) or method reporting limits (MRLs)and the primary or secondary drinking water Maximum Contaminant (MCL), as applicable, with the laboratory data reports.

3. Shalll use only RCRA or EPA equipment or methods for surface and groundwater samples [SW 846 or 40 CFR 136].

4. Shall achieve Method Detection or Reporting Limits (and practical quantitation limits, if any) which must be met by laboratories participating in the EPA Contract Laboratory program.

SURFACE WATER AND ASSOCIATED SAMPLES

I. Presampling Procedure.

A. Decontamination of Equipment

1. All equipment will be decontaminated prior to use at each sampling location and after each use.

2. Non-dedicated sampling and monitoring equipment shall be decontaminated using the following procedure or equivalent: wash with a non-phosphate laboratory grade detergent; rinse with tap water and distilled water; and let air dry.

3. Sample containers shall be decontaminated according to Section II.D.

II. Sample Collection Procedure.

A. Water Column Sampling

1. Grab samples will be collected at each monitoring location at approximately 6 inches below the water surface.

2. Grab samples shall be collected in a manner which minimizes the risk that the sample will contain floating oil or debris, or water which has touched the hands, outside of the sample container, the boat, the motor, and its combustion products. Collecting the sample in an upstream direction will usually minimize the risks.

3. Chemically unstable parameters will only be measured in the field. These parameters include: temperature, specific conductance, pH, and dissolved oxygen.

B. Sediment Sampling

1. Samples shall be collected from the top six inches or less, utilizing a standard sampler. Caution shall be exerted to prevent sample contamination from the sampler.

   a. Metals - utilize plastic sampler and a decontaminated plastic spoon
   b. Organics - utilize metal sampler and a decontaminated stainless steel spoon

C. Sample Preservation

1. Sample preservation procedures shall be equivalent to groundwater preservation methods addressed in Table 1. In most cases samples should be stored in a chest of ice as soon as feasible. Maximum holding time for bacteria testing is 30 hours.

2. Any modifications to preparation and preservation of the sample for laboratory analysis will be as prescribed by DEQ.

D. Sample Containers

1. Type of sample containers used are dependent on the parameters of interest and are listed in Table 1.

2. Sample containers shall be cleaned in the laboratory using the following procedure:

   a. Bacteria test sample containers - wash with a nonphosphate detergent, rinse with tap water, rinse with distilled water, and sterilize in an autoclave or oven.

   b. Non-bacteria test sample containers - wash with laboratory grade nonphosphate detergent in hot water, rinse with tap water, distilled water, acetone, and pesticide-quality hexane.

3. Cleanliness of the sample containers will be verified by the laboratory.

E. Documentation

1. A field logbook shall be maintained as specified in Section IV, below. Measurements and procedures shall be recorded. Copies shall be submitted to Metro with laboratory sample analysis results.

III. Sample Collection Procedure - Biological Sampling

A. Fish and Invertebrate

1. Edible portions of the sample fish and the crayfish shall be removed using an acid-washed stainless steel filet knife;

2. One composite sample of at least 100 grams of tissue shall be collected for each species sample; and

3. Each sample shall be placed in a clean sample jar and frozen prior to transport and analysis at the laboratory.

IV. Chain of Custody Control Program

The tracing of the sampling methodologies, the sample possession and sample handling from the time of field collection through laboratory analysis shall be possible with the proper documentation. Elements of the program include, field logbook, sample labels, sample seals, chain-of-custody records, sample analysis, request sheet, and laboratory logbook. The documentation and chain of custody program for the surface water monitoring shall be equivalent to the well monitoring chain of custody control program, Section IV, with the omission of references to monitoring wells.

V. Field Quality Assurance/Quality Control Program

The field QA/QC program shall insure the reliability and validity of the gathered field samples and data. Elements of the program include a field quality assurance plan, transport blanks, equipment blanks, field duplicates, spiked samples, and field measurement equipment protocol. The field QA/QC program for the surface water monitoring shall be equivalent to the field QA/QC well monitoring program, section V.

VI. Laboratory Quality Assurance/Quality Control Program

The laboratory QA/QC program shall insure the reliability and validity of the sample data. The results from the QC samples shall be used as a measure of performance or as an indicator of potential sources of cross-contamination. These results will be submitted to DEQ with the surface water monitoring sample results. The laboratory QA/QC program for surface water monitoring shall be equivalent to the QA/QC well monitoring program, Section VI.

STORMWATER

I. Presampling Procedure

A. Decontamination of Equipment

1. All equipment will be cleaned prior to use at each sampling location and after each use.

2. Equipment shall be decontaminated using a procedure equivalent to the surface water decontamination procedure.

3. Sample containers shall be decontaminated according to Section II,D.

II. Sample Collection Procedure

A. Grab Samples (routinely collected)

Grab samples shall be collected beneath the water surface during the first 30 minutes of a storm. event.

B. Flow-weighted Composite Samples (if collected)

1. Shall be collected for the entire discharge or for the first three hours of discharge, whichever is less;

2. Sampling may be continuous or may be a composite of a minimum of three sample aliquots per hour of discharge; and

3. Sampling equipment will include:

a. Parshall flumes at sediment basin outlets

b. automatic proportional sampling device connected to a flow measurement device and programmed (either variable time interval or variable volume) such that the volume of one composite sample is proportional to stormwater flow during the sampling period.

C. Sample Preservation

1. Sample container types, holding times, sampling volumes, and preservation procedures shall be equivalent to groundwater preservation methods addressed in Table 1 and Table 3.

2. Maximum holding time for fecal colilform and fecal streptococcus bacteria is 30 hours[1].

D. Sample container types and methods for cleaning depend on the test parameter of interest and shall be equivalent to the type and methods utilized for surface water sample containers, Section II.D, Table 1, and Table 3.

E. Chemically unstable parameters will only be determined in the field including temperature and specific conductance as per procedures addressed in ground water monitoring sample collection, section III.A.9.

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[1]3/91, Dianna Coulter, Public Health Laboratory, OSHD, personal communication with Dennis O'Neil, Metro.

III. Chain of Custody Control Program

The chain of custody program for the stormwater monitoring shall be equivalent to the well monitoring chain of custody program, section IV.

IV. Field Quality Assurance/Quality Control Program

The field QA/QC program for the stormwater monitoring program shall be equivalent to the field QA/QC program for the well monitoring program, Section V.

V. Laboratory Quality Assurance/Quality Control Program

The laboratory QA/QC program for the stormwater monitoring program shall be equivalent to the laboratory QA/QC program for the well monitoring program, Section VI.

LEACHATE SYSTEM DISCHARGE

I. Presampling Procedure.

Sampling equipment shall be decontaminated as addressed in the surface water decontamination of equipment section, I.A.

II. Sample Collection Procedure.

Sampling procedures shall meet the City of Portland discharge permit #400-018 conditions, Schedule B (included in main text of the water monitoring plan).

A. Grab and composite samples shall be collected from Isco sampler at the landfill bridge.

B. Sample container types and methods for cleaning depend on the test parameter of interest and are similar to the type and methods utilized for surface water sample containers, Section II,D.

C. Chemically unstable parameters will be determined in the field including pH as per procedures addressed in ground water monitoring sample collection, section III.B.9, Table 1, and Table 3.

III. Chain of Custody Control Program

The chain of custody program for the leachate monitoring shall be equivalent to the well monitoring chain of custody program, Section IV.

IV. Field Quality Assurance/Quality Control Program

The field QA/QC program for the leachate monitoring program shall be equivalent to the field QA/QC program for the well monitoring program, Section V.

V. Laboratory Quality Assurance/Quality Control Program

The laboratory QA/QC program for the leachate monitoring program shall be equivalent to the laboratory QA/QC program for the well monitoring program, Section VI.

TABLE 1

SAMPLING AND PRESERVATION PROCEDURES FOR DETECTION MONITORING[a]

Parameter	Recommended Container[b]	Preservative	Maximum Holding Time	Minimum Volume Required for Analysis
Indicators of Ground-Water Contamination[c]				
pH	T, P, G	Field determined	None	~~0.25 ml~~ 100-150 ml*
Specific conductance	T, P, G	Field determined	None	~~100 ml~~ 250 ml*
TOC	G, amber, T-lined cap[e]	Cool 4°C,[d] HCl to pH <2	28 days	4 x 15 ml
TOX	G, amber, T-lined septa or caps	Cool 4°C, add 1 ml of 1.1M sodium sulfite	7 days	4 x 15 ml
Ground-Water Quality Characteristics				
Chloride	T, P, G	4°C	28 days	50 ml
Iron Manganese Sodium	T, P	Field acidified to pH <2 with HNO_3	6 months	200 ml
Phenols	G	4°C/H_2SO_4 to pH <2	28 days	500 ml
Sulfate	T, P, G	Cool, 4°C	28 days	50 ml
EPA Interim Drinking Water Characteristics				
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	T, P Dark Bottle	Total Metals Field acidified to pH <2 with HNO_3 Dissolved Metals 1. Field filtration (0.45 micron) 2. Acidify to pH <2 with HNO_3	6 months 6 months	1,000 ml 1,000 ml
Fluoride	T, P	Cool, 4°C	28 days	300 ml
Nitrate/Nitrite	T, P, G	4°C/H_2SO_4 to pH <2	14 days	1,000 ml

(Continued)

Source: RCRA Ground-Water Monitoring Technical Enforcement Guidance Document September, 1986

*Requested by DEQ

TABLE 1
(cont.)

SAMPLING AND PRESERVATION PROCEDURES FOR DETECTION MONITORING

Parameter	Recommended Container[b]	Preservative	Maximum Holding Time	Minimum Volume Required for Analysis
Endrin Lindane Methoxychlor Toxaphene 2,4 D 2,4,5 TP Silvex	T, G	Cool, 4°C	7 days	2,000 ml
Radium Gross Alpha Gross Beta	P, G	Field acidified to pH <2 with HNO_3	6 months	1 gallon
Coliform bacteria	PP, G (sterilized)	Cool, 4°C	6 hours	200 ml
	Other Ground-Water Characteristics of Interest			
Cyanide	P, G	Cool, 4°C, NaOH to pH >12. 0.6 g ascorbic acid[f]	14 days[g]	500 ml
Oil and Grease	G only	Cool, 4°C H_2SO_4 to pH <2	28 days	100 ml
Semivolatile, nonvolatile organics	T, G	Cool, 4°C	14 days	60 ml
Volatiles	G, T-lined	Cool, 4°C	14 days	60 ml

[a]References: Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, SW-846 (2nd edition, 1982).
Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.
Standard Methods for the Examination of Water and Wastewater, 16th edition (1985).

[b]Container Types:
P = Plastic (polyethylene)
G = Glass
T = Fluorocarbon resins (PTFE, Teflon®, FEP, PFA, etc.)
PP = Polypropylene

(Continued)

TABLE 1
(cont.)

SAMPLING AND PRESERVATION PROCEDURES FOR DETECTION MONITORING

[c]Based on the requirements for detection monitoring (§265.93), the owner/operator must collect a sufficient volume of ground water to allow for the analysis of four separate replicates.

[d]Shipping containers (cooling chest with ice or ice pack) should be certified as to the 4°C temperature at time of sample placement into these containers. Preservation of samples requires that the temperature of collected samples be adjusted to the 4°C immediately after collection. Shipping coolers must be at 4°C and maintained at 4°C upon placement of sample and during shipment. Maximum-minimum thermometers are to be placed into the shipping chest to record temperature history. Chain-of-custody forms will have Shipping/Receiving and In-transit (max/min) temperature boxes for recording data and verification.

[e]Do not allow any head space in the container.

[f]Use ascorbic acid only in the presence of oxidizing agents.

[g]Maximum holding time is 24 hours when sulfide is present. Optionally, all samples may be tested with lead acetate paper before the pH adjustment in order to determine if sulfide is present. If sulfide is present, it can be removed by addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.

TABLE 2
Field Standard and Sampling Spiking Solutions

Sample Type	Volume	Composition	Field Standard (Concentration)	Stock Solution for Field Spike of Split Samples: Solvent	Stock Solution for Field Spike of Split Samples: Concentration of Components	Field Spike Volume
Alkalinity	50 mL	Na^+, HCO_3^-	10.0; 25 (ppm)	H_2O	10,000; 25,000 (ppm)	(50 µL)
Anions	1 L	K^+, Na^+, Cl^-, $SO_4^{=}$ F^-, NO_3^-, $PO_4^{\equiv}$, Si	25, 50 (ppm)	H_2O	25,000; 50,000 (ppm)	(1 mL)
Cations	1 L	Na^+, K^+ Ca^{++}, Mg^{++}, Cl^-, NO_3^-	5.0; 10.0 (ppm)	H_2O, H^+ (acid)	5,000; 10,000 (ppm)	(1 mL)
Trace Metals	1 L	Cd^{++}, Cu^{++}, Pb^{++} Cr^{+++}, Ni^{++}, Ag^+ Fe^{+++}, Mn^{++}	10.0; 25.0 (ppm)	H_2O, H^+ (acid)	10,000; 25,000 (ppm)	(1 mL)
TOC	40 mL	Acetone KHP	0.2; 0.5 (ppm-C) 1.8; 4.5 (ppm-C)	H_2O	200; 500 (ppm-C) 1,800; 4,500 (ppm-C)	(40 µL)
TOX	50 mL	Chloroform 2,4,6 Trichlorophenol	12.5; 25 (ppb) 12.5; 25 (ppb)	H_2O/poly* (ethylene glycol)	12,500; 25 (ppm) 12,500; 25 (ppm)	(500 µL)
Volatiles	40 mL	Dichlorobutane, Toluene Dibromopropane, Xylene	25; 50 (ppb)	H_2O/poly* (ethylene glycol)	25; 50 (ppm)	(40 µL)
Extractables A	1 L	Phenol Standards	25; 50 (ppb)	Methanol**	25; 50 (ppm)	(1 mL)
Extractables B	1 L	Polynuclear Aromatic Standards	25; 50 (ppb)	Methanol	25; 50 (ppm)	(1 mL)
Extractables C	1 L	Standards as Required	25; 50 (ppb)	Methanol	25; 50 (ppm)	(1 mL)

*75:25 water/polyethylene glycol (400 amu) mixture.

**Glass distilled methanol.

Source: Barcelona et al., 1981.

TABLE 3

PARAMETER	RECOMMENDED CONTAINER	PRESERVATIVE	MAXIMUM HOLDING TIME	MINIMUM VOLUME
Suspended Solids	P, G	4°c	7 days	100
Biochemical Oxygen Demand	P, G	4°c	2 "	500
Chemical Oxygen Demand	P, G	4°c (H_2SO_4)	7 " (28 days)	250
Total Phosphorus	P, G	4°c (H_2SO_4)	28 "	100
Dissolved Phosphorus	P, G	4°c (filtered)	2 "	100

Appendix C. COSTS

COST PROPOSAL FORM-Summary																						
p.1/5																						
Year:									1993				1994				1995				1996	TOTAL
SUMMARY (from following pages):																						
GROUNDWATER									94,193.00				111,151.00				111,151.00				111,151.00	427,646.00
SURFACE WATER									9,226.00				9,226.00				9,226.00				9,226.00	36,904.00
STORMWATER									3,480.00				3,480.00				3,480.00				3,480.00	13,920.00
SEDIMENT SAMPLING									1,314.00				1,314.00				1,314.00				1,314.00	5,256.00
BIOLOGICAL SAMPLING									1,542.00				3,084.00				3,084.00				2,570.00	10,280.00
LEACHATE COLLECTION SYSTEM									5,677.00				11,576.00				11,576.00				11,576.00	40,405.00
TOTAL									115,432.00				139,831.00				139,831.00				139,317.00	534,411.00

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COST PROPOSAL FORM (cont)																						
p.2/5																						
						1993	1993	1993	1993	1994	1994	1994	1994	1995	1995	1995	1995	1996	1996	1996	1996	Total
		Sample			Samples/	Freq/	Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	
	Method	Points	Dupl.	Blanks	Event	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	
GROUNDWATER																						
Leachate Indicators																						
Alkalinity, CaCO3	310.1	31	3		34	1	34	8.00	272.00	2	68	8.00	544.00	2	68	8.00	544.00	2	68	8.00	544.00	1,904.00
Ammonium, HN4-N	350.3	31	3		34	1	34	10.00	340.00	2	68	10.00	680.00	2	68	10.00	680.00	2	68	10.00	680.00	2,380.00
Bicarbonate, HCO3	SM2320B	31	3		34	1	34	5.00	170.00	2	68	5.00	340.00	2	68	5.00	340.00	2	68	5.00	340.00	1,190.00
Calcium (field filtered)	6010	31	3		34	1	34	6.00	204.00	2	68	6.00	408.00	2	68	6.00	408.00	2	68	6.00	408.00	1,428.00
Carbonate, CO3 (field filtered)	SM2320B	31	3		34	1	34	5.00	170.00	2	68	5.00	340.00	2	68	5.00	340.00	2	68	5.00	340.00	1,190.00
Chemical Oxygen Demand (COD)	410.2	31	3		34	1	34	20.00	680.00	2	68	20.00	1,360.00	2	68	20.00	1,360.00	2	68	20.00	1,360.00	4,760.00
Chloride (field filtered)	00.0 or 325.3	31	3		34	1	34	8.00	272.00	2	68	8.00	544.00	2	68	8.00	544.00	2	68	8.00	544.00	1,904.00
Conductivity	120.1	31	3		34	1	34	5.00	170.00	2	68	5.00	340.00	2	68	5.00	340.00	2	68	5.00	340.00	1,190.00
Hardness, CaCO2	6010	31	3		34	1	34	5.00	170.00	2	68	5.00	340.00	2	68	5.00	340.00	2	68	5.00	340.00	1,190.00
Iron (field filtered)	6010	31	3		34	1	34	6.00	204.00	2	68	6.00	408.00	2	68	6.00	408.00	2	68	6.00	408.00	1,428.00
Magnesium (field filtered)	6010	31	3		34	1	34	6.00	204.00	2	68	6.00	408.00	2	68	6.00	408.00	2	68	6.00	408.00	1,428.00
Manganese, dissolved (field filtered)	6010	31	3		34	1	34	6.00	204.00	2	68	6.00	408.00	2	68	6.00	408.00	2	68	6.00	408.00	1,428.00
Nitrate, as N (field filtered)	00.0 or 353.3	31	3		34	1	34	12.00	408.00	2	68	12.00	816.00	2	68	12.00	816.00	2	68	12.00	816.00	2,856.00
Phosphorus, dissolved	365.3	31	3		34	1	34	10.00	340.00	2	68	10.00	680.00	2	68	10.00	680.00	2	68	10.00	680.00	2,380.00
Potassium (field filtered)	6010	31	3		34	1	34	6.00	204.00	2	68	6.00	408.00	2	68	6.00	408.00	2	68	6.00	408.00	1,428.00
Sodium (field filtered)	6010	31	3		34	1	34	6.00	204.00	2	68	6.00	408.00	2	68	6.00	408.00	2	68	6.00	408.00	1,428.00
Sulfate, SO4 (field filtered)	00.0 or 375.4	31	3		34	1	34	10.00	340.00	2	68	10.00	680.00	2	68	10.00	680.00	2	68	10.00	680.00	2,380.00
Total Dissolved Solids (TDS)	160.1	31	3		34	1	34	8.00	272.00	2	68	8.00	544.00	2	68	8.00	544.00	2	68	8.00	544.00	1,904.00
Total Organic Carbon (TOC)	415.1	31	3		34	1	34	25.00	850.00	2	68	25.00	1,700.00	2	68	25.00	1,700.00	2	68	25.00	1,700.00	5,950.00
Total Suspended Solids (TSS)	160.2	31	3		34	1	34	8.00	272.00	2	68	8.00	544.00	2	68	8.00	544.00	2	68	8.00	544.00	1,904.00
Trace Metals (total recoverable, unfiltered)	EPA 6010,	31	3		34	1	34	87.00	2,958.00	2	68	87.00	5,916.00	2	68	87.00	5,916.00	2	68	87.00	5,916.00	20,706.00
	7470, 7421																					
	7061, 7741																					
Volatile Organic Compounds - Appendix I	EPA 8260	31	3	1	35	1	35	180.00	6,300.00	2	70	180.00	12,600.00	2	70	180.00	12,600.00	2	70	180.00	12,600.00	44,100.00
Volatile Organic Compounds - Other	EPA 8260	31	3	1	35	1	35	50.00	1,750.00	2	70	50.00	3,500.00	2	70	50.00	3,500.00	2	70	50.00	3,500.00	12,250.00
Herbicides	EPA 8150	9	1	1	11	1	11	95.00	1,045.00	1	11	95.00	1,045.00	1	11	95.00	1,045.00	1	11	95.00	1,045.00	4,180.00
Pesticides/PCBs	EPA 608	9	1	1	11	1	11	100.00	1,100.00	1	11	100.00	1,100.00	1	11	100.00	1,100.00	1	11	100.00	1,100.00	4,400.00
EPA Acid/Base Neutral Priority Pollutants	EPA 8270	9	1	1	11	1	11	390.00	4,290.00	1	11	390.00	4,290.00	1	11	390.00	4,290.00	1	11	390.00	4,290.00	17,160.00
SUBTOTAL									23,393.00				40,351.00				40,351.00				40,351.00	144,446.00
PHASE II Parameters (Appendix II)*																						
Metals	6010, 7470,						60	87.00	5,220.00		60	87.00	5,220.00		60	87.00	5,220.00		60	87.00	5,220.00	20,880.00
	7421, 7061,																					
	7741																					
Cyanide	9010						60	28.00	1,680.00		60	28.00	1,680.00		60	28.00	1,680.00		60	28.00	1,680.00	6,720.00
Sulfide	9030						60	30.00	1,800.00		60	30.00	1,800.00		60	30.00	1,800.00		60	30.00	1,800.00	7,200.00
Volatile Organics (60 Analytes)	8260						60	240.00	14,400.00		60	240.00	14,400.00		60	240.00	14,400.00		60	240.00	14,400.00	57,600.00
Semivolatile Organics (103 Analytes)	8270						60	450.00	27,000.00		60	450.00	27,000.00		60	450.00	27,000.00		60	450.00	27,000.00	108,000.00
Chlorinated Pesticides/PCBs (28 Analytes)	8080						60	100.00	6,000.00		60	100.00	6,000.00		60	100.00	6,000.00		60	100.00	6,000.00	24,000.00
Chlorinated Herbicides (4 Analytes)	8150						60	95.00	5,700.00		60	95.00	5,700.00		60	95.00	5,700.00		60	95.00	5,700.00	22,800.00
Organophosphorus Pesticides (9 Analytes)	8140						60	150.00	9,000.00		60	150.00	9,000.00		60	150.00	9,000.00		60	150.00	9,000.00	36,000.00
SUBTOTAL (Phase II only)									70,800.00				70,800.00				70,800.00				70,800.00	283,200.00
SUBTOTAL (All groundwater parameters)									94,193.00				111,151.00				111,151.00				111,151.00	427,646.00

*MS/MSD for Phase II organics charged as samples for sample sets of fewer than 5 samples

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COST PROPOSAL FORM (cont)																					
p.3/5																					
						1993	1993	1993	1993	1994	1994	1994	1994	1995	1995	1995	1995	1996	1996	1996	1996	Total
		Sample			Samples/		Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	
	Method	Locations	Dupl.	Blanks	Event	Freq/yr	year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	
SURFACE WATER																					
Basics - BOD	405.1	8	1		9	2	18	20.00	360.00	2	18	20.00	360.00	2	18	20.00	360.00	2	18	20.00	360.00	1,440.00
Nutrients																						0.00
NO2-NO3		8	1		9	2	18	12.00	216.00	2	18	12.00	216.00	2	18	12.00	216.00	2	18	12.00	216.00	864.00
Total Kjeldahl Nitrogen (TKN)		8	1		9	2	18	18.00	324.00	2	18	18.00	324.00	2	18	18.00	324.00	2	18	18.00	324.00	1,296.00
Total Phosphorus		8	1		9	2	18	10.00	180.00	2	18	10.00	180.00	2	18	10.00	180.00	2	18	10.00	180.00	720.00
Dissolved Phosphorus (Available Phos.)		8	1		9	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	576.00
Bacteria																						
Enterococci Bacteria	SM9230B,	8	1		9	2	18	22.00	396.00	2	18	22.00	396.00	2	18	22.00	396.00	2	18	22.00	396.00	1,584.00
	9230C																					
Fecal Coliform Bacteria	SM9221C,	8	1		9	2	18	22.00	396.00	2	18	22.00	396.00	2	18	22.00	396.00	2	18	22.00	396.00	1,584.00
	9222D																					
Toxins-Total Halogenid Org (TOX)	9020	8	1		9	2	18	70.00	1,260.00	2	18	70.00	1,260.00	2	18	70.00	1,260.00	2	18	70.00	1,260.00	5,040.00
Leachate Indicators																						
Ammonium, NH4-N	350.3	8	1		9	2	18	10.00	180.00	2	18	10.00	180.00	2	18	10.00	180.00	2	18	10.00	180.00	720.00
Chemical Oxygen Demand (COD)	410.2	8	1		9	2	18	20.00	360.00	2	18	20.00	360.00	2	18	20.00	360.00	2	18	20.00	360.00	1,440.00
Conductivity	120.1	8	1		9	2	18	6.00	108.00	2	18	6.00	108.00	2	18	6.00	108.00	2	18	6.00	108.00	432.00
Hardness, as Ca CO3	6010	8	1		9	2	18	5.00	90.00	2	18	5.00	90.00	2	18	5.00	90.00	2	18	5.00	90.00	360.00
Total Dissolved Solids (TDS)	160.1	8	1		9	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	576.00
Total Solids	160.3	8	1		9	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	576.00
Total Suspended Solids (TSS)	160.2	8	1		9	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	576.00
Total Organic Carbon (TOC)	415.1	8	1		9	2	18	25.00	450.00	2	18	25.00	450.00	2	18	25.00	450.00	2	18	25.00	450.00	1,800.00
Leachate Indicator - Anions & Cations																						
Bicarbonate, HCO3 (field filtered)	SM2320B	8	1		9	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	576.00
Calcium, Ca (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Chloride, Cl (field filtered)	300.0	8	1		9	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	2	18	8.00	144.00	576.00
Iron, Fe (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Magnesium, Mg (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Manganese, Mn (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Nitrate, NO3-N (field filtered)	300.0	8	1		9	2	18	15.00	270.00	2	18	15.00	270.00	2	18	15.00	270.00	2	18	15.00	270.00	1,080.00
Potassium (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Silica, SiO2 (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Sodium, Na (field filtered)	6010	8	1		9	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	2	18	7.00	126.00	504.00
Sulfate, SO4 (field filtered)	300.0	8	1		9	2	18	10.00	180.00	2	18	10.00	180.00	2	18	10.00	180.00	2	18	10.00	180.00	720.00
Critical Parameters																						
Trace Metals (total recoverable, unfiltered)	6010	8	1		9	1	9	90.00	810.00	1	9	90.00	810.00	1	9	90.00	810.00	1	9	90.00	810.00	3,240.00
VOCs	EPA 8260	8	1	1	10	1	10	190.00	1,900.00	1	10	190.00	1,900.00	1	10	190.00	1,900.00	1	10	190.00	1,900.00	7,600.00
SUBTOTAL									9,228.00				9,228.00				9,228.00				9,228.00	36,904.00

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COST PROPOSAL FORM (cont)																						
p.4/5																						
						1993	1993	1993	1993	1994	1994	1994	1994	1995	1995	1995	1995	1996	1996	1996	1996	Total
		Sample			Samples/		Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	
	Method	Points*	Dupl.	Blanks	Event	Freq/yr	year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year*	Unit Cost	Cost/yr	
SEDIMENT SAMPLING																						
Total Metals	6010, 7470	4	1		5	1	5	111.00	555.00	1	5	111.00	555.00	1	5	111.00	555.00	1	5	111.00	555.00	2,220.00
	7421, 7061																					
	7741																					
PAH's	8100	4	1	1	6	1	6	145.00	870.00	1	6	145.00	870.00	1	6	145.00	870.00	1	6	145.00	870.00	3,480.00
Pesticides and PCBs	8080	4	1	1	6	1	6	140.00	840.00	1	6	140.00	840.00	1	6	140.00	840.00	1	6	140.00	840.00	3,360.00
Other																						
2,4-D	8150	4	1	1	6	1	6	115.00	690.00	1	6	115.00	690.00	1	6	115.00	690.00	1	6	115.00	690.00	2,760.00
Total Organic Carbon	STM 4129-82 M	4	1		5	1	5	30.00	150.00	1	5	30.00	150.00	1	5	30.00	150.00	1	5	30.00	150.00	600.00
Acid Volatile Sulfides (cold acid soluble)	8/91 EPA dr.	4	1		5	1	5	75.00	375.00	1	5	75.00	375.00	1	5	75.00	375.00	1	5	75.00	375.00	1,500.00
SUBTOTAL									3,480.00				3,480.00				3,480.00				3,480.00	13,920.00
BIOLOGICAL SAMPLING																						
Invertebrate																						
Mercury, Total	EPA 7471	1	0		1	1	1	25.00	25.00	1	1	25.00	25.00	1	1	25.00	25.00	1	1	25.00	25.00	100.00
Cadmium, Total	EPA 7131	1	0		1	1	1	20.00	20.00	1	1	20.00	20.00	1	1	20.00	20.00	1	1	20.00	20.00	80.00
Pesticides and PCBs	EPA 8080	1	0	1	2	1	2	150.00	300.00	1	2	150.00	300.00	1	2	150.00	300.00	1	2	150.00	300.00	1,200.00
	& 3540																					
PAH's		1	0	1	2	1	2	145.00	290.00	1	2	145.00	290.00	1	2	145.00	290.00	1	2	145.00	290.00	1,160.00
Lead, Total	EPA 7421	1	0		1	1	1	22.00	22.00	1	1	22.00	22.00	1	1	22.00	22.00	1	1	22.00	22.00	88.00
Fish Tissue																						
Mercury, Total	EPA 7471	1	0		1	1	1	25.00	25.00	1	1	25.00	25.00	1	1	25.00	25.00	1	1	25.00	25.00	100.00
Cadmium, Total	EPA 7131	1	0		1	1	1	20.00	20.00	1	1	20.00	20.00	1	1	20.00	20.00	1	1	20.00	20.00	80.00
Pesticides and PCBs	EPA 8080	1	0	1	2	1	2	150.00	300.00	1	2	150.00	300.00	1	2	150.00	300.00	1	2	150.00	300.00	1,200.00
	& 3540																					
PAH's		1	0	1	2	1	2	145.00	290.00	1	2	145.00	290.00	1	2	145.00	290.00	1	2	145.00	290.00	1,160.00
Lead, Total	EPA 7421	1	0		1	1	1	22.00	22.00	1	1	22.00	22.00	1	1	22.00	22.00	1	1	22.00	22.00	88.00
SUBTOTAL									1,314.00				1,314.00				1,314.00				1,314.00	5,256.00
STORMWATER SAMPLING*																						
Metals	6010, 7470	5	1		6	1	6	95.00	570.00	2	12	95.00	1,140.00	2	12	95.00	1,140.00	2	10	95.00	950.00	3,800.00
	7421, 7061,																					
	7741																					
Other																						
Oil & grease	413.1	5	1		6	1	6	45.00	270.00	2	12	45.00	540.00	2	12	45.00	540.00	2	10	45.00	450.00	1,800.00
Conductivity	120.1	5	1		6	1	6	5.00	30.00	2	12	5.00	60.00	2	12	5.00	60.00	2	10	5.00	50.00	200.00
COD	410.2	5	1		6	1	6	20.00	120.00	2	12	20.00	240.00	2	12	20.00	240.00	2	10	20.00	200.00	800.00
TOC	415.1	5	1		6	1	6	25.00	150.00	2	12	25.00	300.00	2	12	25.00	300.00	2	10	25.00	250.00	1,000.00
Total suspended solids	160.2	5	1		6	1	6	8.00	48.00	2	12	8.00	96.00	2	12	8.00	96.00	2	10	8.00	80.00	320.00
Total phosphorus	365.3	5	1		6	1	6	10.00	60.00	2	12	10.00	120.00	2	12	10.00	120.00	2	10	10.00	100.00	400.00
Dissolved Ortho phosphorus	365.3	5	1		6	1	6	9.00	54.00	2	12	9.00	108.00	2	12	9.00	108.00	2	10	9.00	90.00	360.00
Fecal coliform	SM9221C,	5	1		6	1	6	20.00	120.00	2	12	20.00	240.00	2	12	20.00	240.00	2	10	20.00	200.00	800.00
	92220																					
Enterococci	SM92308,	5	1		6	1	6	20.00	120.00	2	12	20.00	240.00	2	12	20.00	240.00	2	10	20.00	200.00	800.00
	9230C																					
SUBTOTAL									1,542.00				3,084.00				3,084.00				2,570.00	10,280.00

*No. of sampling points decreases to 4 in 1996.

LAB-9396.XLS

COST PROPOSAL FORM (cont)																						
p.5/5																						
						1993	1993	1993	1993	1994	1994	1994	1994	1995	1995	1995	1995	1996	1996	1996	1996	Total
		Sample			Samples/		Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	Freq/	Samples/		Total	
	Method	Locations	DupL	Blanks	Event	Freq/yr	year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	Year	Year	Unit Cost	Cost/yr	
LEACHATE COLLECTION SYSTEM MONITORING																						
Sulfide	376.2	1	0		1	3	3	25.00	75.00	12	12	25.00	300.00	12	12	25.00	300.00	12	12	25.00	300.00	975.00
Ammonia (grab)	350.3	1	0		1	3	3	12.00	36.00	12	12	12.00	144.00	12	12	12.00	144.00	12	12	12.00	144.00	468.00
Cadmium (composite)	6010	1	0		1	2	2	10.00	20.00	4	4	10.00	40.00	4	4	10.00	40.00	4	4	10.00	40.00	140.00
Chromium, Total (composite)	6010	1	0		1	2	2	10.00	20.00	4	4	10.00	40.00	4	4	10.00	40.00	4	4	10.00	40.00	140.00
Copper (composite)	6010	1	0		1	2	2	10.00	20.00	4	4	10.00	40.00	4	4	10.00	40.00	4	4	10.00	40.00	140.00
Lead (composite)	7421	1	0		1	2	2	12.00	24.00	4	4	12.00	48.00	4	4	12.00	48.00	4	4	12.00	48.00	168.00
Nickel (composite)	6010	1	0		1	2	2	10.00	20.00	4	4	10.00	40.00	4	4	10.00	40.00	4	4	10.00	40.00	140.00
Zinc (composite)	6010	1	0		1	2	2	10.00	20.00	4	4	10.00	40.00	4	4	10.00	40.00	4	4	10.00	40.00	140.00
Sulfate (composite)	300.0	1	0		1	1	1	12.00	12.00	2	2	12.00	24.00	2	2	12.00	24.00	2	2	12.00	24.00	84.00
Mercury (composite)	7470	1	0		1	1	1	25.00	25.00	2	2	25.00	50.00	2	2	25.00	50.00	2	2	25.00	50.00	175.00
Fats, oils, and grease (grab)	413.1	1	0		1	1	1	45.00	45.00	2	2	45.00	90.00	2	2	45.00	90.00	2	2	45.00	90.00	315.00
TTO (grab)	608/624/625	1	0	1	2	2	4	940.00	3,760.00	4	8	940.00	7,520.00	4	8	940.00	7,520.00	4	8	940.00	7,520.00	26,320.00
Acetone		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Aniline		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Butyl Acetate		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Formaldehyde		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Methyl Ethyl Ketone		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Methyl IsoButyl Ketone		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Pyridine		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Styrene		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
Xylene(s)		1	0	1	2	2	4	50.00	200.00	4	8	50.00	400.00	4	8	50.00	400.00	4	8	50.00	400.00	1,400.00
SUBTOTAL									5,677.00				11,576.00				11,576.00				11,576.00	40,405.00
TOTAL									115,432.00				139,831.00				139,831.00				139,317.00	534,411.00

SOLID WASTE COMMITTEE REPORT

CONSIDERATION OF RESOLUTION NO. 93-1850, FOR THE PURPOSE OF AUTHORIZING THE EXECUTIVE OFFICER TO ENTER INTO A CONTRACT WITH AMTEST INC. FOR LABORATORY SERVICES FOR ST. JOHNS LANDFILL

Date: October 6, 1993 Presented by: Councilor Washington

Committee Recommendation: At the October 5 meeting, the Committee voted unanimously to recommend Council adoption of Resolution No. 93-1850. Voting in favor: Councilors McFarland, McLain, Washington and Wyers.

Committee Issues/Discussion: Jim Watkins, Solid Waste Engineering and Analysis Manager, noted that Metro must provide provide a variety of water monitoring and testing programs at the St. Johns Landfill to comply with the provisions of a DEQ-approved water monitoring plan. Under this plan, Metro employees gather the water samples, which then must be analyzed by a laboratory.

The purpose of this resolution is to contract with Amtest for the laboratory analysis work that must be performed under the plan. Metro issued an RFP for this work and 17 proposals were received. Using a laboratory evaluation system developed by the federal EPA, the number of proposals was narrowed to four, and Amtest was selected from this group. The contract will run for 3 1/2 years, until the completion of the major closure work at the landfill.

The cost of the work will be significantly less than had been projected. The department had originally estimated the total cost of the work at about $700,000 and $200,000 was budgeted for the current fiscal year. Watkins now estimates that the cost for this year to be about $120,000 and about $140,000 in subsequent years.